DP\100052

Mapping for evidence based policy, recovery and environmental resilience.

Keyworth, Steve | Environment Systems Limited

Funding sought	**£210,920.00**
Project start/end	**1 Apr 2018 - 31 Mar 2020**

1. Contact Details

Q1. Lead applicant contact details

Please enter the contact details for the lead application. The lead applicant is the same as the Flexi-Grant account holder. Please note that the Flexi-Grant account holder will be the only contact point for the application.
Additionally, please add contact details for the Project Leader if this is different from the lead applicant.

Mr Steve Keyworth

Director
Primary Applicant

9, Cefn Llan Science Park, Aberystwyth ,
Ceredigion, SY23 3AH, United Kingdom
(Work)

Dr Katie Medcalf

Project Leader

9 Cefn Llan Science Park,, Aberystwyth,
SY23 3AH, United Kingdom

Q2. Lead organisation contact details

Please enter the applicant organisation details

Environment Systems Limited

www.envsys.co.uk (Work)

9 Cefn Llan Science Park, Aberystwyth ,
Ceredigion, SY23 3AH, United Kingdom

Q3. Lead organisation type
Please select one of the below options.

Commercial Company

Please add any 'Committee Feedback' to the field below:

Please add any 'Specific Ineligibility' feedback to the field below:

Please add any 'Conditions' to the field below:

Please add any 'Positive Feedback to the field below:

2. Title, Dates & Budget Summary

Q4. Project title

Mapping for evidence based policy, recovery and environmental resilience.

Q5. Project dates

Start date:	End date:	Duration (e.g. 2 years, 3 months):
01/04/2018	31/03/2020	2 years

Q6. UKOT(s)

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

British Virgin Islands (BVI)

Turks & Caicos Islands (TCI)

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

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

Q7. Budget summary

Year:	2018/19	2019/20	2020/21	Total request
Amount:	£122,035.00	£88,885.00		£210,920.00

Q7b. Proposed (confirmed and unconfirmed) co-financing as % of total project cost	29.60%

3. Lead Organisation Summary

Q8. Lead organisation summary

Please provide the following information on the lead organisation

What year was your organisation established/ incorporated/ registered?	2003
What is the legal status of your organisation?	⦿ Other (if selected, please explain below)
Other explained	Private Limited company
How is your organisation currently funded?	Environment Systems is currently funded through commercial contracts
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.	⦿ Yes

**Please attach the requested signed audited/independently examined accounts.
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.**

_____	
_____	

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.

Contract/Project 1 Title	EO4Cultivar - delivering analysis-ready and value-added data to the South American agricultural supply chain and farmer advisory services
Contract Value/Project budget (include currency)	GBP £2,050,535 UK Sterling
Duration (e.g. 2 years 3 months)	3 Years 6 Months
Role of organisation in project	Lead organisation in consortium
Brief summary of the aims, objectives and outcomes of the project	Environment Systems are leading a consortium to deliver analysis-ready and value-added data to the South American agricultural supply chain and farmer advisory services. The project will work with stakeholders in UK, Peru and Colombia to develop and implement a cloud-based processing and storage infrastructure. This approach will enable commercially sustainable services to be stood up to deliver spatially and temporally extensive analysis-ready and value-added data products
Client/independent reference contact details (Name, e-mail, address, phone number)	UK Space Agency Athene Gadsby IPP Programme Manager athene.gadsby@ukspaceagency.bis.gsi.gov.uk Polaris House North Star Avenue Swindon Wiltshire SN2 1SZ

Contract/Project 2 Title	Spatial Analysis for Area Statements
Contract Value/Project budget (include currency)	GBP £82,080 UK Sterling
Duration (e.g. 2 years, 3 months)	5 Months
Role of organisation in project	Lead Organisation
Brief summary of the aims, objectives and outcomes of the project	This project followed on from the SoNaRR pilot study. It built a set of maps and other information that can be used by various stakeholders to support the opportunity mapping for local "Area Statements", to allow further development of ecosystem service concepts. The project consulted both policy stakeholders and local experts to help formulate the maps, review the data and produce output which was clear, understandable and useable by a wide range of people. Examples included urban green infrastructure issues, catchment scale natural flood management and forestry, coastal and upland issues where integration of spatial data highlighted issues and potential solutions suitable to inform the regional Area Statements under the Environment Act (Wales) 2016.
Client/independent reference contact details (Name, e-mail, address, phone number)	Natural Resources Wales (NRW) Russell Elliott russell.elliott@cyfoethnaturiolcymru.gov.uk Senior Advisor Integrated Natural Resource Management Programme Knowledge, Strategy & Planning Natural Resources Wales Tel: 03000 654 881

