

INVITATION TO SUBMIT A QUOTE FOR A MARKET STUDY

PROCUREMENT OF EQUIPMENT FOR THE IMPLEMENTATION OF REMOTE WATER QUALITY MONITORING STATIONS

As part of the “Integrated Management of the Putumayo-Içá River Basin” project, funded by the Global Environment Facility (GEF), implemented by the World Bank (WB), and executed by the Wildlife Conservation Society (WCS), national and international stakeholders are invited to participate in a process to identify equipment, components, and tools for the implementation of remote water quality monitoring stations integrated into the Early Warning System (SAT) in the Putumayo-Içá watershed.

This invitation is part of a preliminary market analysis phase and does not constitute a selection process or a formal request for proposals. Its objective is to gather technical, operational, and implementation information on available equipment in order to assess its relevance, feasibility, and adaptability to the environmental and logistical conditions of the prioritized areas within the basin.

The information gathered will enable WCS to strengthen decision-making in later stages of the project, specifically regarding the procurement of equipment. Equipment that meets the required technical criteria may subsequently participate in the formal bidding process.

1. Background.

The Wildlife Conservation Society (WCS) is an international nongovernmental organization headquartered at the Bronx Zoo in New York City that works to conserve wildlife and natural landscapes, helping to address global conservation challenges in more than 60 countries across Africa, Asia, and the Americas. WCS is organized into a series of regional programs, including the Andes, Amazon, and Orinoquia (AAO) region, which encompasses Bolivia, Brazil, Colombia, Ecuador, and Peru, in addition to regional involvement in a variety of conservation issues.

The Wildlife Conservation Society (WCS) has received funding from the Global Environment Facility (GEF), through the implementing entity, the International Bank for Reconstruction and Development (IBRD or World Bank), via Grant No. TFOB8254-6L, to implement the project “Integrated Management of the Putumayo-Içá Watershed (P172893)”

The “Integrated Management of the Putumayo-Içá River Basin” project aims to strengthen the conditions that will enable participating countries to manage the shared freshwater ecosystems in the Putumayo-Içá basin, in the Amazon region.

The project has three components, as follows:

1. Strengthen governance and capacity for informed and participatory decision-making on integrated watershed management
2. Developing interventions aimed at shared and integrated watershed management
3. Project Management, Communications, Monitoring, and Evaluation

The Putumayo-Içá River basin is an Amazonian territory shared by Brazil, Colombia, Ecuador, and Peru. It is of great ecological and cultural importance and faces growing pressures on its aquatic ecosystems—including gold mining (such as riverine mining), increased sedimentation, wastewater discharges, and mercury pollution. The GEF Putumayo-Içá project aims to strengthen the enabling conditions for the countries to jointly manage the basin’s freshwater ecosystems.

In Component 2 (management interventions for integrated water resources management), Subcomponent 2.1 addresses pollution associated with mercury and other contaminants and includes a mercury sub-strategy whose baseline monitoring actions are Mercury Monitoring and the Early

Warning System (EWS) for water quality. The EWS feeds into the Integrated Watershed Management Plan.

To implement the strategy, it has been proposed that the EWS have two tiers for the Putumayo-Içá watershed. The first tier uses satellite data to provide broad and continuous monitoring of the watershed. Using images from various sources—such as Landsat, NASA, Planet, or SWOT—the data is processed via Google Earth Engine.

At the core of the system is the Total Suspended Sediment Concentration (TSSC) model developed by the Global Land Analysis and Discovery (GLAD) group at the University of Maryland (Zou et al., 2025; Hansen et al., 2025), which primarily uses Landsat red-band reflectance as an indicator to detect potential anomalies or changes in water bodies. The model confirms that mining is the primary driver of increased sediment levels (accounting for 64% of the increase in reflectance from 2000 to 2020) and has already detected recent mining sites (2022–2024) on the Bermejo, Bocoquera, and Betano rivers within the basin.

