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Request for Quotation

Living England Analytical Projects

Natural Capital and Ecosystem Assessment (NCEA): Project 1.1 Living England

You are invited to submit a quotation for the requirement described in the specification below.

Your response should be returned to the following email address by:

Email: Anne.Stefaniak@naturalengland.org.uk

Date: 28/11/2022

Time: 17:30

Ensure you state the reference number and 'Final Submission' in the subject field to make it clear that it is your response.

Contact Details and Timeline

Anne Stefaniak will be your contact for any questions linked to the content of the quote pack or the process. Please submit any questions by email and note that, unless commercially sensitive, both the question and the response will be published on Contracts Finder.

Action	Date
Date of issue of RFQ	11/11/2022
Deadline for clarifications questions	18/11/2022
Deadline for receipt of Quotation	28/11/2022
Intended date of Contract Award	07/12/2022
Intended Contract Start Date	12/12/2022

Intended Delivery Date / Contract Duration	3 months
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Glossary

Unless the context otherwise requires the following words and expressions used within this Request for Quotation shall have the following meanings (to be interpreted in the singular or plural as the context requires):

"Authority"	Means Natural England
"RFQ"	Means this Request for Quotation and all related documents published by the Authority and made available to suppliers
"Contract"	Means the contract to be entered into by the Authority and the successful supplier.

Conditions applying to the RFQ

You should examine your response to the RFQ and related documents ensuring it is complete prior to submitting your completed quotation.

Your quotation must contain sufficient information to enable the Authority to evaluate it fairly and effectively. You should ensure that you have prepared your quotation fully and accurately and that prices quoted are arithmetically correct for the units stated.

The supplier by submitting a quotation is deemed to accept the terms and conditions in the RFQ. Failure to comply with the instructions set out in the RTQ may result in the supplier's exclusion from this procurement.

Acceptance of Quotations

By issuing this RFQ the Authority does not bind itself to accept any quotation and reserves the right not to award a contract to any supplier who submits a quotation.

Costs

The Authority will not reimburse you for any costs and expenses which you incur preparing and submitting your quotation, even if the Authority amends or terminates the procurement process.

Clarifications

The Authority reserves the right to discuss, confidentially, any aspect of your quotation with you prior to any award of Contract to clarify matters.

Amendments

The Authority may amend the RFQ at any time prior to the deadline for receipt. If it amends the RFQ the Authority will notify you in writing and may extend the deadline for receipt in order to give you a reasonable time in which to take the amendment into account.

Conditions of Contract

The terms and conditions attached will be included in any contract awarded as a result of this RFQ process. The Authority will not accept any material changes to these terms and conditions proposed by a supplier.

Specification

The Authority is Natural England. The Authority's priorities are to secure a healthy natural environment; a sustainable, low-carbon economy; a thriving farming sector and a sustainable, healthy and secure food supply. Further information about the Authority can be found at: [Defra](#), [Natural England](#) [MMO](#)

Background to Natural England

Natural England is the government's advisor on the natural environment. We provide practical advice, grounded in science, on how best to safeguard England's natural wealth for the benefit of everyone. Our remit is to ensure sustainable stewardship of the land and sea so that people and nature can thrive. It is our responsibility to see that England's rich natural environment can adapt and survive intact for future generations to enjoy.

Background to the specific Natural England work area relevant to this purchase

The NCEA (Natural Capital & Ecosystem Assessment) Programme

UK Government has set world-leading ambition on protecting our natural assets, internationally through the Convention of Biodiversity and domestically via the ground-breaking 25 Year Environment Plan. Intrinsically linked to the successful delivery of Net Zero, protecting our environmental services has never been more vital.

Achieving these goals is underpinned by the provision of systematic and robust evidence. For the first-time, Defra are developing a programme to deliver up-to-date, UK-wide environmental data to allow for agile policy making grounded in the best available evidence – to truly understand where we are and where we need to get to.

NCEA is a transformative programme to understand the extent, condition and change over time of environmental assets across England's land and water environments, supporting the government's ambition to improve the environment within a generation.

The Living England Project

Natural England leads on both the development of the Living England model (NCEA Project 1.1) and 25 YEP indicator D1 on habitat quantity, quality, and connectivity (which it is proposed will be the basis for the Environment Bill wider habitats target). The use of remote sensing satellite data to measure and monitor the location and change in habitats is a developing area of work. Developing its capacity to detect habitat extent and distribution is critical for assessing ecosystem extent over time and change in natural capital ecosystem assets.