Contract/Project 3 Title	National Ecosystem and Ecosystem Services map for a suite of prioritised services for Ireland.
Contract Value/Project budget (include currency)	Euros 105,687
Duration (e.g. 2 years, 3 months)	1 year 3 months
Role of organisation in project	Lead organisation

| **Brief summary of the aims, objectives and outcomes of the project.** | The European Commission (EC) Biodiversity Strategy aims to halt the loss of biodiversity and ecosystem services in the EU by 2020. Mapping and Assessment of Ecosystems and their Services (MAES) is a core element. Action 5 of the Strategy aims to develop the knowledge base on ecosystems and their services within Europe and is a target for each Member State to achieve. It forms the basis of other targets within the strategy which relate to improving the outcomes of EU nature legislation, integrating biodiversity objectives into sectoral policies and helping to avert global biodiversity loss. Action 5 is also relevant to other EU policies relating to, for example, maritime affairs, forestry, culture and heritage, and agriculture. The MAES initiative has been established by the EC in order to assist member states achieve Action 5 and ensuring that the approaches between the member states are consistent. |
| | Through this project, we developed a National Ecosystem and Ecosystem Service Map for a number of prioritised services, based on available data, following the guidance established in the MAES initiative. The outputs of the projects including the Irish Wildlife Manual No. 95, Ecosystem Services Spatial Framework Database, and online story map viewer are available online with the National Parks and Wildlife Website. The project set out the first steps towards the baseline of developing a National Ecosystem Assessment. As the project was the set at an early stage of developing knowledge and skills capacity in Ireland the project sought to generate discussion and raise awareness via a series of stakeholder engagement events. Using the Common International Classification for Ecosystem Services (CICES) the ecosystem service themes were selected and indicators of ecosystem services were developed by the project team and stakeholders specifically for Ireland. Spatial data linked to these indicators were used to model the benefits, dis-benefits and |

	multiple benefits across Ireland for seven ecosystem services and key spatial indicators of habitat and biodiversity assets including protected and priority species, the protected sites/ conservation designations network and ecological networks (connectivity). Other biophysical factors that affect ecosystem functions and processes such as topography, soils, geology and land-use were also included in the modelling of the ecosystem services. The outcomes of the project allow for the assessment and valuation (monetary and non-monetary) of the known benefits of ecosystem services that. These outcomes can be used to demonstrate how the loss of biodiversity affects society and the economy and how sustainable development including improving the biodiversity can help to ensure healthy resilient ecosystems can often outweigh the costs of neglect and restoration.
Client/independent reference contact details (Name, e-mail, address, phone number).	National Parks and Wildlife Service Gemma Weir Gemma.Weir@ahg.gov.ie Department of Arts, Heritage and the Gaeltacht, 7 Ely Place, Dublin 2, ROI

4. Project Partners

Q10. Project partners

Please list all the partners involved (including the Lead Organisation) and explain their roles and responsibilities in the project. Describe the extent of their involvement at all stages, including project development. This section should illustrate the capacity of partners to be involved in the project, and how local institutions, local communities, and technical specialists are involved as appropriate.
Please provide written evidence of partnerships. Please add fields for more partnerships, if required. Details on roles and responsibilities in this project must be given for the Lead Organisation and all project partners.

Lead Organisation name:	Environment Systems Limited
Details (including roles and responsibilities and capacity to engage with the project):	Environment Systems staff are experienced in running projects and programmes and have an expert staff highly skilled and fully available to meet the requirements of this project: • Katie Medcalf is Project Director; an expert environmental scientist with a strong background in biodiversity mapping, ecosystem services and remote sensing. She has worked on similar projects and training in OT's in the past. She will provide project leadership and training. • Johanna Breyer will be Project Manager; she is an experienced environmental remote sensor having undertaken the management of similar large projects involving multiple partners. She will be responsible for ensuring delivery on time, to quality and to budget. She will lead the M&E, with independent support from Wavehill. • Samuel Pike is a remote sensing consultant, expert in the techniques to be used in this project for both the terrestrial and shallow water marine environment. He has worked on OT related projects involving TCI and BVI. He will be leading the mapping and modelling of the remote sensing data. • Elsa-Kristin Naumann is a GIS analyst skilled in ecosystem service evaluation, resilience and opportunity mapping. She will lead the ecosystem service modelling aspects of the project.

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:	The Government of the Turks and Caicos Islands - Department of Environment and Coastal Resources (DECR)
Website address:	https://www.gov.tc/dema

Details (including roles and responsibilities and capacity to engage with the project):	Eric F. Salamanca is assistant director at DECR he co-ordinated site monitoring, development and mitigation work and environmental management. He is an experienced scientist with a good grasp of policy requirements. Eric will lead the work in TCI supported by Bryan Naqqi Manco who is an eminent botanist based on North and Mid Caicos. They will be supported by colleagues from DECR from other islands and who have experience in marine conservation and by policy makers from other departments. The TCI team will: • Lead the collection of terrestrial and shallow water marine field data, • Validate maps, • Produce a monitoring plan, • Encourage use of ecosystem service maps into policy making, • Support M&E data collection, • Lead the activities to raise awareness on island including: • Creating an accessible digital system for island access to the data, • Establishing new work practices to use the information from the new data, • Understand the data and techniques so that others can be trained. The TCI team has worked on similar projects in the past and confirm, including consideration of capacity post-2017 hurricanes, that they have the ability to be actively engaged in this project.
Would you like to include a letter of support from this organisation?	⊙ Yes

