

Applicant: **Stewart, Heather**  
Organisation: **British Geological Survey**  
Funding Sought: **£77,751.00**

**DPR7P\100047**

**HOT: Hadal zones of our Overseas Territories**

## PRIMARY APPLICANT DETAILS

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**Title** Ms  
**Name** Heather  
**Surname** Stewart  
**Organisation** British Geological Survey  
**Website (Work)**

**Tel (Work)**  
**Email (Work)**  
**Address**

## Section 1 - Contact Details

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### PRIMARY APPLICANT DETAILS

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**Title** Ms  
**Name** Heather  
**Surname** Stewart  
**Organisation** British Geological Survey  
**Website (Work)**

**Tel (Work)**  
**Email (Work)**  
**Address**

### GMS ORGANISATION

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<b>Type</b>	<b>Organisation</b>
<b>Name</b>	British Geological Survey
<b>Phone</b>	
<b>Email</b>	
<b>Website</b>	
<b>Address</b>	

### Q3. Lead organisation type

Please select one of the below options.

UK Government

## Section 2 - Title, Dates & Budget Summary

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### Q4. Project title

HOT: Hadal zones of our Overseas Territories

### Q5. Project dates

**Start date:**

01 April 2019

**End date:**

31 March 2021

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

2 years

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### 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:**

N/A

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

N/A

### Q7. Budget summary

Year:	2019/20	2020/21	2021/22	Total request
<b>Q7a. Request from Darwin:</b>	£41,838.00	£35,913.00	<i>No Response</i>	<b>£</b> 77,751.00

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**Q7b. Proposed (confirmed and unconfirmed) co-financing as % of total project cost**      100% Y1; 15% Y2

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## Section 3 - Lead Organisation Summary

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### Q8. Lead organisation summary

**Please provide the following information on the lead organisation**

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

The British Geological Survey (BGS) is not a registered company in the usual sense. The Survey was first established in 1835 under the British Government's Board of Ordnance, but was not separately covered by legal statute until the passing of the Geological Survey Act of 1845. In 1965 the BGS became a component part of the Natural Environment Research Council (NERC), a Non-Departmental Public Body. In April 2018 all seven Research Councils, including NERC, were brought together under the UK Research and Innovation (UKRI) – a non-departmental body sponsored by the Department for Business, Energy and Strategy (BEIS). Therefore, our legal entity since April 2018 is the United Kingdom Research and Innovation as represented by the British Geological Survey.

**What is the legal status of your organisation?**

Government

**How is your organisation currently funded?**

The BGS annual turnover is in the region of £45m, about 50 per cent of which comes from NERC's Science Budget, with the remainder coming from commissioned research from the public and private sectors.

**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:**

As a Government Agency we are not required to submit audited accounts. However, for reference, our most recent accounts were prepared at the level of our then parent body (NERC), and these can be found at the links given below.

<https://www.gov.uk/government/publications/nerc-annual-report-and-accounts-2017-to-2018>

<https://www.gov.uk/government/publications/nerc-annual-report-and-accounts-2016-to-2017>

<https://www.gov.uk/government/publications/nerc-annual-report-and-accounts-2015-to-2016>

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

No

**If no, provide details of 3 contracts previously held by your institution that demonstrate your credibility as an implementing organisation. These contracts should have been held in the last 5 years and be of a similar size to the grant requested in this application.**

