

Invitation to Quote (ITQ) on behalf of Natural Environment Research Council (NERC)

Subject UK SBS Scientific Software Tools for Catchment Definition and Spatial Aggregation

Sourcing reference number UK SBS IT150084

UK Shared Business Services Ltd (UK SBS) www.uksbs.co.uk

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Table of Contents

Section	Content
1	About UK Shared Business Services Ltd.
2	About our Customer
3	Working with UK Shared Business Services Ltd
4	Specification
5	Evaluation model
6	Evaluation questionnaire
7	General Information

Section 1 – About UK Shared Business Services

Putting the business into shared services

UK Shared Business Services Ltd (UK SBS) brings a commercial attitude to the public sector; helping our customers improve efficiency, generate savings and modernise.

It is our vision to become the leading provider for our customers of shared business services in the UK public sector, continuously reducing cost and improving quality of business services for Government and the public sector.

Our broad range of expert services is shared by our customers. This allows our customers the freedom to focus resources on core activities; innovating and transforming their own organisations.

Core services include Procurement, Finance, Grants Admissions, Human Resources, Payroll, ISS, and Property Asset Management all underpinned by our Service Delivery and Contact Centre teams.

UK SBS is a people rather than task focused business. It's what makes us different to the traditional transactional shared services centre. What is more, being a not-for-profit organisation owned by its customers, UK SBS' goals are aligned with the public sector and delivering best value for the UK taxpayer.

UK Shared Business Services Ltd changed its name from RCUK Shared Services Centre Ltd in March 2013.

Our Customers

Growing from a foundation of supporting the Research Councils, 2012/13 saw Business Innovation and Skills (BIS) transition their procurement to UK SBS and Crown Commercial Services (CCS – previously Government Procurement Service) agree a Memorandum of Understanding with UK SBS to deliver two major procurement categories (construction and research) across Government.

UK SBS currently manages £700m expenditure for its Customers.

Our Customers who have access to our services and Contracts are detailed here.

Our Procurement ambition

Our vision is to be recognised as a centre of excellence and deliver a broad range of procurement services across the public sector; to maintain and grow a procurement service unrivalled in public sector.

Procurement is a market-shaping function. Industry derived benchmarks indicate that UK SBS is already performing at or above "best in class" in at least three key measures (percentage savings, compliant spend, spend under management) and compare well against most other measures.

Over the next five years, it is the function's ambition to lead a cultural change in procurement in the public sector. The natural extension of category management is to bring about a fundamental change in the attitude to supplier relationship management.

Our philosophy sees the supplier as an asset to the business and the route to maximising value from supply. This is not a new concept in procurement generally, but it is not a philosophy which is widely employed in the public sector.

We are ideally positioned to "lead the charge" in the government's initiative to reform procurement in the public sector.

UK SBS Procurement's unique selling points are:

- Focus on the full procurement cycle
- Leaders in category management in common and specialised areas
- Expertise in the delivery of major commercial projects
- That we are leaders in procurement to support research
- Use of cutting edge technologies which are superior to those used generally used across the public sector.
- Use of market leading analytical tools to provide comprehensive Business Intelligence
- Active customer and supplier management

'UK SBS' contribution to the Government Procurement Agenda has been impressive. Through innovation and leadership UK SBS has built an attractive portfolio of procurement services from P2P to Strategy Category Management.'

John Collington

Former Government Chief Procurement Officer

Section 2 - About Our Customer

Natural Environment Research Council

NERC is the UK's main agency for funding and managing research, training and knowledge exchange in the environmental sciences.

NERC's work covers the full range of atmospheric, Earth, biological, terrestrial and aquatic science, from the deep oceans to the upper atmosphere and from the poles to the equator.

The organisation coordinates some of the world's most exciting research projects, tackling major issues such as climate change, environmental influences on human health, the genetic make-up of life on Earth, and much more.

Working internationally, NERC have bases at some of the most hostile places on the planet; running a fleet of research ships and aircraft and investing in satellite technology to monitor gradual environmental change on a global scale. NERC provide forewarning of, and solutions to, the key environmental challenges facing society.