Living England produces a map of broad habitat classifications for the whole of England based on up-to date satellite imagery and a collection of ancillary data layers including elevation (and derivatives such as slope, height above nearest drainage), proximity to various features (e.g., woodland, moorland, surface water, roads) and climatic variables. This is carried out by first splitting up England into 14 Biogeographic Zones, based on National Character Areas, which are distinctive areas each with unique environmental conditions. Recent satellite imagery is then identified for each biogeographic zone, which aims to use as cloud-free imagery as possible to create spring and autumn mosaics. A segmentation process is then applied to identify parcels of land with similar appearances in the imagery – forming a series of polygons using an object-based image analysis framework (OBIA). The polygons are then classified using a random forest, machine learning algorithm to identify the likely broad habitat present, informed by the field collected habitat records, satellite imagery and the ancillary datasets. The resulting map is a habitat probability map showing the likely broad habitat class for each polygon, creating a national picture of our natural capital assets. Living England Phase IV was published under an Open Government Licence in 2022 and can be accessed here [Living England Habitat Map \(Phase 4\) | Natural England Open Data Geoportal \(arcgis.com\)](https://data.naturalengland.org.uk/datacatalogue/england-habitat-map-phase-4).

Living England will produce a new map of the distribution and extent of habitats every two years using the updated satellite imagery, with the aim of identifying regions of broad habitat change. The aim of this project is to further assess the current methodology for satellite mosaic creation for use within the segmentation and modelling processes. This will ensure the workflow is suitable for comparisons of multiple habitat map iterations and improve our understanding of the inherent uncertainty within the image mosaics and subsequent models.

Requirement

Normalisation of satellite imagery for mosaic creation

This project will investigate current best practices and potential impacts of image normalisation in the development of Spring and Autumn satellite mosaic creation used within the Living England workflow for segmentation and habitat classification. The current mosaicking process includes a “Swiss-cheese” method for creating cloud-free mosaics, which involves removing any cloudy or shadow pixels and stacking the imagery to create the mosaic. The primary image is taken as the least cloudy image, with any cloud or shadow gaps filled by subsequent images, ordered from least to most cloudy. However, differences in acquisition timing and ground conditions can result in radiometric differences between the stacked images, the impact of which has not been quantified within the Living England process. There is potential that normalising the input imagery prior to mosaicking will result in improvements in the segmentation and aid comparisons of the segmentations derived from different mosaics. This could result in further improvements to how these maps can be used in assessing habitat change in extent over time due to the comparisons of satellite imagery from different seasons and years. The normalising of imagery values may also impact upon the habitat classification process, as these are used to derive zonal statistics within segment objects and are modelled using a random forest classification model. As a result, normalising the imagery within the mosaicking process may impact upon the overall accuracy of the habitat classification process.

A range of potential approaches exist to implement a normalisation step within Living England. This project will conduct a literature review to explore the different approaches available, in particular open-source tools, and consider the feasibility of each approach for informing habitat mapping on a national scale. Recommendations should be provided detailing the best solutions available and as to whether these can be integrated with the current ‘Swiss Cheese’ mosaic process within Google Earth Engine. Based on this, the project will produce scripts to create normalised mosaics, and a summary of the improvements/differences in outputs and accuracy when applied within the rest of the Living England classification model (dependent upon the scale of the project).

Working in collaboration with the LE team, any approaches should be discussed regarding the feasibility and likely impacts upon the habitat classification of each proposed approach. The project will write up the findings in a technical report, with recommendations for the Living England team on creating normalised mosaics for the segmentation and classification workflow.

The data sets required to deliver the work will be provided by Natural England. A data license will be required between the contractor and Natural England before this data can be released. Contractors will be expected to abide by the contract terms and conditions in relation to all data handling.

Resource required	Data clipped to one biogeographic zone: <ul style="list-style-type: none"> • Sentinel-1 and Sentinel-2 Spring and Autumn mosaics 2020/21 • Google Earth Engine Script for producing the mosaics • Relevant Living England scripts (if required depending on scope of the project) • Living England Phase IV habitat probability map 2021/22 • Living England Technical User Guide
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Skills required	<ul style="list-style-type: none"> • Earth observation knowledge • Scripting/ programming skills (GEE/R preferred) • Data analysis • Technical report writing
Outputs	<ul style="list-style-type: none"> • Technical report reviewing the impacts of imagery normalisation to the Living England mosaic creation workflow. Findings to note any literature reviewed, approaches assessed, supporting datasets, analysis and recommendations and considerations for implementing on a national scale. • Workflow Scripts – annotated reproducible analytical pathways for producing normalised mosaics. • Mosaics created using different approaches for testing with the Living England workflow
Why is this of benefit to Living England? Justification of why to do it	<p>Currently, Living England classifies national habitats based on a “Swiss-cheese” mosaic to create a cloud-free dataset from the satellite imagery. This approach acknowledges that there will be differences in the spectral reflectance values (and DN) due to the mosaicking of satellite imagery from different orbits, days and months. Investigating the potential importance of normalising the individual images when creating seasonal mosaics is critical for determining how much variability and uncertainty is being included at this stage, and the potential impact of this upon the segmentation and classification processes of the workflow.</p> <p>The inclusion of a normalisation step would align each satellite image (or scene) to enable comparability between the spectral reflectance values and thus has the potential to aid the Living England workflow by:</p> <ul style="list-style-type: none"> • Enabling the segmentation to detect true variations in habitats rather than potential artifacts derived from imagery used to fill gaps derived from clouds • Improve the use of seasonal mosaics to detect habitats and aid comparisons • Improve the ability of the random forest model to identify habitats based on more consistent zonal statistics for the training data to label • Enabling comparison of Living England habitat map iterations for determining changes to extent and distribution based on a standardised approach and aligned input imagery.
Measurable outputs	<ul style="list-style-type: none"> • Literature review of approaches to large-scale image normalisation and best practices • Well documented analytical steps for reproducibility • Scripts for mosaic creation with normalisation step and set of mosaic outputs • Provision of recommendations considering the scope of the Living England project