The second level, meanwhile, will focus on field monitoring, allowing for verification of whether the signals detected through satellite observation actually correspond to relevant changes in the territory. Its primary function is to provide local information, generate complementary data, and contribute to the validation of the signals identified by the satellite model. Both levels feed into a multisource analysis by integrating satellite information, field data, and local reports. This integration will enable the generation and validation of alerts, which can then be communicated to the various end-user groups identified in the basin through reports and targeted channels such as WhatsApp for communities, thereby helping to close the cycle of detection, validation, communication, and response.

This process focuses specifically on the second level, which consists of two main components: (1) monitoring and communication platforms for data generation and collection; and (2) specific validation of signals related to mercury. First, the plan includes platforms for monitoring water quality variables—such as turbidity, pH, dissolved oxygen, ORP, electrical conductivity, and temperature—and for communication via a LoRaWAN network to transmit data from the stations, along with tools such as EarthRanger and SMART (in transition to SERCA), which allow for the integration of information collected by local monitors and communities.

Second, the generation and collection of data are considered, supplemented by reports from indigenous peoples and local communities. Both the data from the monitoring stations and that from the communities will provide contextual information on the conditions observed in the territory and may contribute to the interpretation and validation of detected signals related to mercury through analyses of water, sediments, fish, or hair, as well as eDNA analyses, in accordance with the monitoring and validation requirements defined by the project.

In this context, and with the aim of contributing to the achievement of the goals set forth in the strategy, the GEF Project proposes the implementation of at least four (4) remote water quality monitoring stations integrated into the SAT, one for each of the four countries that make up the Putumayo-Içá River basin. At this stage, the purpose of the call for proposals is to identify suppliers and solutions available on the market that can provide the equipment, components, and tools required for the design, assembly, and implementation of these monitoring stations. The information gathered will enable the project to assess existing market capabilities, the characteristics of the solutions offered, and their potential applicability to the anticipated operating conditions in the region.

The results of this process will serve as input for defining the technical scope and specifications of a potential future contract, which may include the selection, procurement, integration, and implementation of the equipment and components required for the stations.

2. Geographic Context and Potential Sites for SAT Stations

By way of illustration, the following provides a general description of the watershed where the stations covered by this market study will be installed:

The Early Warning System (SAT) stations are proposed to be installed at strategic locations in the Putumayo-Içá River basin, which drains approximately 118,000 km² along a river stretch of about 1,800 km, from its Andean headwaters, at an elevation of approximately 4,000 m, to lowland and floodplain forests before its confluence with the Amazon River. The basin has high concentrations of sediment that cause water turbidity, annual rainfall exceeding 3,000 mm, and extensive wetlands and floodplains. It is also characterized by a dispersed population, access primarily by air and river, and limited infrastructure concentrated mainly in the Andean foothills.