<b>Contract/Project 1 Title</b>	Lough Neagh, Resource Survey, Northern Ireland
<b>Contract Value/Project budget (include currency)</b>	
<b>Duration (e.g. 2 years 3 months)</b>	3 months (01/7/2015 to 01/10/2015)
<b>Role of organisation in project</b>	IHO Special Order Multibeam echosounder data acquisition, all H&S and RA for fieldwork, post-cruise data processing to IHO Special Order, assessment of seafloor substrate and resource assessment, presentation to client, data upload to UK Government INSPIRE data portal.
<b>Brief summary of the aims, objectives and outcomes of the project</b>	<p>Survey work was carried out by the British Geological Survey (BGS) in Lough Neagh, Northern Ireland on behalf of the Sander Traders Association. A high-resolution bathymetric and seismic survey was undertaken using the survey vessel 'White Ribbon'. The aim was to determine the extent of current dredged areas and provide the data required for a resource assessment.</p> <p>The British Geological Survey conducted a full coverage, high density multibeam survey using our vessel the White Ribbon and its Kongsberg EM3002D multibeam system. Water depths were extremely shallow, ranging from 1-20m. These data were required for an Environmental Impact Assessment, to be submitted by the Sand Traders Association, in application for the continued dredging of the Lough. The data BGS has provided has formed the basis of case. The bathymetric data allowed precise locations for sampling (drill &amp; grab) to be precisely determined, enabling BGS geologists to provide accurate resource assessments.</p>
<b>Client/independent reference contact details (Name, e-mail, address, phone number)</b>	
<b>Contract/Project 2 Title</b>	European Marine Observation and Data Network (EMODnet) 3 Geology
<b>Contract Value/Project budget (include currency)</b>	
<b>Duration (e.g. 2 years, 3 months)</b>	2 years (2017-2019)

**Role of organisation in project**

The BGS were active in establishing the European Marine Observation and Data Network (EMODNET), which is a large European-Commission funded partnership to synthesise marine data and geospatial products, and to make this information freely available. The BGS served as the lead coordinating organisation in the previous phase of EMODNET (2013-2016), and in this phase (2018-2019) serve as task leaders on Submerged Landscapes. We however contribute geospatial data and map-products to all Geology work-packages (e.g. seafloor geomorphology).

**Brief summary of the aims, objectives and outcomes of the project**

Review and update geological mapping for the United Kingdom marine areas, in coordination with European partners, to produce harmonised mapping across national boundaries. Map types include Quaternary Geology, Seabed Sediments, Bedrock Geology, Coastal, and Palaeolandscapes. <https://www.emodnet-geology.eu/>

Thorsnes, T., et al., 2018. National Programmes: Geomorphological Mapping at Multiple Scales for Multiple Purposes. In *Submarine Geomorphology* (pp. 535-552). Springer, Cham.

Stevenson, A., 2012. The European marine observation and data network: geological data. *Baltica*, 25(1), pp.87-90.

**Client/independent reference contact details (Name, e-mail, address, phone number)****Contract/Project 3 Title**

IODP Expedition 357 Atlantis Massif

**Contract Value/Project budget (include currency)****Duration (e.g. 2 years, 3 months)**

2 years planning, offshore 45 days, onshore 3 weeks and then moratorium 1 year post onshore. Our role in the project finished September 2017.

**Role of organisation in project**

BGS are responsible for the operation of the project. This ranges from issuing tenders and undertaking contract negotiations to providing project management, data management, drilling supervision, and all laboratory facilities and technical staff for the project.

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**Brief summary of the aims, objectives and outcomes of the project.**

The aims of the project were to investigate the role of serpentinisation in driving hydrothermal systems, to characterise tectonomagmatic processes working in the area, and also assess how microbiological factors affect the overall ecosystem processes and changes with variations in rock type and progressive exposure on the seafloor.

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**Client/independent reference contact details (Name, e-mail, address, phone number).**

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## Section 4 - Project Partners

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### 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:** British Geological Survey

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

**Role:**

Our role is to process and analyse data acquired from the South Sandwich Trench. We will engage with the South Georgia and South Sandwich Islands (SGSSI) Government in order to disseminate the findings from this project so they can inform management of the existing Marine Protected Area (MPA).

**Responsibilities:**

Project Management - Heather Stewart has worked at the BGS since 2001 and has managed and delivered complex projects (e.g. JNCC SAC deep-water surveys, Shell technology innovation). HS will run the project and oversee data processing (Rhys Cooper) and undertake analysis and mapping of these data (with Dayton Dove).

Data Acquisition, Processing and Interpretation - Staff named here have a proven track record in hydrographic survey, sampling and post-cruise data processing. Furthermore, geoscientists named here, specialise in characterising the seafloor geology and shallow sub-seafloor, and are recognised internationally in developing innovative mapping and classification approaches (see CVs).

Project dissemination - HS will coordinate with partners at Newcastle University and SGSSI Government to ensure project outputs inform MPA management.