Examples of funded research

- Showing the importance of mature tropical forests to the global climate.
- Developing a safer and cleaner way to mine gold by reducing the use of mercury.
- Studying the hole in the ozone layer discovered by our British Antarctic Survey and monitoring climate change.
- Playing a major role in the International Census of Marine Life that monitors our oceans.

NERC also runs six organisations of world renown:

- British Antarctic Survey, in Cambridge.
- British Geological Survey, in Nottingham.
- National Oceanography Centre, in Southampton.
- Centre for Ecology & Hydrology, in Oxfordshire.
- National Centre for Atmospheric Science, in Leeds.
- National Centre for Earth Observation, Swindon.

www.nerc.ac.uk

Section 3 - Working with UK Shared Business Services Ltd.

In this section you will find details of your Procurement contact point and the timescales relating to this opportunity.

Section 3 – Contact details		
3.1	Customer Name and address	NERC Centre for Ecology and Hydrology, Maclean Building, Crowmarsh Gifford, Wallingford, Oxon, OX10 8BB
3.2	Buyer name	UK SBS ICT Procurement
3.3	Buyer contact details	ICTProcurement@uksbs.co.uk 01793 867005
3.4	Estimated value of the Opportunity	£50,000
3.5	Process for the submission of clarifications and Bids	All correspondence shall be submitted within the Emptoris e-sourcing tool. Guidance Notes to support the use of Emptoris is available

Section	on 3 - Timescales	
3.6	Date of Issue of Contract Advert and location of original Advert	13/10/2015 Contract Finder
3.7	Latest date/time ITQ clarification questions should be received through Emptoris messaging system	19/10/2015 14:00
3.8	Latest date/time ITQ clarification answers should be sent to all potential Bidders by the Buyer through Emptoris	21/10/2015 14:00
3.9	Latest date/time ITQ Bid shall be submitted through Emptoris	29/10/2015 14:00
3.10	Date/time Bidders should be available if face to face clarifications are required	N/A
3.11	Anticipated rejection of unsuccessful Bids date	31/10/2015
3.12	Anticipated Award date	31/10/2015
3.13	Anticipated Contract Start date	01/12/2015

3.14	Anticipated Contract End date	30/11/2016 with an option to extend for a further 1 year period
3.15	Bid Validity Period	60 Days

Section 4 - Specification

Introduction

This document is a requirements specification for the development of scientific software tools for web-enabled data services for defining river catchments, and extracting specific datasets from large gridded time series datasets, including time series of spatially aggregated data.

It describes:

- the existing systems on which the software is to be based
- the core functionality to be developed
- · how the development will be managed

Background

The Centre for Ecology & Hydrology (CEH) is a world-class research organisation focusing on land and freshwater ecosystems and their interaction with the atmosphere.

Uniquely, CEH integrates UK-wide observation systems and curiosity driven research, from the smallest scale of genetic diversity to large-scale, whole-Earth systems. We work across disciplines and facilitate academic, public, private and voluntary sector partnerships. CEH's extensive, long-term monitoring, analysis and modelling deliver UK and global environmental data, providing early warnings of change and management solutions for our land and freshwaters.

We produce and maintain a wide variety of datasets, including from our monitoring activities, but also from modelling and from integration and synthesis of available environmental datasets. Many of these datasets represent an aspect of the environment (e.g. rainfall, soil moisture) as a gridded time series. These are often stored in files using the netCDF format, and are made available via an instance of the THREDDS Data Server.

There is a need for tools to make these datasets more accessible to users, in more ready to use formats, subset over specific areas and time frames, and available more reliably and efficiently over the internet. Specifically many users are interested in a single time series representing the average of the time series over a given spatial area, which can be complicated to produce without downloading the data or using specialist software code. The work described is to produce the code that will form tools to make such operations simple for non-expert end-users.

CEH stores and makes available a number of datasets in the netCDF format, e.g. http://doi.org/10.5285/5dc179dc-f692-49ba-9326-a6893a503f6e, http://doi.org/10.5285/94c9eaa3-a178-4de4-8905-dbfab03b69a0. The datasets follow the Climate and Forecast (CF) conventions. Many of these datasets are made available via an instance of the THREDDS Data Server, e.g. http://thredds-water.ceh.ac.uk/thredds/CEH-GEAR.html. To optimise production, download, update and use the datasets are often

stored as numerous smaller files representing for example a single year of daily grids.

