NPL - Commercial

Request for proposals to join the "TACOS" consortium to undertake a marketing/outreach study: Reaching small-sat users for the TRUTHS[1,2,3] satellite mission

1. Overview

This Expression of Interest is to find a consortium partner to join NPL in delivering a study to explore the benefit of the **TRUTHS**[1,2,3] satellite mission *(Traceable Radiometry Underpinning Terrestrial- and Helio- Studies)* to 'small-sat' / commercial operators and their customers.

As part of **TACOS** (*TRUTHS Accompanying Consolidation towards Operational Study*), an ESA funded project supporting TRUTHS, we are looking for a partner to lead delivery on a **study which focusses on the small-sat user benefits of the TRUTHS mission**, afforded primarily through the TRUTHS instrument's intercalibration capability.

- **Application timescales:** Final submission due 28 February 2025 and notification of outcome mid-March 2025.
- **Delivery timescales:** Kick-off in March 2025 – with project duration running until November 2025, and key delivery dates for Living Planet Symposium 2025[4].
- **Expected budget:** Up to a maximum of **£150,000.00** (excluding VAT). The funding is subject to ESA financial rules, audits and approval with a capped profit margin of 8%.
- **Nature of commercial arrangement:** TACOS Consortium partner via a subcontract with NPL. Flow-down of ESA Terms and Condition terms will apply to the subcontract. Final confirmation of partner is subject to ESA approval and submission of a direct award proposal to ESA. This RfP is to identify a partner as part of a direct negotiation with ESA and not in itself a competitive procurement process.

2. Background on TRUTHS Mission

TRUTHS is a UK-led climate focussed mission delivered by ESA:

- Uniquely, TRUTHS has an on-board calibration system that allows it to self-calibrate in-flight, direct to a primary standard of the international system of units (SI). This is achieved at unprecedented uncertainties (goal 0.3% k=2, equivalent to ~95% confidence level), ~10x better than other satellite imagers.
- TRUTHS provides spectrally continuous hyperspectral reflectances and radiances of the top and bottom of atmosphere and incoming solar Irradiance (from 320 to 2400 nm in bandwidths of ~ 2-6 nm). The TRUTHS detector samples the entire globe at a 50 m spatial resolution and can point and image off-nadir upon request; in ground calibration studies and special observational modes it is possible to acquire spatial data at the maximum detector resolution, the standard otherwise being 100 m over land and coastal areas and 200 m over ocean.
- TRUTHS' improved radiometric accuracy can also be used to upgrade the calibration of other satellite imagers (multi- and hyper- spectral and spectroscopic) improving the quality and performance of the data from the global EO ecosystem. TRUTHS hyperspectral data enabling it to match the spectral response of many sensors with differing spectral bands across the spectrum to target specific applications. Although not spectroscopic it can still provide a variety of benefits to these types of mission and their retrieval algorithms.

3. Background on TRUTHS applications for small-sat users

The expected benefits of TRUTHS as a Climate Model Benchmark or Calibration Anchor to large scientific and operational programmes has been clearly established and developed in previous TRUTHS related work.

Unlike TRUTHS, small-sats typically do not usually contain on-board calibration systems, relying on pre-launch and on-ground calibration and, in most cases, in-flight vicarious calibration or intercalibration with another sensor serving as a reference.

The potential benefits of TRUTHS to serve as a space calibration segment for small-sats are significant, providing not only increased accuracy, but also more flexibility through its ability to utilise its hyperspectral observations to more closely match the spectral response of other sensors. Its unique orbit also provides simultaneous observation opportunities over most parts of the globe and at different observation times to help address constellations and their internal consistency over differing parts of their orbital cycles. However, the small-sat user community has had limited exposure to TRUTHS and its potential benefits. Recent contact with the small-sat community was established during the 4S Symposium 2024[5] and VH-RODA[6] The following key points were identified;

- There is a lack of awareness of TRUTHS in the small-sat community,
- There is curiosity and interest in the principle of using an absolute calibration reference in space,
- Operations of small-sats in the 2030s are beyond the common horizon of many small-sat players, and therefore are less likely to factor-in TRUTHS' intercalibration activities at this time.