Letter of Support:	**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.**

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

Yes

2. Partner Name:	National Parks Trust of the Virgin Islands
Website address:	www.bvi.gov.vg/departments/national-parks-trust

Details (including roles and responsibilities and capacity to engage with the project):	Nancy Woodfield Pascoe will lead the input from the BVI. She is Deputy Director for Science and Environmental Policy at the National Parks Trust of the Virgin Islands responsible for planning, monitoring and developmental work. Nancy is part of the National GIS Committee for BVI which meets monthly to share knowledge and experience. Working with other key stakeholders including other Government Departments, such as the Conservation and Fisheries Dept. and members of the National GIS Committee, Nancy will: •Lead the collection of terrestrial and shallow water marine field data, •Validate maps, •Produce a monitoring plan, •Encourage use of ecosystem service maps into policy making, •Support M&E data collection, •Lead the activities to raise awareness on island including: • Creating an accessible digital system for island access to the data, • Establishing new work practices to use the information from the new data, • To understand the data and techniques so that others can be trained. NPTVI will share experiences of a National GIS with TCI to transfer skills. The BVI team has worked on similar projects in the past and confirm, including consideration of capacity post-2017 hurricanes, that they have the ability to be actively engaged in this project
Would you like to include a letter of support from this organisation?	⦿ Yes
Letter of Support:	_____ _____

3. Partner Name:	Joint Nature Conservation Committee
Website address:	www.jncc.defra.gov.uk/
Details (including roles and responsibilities and capacity to engage with the project):	JNCC input will be led by Gwawr Jones. Gwawr is an Earth Observation Specialist for the Joint Nature Conservation Committee, with over 6 years' experience in remote sensing and GIS for environmental applications. She is expert at developing systems for habitat mapping and monitoring, and is an open data and software champion. She is developing an open source mapping product following DEFRA's Living Map programme, which will be adaptable by the project for use on the island. Gwawr will also be involved in training and develop analysis and modelling techniques for the islands to use over the long term.
Would you like to include a letter of support from this organisation?	⦿ Yes
Letter of Support:	

4. Partner Name:	
Website address:	
Details (including roles and responsibilities and capacity to engage with the project):	
Would you like to include a letter of support from this organisation?	○ Yes ○ No

5. Partner Name:	
Website address:	
Details (including roles and responsibilities and capacity to engage with the project):	
Would you like to include a letter of support from this organisation?	⊙ Yes ⊙ No

6. Partner Name:	
Website address:	
Details (including roles and responsibilities and capacity to engage with the project):	
Would you like to include a letter of support from this organisation?	⊙ Yes ⊙ No

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

5. Project Staff

Q11. Project staff

Please identify the core staff on this project, their role and what % of their time they will be working on the project.
These should match the names and roles in the budget spreadsheet.
Please provide 1 page CVs for these staff.

Name (First name, Surname)	Role	% time on project	CV attached below?
Katie Medcalf	Project Leader	10	☑
Johanna Breyer	Project Leader	25	☑
Samuel Pike	Project Staff	20	☑
Elsa-Kristen Naumann	Project Staff	20	☑

Do you require more fields?

Yes

Name (First name, Surname)	Role	% time on project	CV attached below?
Gwawr Jones	Project Partner	5	☑
Eric F. Salamanca	Project Partner	10	☑
Bryan Naqqi Manco	Project Partner	5	☑

Nancy Woodfield Pascoe	Project Partner	15	☑

Please provide 1 page CVs (or job description if yet to be recruited) for the Project staff listed above. Ensure the file is named clearly, consistent with 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.

_____	

Have you attached all Project staff CVs?

Yes

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.

> The project will provide evidence to develop policy to aid post-hurricane environmental recovery and enhance future resilience to natural disasters. It will use satellite data to map and model the marine and terrestrial environment in the TCI and BVI, pre- and post the 2017 hurricanes Maria and Irma.
>
> The project will share experience and learning to develop both island's expertise in relevant techniques and be integrated closely with other UK Government supported projects in the BVI and TCI.

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?

> Ecosystem goods and services, including those derived from biodiversity, are essential drivers for the TCI and BVI economies, supporting tourism, food provision and mitigating the effects of extreme weather events. The natural environment is susceptible to damage from human activities resulting in significant loss of value to the economies of the Territories and an increased risk from natural disaster such as hurricane-generated storm surges and flooding. The recent hurricane damage to the islands highlights the importance of protecting these natural assets.
>
> The project will support Territory priorities to protect and enhance these critical goods/services and biodiversity values;
>
> - in the BVI it will support the proposed Environment Bill (to be completed in 2018) including development of an Environmental Sensitivity Index based on ecological and socioeconomic indicators;
> - In the TCI it will support TCIG physical planning studies and development strategies to achieve the 'Turks and Caicos Island 2040 Vision Strategy'.
>
> The project will address these issues through:
>
> - building capacity to use remote sensing technologies/methods to undertake detailed mapping of the marine and terrestrial environments for monitoring change; evaluating hurricane impacts on the natural environment; mapping opportunities for habitat restoration;

- providing firm evidence for policy development and planning.

