

## Darwin Plus: Overseas Territories Environment and Climate Fund Annual Report

**Important note** *To be completed with reference to the Reporting Guidance Notes for Project Leaders:  
it is expected that this report will be about 10 pages in length, excluding annexes*

**Submission Deadline: 30<sup>th</sup> April 2018**

### Darwin Plus Project Information

Project reference	DPLUS069
Project title	Building data resources for managing the SGSSI Marine Protected Area
Territory(ies)	South Georgia and the South Sandwich Islands
Contract holder institution	British Antarctic Survey, NERC (part of UK Research and Innovation)
Partner institutions	Government of South Georgia and the South Sandwich Islands
Grant value	£173,932
Start/end date of project	1 <sup>st</sup> April 2017 to 30 <sup>th</sup> April 2019
Reporting period (e.g., Apr 2017-Mar 2018) and number (e.g., AR 1,2)	Apr 2017 – Mar 2018 Annual Report 1
Project leader name	Dr Susie Grant
Project website/blog/Twitter	<a href="https://www.bas.ac.uk/project/building-data-resources-for-managing-the-south-georgia-south-sandwich-islands-marine-protected-area/">https://www.bas.ac.uk/project/building-data-resources-for-managing-the-south-georgia-south-sandwich-islands-marine-protected-area/</a>
Report author(s) and date	Susie Grant, Helen Peat, Sophie Farenden, David Herbert, Phil Trathan, Eugene Murphy April 2018

### 1. Project overview

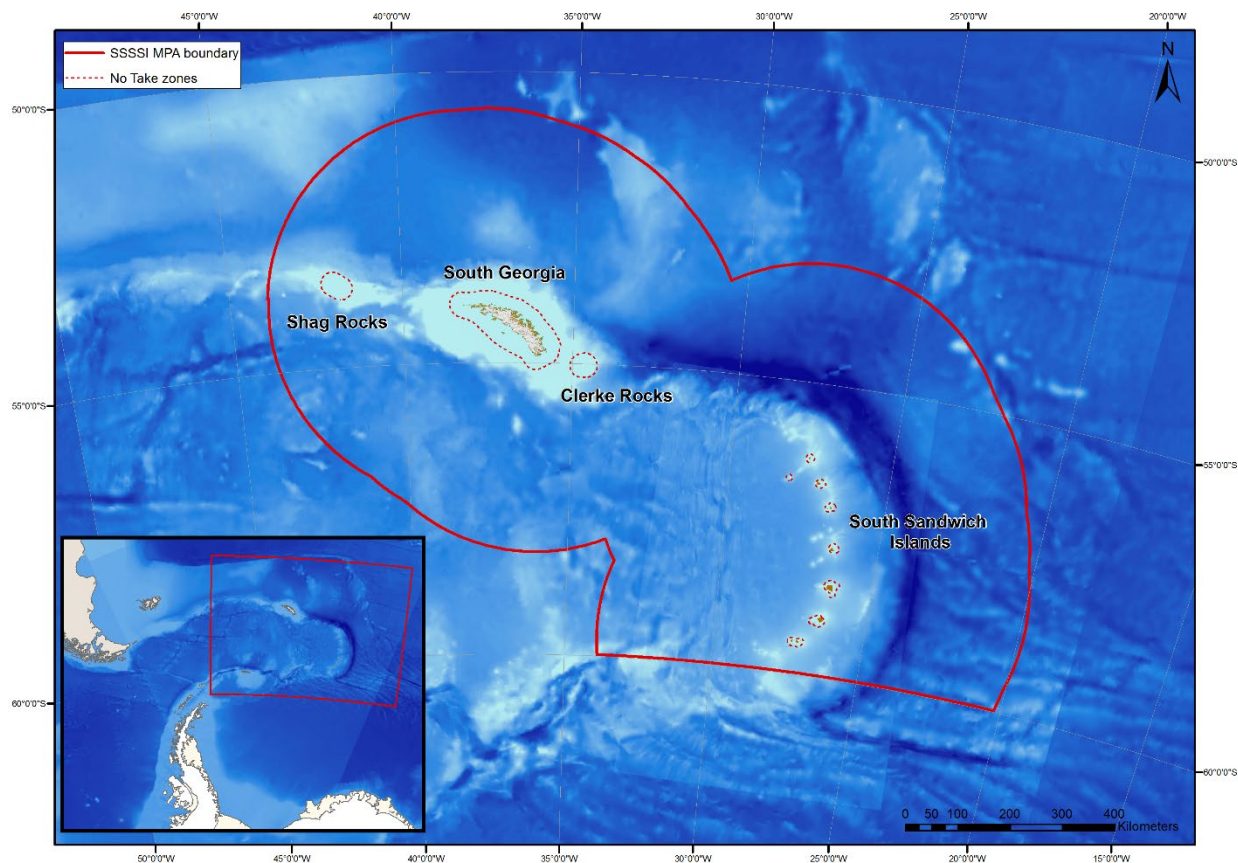
The South Georgia and South Sandwich Islands Marine Protected Area (SGSSI MPA) was established in 2012, with the aim of ensuring the protection and conservation of the region's rich and diverse marine life, whilst allowing the continuation of sustainable and carefully regulated fisheries. Further protection was incorporated in 2013, and in total includes no-take zones around South Georgia, Shag and Black Rocks, Clerke Rocks and the South Sandwich Islands, seasonal (summer) closure of the Antarctic krill fishery, benthic closed areas to protect sensitive seafloor habitats, the prohibition of all bottom trawling, and a ban on bottom fishing at depths shallower than 700 m and deeper than 2,250 m.