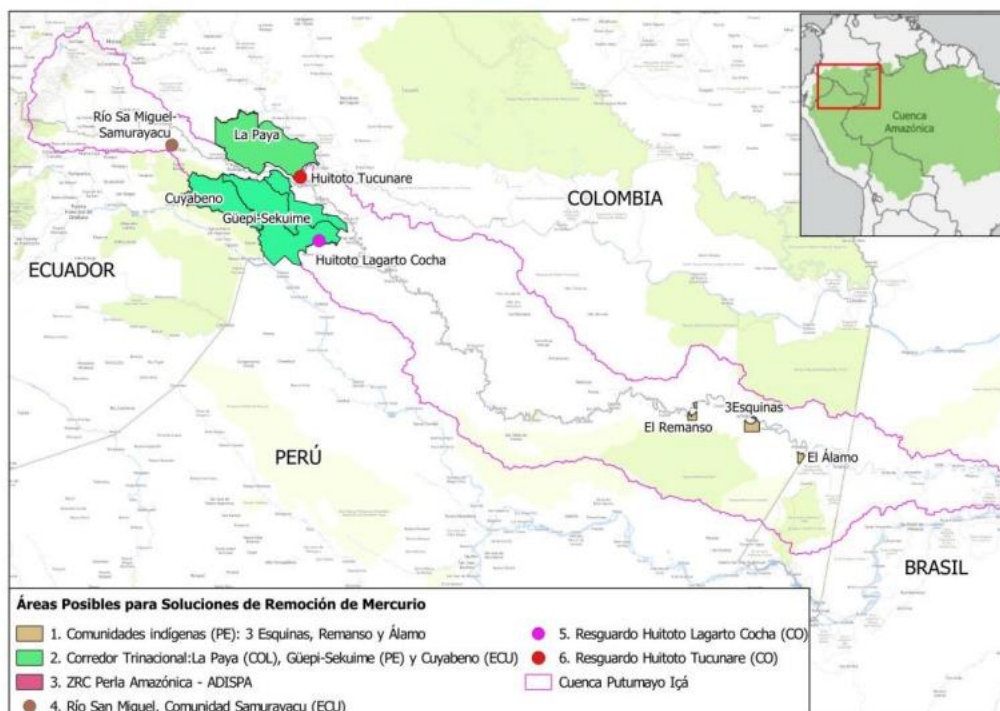
These characteristics present significant challenges for the design and operation of a water quality monitoring system. The basin's size, the dispersion of communities, climatic conditions, and limited communications infrastructure require stations capable of operating remotely and transmitting data via an adequate connectivity infrastructure. Therefore, site selection must consider their representativeness for monitoring, accessibility for installation and maintenance, availability of infrastructure and connectivity, as well as the capacity of local communities and institutions to participate in their operation and monitoring.

In this context, the SAT seeks to strengthen the monitoring of water quality parameters and facilitate the timely identification of changes in the monitored conditions. The information generated may help trigger alert mechanisms and support the response of responsible stakeholders to events that could affect water quality. This is particularly relevant in areas exposed to various environmental pressures, including those associated with mining activities and potential oil spills from nearby industries.

Potential sites for the installation of the stations are currently under evaluation. However, the plan is to consider areas with characteristics similar to the following (see map):

1. Indigenous communities: Tres Esquinas, El Remanso, and El Álamo (Peru).
2. Tri-national sustainable development corridor: La Paya (Colombia), Güeppí-Sekime (Peru), and Cuyabeno (Ecuador).
3. La Perla Amazónica Peasant Reserve and its association ADISPA (Colombia).
4. San Miguel River, Samurayacu community (Ecuador).
5. Huitoto Tukunare Indigenous Reserve (Colombia).
6. Huitoto Lagarto Cocha Indigenous Reserve (Colombia).

The final selection of sites will be made by taking into account environmental and territorial conditions, the system's coverage needs, the availability of connectivity and infrastructure, and the conditions necessary to ensure the operation, maintenance, and continuity of the stations.



3. Market Profile.

National or international organizations, including research institutions, nongovernmental organizations, private-sector companies (including technology providers), universities and academic institutions, civil society organizations, and consortia with proven solutions applicable to the problem described.

4. Technical Specifications for the Equipment

The following describes the requirements for the supply of equipment:

Item	Description	Quantity	Technical Specifications
1	Gateway	4	LoRaWAN network connection (See Note 2) LTE: LTE CAT-1 for Latin America (Peru, Brazil, Colombia, and Ecuador) Frequency: 915 MHz for AU 915 Power cable and AC adapter for: - Peru: (1) - Brazil (1) - Colombia (1) - Ecuador (1)
2	Battery	4	Compatible with the Gateway
3	Solar Panel	4	Compatible with Gateway Battery Charging
4	Power Adapter	4	- Compatible for charging the gateway battery - Compatible connector for: - Peru (1): Type A, Type B, and Type C, 220 V - Brazil (1): Type C and Type N, voltage 127 V or 220 V - Ecuador (1): Type A and Type B, 120 V - Colombia (1): Type A and Type B, 110 V
5	Converter/Transmitter/Node for Water Quality Sensor	4	- Connection to the LoRaWAN gateway - Band frequency: AU 915