Q14. Methodology

Describe the methods and approach you will use to achieve your intended outcomes 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.

Project stages:

Acquisition and processing of satellite imagery and necessary computer hardware to:

- create land cover/ecosystem service related maps (pre-and post-2017 hurricane).
- use ultra-high-resolution Pleiades (4band) imagery already purchased by JNCC. supplemented by new, post-hurricane data to map and model changes;
- supplement existing habitat maps creating further data layers for TCI and BVI post hurricane to understand changes to vegetation (habitat) distribution and vegetation;
- purchase hardware (computers/servers) for TCI and BVI to run the analyses and process data.

Lead -Environment Systems.

Ground-truthing/collection of additional data and training to:
- supplement satellite based mapping and provide quality assurance, including collect shallow water marine data;
- train local data collectors to use relevant techniques, including use of GPS enabled field devises for terrestrial/shallow water marine mapping.

Lead -TCI and BVI Governments, BVI National Trust.

Mapping of the terrestrial and shallow water environment to:
- use open source software 'R' and data for vegetation mapping as used in the Natural England Living Map programme and JNCC project work on TCI mapping.
- produce island-wide vegetation maps/other relevant data layers to understand the geographic distribution of species (particularly endemics) and effect of recent hurricanes on the islands biodiversity;
- provide evidence to support planning and policy measures for: protection/restoration of natural habitats; developing sustainable agriculture strategies; land resource planning; water resource management.

Lead -Environment Systems.

Modelling of Ecosystem Services, opportunities and policy relevant questions to:
- build on JNCC vulnerability modelling in progress in Anguilla, Montserrat, BVI and TCI, to use landform maps/ risk assessments to determine how the natural

environment is providing significant ecosystem services and resilience to natural disaster.
- investigate the implications of: sand mining and beach nourishment; land-use change and options for land management; optimising the location of marine infra-structure; fire risk to natural habitats; understanding and mitigating flood risks;
- undertake 'Opportunity mapping' to identify priority areas/habitats for: restoration post hurricane; protection from future damage (human induced or through natural disaster); rehabilitation of habitat or extension to areal extent to enhance key services, including the role for protecting human life and infrastructure;

Design of OT specific monitoring plans to:
- develop monitoring mechanisms, include future use of remote sensing imagery for each OT, including frequency of monitoring and techniques to be employed;
- to fit existing/new legislation, planning and policy measures to monitor change to habitat condition, areal extent and functional roles in consultation with island stakeholders.

Environment Systems will lead the change mapping. Monitoring mechanisms will be agreed during an on-island workshop.

Training and workshops;
- 3 Workshops will be held in the TCI and BVI and a fourth training event will be held for key staff in the UK.
- The training will enhance OT professional skills in the following areas: use of remote sensing and modelling in Arc GIS and open-sourced software; ground-truthing and data collecting; creation and implementation of monitoring strategies; application of RS derived evidence into policies and planning.

Environment Systems and JNCC will lead the events.

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.

File name	Date uploaded

7. Objectives, Stakeholders & Sustainability

Q15. Project Objectives

How does this project:

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

Policy Priorities

Contributes to following 6th round priorities:
• UK Governments commitment to create a Blue Belt of marine protection around the OTs;
• Developing tools to value ecosystem services and monitor biodiversity;
• Developing ecosystem-based initiatives; and,
• Developing data systems on biodiversity.

Specifically:
• Have measurable environmental outcomes with new mapping and assessments of terrestrial and marine ecosystem goods/services, new techniques for long term monitoring, demonstration of the impact of the 2017 hurricanes and the role of the natural environment in mitigating vulnerability to such events.

• Contribute to the delivery of existing commitments in the OTs including existing/ proposed national legislation/planning initiatives (BVI Environment Bill and proposed Environmental Sensitivity Index; TCI physical planning to achieve the 'Turks and Caicos Island 2040 Vision Strategy').

• Have good local ownership through participation of the TCI Government, BVI Government and National Trust.

• Outcomes will contribute to embedding good environmental decision-making in UKOT policies and processes through contribution to planning and policy initiatives (see above), developing monitoring strategies, providing access to new satellite data sets and building significant capacity to access, analyse and use this data in decision making.

Impact

• Capacity/capability to deliver- ES and its partners have significant experience of using satellite data to map habitats/ecosystem goods and services in the UK and OTs and have significant capacity to transfer UK based approaches to the two OTs. The OTs have confirmed their capacity to undertake the island based activities despite hurricane damage to infrastructure.

• Contribution to environmental goods and services-The project will map and evaluate ecosystem goods and services and define their multiple roles within each Territory, including that of disaster mitigation, and establish long term satellite based monitoring procedures.