The Government of South Georgia and the South Sandwich Islands (GSGSSI) has committed to monitor activities throughout the MPA and to undertake a review every 5 years. The first of these reviews is now underway, and is scheduled to be completed in 2018. Review and ongoing management of the SGSSI MPA requires accessible and comprehensive data on the status and trends of marine biodiversity, ecosystem features and human activities. This project will deliver an integrated biological data and Geographic Information System, tailored to provide information and analyses to support the 2018 MPA review as well as the future management of the MPA.

The development of a Research and Monitoring Plan (RMP) for the MPA will contribute to GSGSSI objectives to ensure that high quality research underpins the Territory's management. Once agreed, the RMP will guide future scientific activities in and around the SGSSI MPA that will contribute to an increased

understanding of the marine ecosystem, provide information to evaluate the effectiveness of the MPA, and inform the development of enhanced management.

The integration of biological data with spatial information will also have significant benefits in terms of improving fundamental understanding of the marine ecosystem in this region. This is critical not only for management of the MPA, but also as a basis for extending our knowledge on the distribution and abundance of species, and their likely responses to potential future environmental change.



## 2. Project stakeholders/partners

This project is a collaboration between the British Antarctic Survey (BAS Ecosystems team, BAS Mapping and Geographic Information Centre, and NERC UK Polar Data Centre) and the Government of South Georgia and the South Sandwich Islands (GSGSSI). The project leader (BAS) has communicated regularly with GSGSSI to determine specific inputs required to inform the 2018 MPA review. Personnel changes within GSGSSI during the first year of the project have been challenging in terms of maintaining relationship continuity; however we have had opportunities to discuss the project background with new GSGSSI staff and to obtain their input on the project objectives in the context of government priorities.

The project has also built on an existing partnership between BAS and Cefas (UK Centre for Environmental, Fisheries and Aquaculture Science) that provides scientific advice on fisheries and environmental management to GSGSSI and to the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

Project stakeholders include scientists who contribute and use biological and environmental datasets relevant to the SGSSI region. We have engaged with this community during the course of the year, particularly through a workshop held early in the project to obtain input on the priorities for data to be included in the database/GIS, and derived data products to be generated. A total of 32 scientists attended the data prioritisation workshop, and we hope to draw further on the expertise of this network as the project continues.

Environmental NGOs are also key stakeholders in the development of effective protection and management for SGSSI, and there is broad interest from this community in accessing details of scientific and monitoring activities relevant to the MPA. In response to this interest, and with the aim of ensuring transparent and open access to data wherever possible, summary outputs will be made available to

assist all stakeholders in evaluating the MPA, and in developing advice and objectives based on scientific evidence.

### 3. Project Progress

The project started in April 2017, and we successfully recruited a data manager (Sophie Farenden) to join the project team in May 2017.