			- Compatible with remote configuration via LoRaWAN - Probe compatibility/detection: - EC: Electrical conductivity (salinity and dissolved solids). - pH: Acidity/alkalinity. - DO: Dissolved oxygen. - ORP: Oxidation-Reduction Potential - TS / Turbidity: Clarity or cloudiness of the water. - Supports at least 5 probes (See note 3) - Common CC Features: - Power supply: Built-in long-life battery (~8500 mAh); Operating range: 2.5 V to 3.6 V. - Operating temperature: 10 ~ 45 °C
6	Electrical Conductivity (EC) Sensor	4	- Range: 0 ~ 2,000 µS/cm - Minimum resolution: 1 µS/cm - Accuracy: ±1% FS - IP Rating: IP68
7	pH Sensor	4	- Range: 0 ~ 14.00 pH - Minimum resolution: 0.01 pH - Accuracy: ±0.15 pH - IP Rating: IP68
8	Dissolved Oxygen (DO) Sensor	4	- Range: 0 ~ 20.00 mg/L - Minimum resolution: 0.01 mg/L - Accuracy: ±3%
9	Oxidation-Reduction Potential (ORP) Sensor	4	- Range: -1999 to 1999 mV - Minimum resolution: 1 mV - Accuracy: ±3 mV
10	Turbidity Sensor (TS)	4	- Range: 0.1-1000.0 NTU - Minimum resolution: 0.1 m NTU - Accuracy: ±5%

Note 1: The installation sites are located in the Amazonian lowlands of the Putumayo-Içá River basin, a warm tropical environment with high humidity and frequent condensation: the average annual relative humidity is around 85–86%, with peaks of 95–99% (practically saturation) and dew formation due to temperature fluctuations between day and night. All equipment, components, and materials supplied must be designed and certified to operate continuously and reliably under these conditions, without any degradation in performance or service life. At a minimum, they must meet the following requirements:

- Relative humidity.** Components not in direct contact with water (gateway, main unit or converter, circuit boards, battery, charge controller, and other electronics housed in the cabinet) must be suitable for continuous operation within a relative humidity range of 0 to 100%, with condensation. Components with a declared tolerance of less than 95% relative humidity without condensation will not be accepted; if components with that limit are offered, the bidder must demonstrate that the enclosure and the humidity control measures (subparagraph e) maintain the internal humidity within the component's permissible range.
- Temperature.** Minimum ambient air operating range of –5 to +50 °C [adjustable], without performance degradation. Since electronics housed in enclosures exposed to sunlight may exceed ambient temperature, a wider operating range for the components will be preferred.
- Ingress Protection (IP) Rating.** Enclosures and housings for non-submerged electronics must have a minimum IP66 rating; housings exposed to temporary immersion or continuous splashing must have an IP67 rating. Connectors, cable glands, and feed-throughs must be sealed and have the same or a higher IP rating.

- d) **Tropicalization.** All printed circuit boards must have a *conformal coating* or other equivalent tropicalization treatment to protect them against moisture, condensation, mold, and corrosion.
- e) **Condensation Management.** Each enclosure must incorporate measures to prevent the accumulation of moisture and condensation, such as vapor-permeable, water- and dust-tight membrane vents (pressure-equalizing vents) and/or refillable or replaceable desiccant, specifying the maintenance procedure and frequency.
- f) **Resistance to Solar Radiation and Weathering.** Cabinets, mounts, wiring, and other materials exposed to the elements must be resistant to ultraviolet (UV) radiation and suitable for permanent exposure to sunlight and rain, without embrittlement, functional discoloration, or loss of watertightness during their service life.
- g) **Corrosion resistance.** Materials, hardware, and fasteners must be corrosion-resistant (stainless steel, anodized aluminum, stabilized polymeric materials, or equivalents) and suitable for a permanently humid environment.
- h) **Solar Power.** Solar panels, batteries, charge controllers, and their wiring must be specified for the conditions described above and sized to ensure energy self-sufficiency, taking into account the region's high cloud cover.
- i) **Verification.** The supplier must demonstrate compliance with the above conditions by providing the manufacturer's technical data sheets and certificates. The final evaluation will be contingent upon verification of these conditions.