• The project outcomes will be sustained through significant capacity building within the UKOT(s), developing a long-term monitoring programme for implementation by the Territories and developing modelling/mapping techniques of long term value to the Territories.

Technical Excellence

Project is well-planned with goals, purpose and outputs defined in consultation with the TCI and BVI partners and JNCC. The activities proposed represent extensions to existing Remote Sensing work in the OTs and UK, applying the same techniques and using in part data already available. This ensures activities and outcomes are practical, achievable and risks identified with mitigation carefully considered.

Changes as a result of the project are measurable, in terms of new data sets available to the Territories; an increase in the number of OT professionals trained to access, analyse and utilise remote sensing data; new ecosystem service maps; and RS based environmental monitoring methods in place.

The Exit strategy includes leaving a trained body of OT personnel to continue work post-project project, building IT capacity to ensure continuity, developing a long-term monitoring programme for implementation by the Territories, developing modelling techniques of long term value to the Territories.

Value for money to be achieved by building on existing HMG investment (including the JNCC implemented CSSF programme) in the Territories, using techniques developed/ skills employed for comparable UK work.

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.

National Parks Trust and Conservation and Fisheries Department, BVI, are key stakeholders, in addition to the Ministry of Natural Resources and Labour (MNRL) and the Town and Country Planning Department and the Department of Disaster Management. All named parties have been consulted as all are members of the BVI National GIS Committee and will assist with data collection and be involved in training.

For the TCI, the stakeholders (Department of Environment and Coastal Resources, Survey and Mapping Department, Department of Planning, Crown Land Unit, Department of Agriculture, Department of Disaster and Management) were consulted

during a capacity-building training workshop under the JNCC natural capital project in June 2017. The participants to the said workshop provide technical comments and recommendations to the Turks and Caicos government in terms of major decisions on policies and coastal developments. These relevant government departments will continue to be involved and consulted to ensure environmental sustainability while achieving the economic prosperity through sustainable tourism and sustainable agriculture. They will attend training events and help with the collection of data.

Joint Nature Conservation Committee has been involved in formulating project objectives and work programme. JNCC will provide expert contribution based on its in-house EO expertise; the proposed project will link to the CSSF supported 'Natural capital in the Caribbean and South Atlantic Overseas Territories: valuation, vulnerability and monitoring change' including through data sharing and developing linkages through joint workshops to deliver training, funded and managed by JNCC.

Q17. Institutional Capacity

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

Environment Systems will be the lead organisation. Environment Systems is an environmental and agricultural data company. As an SME, we are trusted providers of environmental and agricultural evidence and insight to governments and industry across the world.

Our consultancy delivers bespoke advice and solutions for land management, monitoring and policy. Our data services deliver always-on, accessible data insights from satellite earth observations.

As lead organisation, Environment Systems has the experience and track record to deliver fully on this project. We have experience of leading major environmental projects, bringing together other organisations and key stakeholders to form partnerships and expert delivery teams, agreeing and managing partner and stakeholder inputs and budgets and ensuring high quality delivery to clients on time and within budget.

This experience extends to work in the British Overseas Territories. We have worked closely with a range of stakeholders in Anguilla for the last 5 years on habitat assessment and monitoring, we have worked closely with stakeholders in TCI and more recently Montserrat and we have worked with JNCC on a range of projects both in the UK and in the OTs.

We have also worked extensively in other OTs, including the Falklands, Gibraltar and St Helena. We understand the culture and specific needs and requirements of OTs, we know most of the key stakeholders and can implement new projects quickly and effectively. We are members of the Overseas Territories GIS Group, which aims to disseminate and ensure best practice in mapping and the use of spatial data in the

OTs.

For this project our partners are:

For TCI; DECR, a government agency, overseeing conservation, protection and management of TCI's natural resources. The Director, Deputy Director and three Assistant Directors (Research and Development; Law Enforcement; and Protected Areas and Fisheries) have relevant advanced degrees and experiences. They will oversee and manage the fieldworks in TCI, with support from Environmental Officers and Conservation Officers.

DECR will provide vessels, training/conference rooms, equipment and crew for Ground truthing operations. The DECR and other TCI government department's technical and support staff will be involved from implementation through completion of the project. DECR has successfully implemented, managed and completed many studies of similar scale and significance.

For BVI; The National Parks Trust of the Virgin Islands, responsible for the preservation, conservation and management of the 21 designated protected areas of natural and cultural significance as well as species restoration, marine conservation, reforestation, biodiversity research & conservation, and youth environmental education on BVI. They have skilled and very knowledgeable staff who are able to input into the project leading the collection of field data and input into the GIS analysis under Nancy Woodfield Pascoe, the Deputy Director for Science, Research and Environmental Policy.

For wider OTs coordination and support; JNCC has a dedicated OT team drawing on expertise in Earth Observation, data management, marine management and spatial planning. JNCC has significant relevant regional Caribbean and OT specific expertise in analysis and use of satellite data, working in partnership with the OTs and organising workshops.