The 'South Georgia MPA Data Prioritisation Workshop' (Activity 1.1) was held at British Antarctic Survey, Cambridge, in May 2017, and was attended by 32 scientists and other stakeholders involved in research within the SGSSI region. The aims of the workshop were to:

1. Generate a prioritised list of datasets to be included in the SGSSI MPA database/GIS
2. Determine how these data can be summarised and visualised to provide relevant information for the review and future management of the SGSSI MPA
3. Identify data gaps
4. Ensure appropriate data access/use requirements

The workshop was an important opportunity to engage with a broad network of scientists working in the SGSSI region across a range of disciplines. The outputs of the workshop are a valuable resource on which to build the second phase of the project on the development of a research and monitoring plan for the SGSSI MPA.

The workshop outputs were included in a report for the South Georgia Government ("*South Georgia & South Sandwich Islands MPA Review: Summary of recent (2013-2017) and planned research and monitoring*"), which provided background information to support the SGSSI MPA Review (Activity 2.3), and specifically to inform a meeting of the SGSSI MPA Review Panel in November 2017.

The summary report outlines scientific research activities relevant to the MPA and its objectives that have been undertaken since 2013, and key science questions that have arisen or have started to be addressed since the designation of the MPA. It focuses on recent scientific and fisheries activities, and highlights further research needs together with details of current or planned research projects that may provide relevant outputs. The report provides information on key data gaps (Activity 1.2) which may be incorporated into a draft MPA Research and Monitoring Plan, and inform the development of future research activities.

Initial updates have been made to the existing South Georgia GIS (Activity 2.1), in order to build a foundation for the new South Georgia MPA database/GIS. Good progress has also been made on collating prioritised datasets (Activity 1.3) as identified during the workshop, and on devising the best ways to show map-based visualisations of these datasets (Activity 2.2). This has included information on ship survey locations and sampling sites, spatial attributes of biological datasets, oceanographic models, predator tracking information and physical habitat data.

#### 3.1 Progress in carrying out project Activities

All of the planned activities for 2017/18 have started, and good progress is being made towards full implementation. Progress on individual activities within each Output is set out below.

##### *Output 1 – South Georgia and South Sandwich Islands MPA database*

- 1.1 The 1-day data prioritisation workshop was held in May 2018, and was attended by 32 scientists and other stakeholders from BAS, GSGSSI, Birdlife, Cefas, Exeter University, Joint Nature Conservation Committee (JNCC), Marine Resources Assessment Group (MRAG), Oxford University, Pew Trusts, RSPB, South Atlantic Environmental Research Institute (SAERI), and WWF-UK. Discussions on relevance and availability of priority datasets, and approaches for summarising and visualising information provided guidance on further work towards Output 1. Products from the data prioritisation workshop included a prioritised list of relevant datasets which should be included in the SGSSI MPA database/GIS, with information on data owners and location, access constraints, and specific parameters relevant to MPA objectives.
- 1.2 Gaps in the available data sources were identified during the data prioritisation workshop, and discussed further in subsequent discussions with individual scientists (summarised in the report to the MPA Review Panel). This will form the basis for work during 2018/19 on the development of a draft MPA Research and Monitoring Plan (Output 3).
- 1.3 Work is progressing on the collation of datasets not currently in an accessible form, for example GPS point data from predator tracking studies, ship survey and sampling locations held within cruise reports, and bird strike data from BAS internal reports.

- 1.4 Work has started on extracting prioritised data on environmental variables such as chlorophyll-a (surface productivity) and sea surface temperature into relevant summaries (e.g. summer and winter mean values). This activity was started later in the project than originally planned, but access to work previously undertaken as part of related projects will facilitate progress.
- 1.5 The overall design and structure of a web-portal has been confirmed. Example pages have been developed to allow visualisation, both graphical and spatial, of specific datasets in relation to MPA objectives, including background information on key species. Feedback has been obtained from GSGSSI and from individual scientists on the content of these pages, and will be incorporated into their further development. This activity will be ongoing in 2018/19.