Note 2: The manufacturer's LoRaWAN network shall not be used. The sensors must be compatible with and integrated into the project's private LoRaWAN network.

Note 3: If the converter offered supports fewer than the five required sensors, the supplier must include in its bid the additional converters, transmitters, or nodes necessary to ensure the connection and operation of all sensors, specifying the corresponding quantities.

Note 4: All equipment suppliers must offer, at a minimum, a one-year warranty from the date of delivery confirmation. The total cost must include transportation, insurance, and risk costs for loss and/or damage until the equipment is actually delivered to the locations specified in the "Place of Delivery of Goods" section.

In the event of a failure, the warranty covers either repair, substitution, or replacement of any parts with similar characteristics to those purchased (of no lesser quality). The replacement of damaged parts must not incur additional costs for labor and/or spare parts.

Note 5: The supplier must ensure that it will provide original catalogs and user manuals or a document containing the technical data sheets and specifications for the equipment included in the quote.

Note 6: At least one (1) training session must be provided for each piece of equipment supplied to the person or team designated by the contracting or receiving entity. The training must cover, at a minimum, the proper use, calibration, data logging, operation, maintenance, and recommendations for the transport and storage of the equipment under field conditions, within the timeframe for fulfilling

the purchase order. The training may be conducted virtually or in person, as determined by the contracting entity.

5. Submission of Information

Interested parties must complete **Annex 1—Information Submission Form**—of this invitation and submit it, along with the requested supporting documents, to seleccionaao@wcs.org. The subject line of the email must include the name of the interested party.

The information must be submitted no later **than November 6, 2026, at 11:59 p.m.**

Appendix 1 – Information Submission Form

1. Instructions for Completion

- Complete all sections (A through G). If a field does not apply, write "Not applicable"; if you do not have the information, write "Not available."
- You may respond in Spanish, Portuguese, or English.
- For each item in Section B, indicate whether your equipment meets the requirement, partially meets the requirement, or does not meet the requirement, and explain in the comments section. Equivalent alternative equipment is accepted, provided it is described.
- Attach supporting documents (technical data sheets, manuals, or certificates) and name each file according to the corresponding item.
- The information in this form is for reference only and is not binding. Submitting it does not constitute a formal quote nor does it create any obligation for WCS or the applicant.
- Submit this completed form and its supporting documents to seleccionaao@wcs.org , indicating the applicant's name in the subject line, by **November 6, 2026, at 11:59 p.m.**

2. Applicant Information

Information	Response
Name or Business Name	
Country	
Type of organization (manufacturer, distributor, integrator, other)	
Contact person	
Email	
Phone	
Website	
Presence, representative, or technical support in Colombia, Peru, Ecuador, or Brazil	

a) Compliance with technical specifications by item

Estimated quantity for the project: four (4) stations, one per country.