The Intellectual Property Rights resulting from the work shall belong to Natural England.

The cover of all reports or drawings will include a statement © Natural England and the date of creation.

When using existing data the supplier should own, or be licensed to use, all Intellectual Property Rights that are necessary to provide the Services. You should seek advice from Natural England on responsibilities for obtaining a data licence for third party data. Note that Natural England requires to know the lineage of your output (i.e., all the datasets that went into the work) and be able to identify what the licence terms for each of the inputs is in order to be able to license the output for use.

The Supplier shall indemnify and keep indemnified Natural England against all actions, claims, demands, losses, damages, costs and expenses and other liabilities Natural England may suffer or incur arising from any infringement or alleged infringement of any third-party Intellectual Property Rights except to the extent that they have been caused by or contributed to by Natural England's acts or omissions.

Scope of the specification

This is a one-off requirement; however, there may be scope in future to extend the project where further analysis has been identified or to further explore their incorporation in the Living England standardised methodology. All analyses and justification for decisions taken should be well-documented in technical reports, as well as analytical steps provided in well-annotated programming scripts for reproducibility.

Outputs and Contract Management

Natural England will nominate a Project Officer who will manage the project and serve as the principle point of contact from Natural England. They will be responsible for the day-to-day management of this contract and will coordinate regular meetings to review the work and ensure it meets the projects aims and objectives. As outlined below, meetings will be incorporated into the programme of works to discuss progress and facilitate feedback provision. Meetings will be organised by the successful Tenderer.

The contractor will be expected to appoint a Project Manager who will act as the principle point of contact and will be responsible for the day-to-day management of the project. The contractor will be required to regularly update the Natural England

Project Officer on project progress via meetings (held on MS Teams) arranged by the contractor, and when there are any significant issues.

Specific outputs will be required from the contractor during the course of this project. All reports must be produced in accordance with the Authority's templates for publications. The deliverables are to be provided as MS Word (in draft) and PDF documents (once finalised), MS Excel spreadsheets and MS PowerPoint presentations.

W/C 19 th December 2022	Inception meeting between project officer and suppliers	Online – MS Teams
Ongoing	Weekly catch-up meetings to discuss any issues	Online – MS Teams
W/C 27 th February 2023	Draft report to project officer	Digital format (MS Word) via email
W/C 13 th March 2023	Final reports and outputs to project officer	Report in a digital format (Pdf) via email. Outputs via email provided as spatial data files (csv, shp, gdb), and programming scripts.
W/C 20 th March 2023	Final meetings with project officer and suppliers	Online – MS Teams
31 st March 2023	Contract completion	

It is anticipated that this contract will be awarded for a period of 4 months, to end no later than 31/03/2023. Prices will remain fixed for the duration of the contract award period.

Quotation Submission

We will award this contract in line with the most economically advantageous tender (MEAT) as set out in the following award criteria:

Price – 40%

Quality – 60%

Evaluation Criteria

Prices

Prices must be submitted in £ sterling, inclusive of VAT. Please indicate if VAT will apply to your services and at what rate.