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?

Capability building lies at the heart of this proposal. Through workshops, active involvement and staff exchanges, knowledge will be shared with local staff. Training materials and operating guidelines will be produced, to facilitate ongoing activities after this project. This has proven successful during DPLUS022 and DPLUS045 that Environment Systems was a partner on.

Data-driven decision making is becoming routine. This project will build on the concept of "collect once, use many times" to maximise the data that can be extracted from routine sources e.g. Sentinel satellites and other survey data, achieving benefits for a

wide range of stakeholders. We will bring together all parties with an interest in policy and planning data collection and demonstrate the sustainability of a joined-up delivery model and benefit for all.

The project team have a strong track record of delivering sustainability beyond the lifetime of projects in the Caribbean over a number of years. This project will enable decision makers in TCI and BVI to implement approaches to deal with the effects of climate change in the context of ecosystem services and biodiversity monitoring. Aligning closely with the JMC Communiques and existing national strategies.

8. Funding and Budget

Q19.   Budget

Please complete the appropriate Excel spreadsheet linked below, 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.
R6 D+ Budget form for projects under £100,000
R6 D+ Budget form for projects over £100,000
Please refer to the Finance Guidance 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.
Please upload your completed Darwin Plus Budget Form Excel spreadsheet using the field below.

_____	
_____	

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)

Secured funding from JNCC for year 1 of the project
JNCC has committed expert staff time with costs covered up to £15000.
JNCC will organise and fund two workshops in the first year of the project in each of the two TS – total cost £50,000.
Total secured funding = £65,000

DECR TCI - Total secured funding £23,186 for staff time, field work, use of boats to support marine field work and local facilities for meetings and workshops.

Environment Systems - Total Secured funding £500 for facilities, including room hire, for training.

All capital expenditure in this project is for equipment for TCI and BVI and both during and post project will remain on the islands for their use.

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

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.

Not applicable

Do you require more fields?

No

9. Financial Controls, Value for Money & Open Access

Q21. Financial Controls

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

To ensure that the resources of the project are utilised in the best possible way, only the Environment Systems Executive Board have authority to approve and control requisitions and expenditure. The Commercial Director leads the development of and signing of sub contracts and the Operations Director has an established and effective system of internal cost control and risk management, oversees the relationship with external audit and reviews the annual financial statements. Environment Systems has an established and effective internal time recording system for the tracking of staff time.

The Project Manager will be responsible for the day-to-day management of project funds, subject to the controls described above. The project manager has over 10 years experience managing projects and project budgets; up to £300k multi-year projects for Government and commercial customers, and varying complexity.

All goods and services will be procured in a fair and open manner.

Q22. Financial Management Risks

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.

Environment Systems has fully considered risks and threats to the project and has put in place strategies to ensure these are avoided or managed effectively, including;
Capacity and skills:
•Specialist skills, experience and capacity are required to provide a flexible and responsive service across the project.
•Staffing and resourcing plans meet requirements by bringing together leading experts and organisations.
Coordination and project management:
•Well-defined tasks describe the project elements and organisational roles.
•Regular feedback and reporting (internal/external) and change control processes will be used.
•Established communication channels exist across project partners already through previous projects.
Collaborative working relationships:
•Collaborative working with stakeholders is crucial for success. This philosophy is at the heart of our proposal.
•Contractual arrangements ensure the consortium functions as a single team.
•All consortium members have agreed for project outputs to be made available under open licencing.

Fraud and bribery
•This project has a zero tolerance for fraud and bribery based on; adherence to the Bribery Act 2010, project partner contracts and organisation policies. Any indication of fraud or bribery will be reported immediately.
A detailed table of risks will be further developed at the outset and be updated and shared during its lifecycle.

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.

This budget has been built using the project team's experience undertaking similar work. Environment Systems, JNCC and the project partners are proficient in the cost effective and efficient delivery of projects; this experience will be drawn upon for this Darwin Plus project.
Budget assumptions:
•A mix of senior and junior staff ensuring a strong blend of experience and expertise to deliver value for money.
•All capital expenditure items will remain on islands both during and post project to help deliver long term impact.
•Inclusion of VHR satellite imagery necessary to identify detailed hurricane impacts such as felled trees and erosion features.
•TCI has a large shallow water marine area and we will enhance the value for money by including (open licence) Sentinel 2 imagery in the analysis for less critical areas; to complete the time series and as the basis of ongoing monitoring; ensuring long term value.
•Project partners have made available considerable resources in terms of staff time, the supply of meeting / training facilities on islands and in the UK and to help support the workshops.
•The joint island bid is designed to share skills, experience and best practice and learning; maximising the value gained.

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.

Data standards:
Environment Systems actively supports the underpinning principles of best practice for data collection, management and analysis; adoption and use of common data and metadata standards (ISO19139), promotion of 'collect once use many times'.
Environment Systems is an active member of; Open Geospatial Consortium who

develop open standards for the global geospatial community; Open Data Institute who promote and support the development of open data.