*Output 2 - South Georgia and South Sandwich Islands marine Geographic Information System (GIS), integrated with MPA database*

- 2.1 The South Georgia GIS (<http://www.sggis.gov.gs>) has been updated with over 20 additional spatial base data layers, including a new coastline and interpreted surface layer (digitised from up-to-date Landsat 8 imagery), with contours now available for the South Sandwich Islands. A whole island vegetation overview was created from 2016 Landsat imagery using an NDVI indexing technique. Backdrop Landsat and VHR imagery (for South Sandwich Islands) are also available as alternative base layers. Where higher resolution data exists (e.g. for surface, lakes, streams etc in certain regions) this has been included separately. For example, there are downloadable data packages corresponding to the most recent BAS/GSGSSI maps for Barff, Busen and Thatcher Peninsulas, as well as for heavily visited areas like Bird Island and the Shackleton Hike. Glacier front change data has been updated for the years 2010-2016. There are at present 59 data layers incorporated in the South Georgia GIS.
- 2.2 Progress on the development of data visualisations and syntheses has been slower than expected because of unforeseen delays with a software upgrade that was beyond our control. However, the upgrade has now enabled dynamic links to be established between biological databases and web-based maps. These links mean that it is now possible to embed maps within the data portal which use base layers from the SGGIS and have data overlays. This allows spatial visualisation of any data sets which have a spatial element, thus allowing for maps and other visualisations to be automatically updated when new data are included.
- 2.3 Initial data products and visual summaries were provided to the November 2018 meeting of the SGSSI MPA Review Panel, including in the report on “*South Georgia & South Sandwich Islands MPA Review: Summary of recent (2013-2017) and planned research and monitoring*”.
- 2.4 The underlying web GIS software has been enhanced to allow the possibility of embedding much simpler maps into web pages, providing extra visualisation capability alongside presentations of scientific data. Embedded maps can be created and managed using a simple web interface. Embedded maps have been produced for example datasets to enable visualisation of their spatial extent and other properties; these are included in the preliminary web-portal pages. These maps are interactive and clickable with pop-ups with further information and metadata links. The maps are closely integrated with the data visible on the page, and update when these data are filtered.

*Output 3 – MPA Research and Monitoring Plan*

Most of the activities on the development of a draft MPA Research and Monitoring Plan are scheduled for Year 2; however progress on Year 1 activities has provided a good foundation for this next phase of the project. A workshop to determine the requirements for a Research and Monitoring Plan was initially planned for Q4 of the first year, however the extension of the MPA Review process has resulted in this being re-scheduled for September 2018.

### **3.2 Progress towards project Outputs**

*Output 1 – South Georgia and South Sandwich Islands MPA database*

The data prioritisation workshop held in May 2018 was attended by a good range of scientific and other stakeholders from 12 organisations, with expertise on topics including oceanography, the krill-based ecosystem, higher predators, fisheries, climate change, geomorphology and benthic ecology. Although not all invited participants were able to attend, this broad representation allowed for focused discussion on the full range of potential data types identified.

*Output 2 - South Georgia and South Sandwich Islands marine Geographic Information System (GIS), integrated with MPA database*

Updates to the GIS have significantly improved the range of datasets available through this online resource. A total of 59 data layers are now accessible at [www.sggis.gov.gs](http://www.sggis.gov.gs), and free to download (in ESRI shapefile, kmz and csv formats) via the British Antarctic Survey Geodata Portal by any interested organisation or individual (provided the South Georgia GIS is acknowledged as the source).

Spatial data products from the GIS were submitted as part of background information provided to the SGSSI MPA Review Panel.

### *Output 3 – MPA Research and Monitoring Plan*

Consultation with GSGSSI is underway to determine the most effective approach for developing a draft Research and Monitoring Plan in collaboration with relevant stakeholders, as part of the ongoing MPA review process. This output will be further developed in Year 2 of the project; indicators will include the report from a planned workshop in September 2018, and progress towards agreement of a Research and Monitoring Plan.

### **3.3 Progress towards the project Outcome**

We anticipate that the Outcome of supporting enhanced management of the SGSSI MPA will be achieved by the end of the funding period (May 2019), and that the project outputs will continue to support the management of the MPA beyond this time. Building relationships with the major stakeholders has been an important part of this progress, and we recognise the importance of continuing to engage with these stakeholders as widely as possible.

In relation to the indicators for this Outcome, we are on track to i) increase the availability of datasets within the database/GIS to support management, ii) draw on the expertise of a network of SGSSI researchers to develop an effective RMP that has practical application in future management of the MPA, and iii) build a facility that supports the direct application of science into policy and management outcomes. While these are high-level indicators that may be difficult to measure until the end of the project, we believe they are adequate when used in the context of indicators for specific outputs and activities.