Data Archiving and Open Access - The BGS are the accredited Data Archive Centre for geology and geophysics and are active participants in the UK Marine Environment Data and Information Network (MEDIN).

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

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**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:** Newcastle University

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**Website address:** [www.ncl.ac.uk](http://www.ncl.ac.uk)

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

**Role:**

Dr Alan Jamieson from Newcastle University has co-designed this project with Heather Stewart. Dr Jamieson is an essential project partner as he leads data acquisition for this project in his role as Chief Scientist on the expedition (scheduled January 2019, funded by private initiative). Dr Alan Jamieson is one of the very few people in the world with the experience in operations at hadal water depths. Dr Jamieson and his team have unique expertise in hadal technology, ecology, biochemistry and modelling.

**Responsibilities and Engagement:**

Dr Jamieson and his team will engage in this project by:

- Acquisition of data from the South Sandwich Trench in Q1 of 2019 (Lead PI on application is Dr Jamieson);
- Participate on the Project Board;
- Contribute information on marine biodiversity of the South Sandwich Trench (funding applied for elsewhere);
- Project dissemination, and utilising project outputs to inform MPA management.

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

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

No

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

 **Combined PDF**

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## Section 5 - Project Staff

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### 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?
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Heather Stewart	<b>Project Leader</b>	20%	Checked
Dayton Dove	Seafloor and habitat mapping, modelling	10%	Checked
Rhys Cooper	Hydrographic Data Processor, internal project reviewer.	5%	Checked
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	Unchecked

**Do you require more fields?**


No

**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.**

 **Combined CVs SouthSandwich**

 03/09/2018

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 pdf 466.2 KB

**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.**

HOT: Hadal zones of our Overseas Territories is a multi-disciplinary program that will deliver a step-change in our understanding of the fundamental ecological and geological processes in the South Sandwich Trench (SST). The SST reaches water depths of around 8100m and uniquely is the only sub-zero hadal environment on Earth. This project will improve understanding of marine biodiversity and geodiversity to fill an identified knowledge gap supporting the existing Marine Protected Area and obligations under the Convention of Biological Diversity.

### 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?**

The South Georgia and the South Sandwich Islands Marine Protected Area (MPA) is one of the largest MPAs

on Earth covering >1 million km<sup>2</sup> and includes the South Sandwich Trench (SST). Predicting trench habitats and their fauna cannot be extrapolated from shallower systems as they exhibit stark ecotones and abrupt changes in geology, making MPA management at depths >6000m at best difficult. The MPA is designed to ensure the protection and conservation of the region's rich and diverse marine life, whilst allowing sustainable and carefully regulated fisheries. Key outcomes of the 5-year review of the MPA (November 2017) included: a need to enhance bathymetric knowledge around the region; recognition there is a lack of data on the deep-water/midnight zone ecosystem; that more information is needed on assemblages versus biodiversity, ecosystem processes and function; and general information on how to record long-term change to factors such as climate change.

This project will improve understanding of marine biodiversity and geodiversity to fill the current knowledge gap in the ultra-deep-sea area of the SST. This will support the existing MPA and meet obligations under the Convention of Biological Diversity (CBD). These areas are a known data gap identified during the 2017 MPA review.

## 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.**

### Fieldwork

Data acquisition within the SST will take place in January 2019 (PI: Dr Jamieson, Newcastle University). It is anticipated that high-resolution multibeam echosounder acquisition will be undertaken along the axis of the trench using an EM124 system. 50cm sediment push cores, geological samples and ultra-high definition video and photographic transect data will be acquired using a bespoke 2-man submersible at sites identified by Dr Jamieson and H. Stewart pre-cruise.

### Seafloor Mapping/Geohazard Assessment (BGS)

Accurately describing the physical character of the seafloor is important for understanding the diversity, distribution and community structure of marine ecosystems, and allows for the identification of past environmental change, and the assessment of natural hazard risk.