Data access:

All data outputs for the project will be published under open licence (subject to Data Protection Act, or legacy licencing outside of project control). Where appropriate, data layers will be added to global data centres such as GBIF, thereby increasing the visibility of the data. On island data accessibility will be enhanced by the use of the GIS group on BVI and the group to be formed in TCI.

Commercial imagery will be purchased with multi-use licences. Raw Sentinel 1 and 2 data is open licenced and Environment Systems Analysis Ready Data is published under Creative Commons and will be freely shareable by the islands.

Software and training:

Analysis systems developed for the project will use free open source software (e.g. QGIS and R) to avoid vendor lock-in, or licence restrictions. Training material will be written to allow new members of staff to access the technology and data once the project is ended.

Public access:

Environment Systems undertake to make available the project outputs or links to outputs via www.envsys.co.uk to ensure that they can be publicly accessed and sign posted post-project.

10. Logical Framework

Q25. 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:

Biodiversity, ecosystem services and the role they play in mitigation are further integrated and strengthened in planning and development activities in marine and terrestrial areas of BVI and TCI.

Project Summary	Measurable Indicators	Means of Verification	Important Assumptions

Outcome: Planning and policy decisions in TCI and BVI routinely use marine and terrestrial maps, models and monitoring to consider spatial attributes of environmental mitigation and ecosystem services produced by nature.	0.1 BVI and TCI have full and easy access to terrestrial and marine ready to use remote sensing data and quality control ground truth data. 0.2 Biodiversity maps of the terrestrial and shallow water marine areas of TCI and BVI before and after hurricanes Irma and Maria are created. Change and resilience maps created. 0.3 Monitoring method to inform sustainable development policies and practices using remote sensing (RS) data are developed and implemented. 0.4 Key ecosystem services identified and mapped for each islands	0.1 Ready to use RS data collected and shared with partners. Field data collated and in a form suitable for use with model. 0.2 Maps from at least 2 time frames of terrestrial and shallow water environment. Short 5 page report documenting methods are produced. 03 Change maps produced, map showing key areas of resilience produced, Short 5 page report documenting methods. 0.4 Key ecosystem service and opportunity maps produced. Workbooks and workflows produced and those on island have run through an example to	Imagery purchased by JNCC for the islands as part of previous projects will be available to use. Landform data and data form the JNCC vulnerability model is available to integrate into the process. Key stakeholders within each island continue to support and realise the value of the project. No further catastrophic events hit the islands during the project.

priority to allow sustainable use of terrestrial and marine environments. Legacy usage ensured by production of workbooks and processes.

0.5 Plans developed to integrate this new type of spatial mapping into policy decisions to help improve marine and terrestrial conservation, protection of key resources and integrated planning. Workshop run with key stakeholder to raise awareness.

0.6 Key staff are training and there is a plan on each island to continue integrating the RS data and techniques into the GIS working group remits. GIS working group

demonstrate their understanding.

0.5 Integration plan for each island developed. Maps used in at least three policy decisions.

0.6 Three workshops and one UK-based training course held. Awareness of the use of the maps and monitoring tested by online questionnaire to key stakeholders and policy makers.

	set up on TCI.		
Output 1: 1. Satellite imagery sourced and processed and supplied to BVI and TCI; mapping produced for multiple dates supported by existing and new ground truth data	1.1 Imagery sourced within budget with multi-user licence to allow islands to retain and build a library of suitable imagery. 1.2 Mechanism for the acquisition of Sentinel imagery agreed and put into place. 1.3 Field work data points and shallow water marine bathymetry points are collected. 1.4 Maps produced for each time frame, using both VHR (including Pleiades) data and Sentinel 2 data. Short report on the uses of each data type produced.	1.1 Analysis ready imagery provided to islands. 1.2 Sentinel imagery available on island for monitoring. 1.3 Collated field work data points ready for analysis and modelling with RS data. 1.4 Maps created and verified on islands by their experts – any re-running of the model completed to give 6 finalised outputs.	Suitable cloud-free satellite imagery can be purchased within budget. There is a low risk of the imagery being unsuitable or costly. Existing data can be used for pre-hurricane reference data points. Pre-hurricane land cover maps provided for TCI by JNCC.

Output 2: 2. Monitoring of mapping outputs and creation of a monitoring plan for TCI and BVI for future use	2.1 Change maps created to show effects of the 2017 hurricanes. 2.2 Maps and a short 5 page report created showing resilient and sensitive areas needing restoration or further action. 2.3 Monitoring plan agreed on for both islands to use RS to update maps both systemically and after future extreme events.	2.1 Change maps presented to each of the islands, short 5 page report highlighting key points. 2.2 Eight resilience / sensitivity maps presented to each of the islands, short 5 page report highlighting key points. 2.3 Monitoring plans written for the islands, by the islands and signed off by GIS working group stakeholders.	