GSGSSI has explicitly recognised the importance of a scientific approach to management of the marine ecosystem, and continues to express strong support for the development of this resource.

### **3.4 Monitoring of assumptions**

The identified risks for this project still hold true, however we have mitigated against these risks as far as possible during Year 1. An unforeseen risk was the delay in upgrading critical software – this caused some initial setbacks, however other project activities were undertaken during this period and overall delays have therefore not been significant.

A potential new risk to the project is the uncertainty surrounding the timeframe of the MPA Review (currently ongoing, and due to be completed in 2018), in terms of the scheduling of future project activities to fit with this timeframe. In particular, this may have an impact on the scheduling of the proposed workshop on developing a draft MPA Research and Monitoring Plan (currently planned for September 2018, but to be confirmed following the next stages of the MPA review process). We will continue to work closely with GSGSSI and with the MPA Review Panel to determine the most appropriate way to deliver maximum benefits for the review process.

### **3.5 Project support to environmental and/or climate outcomes in the UKOTs**

The outputs generated by this project will provide an important resource to enhance the management of the SGSSI MPA into the future, and to maintain biodiversity and sustainable fisheries in this territory. In particular, improved access to data on ecosystem responses to climate change may facilitate the implementation of adaptive management. The provision of an integrated spatial data system and Research and Monitoring Plan may also provide a useful model for data management and access on which similar initiatives for other UKOTs could be based.

## **4. Monitoring and evaluation**

Monitoring and evaluation of the project is undertaken internally via regular meetings of the BAS project team. This provides adequate opportunity to receive updates on progress from team members, and to

evaluate the extent to which activities have been achieved, identify potential issues, and agree next steps. Information is shared with the project partners via email and telephone updates. GSGSSI staff changes resulted in some discontinuity in this regular monitoring, however the relocation of one staff member from the Falkland Islands to the UK was beneficial in allowing for more direct contact.

## 5. Lessons learnt

During the course of the first year, we have been very aware of the complexity of dealing with many different stakeholders, and the importance of understanding a broad range of aspirations. This can sometimes cause difficulties in moving forward, however our aim has been to engage as widely as possible, and to maintain openness and transparency. The development of an agreed RMP for the SGSSI MPA will be a challenging process because of this potentially broad range of stakeholder views and objectives. We plan to consult as widely as possible, and to invite feedback on a regular basis; and we are increasingly aware of the amount of time that needs to be allowed for this.

## 6. Actions taken in response to previous reviews (if applicable)

N/A

## 7. Other comments on progress not covered elsewhere

N/A

## 8. Sustainability and legacy

The review of the SGSSI MPA is of significant interest to a broad range of stakeholders, and has been the focus of a number of high-profile campaigns. Many of these stakeholders have expressed a strong interest in the enhanced transparency and availability of information that will result from this project. GSGSSI have continued to express strong support for such resources to be made available, in accordance with their commitment to stakeholder engagement.

The database and GIS under development are designed to allow for new information to be collected, stored, accessed, and used for management purposes, well beyond the lifetime of this project. We plan to implement a 'mirrored' system that can be accessed from the Falkland Islands and South Georgia, to avoid issues with obtaining access across limited-bandwidth internet. A detailed plan for handover and maintenance of the system will be developed prior to the end of the project. The ongoing working relationship between BAS and GSGSSI will also allow for technical support to be requested beyond the end of the project.

## 9. Darwin identity

We have incorporated the Darwin Initiative logo on our project website, and in presentations and workshop materials. The Darwin Initiative is well understood among scientists and practitioners working in South Georgia and the South Sandwich Islands, and this project is drawing on expertise and data from previous and current OTEP and Darwin Plus projects.