CEH produces and maintains a web-server stack, which underpins the CEH Environmental Information Platform (https://eip.ceh.ac.uk). This includes servers for providing bespoke web-services, often enabling extraction and formatting of data. Python (and the Django framework) is the primary language of choice for the development. Spatial data analysis and functionality is often undertaken using the GDAL libraries, in combination with the netCDF4 library for accessing netCDF files.

CEH has developed bespoke code for rapid catchment definition, based on a 50m DTM-based grid, in FORTRAN, reading data from an Oracle database. An important aspect of the project will be to adapt this code to read from a netCDF data source, and to wrap the code in Python to allow the functionality to be accessed as a web-service. The code is inevitably complex in order to achieve high levels of efficiency.

Tools also exist for the spatial aggregation of gridded time series to produce single areal-average time series. The requirement of this work is to extend these tools to enable:

- Extraction of subsets of gridded time series from netCDF in other formats e.g. ESRI ASCII grid
- Production spatially aggregated time series based on a user-defined polygon (or MultiPolygon), submitted in various formats (ESRI Shapefile, ArcGIS REST API, geojson, wkt, including from the above-mentioned catchment definition tools). The tools will need to be flexible as to buffering zones and weighting of grid cells partially covered by the polygon.
- Accessing of tools via web-services

To increase performance of extracting data from large datasets (high resolution grids, long time periods) the tools will need to make use of parallelisation / multi-processing. A solution requiring specific VM and software configuration will be required to be defined in such a way as to enable rapid rollout to new environments, e.g. the cloud. Applicability within JASMIN, NERC's research cloud would be a distinct advantage of any solution.

No UI development for providing access to the code will be required.

Requirements

Task 1. Convert existing FORTRAN catchment definition code to read input grid data from netCDF-CF formats, wrap with Python and implement as a web-service.

Task 2. Produce web-services that:

- Extend existing code for extracting spatially aggregated time series from netCDF data:
- Allow polygon input to this code to be defined in a variety of formats;
- Optimise this code, using multi-processing / parallelisation to read from multiple netCDF files:
- Create a deployable combined VM /software solution.

Task 3. Testing of the solution to ensure robustness and deployability.

The development will be undertaken on a time-and-materials basis, and tenders will need to specify daily rates against specific skills.

Production of the system will be undertaken from December 2015 and can take place over the following 4 months. Tenders should set out an expected end point, which will be included in the final contract. The system will have to pass User Acceptance Testing against agreed benchmarks prior to the completion of the project.

- Applicants will have experience of developing for managed and unmanaged cloud systems.
- Applicants will be able to demonstrate a high level of experience of the following technologies, applied in an operational environment, are required, and must be demonstrated: FORTRAN, Django, Python, SQL (Oracle), netCDF, THREDDS.
- Applicants will be able to demonstrate experience of the development of robust webservices, and multi-processing / parallelised Python code in a working environment.
- Applicants will be able to start the work in December 2015.

Proposals need to demonstrate a good fit to the skills required to undertake the above tasks. The functional requirements above define the essential elements of each aspect of the system. Proposals should address approaches to each of the tasks described above, with estimates of number of days required, and uncertainties within this. Proposals should indicate availability of staff with the skills described. Proposals should demonstrate detailed understanding of the technologies to be used.

Approach to implementation

CEH will appoint a manager to oversee development of the project, ensure specifications are fit for purpose and that contractors have the information required at each stage, and to ensure requirements are met.

Applicants will preferably be based at CEH Wallingford, working closely with CEH staff over detailed requirements.

Where possible the system will be based on open source tools that exist elsewhere. The system will need to be maintained and further developed after the completion of the project, including by CEH scientists. Therefore documentation is important and programming languages used should be selected to fit with skills widely available, e.g. Python.

As recommended by the Digital by Default Service Standard, the system will be developed using the Agile methodology, allowing for regular short sprints iteratively building on existing work and demonstrating working outputs. Requirements and success criteria for each sprint will be developed at appropriate points.