To achieve this we will:

- Process data acquired in January 2019 [R. Cooper, H. Stewart]. The high-resolution data will provide high-resolution bathymetry (water depth), and backscatter (proxy for seafloor texture and hardness) data (weather permitting as backscatter data is known to deteriorate due to poor sea states whereas water depth information is more resilient in marginal conditions).
  - o Grids of the processed data made available to project partners, uploaded to MEDIN DAC after moratorium.
- Process physical samples and seafloor video data acquired using suite of newly developed hadal landers [H. Stewart, D. Dove].
  - o Sediment cores will be x-rayed, tested for physical properties and X-ray Fluorescence (XRF).
  - o Sediment cores will be analysed for particle size distribution (PSD) and sedimentation rates (calculated using Pb210).
  - o Photographic and video imagery will be analysed for changes in substrate.
- Substrate mapping and geohazard assessment.
  - o Geospatial analysis of seafloor morphology and composition using range of methodologies, including automated feature detection [D. Dove, H. Stewart];
  - o Produce products of several key seafloor metrics (e.g. rugosity) together with classified maps (e.g. 'hard

substrate' extent, and seafloor geomorphology [e.g. identifying erosional areas, submarine landslides, fault escarpments]) [H. Stewart].

o If possible, use the above data to examine possible mechanisms of slope failure and deformation to identify potential earthquake and tsunami hazards [D. Dove].

Biodiversity (Newcastle University)

Samples and in situ data for biodiversity will be taken for infauna (sediment cores), epifauna (submersible collection and video) and demersal fauna (baited traps and video). The physical voucher specimens will be used for taxonomic purposes and the in situ data used for density and distribution analyses.

Comprehensive genetic sequencing analysis will take place post-cruise. Additionally, the SST is the only sub-zero hadal environment on Earth, making it an ideal site to examine isolation as a driver for biodiversity and distinguish the effects of pressure and temperature across the abyssal-hadal transition zone, concurrently allowing comparison with other trench systems to elucidate the significance and uniqueness of the SST MPA communities. All BGS analysis will feed into this work providing a context for those findings.

Dissemination of results and outreach

- Support the GSGSSI via delivery of project results via data, reports and presentations to ensure the results of this project inform the future MPA review and feed into their Research and Monitoring Plan (see 2017 review).

**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.**

*No Response*

## Section 7 - Objectives, Stakeholders & Sustainability

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### 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)**

The primary objective aim is to determine the morphology of the seafloor using multibeam echosounder bathymetry and backscatter data and geological samples. These data, interpretations (e.g. hard substrate, seafloor geomorphology, assessment of geohazards) and derived layers (e.g. slope and rugosity) underpin a range of marine biodiversity and geodiversity research and will support ecosystem assessment (undertaken collaboratively with Newcastle University) and MPA management.

Delivery of Policy Priorities:

Successful delivery of this project will provide information on the following key priorities:

- Improve understanding of marine biodiversity and geodiversity to fill the current knowledge gap in the SST in support the existing MPA and meet obligations under the Convention of Biological Diversity (CBD). A known data gap identified during the 2017 MPA review.
- Delivery of information on past earthquake and tsunami to inform potential future geohazard

identification;

- This project will contribute to Objectives 3 and 5 of the Biodiversity Action Plan for South Georgia & the South Sandwich Islands 2016-2020.

o <http://www.gov.gs/docsarchive/Environment/NBAP/SGSSI%20NBAP%202016-2020.pdf>

- Implementation of approaches that could be used in the only other hadal zone within UK jurisdiction (Puerto Rico Trench) where the British Virgin Islands (BIV) and Anguilla have offshore exclusive economic zones and as yet no protection or conservation policies in place for the deep ocean.

Impact:

Even with the recent data compilation exercises undertaken by both the BAS and IBCSO, there is very little high-resolution data available to robustly analyse from the SST where even the maximum water depth is currently unknown. This project will acquire, for the first time, high-resolution acoustic data and geological samples from the abyssal hadal transition to full ocean depth to produce data baseline seafloor substrate maps (geohazard, morphology and composition) underpinning ecosystem science for better-informed management of MPAs.

Technical Excellence:

This study will utilise samples acquired using state-of-the-art new technology in the form of a suite of newly designed hadal technology used by Newcastle University and the newly released Kongsberg EM124 multibeam echosounder system. As well as proven techniques and established standards during interpretation, if data quality allows, novel automated classification of acoustic data will also be undertaken which the project partners have published in peer review literature previously.