## 10. Project Expenditure

**Table 1: Project expenditure during the reporting period (1 April 2017 – 31 March 2018)**

Project spend (indicative) in this financial year	2017/18 D+ Grant (£)	2017/18 Total actual D+ Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs				
Consultancy costs				
Overhead Costs				

Travel and subsistence				
Operating Costs				
Capital items				
Others (Please specify)				
<b>TOTAL</b>				

## Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2017-2018 – if appropriate

Project summary	Measurable Indicators	Progress and Achievements April 2017 - March 2018	Actions required/planned for next period
<p><b>Impact</b></p> <p>Effective protection of the South Georgia and South Sandwich Islands marine ecosystem, and sustainable management of its resources.</p>		<p>The contribution of outputs from this project to date has had a positive impact on the availability of information to support the management of the SGSSI marine ecosystem and its resources.</p>	
<p><b>Outcome</b></p> <p>Management of the SGSSI MPA will be enhanced and supported into the future by development of an integrated marine data and geographic information system, and associated Research and Monitoring Plan.</p>	<p>0.1 Availability of datasets within a database and GIS to undertake spatial and temporal analyses, and to support MPA management</p> <p>0.2 Research and monitoring activities undertaken in accordance with an agreed MPA Research and Monitoring Plan.</p> <p>0.3 Implementation of a clear pathway from data acquisition to databasing, visualisation and analysis, to management decisions.</p>	<p>Key assumptions include an ongoing commitment from GSGSSI to maintain the MPA, and to incorporate scientific advice into future management decision-making. GSGSSI has explicitly recognised the importance of a scientific approach to management of the marine ecosystem, and continues to express strong support for the development of this resource.</p>	<p>Key actions planned for the next period include:</p> <ul style="list-style-type: none"> <li>• Completion of a web portal for access to spatial information relevant to management of the SGSSI MPA.</li> <li>• Further engagement with stakeholders to ensure broad agreement on the components of a draft MPA Research and Monitoring Plan.</li> </ul>
<p><b>Output 1.</b></p> <p>South Georgia and South Sandwich Islands MPA database</p>	<p>1.1 Attendance of key scientists at workshop to prioritise relevant datasets.</p> <p>1.2 Increase in volume and types of data held in MPA database</p>	<p>The data prioritisation workshop was attended by a broad network of scientists engaged in research around South Georgia and the South Sandwich Islands.</p> <p>Work is still ongoing to develop the structure of the MPA database system; we expect to see evidence of an increase in the volume and types of data held during Year 2.</p> <p>Evidence provided in sections 3.1 and 3.2 of report.</p>	
<p><b>Activity 1.1</b></p> <p>Hold a 1-day workshop with relevant scientists and data managers to generate a prioritised list of datasets for spatial analyses to be included (including on marine biodiversity, ecosystem features and human activities), and to determine how these need to be summarised and visualised in order to be most useful for the MPA review process.</p>		<p>Activity completed.</p>	



<p>Activity 1.2</p> <p>Identify data gaps in existing databases and South Georgia GIS, and develop proposals with relevant scientists for how these might be filled (see also Activity 3.1)</p>	<p>Activity partially completed; consultation with individual scientists will continue into the next period.</p>		
<p>Activity 1.3</p> <p>Collate prioritised datasets that are not currently in an accessible format</p>	<p>Activity partially completed; additional datasets (including aggregated fisheries data) will be collated in the next period.</p>		
<p>Activity 1.4</p> <p>Design and implement queries to extract prioritised data from existing databases</p>	<p>Activity partially completed; work will continue in the next period on extracting further data products with specific relevance to the MPA objectives.</p>		
<table border="1"> <tr> <td data-bbox="114 489 607 802"> <p><b>Output 2.</b></p> <p>South Georgia and South Sandwich Islands marine Geographic Information System (GIS), integrated with MPA database</p> </td> <td data-bbox="607 489 1102 802"> <p>2.1 Transfer of datasets into GIS for spatial mapping</p> <p>2.2 Availability of data maps and visualisations</p> <p>2.3 Use of map products in MPA review process</p> <p>2.4 Use of derived products in further spatial analyses e.g. ecoregionalisation</p> </td> </tr> </table>	<p><b>Output 2.</b></p> <p>South Georgia and South Sandwich Islands marine Geographic Information System (GIS), integrated with MPA database</p>	<p>2.1 Transfer of datasets into GIS for spatial mapping</p> <p>2.2 Availability of data maps and visualisations</p> <p>2.3 Use of map products in MPA review process</p> <p>2.4 Use of derived products in further spatial analyses e.g. ecoregionalisation</p>	<p>New datasets have been incorporated into the South Georgia GIS as planned. Evidence is provided in a news story on the GSGSSI website:  <a href="http://www.gov.gs/31493-2/">http://www.gov.gs/31493-2/</a></p> <p>Maps and data summaries were provided for use as part of the MPA review process. Evidence is provided in Sections 3.1 and 3.2 of the report.</p>
<p><b>Output 2.</b></p> <p>South Georgia and South Sandwich Islands marine Geographic Information System (GIS), integrated with MPA database</p>	<p>2.1 Transfer of datasets into GIS for spatial mapping</p> <p>2.2 Availability of data maps and visualisations</p> <p>2.3 Use of map products in MPA review process</p> <p>2.4 Use of derived products in further spatial analyses e.g. ecoregionalisation</p>		
<p>Activity 2.1</p> <p>Update the South Georgia GIS with newly available spatial base data (including physical environmental data, e.g. bathymetry, physical oceanographic features, and data on existing management)</p>	<p>Activity completed.</p>		
<p>Activity 2.2</p> <p>Develop a series of spatial visualisations of prioritised datasets (based on outcomes of Activity 1.1), including data syntheses and other derived products. Analyses will include integration of physical and multi-trophic level biological data.</p>	<p>Activity partially completed, and is scheduled to be completed in the next period.</p>		
<p>Activity 2.3</p> <p>Provide synthesised data products and visualisations as requested by SGSSI MPA review committee or other review contributors.</p>	<p>Activity completed (for MPA review process to date – additional products may be requested during next stages of the review).</p>		
<p>Activity 2.4</p> <p>Provide access to South Georgia GIS via new web pages, with maps embedded or closely integrated with the MPA database where appropriate.</p>	<p>Activity started with the development of example web pages, to be refined in the next period.</p>		

## Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed) - if appropriate

*N.B. if your application's logframe is presented in a different format in your application, please transpose into the below template. Please feel free to contact [Darwin-Projects@ltsi.co.uk](mailto:Darwin-Projects@ltsi.co.uk) if you have any questions regarding this.*

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<b>Impact:</b>			
Effective protection of the South Georgia and South Sandwich Islands marine ecosystem, and sustainable management of its resources.			
<b>Outcome:</b> Management of the SGSSI MPA will be enhanced and supported into the future by development of an integrated marine data and geographic information system, and associated Research and Monitoring Plan.	<p>0.1 Availability of datasets within a database and GIS to undertake spatial and temporal analyses, and to support MPA management</p> <p>0.2 Research and monitoring activities undertaken in accordance with an adopted MPA Research and Monitoring Plan.</p> <p>0.3 Implementation of a clear pathway from data acquisition to databasing, visualisation and analysis, to management decisions.</p>	<p>0.1 List of datasets included in the new marine data and geographic information system.</p> <p>0.2 Information on objectives and outcomes of MPA research and monitoring field studies undertaken annually.</p> <p>0.3 Maps and other visualisation products derived from the data. Referencing of such products in MPA reports and reviews.</p>	<p>This project depends on an ongoing commitment by GSGSSI to maintain the MPA, and to incorporate scientific advice into future management decision-making.</p> <p>GSGSSI recognises the importance of a scientific approach to management of the marine ecosystem, and has expressed strong support for the development of this resource.</p> <p>Continuing to work closely with GSGSSI will help to identify any concerns or potential obstacles, and will minimise risks of these becoming real difficulties.</p>
<b>Outputs:</b> 1. South Georgia and South Sandwich Islands MPA database	<p>1.1 Attendance of key scientists at workshop to prioritise relevant datasets.</p> <p>1.2 Increase in volume and types of data held in MPA database</p>	<p>1.1 Workshop report</p> <p>1.2 Data statistics from BAS Polar Data Centre.</p> <p>1.3 Quarterly reports</p>	<p>Assumed availability of key scientists, and engagement in the planned workshop.</p> <p>Although key data will be provided by BAS, there is a risk that additional scientific data may not be available (e.g. unpublished data may be withheld by external data owners), or key experts and stakeholders may not engage to the extent required.</p>