Section 5 - Evaluation model

The evaluation model below shall be used for this ITQ, which will be determined to two decimal places.

Where a question is 'for information only' it will not be scored.

The evaluation team may comprise staff from UK SBS, the Customer and any specific external stakeholders UK SBS deem required. After evaluation the scores will be finalised by performing a calculation to identify (at question level) the mean average of all evaluators (Example – a question is scored by three evaluators and judged as scoring 5, 5 and 6. These scores will be added together and divided by the number of evaluators to produce the final score of 5.33 ($5+5+6=16\div 3=5.33$)

Pass / fail criteria		
Questionnaire	Q No.	Question subject
Commercial	FOI1.1	Freedom of Information Exemptions
Commercial	AW1.1	Form of Bid
Commercial	AW1.3	Certificate of Bona Fide Bid
Commercial	AW3.1	Validation check
Commercial	AW4.1	Contract Terms
Price	AW5.5	E Invoicing
Price	AW5.6	Implementation of E-Invoicing
Quality	AW6.1	Compliance to the Specification
Quality	AW6.2	Timescale

Scoring criteria

Evaluation Justification Statement

In consideration of this particular requirement UK SBS has decided to evaluate Potential Providers by adopting the weightings/scoring mechanism detailed within this ITQ. UK SBS considers these weightings to be in line with existing best practice for a requirement of this type.

Questionnaire	Q No.	Question subject	Maximum Marks
Price	AW5.2	Price	30%
Quality	AW6.3	Account Management	4.97%
Quality	AW6.4	Task 1 efficiency	4.97%
Quality	AW6.5	Web service	25.06%
Quality	AW6.6	Testing	25.06%
Quality	AW6.7	Hardware and Software	4.97%
Quality	AW6.8	Proposal	4.97%

Evaluation of criteria

Non-Price elements

Each question will be judged on a score from 0 to 100, which shall be subjected to a multiplier to reflect the percentage of the evaluation criteria allocated to that question.

Where an evaluation criterion is worth 20% then the 0-100 score achieved will be multiplied by 20.

Example if a Bidder scores 60 from the available 100 points this will equate to 12% by using the following calculation: Score/Total Points available multiplied by 20 ($60/100 \times 20 = 12$)

Where an evaluation criterion is worth 10% then the 0-100 score achieved will be multiplied by 10.

Example if a Bidder scores 60 from the available 100 points this will equate to 6% by using the following calculation: Score/Total Points available multiplied by 10 ($60/100 \times 10 = 6$)

The same logic will be applied to groups of questions which equate to a single evaluation criterion.

The 0-100 score shall be based on (unless otherwise stated within the question):

0	The Question is not answered or the response is completely unacceptable.
10	Extremely poor response - they have completely missed the point of the
	question.
20	Very poor response and not wholly acceptable. Requires major revision to the

	response to make it acceptable. Only partially answers the requirement, with major deficiencies and little relevant detail proposed.
40	Poor response only partially satisfying the selection question requirements with deficiencies apparent. Some useful evidence provided but response falls well short of expectations. Low probability of being a capable supplier.
60	Response is acceptable but remains basic and could have been expanded upon. Response is sufficient but does not inspire.
80	Good response which describes their capabilities in detail which provides high levels of assurance consistent with a quality provider. The response includes a full description of techniques and measurements currently employed.
100	Response is exceptional and clearly demonstrates they are capable of meeting the requirement. No significant weaknesses noted. The response is compelling in its description of techniques and measurements currently employed, providing full assurance consistent with a quality provider.

All questions will be scored based on the above mechanism. Please be aware that the final score returned may be different as there may be multiple evaluators and their individual scores will be averaged (mean) to determine your final score.

Example

Evaluator 1 scored your bid as 60

Evaluator 2 scored your bid as 60

Evaluator 3 scored your bid as 50

Evaluator 4 scored your bid as 50

Your final score will $(60+60+50+50) \div 4 = 55$

Price elements will be judged on the following criteria.

The lowest price for a response which meets the pass criteria shall score 100. All other bids shall be scored on a pro rata basis in relation to the lowest price. The score is then subject to a multiplier to reflect the percentage value of the price criterion.