Risk:

In the current project, risk is highly limited in that the data will have been acquired approximately 2 months before the start of the project therefore an assessment of whether the data is fit for purpose to deliver the project objectives can be communicated to the funding agency ahead of the project start date.

## 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.**

Newcastle University's Dr Jamieson will lead the data acquisition cruise on which BGS will consult. Dr Jamieson's research group will be leading on the biodiversity and ecology research, complementary to this project, which will be funded elsewhere. Dr Jamieson will sit on the project board monitoring progress, meet with the HOT project team 4 times a year and review outputs.

The SGSSI Government has been consulted regarding this proposal and a letter of support has been supplied. A kick off meeting in April 2019 will be held via video conference with the SGSSI Government to discuss their needs, anticipated project outcomes and to ensure that the project delivers fit-for-purpose information for management of the MPA. A project update will be supplied at the end of Y1 with delivery of project report, relevant information and data, and presentations at the end of Y2.

Two members of the MPA review workshop (Dr Martin Collins and Dr Susie Grant) will be contacted and also asked to participate in the project kick off meeting. Thus ensuring this project fully engages with the previous MPA review.

## Q17. Institutional Capacity

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

### Offshore Data Acquisition

BGS marine scientists have extensive experience in managing and operating hydrographic surveys, from small coastal surveys to large-vessel operations. Trained hydrographic surveyors have experience in both academic and commercial projects, and our lead surveyor (Rhys Cooper) is active in developing internationally recognized best-practice data processing routines.

### Seafloor Substrate and Habitat

Several marine geoscientists within BGS specialise in characterising the geology of the seafloor and shallow sub-seafloor, and are recognized internationally in developing innovative mapping and classification approaches (e.g. Diesing et al., 2015; Dove et al, 2017). With regards to marine ecosystems, their experience includes applying this information to help delimit MPA boundaries within the UK (e.g. the Mapping European Seafloor Habitats (MESH) project (Davies et al., 2014, Stewart et al., 2014), working with the Joint Nature Conservation Committee on deep-water Special Area of Conservation work Stewart et al., 2007, Stewart et al., 2009) and hard substrate mapping (Joint Nature Conservation Committee).

More recently collaboration with Newcastle University on the largest lander derived dataset acquired within hadal trenches has resulted in new insights into the relationship between the morphology of these areas and associated hadal fauna Stewart and Jamieson (2018). Ongoing projects on the Peru-Chile (Atacama) Trench and South Shetland Trench (e.g. Stewart and Jamieson 2017) are furthering our knowledge of these relatively unexplored areas.

This work is presented in relevant project-reports, policy documents, and peer-reviewed literature (see CV's).

### Biodiversity (funded by another agency to run concurrently with this project)

Dr Jamieson's research has brought about a step-change in our understanding of hadal science including discovery of the deepest fish alive in 2008, the deepest fish in the Southern Hemisphere, leading research that demonstrated that fish may be biochemically constrained from reaching full ocean depth and the presence of Persistent Organic Pollutants (Jamieson et al. 2018) within amphipods from the deepest places of the planet. Dr Jamieson has garnered significant media coverage from his ground-breaking research including featuring on documentaries, live news broadcasts and presenting at the 2017 New Scientist Live. <https://www.ncl.ac.uk/nes/staff/profile/alanjamieson.html#background>

Dr Jamieson is leading the data acquisition expedition and is currently in contact with SGSSI Government regarding this. Dr Jamieson has a research team and funding sourced in order to undertake this body of research therefore is fully committed to engage with this proposal.

## **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?**

Interpretations and products from this project will be made available to the SGSSI Government and their stakeholders to ensure they contribute to their effective management of the MPA. This project is a unique opportunity to acquire knowledge from a known data gap in our understanding of the MPA identified during a review. Findings will be published (open access) and data uploaded to the relevant databases at the end of the project.

Implementation of approaches that could be used in the only other hadal zone within UK jurisdiction

(Puerto Rico Trench) where the British Virgin Islands (BIV) and Anguilla have offshore exclusive economic zones and as yet no protection or conservation policies in place for the deep ocean. This work provides proof of concept and framework should those UK OT Governments wish to construct an application for MPA. Furthermore, our project partners at Newcastle University will also be acquiring new data from the Puerto-Rico Trench in 2019 which may form the basis of a future funding application following discussion with the relevant stakeholders.