			<p>The project relies on appointing a new MPA data manager. It may also be put at risk if existing staff are not available to contribute to the project, or if key staff resign before the work is completed.</p> <p>In the event of this risk occurring, there is sufficient support from other project contributors within BAS to ensure that the project could continue until staff are replaced, and that appropriate training could be provided for new staff.</p>
<p>2. South Georgia and South Sandwich Islands marine Geographic Information System (GIS), integrated with MPA database</p>	<p>2.1 Transfer of datasets into GIS for spatial mapping</p> <p>2.2 Availability of data maps and visualisations</p> <p>2.3 Use of map products in MPA review process</p> <p>2.4 Use of derived products in further spatial analyses e.g. ecoregionalisation</p>	<p>2.1 Submission of derived spatial data products to MPA review process</p> <p>2.2 Data access statistics from BAS Mapping &amp; Geographic Information Centre</p> <p>2.3 Quarterly reports</p> <p>2.4 Reports of MPA review steering committee</p> <p>2.5 Referenced data products in peer-reviewed publications</p>	<p>Data quality varies, and the databasing process may indicate that there is insufficient information for all of the planned spatial analyses.</p> <p>Undertaking the project at BAS will allow access to data and expertise from existing and planned science programmes.</p>
<p>3. MPA Research and Monitoring Plan</p>	<p>3.1 Attendance of key scientists at workshop to determine requirements of MPA Research and Monitoring Plan.</p> <p>3.2 Agreement of Research and Monitoring Plan.</p>	<p>3.1 Workshop report</p> <p>3.2 Quarterly reports</p> <p>3.3 Research and Monitoring Plan adopted by GSGSSI following the 2018 MPA review.</p>	<p>Assumed availability of key scientists, and engagement in the planned workshop.</p> <p>Commitment by GSGSSI to establish a Research and Monitoring Plan as part of updated management provisions for the MPA, following its review in 2018.</p>
<p><b>Activities</b> (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)</p> <p>1.1 Hold a 1-day workshop with relevant scientists and data managers to generate a prioritised list of datasets for spatial analyses to be included (including on marine biodiversity, ecosystem features and human activities), and to determine how these need to be summarised and visualised in order to be most useful for the MPA review process.</p> <p>1.2 Identify data gaps in existing databases and South Georgia GIS, and develop proposals with relevant scientists for how these might be filled (see also Activity 3.1)</p> <p>1.3 Collate prioritised datasets that are not currently in an accessible format</p>			

- 1.4 Design and implement queries to extract prioritised data from existing databases
- 1.5 Design and implement a web data-portal to bring together prioritised datasets, to enable their use for analysis and visualisation.
  
- 2.1 Update the South Georgia GIS with newly available spatial base data (including physical environmental data, e.g. bathymetry, physical oceanographic features, and data on existing management)
- 2.2 Develop a series of spatial visualisations of prioritised datasets (based on outcomes of Activity 1.1), including data syntheses and other derived products. Analyses will include integration of physical and multi-trophic level biological data.
- 2.3 Provide synthesised data products and visualisations as requested by SGSSI MPA review committee or other review contributors.
- 2.4 Provide access to South Georgia GIS via new web pages, with maps embedded or closely integrated with the MPA database where appropriate.
- 2.5 Publicise and facilitate access to the GIS via media releases etc.
  
- 3.1 Hold a 2-day workshop with relevant scientists to determine the requirements for an MPA Research and Monitoring Plan, based on supporting the MPA conservation objectives and management requirements, and filling the data gaps identified in Outputs 1 & 2. Consider the need for reference areas that will aid in the process of distinguishing between the impacts of climate change and harvesting.
- 3.3 Prepare draft Research and Monitoring Plan for consultation with relevant scientists, and review by SGSSI MPA review committee.
- 3.3 Finalise Research and Monitoring Plan, in consultation with GSGSSI.
- 3.4 Establish a plan and practical mechanisms to ensure that future data collected in accordance with the MPA Research and Monitoring Plan is incorporated into the MPA database and GIS.

**Annex 3 Onwards – supplementary material (optional but encouraged as evidence of project achievement)**

## Checklist for submission

	Check
<b>Is the report less than 10MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> putting the project number in the Subject line.	Yes
<b>Is your report more than 10MB?</b> If so, please discuss with <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> about the best way to deliver the report, putting the project number in the Subject line.	No
<b>Have you included means of verification?</b> You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	Yes
<b>Do you have hard copies of material you want to submit with the report?</b> If so, please make this clear in the covering email and ensure all material is marked with the project number.	No
Have you involved your partners in preparation of the report and named the main contributors	Yes
Have you completed the Project Expenditure table fully?	Yes
Do not include claim forms or other communications with this report.	