Cost Allocation	Year 1			
	Staff / Grade	Day rate	No. of days	Year 1 total
Literature review of normalisation approaches				
Production of scripts and mosaics using normalised mosaic creation process				
Technical report with recommendations				
Sub-contracts				
Overheads				
Travel and sustenance				
Other				
Total (excluding VAT)				
VAT				
Total (including VAT)				

Quality criteria

Criteria	Weighting	Details
Experience and Expertise	40%	Please provide details of your teams' member's expertise, previous experience and, if applicable, examples of similar projects worked on, relevant to this requirement. Please include abridged CVs of proposed members of team.
Methodology	40%	Please outline your proposed methodology for delivering [insert project name here]

Project Management	20%	<p>Please detail how you intend to manage this contract, including any consortium or sub-contracting arrangements, to ensure that project tasks and timescales are achieved. Your response should:</p> <ul style="list-style-type: none"> • Include Gantt chart, including the deliverables, critical pathways, and project dependencies, demonstrating how you will deliver the scope of services stated within the Specification of Requirements. • Demonstrate what safeguards you have in place for processing personal data and provide details of your approach to data security and GDPR • Provide details of how you intend to quality assure work undertaken as part of this contract and outputs, so that deliverables are provided efficiently, to a high standard, and on time
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Scoring criteria

Score	Justification
For a score of hundred (100):	Excellent - Response is completely relevant and excellent overall. The response is comprehensive, unambiguous and demonstrates a thorough understanding of the requirement and provides details of how the requirement will be met in full.
For a score of seventy (70):	Good - Response is relevant and good. The response demonstrates a good understanding and provides details on how the requirements will be fulfilled.
For a score of fifty (50):	Acceptable - Response is relevant and acceptable. The response provides sufficient evidence to fulfil basic requirements.
For a score of twenty (20):	Poor - Response is partially relevant and/or poor. The response addresses some elements of the requirements but contains insufficient / limited detail or explanation to demonstrate how the requirement will be fulfilled.
For a score of zero (0):	Unacceptable - Nil or inadequate response. Fails to demonstrate an ability to meet the requirement.

Disclosure

All Central Government Departments, their Executive Agencies and Non Departmental Public Bodies are subject to control and reporting within Government. In particular, they report to the Cabinet Office and HM Treasury for all expenditure. Further the Cabinet Office has a cross-Government role delivering overall Government policy on public procurement, including ensuring value for money and related aspects of good procurement practice.

For these purposes, the Authority may disclose within Government any details contained in your quotation. The information will not be disclosed outside Government during the procurement.

In addition, the Authority is subject to the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, which provide a public right of access to information held by public bodies. In accordance with these two statutes, the Authority may be required to disclose information contained in your quotation to any person who submits a request for information pursuant to those statutes.

By submitting a quotation you consent to these terms as part of the procurement.

Disclaimers

Whilst the information in this RFQ and any supporting information referred to herein or provided to you by the Authority have been prepared in good faith the Authority does not warrant that this information is comprehensive or that it has been independently verified.

The Authority does not:

- make any representation or warranty (express or implied) as to the accuracy, reasonableness or completeness of the RFQ;
- accept any liability for the information contained in the RFQ or for the fairness, accuracy or completeness of that information; or
- accept any liability for any loss or damage (other than in respect of fraudulent misrepresentation or any other liability which cannot lawfully be excluded) arising as a result of reliance on such information or any subsequent communication.

Any supplier considering entering into contractual relationships with the Authority following receipt of the RFQ should make its own investigations and independent assessment of the Authority and its requirements for the goods and/or services and should seek its own professional financial and legal advice.

Protection of Personal Data

In order to comply with the General Data Protection Regulations 2018 the contractor must agree to the following:

- You must only process any personal data in strict accordance with instructions from the Authority
- You must ensure that all the personal data that we disclose to you or you collect on our behalf under this agreement are kept confidential.
- You must take reasonable steps to ensure the reliability of employees who have access to personal data.
- Only employees who may be required to assist in meeting the obligations under this agreement may have access to the personal data.
- Any disclosure of personal data must be made in confidence and extend only so far as that which is specifically necessary for the purposes of this agreement.
- You must ensure that there are appropriate security measures in place to safeguard against any unauthorised access or unlawful processing or accidental loss, destruction or damage or disclosure of the personal data.
- On termination of this agreement, for whatever reason, the personal data must be returned to us promptly and safely, together with all copies in your possession or control.

General Data Protection Regulations 2018

For the purposes of the Regulations the Authority is the data processor.

The personal information that we have asked you provide on individuals (data subjects) that will be working for you on this contract will be used in compiling the tender list and in assessing your offer. If you are unsuccessful the information will be **held and destroyed within two years** of the award of contracts. If you are awarded a contract, it will be retained for the duration of the contract and destroyed within **seven years** of the contract's expiry.

We may monitor the performance of the individuals during the execution of the contract, and the results of our monitoring, together with the information that you have provided, will be used in determining what work is allocated under the contract, and in any renewal of the contract or in the award of future contracts of a similar nature. The information will not be disclosed to anyone outside the Authority without the consent of the data subject, unless the Authority is required by law to make such disclosures.