## Section 8 - Funding and Budget

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### 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-under-100k-Sout](#)

[h-Sandwich](#)

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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)**

The biggest expense is of course offshore data acquisition. Given that this has been funded through private sponsorship this is the single biggest co-financing listed in the project. The cost of a 4 week data acquisition cruise complete with associated technological and scientific complement is approximately £500,000. It has been agreed, through Dr Jamieson and that agency that the data will be made available to the project team for the start of this project.

Furthermore the BGS have provided in kind contributions of staff time for David McInroy in his role as



project reviewer and as part of the monitoring and evaluation plan, and funding to cover conference attendance to disseminate results from this project in 2020.

### 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
No Response	No Response	No Response	No Response	No Response
No Response	No Response	No Response	No Response	No Response
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.**

N/A

**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?**

Heather Stewart is an experienced project manager with expenditure and procurement continuously monitored and supported by qualified accountants within BGS. BGS as a public body adheres to UK Government Treasury guidelines. Heather will report to her Team Leader and Science Director who will review the project accounts independently with BGS Accountants on a quarterly basis.

The BGS is a non-departmental public body, part of the Natural Environment Research Council (NERC), responsible to the United Kingdom Research and Innovation (UKRI) and to the Department for Business, Innovation and Skills. NERC and UKRI, being publicly funded bodies, are subject to the scrutiny of the National Audit Office with their accounts presented to the UK Parliament annually. The accounts are publically available online. There are strict procurement regulations and formal approvals required by the PM before procurement or travel and subsistence are purchased and these are administered by UKSBS, as dictated by BEIS.

## 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 BGS is a non-departmental public body subject to UK Government Treasury Department accounting and audit procedures. As such it is not incorporated according to UK company law and therefore cannot be declared bankrupt or have its affairs administered by a court.

The BGS operates under a UKRI policy regarding fraud, based on The Fraud Act 2006. The Chief Executive, as Accounting Officer, is formally responsible for ensuring that reasonable and effective controls exist to prevent and detect fraud. In conjunction with this Policy, UKRI has defined a clear Fraud Response Plan, which will be followed in all cases. This covers the conduct of a formal investigation, which will accord with both the tenets of prevailing legal jurisdiction and laid down internal procedures, and subsequent reporting to both the Department for Business, Energy and Strategy (BEIS) and the NERC's Audit Committee. The BGS also operates under the UKRI policy regarding bribery, which is based on the Bribery Act 2010. Both policies cover actions by staff and contractors, and those in a contractual or commercial relationship with Innovate UK (UKRI).

## 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 biggest potential cost to the project is offshore data acquisition. Given that this has been funded elsewhere with fieldwork scheduled for January 2019, during the optimum weather window for the study area, the best value for money is that the data will be handed to the project team for the start of this project.

In calculating the budget we used experience from previous projects to determine realistic costs for staff to process, analyse and interpret the data required to address our project objectives. Calculated travel and subsistence based on 'receipted actuals', overhead costs were then calculated, as well as aspects like Monitoring and Evaluation. We then included further activity-specific costs such as laboratory analysis.

The BGS will be supplying in-kind contributions of internal review of project progress and budgetary considerations (D. McInroy, T. Shimmield, M. Christie) every 3 months. Furthermore, the project lead has identified a value for money laboratory to undertake PSA at a fraction of commercial cost (commercial rates per sample quoted £65 per sample compared to £5.60). HS will also make use of the new core logging facilities at the BGS installed in 2018 which includes state-of-the-art core loggers from GeoTek Ltd.

## 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.**

We anticipate a number of peer reviewed scientific publications. We will aim for at least one high profile synthesis publication. Specialized papers will follow, as will presentations at national and international professional meetings [international travel and conference line items in the project budget for GeoHab in 2020]. Open Access budgetary line covers costs for 1 synthesis paper with other publications funded by the

partner organisations after the completion of the project taking account of timelines for submission, review through to publication.

Acoustic and sample data will be made publicly available as part of the MEDIN compliant DAC which the BGS is DAC for geological data. Bathymetry data will be uploaded to public repositories such as Global Multi-Resolution Topography (GMRT) and the National Oceans and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI). The funders for the offshore data acquisition will dictate the timeline for this.