4. Scope Requirements

The following requirements are taken from ESA's statement of work for the TACOS project. NPL and ESA expects proposals to clearly demonstrate how each of the requirements will be met in the proposal. Note proposers can assume that input from ESA and members of the TACOS project will provide supporting information and guidance as necessary.

a) **Analyse the potential user-basis of optical small-sat sensors for TRUTHS as a calibration reference:**
   i. Evaluating possible trends and plans in the small-sat community, both providers and users, to move towards more quantitative services.
   ii. Quantifying to what extent radiometric uncertainty and/or its trustworthiness is or will be playing a higher role in the near future for those actors
   iii. Stratifying the potential user pool against application areas, programme duration (one-off or long-term operations), commercial or public/non-for-profit mission statements and other relevant parameters.

b) **Develop a short-term user engagement and communication strategy to raise awareness and actively engage with the commercial and institutional small-sat community.** This shall include innovative communication and outreach supports and strategies, disruptive with traditional ways to address scientific and technical experts for (a) and targeted to the New Space (operators and users).

c) **Implement promotional tools and material tailored for Small-sat actors.** This will require a concept demonstrator to be presented to ESA to be agreed before full implementation.
d) **Organise small-sat user consultation meetings or other appropriate events/formats**, with timing to be agreed with ESA, where possible, capitalising on existing ESA events.
e) **Based on the above requirements, establish a roadmap for TRUTHS uptake** in the small-sat commercial and institutional communities, including:
    i. collection of user requirements specific to these communities,
    ii. updated user engagement strategy,
    iii. scientific demonstration case studies, possibly drawing from the other TACOS activities,
    iv. generation of specific demonstration test data/examples,
    v. design of peripheral TRUTHS service and training materials targeting the small-sat market.

5. Deliverables and format:

D1 TRUTHS small-sat user basis and benefits analysis

D2 Short-term communication plan

D3 Innovative promotional tools and materials

D4 User consultation outcome and requirements

D5 Roadmap for TRUTHS utilization by Small-sats

The exact nature and format of the deliverables should be specified in the proposal. We encourage potential consortium partners to be creative in how deliverables are presented and formatted, particularly for deliverables 3 and 5.

It is expected that each deliverable will be iterated on 3 times, with milestone delivery in May 2025, July 2025 and November 2025.

Initial drafts and progress updates will be expected for all deliverables by May 2025, with a particular focus on deliverable 2.

It is anticipated that the delivery in July 2025 will be oriented around engagement at ESA's Living Planet Symposium and focus more heavily on engagement with the small-sat user community as opposed to operators, with a particular focus on deliverables 3 and 5.

All deliverables must be completed and finalised by November 2025.

References:

1/ TRUTHS - Space4Climate

2/ ESA - TRUTHS

3/ TRUTHS - NPL

4/ Living Planet Symposium

5/ 4S Space Symposium 2024

6/ VH-RODA 2024 - Earth Online

6. Eligibility criteria

The following eligibility criteria apply:

- Applicants must accept flow-down of ESA Terms and Conditions (see Appendix B).
- Applicants must comply with the outlined delivery timescales and requirements within the maximum budget, meeting the full scope of work.
- Applicants must be led by a UK registered organisation with at least 70% of the work undertaken by UK residents.
- Applicant organisations must be willing to travel to Living Planet Symposium and up to 2 further ESA related events likely to be VH-RODA 25 (ESA ESRIN) and a workshop in the UK (TBC, Autumn 2025), with a travel budget of no more than **10%** of the total budget.

Proposals which do not meet the eligibility criteria will be rejected.

7. Application process and assessment criteria

Applicants must fill out the Proposal Template (Appendix A in this document) with any additional appendices and submit electronically to truths@npl.co.uk.

Appendix A should not exceed 20 pages. CVs, a risk register and project plan can be submitted separately. Please identify any additional attachments clearly in your email.

Proposals should be submitted by 28th February 2025 with a notification of outcome mid-March 2025.

Projects will be selected by a panel based on the following evaluation criteria:

- **Anticipated degree of impact/benefit of the proposed application**
- **Likelihood of viability (based on evidence within proposal and independent judgement)**
- **Creativity of deliverables (communication method)**
- **Track record and experience of proposal team**
- **Cost & timeliness of delivery**

Please use Appendix A in your response. Proposers may be asked for clarifications to aid selection.

Once a proposal is selected, a direct award process (led by NPL) will be triggered with ESA to join the TACOS consortium. It is expected successful proposals will need to submit to ESA PSS forms and accept flow-down of ESA terms and conditions a via an NPL subcontract. NPL is the prime on TACOS.