For example - Bid 1 £100,000 scores 100.

Bid 2 £120,000 differential of £20,000 or 20% remove 20% from price scores 80

Bid 3 £150,000 differential £50,000 remove 50% from price scores 50.

Bid 4 £175,000 differential £75,000 remove 75% from price scores 25.

Bid 5 £200,000 differential £100,000 remove 100% from price scores 0.

Bid 6 £300,000 differential £200,000 remove 100% from price scores 0.

Where the scoring criterion is worth 50% then the 0-100 score achieved will be multiplied by 50.

In the example if a supplier scores 80 from the available 100 points this will equate to 40% by using the following calculation: Score/Total Points multiplied by 50 ($80/100 \times 50 = 40$)

The lowest score possible is 0 even if the price submitted is more than 100% greater than the lowest price.

Section 6 – Evaluation questionnaire

Bidders should note that the evaluation questionnaire is located within the **e-sourcing questionnaire**.

Guidance on completion of the questionnaire is available at http://www.uksbs.co.uk/services/procure/Pages/supplier.aspx

PLEASE NOTE THE QUESTIONS ARE NOT NUMBERED SEQUENTIALLY

Section 7 - General Information

What makes a good bid – some simple do's ©

DO:

- 7.1 Do comply with Procurement document instructions. Failure to do so may lead to disqualification.
- 7.2 Do provide the Bid on time, and in the required format. Remember that the date/time given for a response is the last date that it can be accepted; we are legally bound to disqualify late submissions.
- 7.3 Do ensure you have read all the training materials to utilise e-sourcing tool prior to responding to this Bid. If you send your Bid by email or post it will be rejected.
- 7.4 Do use Microsoft Word, PowerPoint Excel 97-03 or compatible formats, or PDF unless agreed in writing by the Buyer. If you use another file format without our written permission we may reject your Bid.
- 7.5 Do ensure you utilise the Emptoris messaging system to raise any clarifications to our ITQ. You should note that typically we will release the answer to the question to all bidders and where we suspect the question contains confidential information we may modify the content of the question to protect the anonymity of the Bidder or their proposed solution
- 7.6 Do answer the question, it is not enough simply to cross-reference to a 'policy', web page or another part of your Bid, the evaluation team have limited time to assess bids and if they can't find the answer, they can't score it.
- 7.7 Do consider who your customer is and what they want a generic answer does not necessarily meet every customer's needs.
- 7.8 Do reference your documents correctly, specifically where supporting documentation is requested e.g. referencing the question/s they apply to.
- 7.9 Do provide clear and concise contact details; telephone numbers, e-mails and fax details.
- 7.10 Do complete all questions in the questionnaire or we may reject your Bid.
- 7.11 Do check and recheck your Bid before dispatch.

What makes a good bid – some simple do not's ⊗

DO NOT

- 7.12 Do not cut and paste from a previous document and forget to change the previous details such as the previous buyer's name.
- 7.13 Do not attach 'glossy' brochures that have not been requested, they will not be read unless we have asked for them. Only send what has been requested and only send supplementary information if we have offered the opportunity so to do.
- 7.14 Do not share the Procurement documents, they are confidential and should not be shared with anyone without the Buyers written permission.
- 7.15 Do not seek to influence the procurement process by requesting meetings or contacting UK SBS or the Customer to discuss your Bid. If your Bid requires clarification the Buyer will contact you.
- 7.16 Do not contact any UK SBS staff or Customer staff without the Buyers written permission or we may reject your Bid.
- 7.17 Do not collude to fix or adjust the price or withdraw your Bid with another Party as we will reject your Bid.
- 7.18 Do not offer UK SBS or Customer staff any inducement or we will reject your Bid.
- 7.19 Do not seek changes to the Bid after responses have been submitted and the deadline for Bids to be submitted has passed.
- 7.20 Do not cross reference answers to external websites or other parts of your Bid, the cross references and website links will not be considered.
- 7.21 Do not exceed word counts, the additional words will not be considered.
- 7.22 Do not make your Bid conditional on acceptance of your own Terms of Contract, as your Bid will be rejected.