Output 3:	3.1 Key staff understand and can use RS data for key points. 3.2 Key staff understand and can carry out monitoring activities. 3.3 Monitoring activity plan is produced on each island and is supported by GIS group.	3.1 Staff trained via 3 workshops and 1 UK training event. Questionnaire at end of training comes back with at least 75% of attendees feeling confident they can use the data and the resultant maps and 4 experts trained. 3.2 TCI start a GIS group based on the BVI model. 3.3 Monitoring plans produced to show how the techniques will be implemented for the long term.	
3. Workshops and training held on remote sensing, monitoring and ecosystem service mapping techniques			
Output 4:			
Output 5:			

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.

Output 1: Satellite imagery sourced and processed and supplied to BVI and TCI; mapping produced for multiple dates supported by existing and new data
1.1 Imagery planning, acquisition and preparation
1.2 Purchase of hardware to allow TCI and BVI to plan for using Sentinel data
1.3 Collect field work data for training and modelling
1.4 Produce timeseries of maps for before and after hurricane Irma and Maria showing diversity maps of terrestrial areas and key shallow water marine features

Output 2: Monitoring of mapping outputs and creation of a monitoring plan for TCI and BVI for future use
2.1 Create change maps to show the effect of hurricanes Irma and Maria
2.2 Develop and trial monitoring method
2.3 Write monitoring plan
2.4 Create ecosystem service and opportunities maps to identify priority areas/habitats for restoration post hurricane to maximise natural protection
2.5 Write methodology report and workbook to allow the ecosystem service and opportunity maps to be re-created as part of future monitoring

Output 3: Workshops and training held on remote sensing, monitoring and ecosystem service mapping techniques
3.1 Workshop 1; use of remote sensing and modelling in Arc GIS and open-sourced software including shallow water marine, training in ground truth data collection
3.2 Workshop 2; training in monitoring methods, design of monitoring strategies
3.3 UK training; detailed training for two key individuals from each island to enhance their skill base in the UK at JNCC and Environment Systems offices
3.4 Workshop 3: Training in modelling for opportunity mapping and ecosystem service resilience, stakeholder awareness event in policy.

11. Implementation Timetable

Q26. 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 XLS
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.

_____ _____	

12. Monitoring and Evaluation

Q27.   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.

M&E will commence at the start of the project and run throughout its lifecycle. To ensure that this is run professionally and independently, Environment Systems have included Wavehill to provide specialist monitoring and evaluation support to the project team. Wavehill is an independent social and economic research company. Environment Systems have successfully engaged Wavehill in a similar way on other international projects.

The M&E plan will be developed as a guide as to what we will monitor and evaluate, what information we need, and who we are evaluating for. The plan will outline the key evaluation questions and the approach to monitoring that will help to design evaluations and data collection activities. This will allow us to identify the information we need to collect, how we can collect it, and who will collect it. The plan will be developed such that it can be picked up by anyone involved in the project at any time and be clear as to what is happening in terms of monitoring and evaluation.

The M&E process will start with the log frame presented in this proposal and the associated theory of change; as the project is due to start 6 months from proposal submission these will be rapidly evaluated to ensure that nothing has changed.

Once the log frame is finalised, the data required to measure the indicators will be confirmed. A range of data collection methods will be employed as part of the monitoring and evaluation activities for each indicator to include:

· Analysis of open access / published data
· Analysis of project management and monitoring data
· Surveys of stakeholders and project participants
· In-depth stakeholder and participant interviews

It is proposed to include two key reporting points:

• Baseline evaluation report (project start): an assessment of the project's starting point, used for comparisons later (see below). It will capture a comprehensive picture of situation or conditions before the project takes place.

• Final evaluation report: conducted at the end of a project and will be focused on assessing the final results (outcomes and impacts) of the project, with one of the

outcomes of the evaluation (rather than being recommendations for the final delivery window) are recommendations and identified key learnings for future projects.

In addition, it is proposed that there is a simplified, rapid mid-term evaluation review to take place part way through the project to ensure that it is on track and that there are no new risks or issues associated with the project.

Environment Systems have budgeted sufficient resource in the project to deliver the M&E under Wavehill guidance. This includes the data collection and evaluation reporting. This will enable the project to report to Darwin Plus on the outcomes and impacts of this work.

Number of days planned for M&E	40
Total project budget for M&E (this may include Staff and Travel and Subsistence Costs)	£18,000.00
Percentage of total project budget set aside for M&E (%)	6

13. Certification

Q28. Certification

On behalf of the

> company

of

> Environment Systems Ltd

I apply for a grant of

> £210,920.00

in respect of all expenditure to be incurred during the lifetime of this project based on the activities and dates specified in the above application.

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 have uploaded CVs for project principals and letters of support.
- I have uploaded our most recent signed audited/independently verified accounts and annual report (if appropriate).

> ☑

Name	Steve Keyworth
Position in the organisation	Director

Signature (please upload e-signature)	
Date	10/10/2017

If this section is incomplete the entire application will be rejected.

14. Submission Checklist

Checklist for submission

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