Relevant outputs will be made available to the SGSSI Government and their stakeholders to inform the next 5-year MPA review.

## 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

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### 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:

There is a step-change in our understanding of the fundamental ecological and geological processes in the South Sandwich Trench to support the existing MPA and meet obligations under the CBD.

**Project Summary**

**Measurable Indicators**

**Means of Verification**

**Important Assumptions**

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<p><b>Outcome:</b></p> <p>The Government of South Georgia and South Sandwich Islands have information on geodiversity and biodiversity to successfully support management of their Marine Protected Area.</p>	<p>0.1 Effective liaison with Project Partners and key Stakeholders;</p> <p>0.2 Data quality and coverage suitable to make meaningful assessments</p> <p>0.3 Successful data analysis and project reporting;</p> <p>0.4 Effective dissemination of results and conclusions.</p>	<p>0.1 Project Partners and Stakeholders are engaged effectively with clear guidance on what they require for management purposes;</p> <p>0.2 The January 2019 cruise is successful;</p> <p>0.3 Project outputs are meaningful not only scientifically but fit-for-purpose regards to MPA management;</p> <p>0.4. Project partners and stakeholders satisfied with outputs and dissemination of results.</p>	<p>0.1 Project Partners keen to participate in the project.</p> <p>0.2 The January 2019 cruise is successful.</p> <p>0.3 Data of suitable quality and project participants have suitable training and expertise.</p> <p>0.4 Reporting completed on time, continue good engagement with relevant stakeholders.</p>
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<p><b>Output 1:</b></p> <p>1. Stakeholders identified and engaged with by project team.</p>	<p>1.1 Minimum 2 external stakeholders contacted and engaged with.</p> <p>1.2 Meeting held (virtual or in person) with identified stakeholders in Y1 at project start.</p> <p>1.3 Meeting held (virtual or in person) with stakeholders in Y2 at end of project</p> <p>1.4 Interpretations and outputs fed into the MPA management and review process.</p>	<p>1.1 Receive positive feedback from stakeholders SGSSI Government, Cefas (Martin Collins), BAS (Susie Grant), Alan Jamieson (Newcastle).</p> <p>1.2 Meeting takes place before April 2019 (Y1).</p> <p>1.3 Meeting takes place between January 2021 and March 2021.</p> <p>1.4 During the next MPA review the data gap from the SST is in part or in full addressed and key findings from this project are incorporated.</p>	<p>Stakeholders are willing to engage with the project team.</p> <p>We have something relevant to feed into the ongoing MPA process.</p>
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<p><b>Output 2:</b></p> <p>2. Acquisition of high-resolution acoustic data, geological and biological samples from the abyssal hadal transition to full ocean depth.</p>	<p>2.1 High-resolution multibeam echosounder data delivered to the project partners.</p> <p>2.2 Sediment cores, physical samples, biological samples delivered to the project partners.</p>	<p>2.1 Data received by 31st March 2019.</p> <p>2.2 Data received by 31st March 2019.</p>	<p>The January 2019 cruise is successful.</p>
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<b>Output 3:</b> 3. GIS Database with environmental layers and maps of seafloor substrate, geomorphology and derived layers.	3.1 Acoustic data is of suitable resolution and quality for derivative layer production, interpretation, automated feature classification.	3.1 Experienced BGS data processors (UKHO accredited) process the data successfully and marine geologists can manipulate the data within ArcGIS to derive the layers and maps of interest by September 2019.	The data is of suitable quality and fit for purpose.
<b>Output 4:</b> 4. Knowledge of the geodiversity and biodiversity of this hitherto unexplored hadal zone.	4.1 Project managed from inception to conclusion. 4.2 Papers published in peer-reviewed journals. 4.3 Findings presented to the Stakeholders who feed into the MPA process. 4.4 Findings presented at conferences. 4.5 Findings incorporated into marine guide anticipated to be published by the SGSSI as per their Biodiversity Action Plan.	4.1 Project board (2 BGS internal reviewers; BGS accounts/contracts representative; Alan Jamieson at Newcastle University) meet every 3 months to review progress and monitor barriers to progress. 4.2 Papers published in peer-reviewed journals. 4.3 During the next MPA review the data gap from the SST is in part or in full addressed and key findings from this project are incorporated. 4.4 Minimum 2 conference presentations. 4.5 Guide published that includes the hadal zone.	The project hits no insurmountable barriers. The data and findings are of suitable for publication in peer-review journals or presenting at conferences etc.
<b>Output 5:</b> 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. Stakeholder Engagement:
  - 1.1. Kick off Meeting between GSGSSI, project participants, project partners and identified stakeholders at BAS and Cefas.
  - 1.2. Identification of key information and data gaps against which to report.