Some additional guidance notes 🗹

- 7.23 All enquiries with respect to access to the e-sourcing tool and problems with functionality within the tool may be submitted to Crown Commercial Service (previously Government Procurement Service), Telephone 0345 010 3503.
- 7.24 Bidders will be specifically advised where attachments are permissible to support a question response within the e-sourcing tool. Where they are not permissible any attachments submitted will not be considered.
- 7.25 Question numbering is not sequential and all questions which require submission are included in the Section 6 Evaluation Questionnaire.
- 7.26 Any Contract offered may not guarantee any volume of work or any exclusivity of supply.
- 7.27 We do not guarantee to award any Contract as a result of this procurement
- 7.28 All documents issued or received in relation to this procurement shall be the property of UK SBS.
- 7.29 We can amend any part of the procurement documents at any time prior to the latest date / time Bids shall be submitted through Emptoris.
- 7.30 If you are a Consortium you must provide details of the Consortiums structure.
- 7.31 Bidders will be expected to comply with the Freedom of Information Act 2000 or your Bid will be rejected.
- 7.32 Bidders should note the Government's transparency agenda requires your Bid and any Contract entered into to be published on a designated, publicly searchable web site. By submitting a response to this ITQ Bidders are agreeing that their Bid and Contract may be made public
- 7.33 Your bid will be valid for 60days or your Bid will be rejected.
- 7.34 Bidders may only amend the Contract terms if you can demonstrate there is a legal or statutory reason why you cannot accept them. If you request changes to the Contract and UK SBS fail to accept your legal or statutory reason is reasonably justified we may reject your Bid.
- 7.35 We will let you know the outcome of your Bid evaluation and where requested will provide a written debrief of the relative strengths and weaknesses of your Bid.
- 7.36 If you fail mandatory pass / fail criteria we will reject your Bid.
- 7.37 Bidders are required to use IE8, IE9, Chrome or Firefox in order to access the functionality of the Emptoris e-sourcing tool.

- 7.38 Bidders should note that if they are successful with their proposal UK SBS reserves the right to ask additional compliancy checks prior to the award of any Contract. In the event of a Bidder failing to meet one of the compliancy checks UK SBS may decline to proceed with the award of the Contract to the successful Bidder.
- 7.39 All timescales are set using a 24 hour clock and are based on British Summer Time or Greenwich Mean Time, depending on which applies at the point when Date and Time Bids shall be submitted through Emptoris.
- 7.40 All Central Government Departments and 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, UK SBS may disclose within Government any of the Bidders documentation/information (including any that the Bidder considers to be confidential and/or commercially sensitive such as specific bid information) submitted by the Bidder to UK SBS during this Procurement. The information will not be disclosed outside Government. Bidders taking part in this ITQ consent to these terms as part of the competition process.

7.41 From 2nd April 2014 the Government is introducing its new Government Security Classifications (GSC) classification scheme to replace the current Government Protective Marking System (GPMS). A key aspect of this is the reduction in the number of security classifications used. All Bidders are encouraged to make themselves aware of the changes and identify any potential impacts in their Bid, as the protective marking and applicable protection of any material passed to, or generated by, you during the procurement process or pursuant to any Contract awarded to you as a result of this tender process will be subject to the new GSC from 2nd April 2014. The link below to the Gov.uk website provides information on the new GSC:

https://www.gov.uk/government/publications/government-security-classifications

UK SBS reserves the right to amend any security related term or condition of the draft contract accompanying this ITQ to reflect any changes introduced by the GSC. In particular where this ITQ is accompanied by any instructions on safeguarding classified information (e.g. a Security Aspects Letter) as a result of any changes stemming from the new GSC, whether in respect of the applicable protective marking scheme, specific protective markings given, the aspects to which any protective marking applies or otherwise. This may relate to the instructions on safeguarding classified information (e.g. a Security Aspects Letter) as they apply to the procurement as they apply to the procurement process and/or any contracts awarded to you as a result of the procurement process.

USEFUL INFORMATION LINKS

- Emptoris Training Guide
- Emptoris e-sourcing tool
- Contracts Finder
- Tenders Electronic Daily
- Equalities Act introduction
- Bribery Act introduction
- Freedom of information Act