8. Queries

Please submit queries via truths@npl.co.uk

Answers to queries from all interested partners will be posted publicly here.

Appendix A Proposal Template

[Appendix A: TACOS Proposal Template, small-sat users study]

[Guidance for applicants: *Please fill the template in full. When the proposal is ready for submission, please remove all captions in red and NPL headers, adding in your organisation's logo and attaching a cover page to the proposal.*

Proposals must be submitted electronically in a searchable PDF format to truths@npl.co.uk, with nigel.fox@npl.co.uk and liam.mullen@npl.co.uk in CC, by 28th February 2025.

Proposals in Appendix A should be limited to 20 pages in length (not including Appendices). Concise proposals are encouraged.

A project plan, risk register and CVs can be attached separately as searchable PDFs in addition to Appendix A. Appendices should be appended to Appendix A to form one PDF document.

Please indicate in Section 9 "Appendices" and in your submission email: ***the title(s) of any supplementary appendices.]***

1. **Project title**

[Project Title]

2. **Proposer details**

Organisation name	*Legal name of entity*		
Organisation type	*i.e. SME/Private company/Academic institution*		
UK VAT number	*UK VAT Number*		
ESA entity code	*"N/A" if not yet an ESA-star registered supplier*		
	Name	**Email**	**Telephone**
Lead contact			
Secondary contact			

3. **Compliance with eligibility criteria**

I herby declare that this proposal is in compliance with the eligibility criteria listed in the Request for Proposal: ☐

[Eligibility Criteria]

- *Applicants must accept flow-down of ESA General Clauses and Conditions and the existing NPL-ESA contract for TACOS if successful in securing the project. This information will be shared with the successful applicant.*
- *Applicants must comply with the outlined delivery timescales and requirements within the maximum budget, meeting the full scope of work.*
- *Applicant organisations must be willing to travel to Living Planet Symposium and up to 2 further ESA related events, with a travel budget of no more than* ***10%*** *of the total budget.*

4. **Organisational background and relevant experience**

[Present the background of your organisation and briefly describe relevant experience to delivery of this project.]

5. **Overall team composition and proposed key personnel**

[Please describe the overall team composition, including any subcontractors or suppliers. A "Key Person" is a person who substantially contributes to the proposal in terms of effort and knowledge and is explicitly nominated to perform those duties.

Please list which CVs are attached to this proposal in this section.]

6. **Proposed approach to work**

[Please demonstrate how you intend to meet the requirements outlined in the scope of work and the overall approach you will take to this project.

Outline the key activities that will be undertaken for each requirement and deliverable, describe how they will be achieved. Specify the suggested formats for the deliverables.

In particular, please also briefly consider how the proposed deliverables can be used as a starting point for further engagement at later stages of the TRUTHS mission lifecycle]

7. **Project planning**

[Please detail your project and risk management processes to ensure timely delivery of the project. Include a project plan and risk register as an appendix to this proposal]

8. **Finances**

[Please fill in the finance table below with costs broken down by labour, consumables (if any), travel. Add extra rows as necessary.

***NOTE:** The successful applicant organisation will have to fill in the ESA PSS-A forms and be subject to ESA financial rules. PSS A1, A2 (incl. Exhibit A & B), A8, A15.1 will be required. NPL will be able to assist with this process.]*

Labour Cost					
Grade or Code	**Description or named individual**	**No. Hours Required**	**Gross hourly rate (£)**	**Deliverables contribution**	**Total (£)**
i.e. grade designation/code (N/A for direct cost of named individual)	*Job title OR named individual*	*Hours required for this grade or named individual*	*Fully burdened hourly rate, inclusive of overheads, according to General Accepted Accounting Principles*	*List deliverables contributed to and the hourly allocation for each deliverable* *e.g. (1. TRUTHS small-sat user basis and*	*Total cost of labour centre or named individual in GBP*

				benefits analysis – 100 hours): *etc.*	
				Total Labour Cost (£)	*Total cost of labour in GBP*
Non-labour costs					
Cost type	**Justification**				**Total (£)**
Travel	*Please provide justification of the cost. Where possible, include a short breakdown of contributing costs.*				*Total cost in GBP*
Equipment					
Consumables					
External services					
Other (specify)					
				Total non-labour costs (£)	*Total cost of labour in GBP*
				Total Price for NPL (£)	*Total price of proposal in GBP*

9. Attached Appendices

[Please list the attached appendices in order, appending them to this document upon completion of the proposal]