- 1.3. Knowledge transfer and project dissemination plan between project team and stakeholders.
2. Data Preparation Phase:
  - 2.1. Multibeam echosounder data processed (bathymetry and backscatter intensity) and best resolution grids produced.
  - 2.2. Bathymetric derivatives (e.g., rugosity, bathymetric position index) at best resolution possible produced.
  - 2.3. Produce equivalent bathymetry derivatives for the regional, publically available data (e.g. GMRT) to infill data gaps and produce seamless map over large geographic coverage.
  - 2.4. Physical samples analysed in laboratory all video data analysed.
  - 2.5. All data delivered to project partners.
3. Interpretation Phase:
  - 3.1. Produce seafloor substrate, geomorphology maps.
  - 3.2. If possible, use the above data to examine possible mechanisms of slope failure and deformation to identify potential earthquake and tsunami hazards.
4. Project Reporting and Analysis:
  - 4.1. Project board meetings held on schedule every 3 months to monitor progress against project implementation timetable and the monitoring and evaluation plan.
  - 4.2. Project report writing and synthesis documents.
  - 4.3. GIS database made available to stakeholders on project completion, and publicly available (via open-access portal) after moratorium.
  - 4.4. Knowledge transfer (refer back to plan constructed at project kick-off) between project team and stakeholders.
  - 4.5. Conference presentations, overview paper produced.
  - 4.6. Darwin project reporting completed on time and to specification.
  - 4.7. Follow on proposals.

## Section 11 - Implementation Timetable

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### **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.**

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↓ [darwin-plus-round7-implementation-timeta](#)

[ble-SouthSandwich](#)

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## 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.**

Management and Coordination

Overall management of the project will be undertaken by H. Stewart with support from BGS senior staff and accounting officers.

Within the project we will use the Logical Framework to monitor and evaluate the progress of the project in accordance with the Implementation Timetable. We will report on our progress, and adapt as necessary (e.g. delays at laboratories, problems with the data during processing, ill health of staff). Significant challenges will be anticipated/identified at an early juncture and contingency strategies implemented. In addition to the Darwin Logical Framework and Implementation timetable, we will also utilise a BGS in-house tracking system with a traffic light method of monitoring progress.

Our Monitoring and Evaluation Plan includes:

- 1) Project Board meetings every 3 months (Stewart, Cooper, Dove, Christie, Jamieson). The people involved will report on progress and these meetings will be documented.
- 2) The clearly defined deliverables (Logical Framework and Implementation Timetable) will be circulated to all project participants and % completeness will be discussed, milestones logged as traffic light system (i.e. used to track progress i.e. on schedule/complete, behind schedule, barriers to progress, contingencies implemented / resources diverted, prioritisation).
- 3) Rhys Cooper and David McInroy will act as internal reviewers to evaluate the quality of the work/research at minimum 3 monthly intervals. Alan Jamieson will act as external reviewer.
- 4) Heather Stewart will act as liaison between the project team and the stakeholders including Darwin. Reviews and feedback (positive and negative) will be incorporated into the management of the project via the Project Board.

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**Number of days planned for M&E**

10.00

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**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 (%) 4.00

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## Section 13 - Certification

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### Certification

**On behalf of the**

company

**of**

British Geological Survey

**I apply for a grant of**

£77,751.00

**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

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**Name** Chris Luton

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**Position in the organisation** Head of Intellectual Property and Legal Services

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**Signature (please upload e-signature)**  [darwin-plus-round7-application-form\\_Hadal 26](#)  
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**Date** 03 September 2018

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## Section 14 - Submission Checklist

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## 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).