Item	Description	Qty.	Minimum requirement (summary)	Proposed brand and model	Complies / Partially complies / Does not comply	Comments and attached supporting documentation
1	Gateway	4	Project's private LoRaWAN network; LTE CAT-1 for Latin America; AU915 band; power cable and adapter for Peru, Brazil, Colombia, and Ecuador			
2	Battery	4	Compatible with the Gateway			
3	Solar panel	4	Compatible with Gateway battery charging			
4	Power adapter	4	Compatible with Gateway battery charging; connectors compatible with Peru (220 V), Brazil (127 V or 220 V), Ecuador (120 V), and Colombia (110 V)			

Item	Description	Qty.	Minimum requirement (summary)	Proposed brand and model	Complies / Partially complies / Does not comply	Comments and attached supporting documentation
5	Converter/transmitter/node device for water quality sensors	4	Connects to the LoRaWAN Gateway; AU915 band; remote configuration via LoRaWAN; detects EC, pH, DO, ORP, and turbidity probes; minimum of 5 probes; long-life built-in battery (~8,500 mAh); operating voltage 2.5 V to 3.6 V; operating temperature 10–45 °C			
6	Electrical Conductivity (EC) Sensor	4	Range 0–2,000 µS/cm; minimum resolution 1 µS/cm; accuracy ±1% FS; IP68			
7	pH sensor	4	Range 0 ~ 14.00 pH; minimum resolution 0.01 pH; accuracy ±0.15 pH; IP68			
8	Dissolved Oxygen (DO) Sensor	4	Range 0–20.00 mg/L; minimum resolution 0.01 mg/L; accuracy ±3%			
9	Oxidation-Reduction Potential (ORP) Sensor	4	Range -1999 to 1999 mV; minimum resolution 1 mV; accuracy ±3 mV			
10	Turbidity Sensor	4	Range 0.1–1,000.0 NTU; minimum resolution 0.1 NTU; accuracy ±5%			

If the offered converter/transmitter/node supports fewer than five probes, indicate how many additional nodes are required to connect all the sensors:

Question	Answer
Number of probes supported by the proposed converter/transmitter/node	
Additional converters/transmitters/nodes required per station	

b) Environmental and operating conditions

The stations would be installed in the Amazonian lowlands: average annual relative humidity of 85–86% with daily highs of 95–99%, frequent condensation, heavy rain, and high solar radiation. Indicate the value specified by the manufacturer and attach the supporting certificate or technical data sheet.

Condition	Minimum requirement	Manufacturer's Specified Value	Meets / Partially meets / Does not meet	Supporting documentation attached
Relative humidity (non-submerged components)	Continuous operation from 0 to 100% with condensation			
Ambient operating temperature	Minimum -5 to +50 °C; a wider range will be considered			
Degree of protection for cabinets and enclosures	Minimum IP66; IP67 for enclosures exposed to temporary immersion or constant splashing; connectors and cable glands must be of the same or higher rating			

Condition	Minimum requirement	Manufacturer's Specified Value	Meets / Partially meets / Does not meet	Supporting documentation attached
Tropicalization of electronic boards	Conformal coating or equivalent treatment			
Condensation management in enclosures	Membrane and/or desiccant vents; specify maintenance procedure and frequency			
UV and weather resistance	Enclosures, mounts, and wiring suitable for permanent exposure to sun and rain			
Corrosion resistance	Materials and hardware resistant to a permanently humid environment			
Solar power supply	Panel, battery, and controller sized for high cloud cover; specify runtime in days without sunlight			

c) Integration with the project's private LoRaWAN network

The sensors must be integrated into the project's private LoRaWAN network, not the manufacturer's network.

Question	Answer
Do the gateway and node work with a third-party LoRaWAN network server (e.g., ChirpStack or The Things Stack)? Specify which ones.	
Does it operate on the AU915 band?	
LoRaWAN device class (A, B, or C)	
Can the node be configured remotely? With what tool?	
Format of transmitted data (decoders, payload) and how to deliver it to an external platform	
Does the device work without a connection to the manufacturer's cloud?	
Configurable measurement and transmission frequencies	
Expected transmission range in jungle and dense vegetation	

d) Experience with similar deployments

List up to three examples of similar equipment deployments, preferably in tropical or humid climates.

Case	Client or project	Country	Year	Equipment Supplied	Contact person
1					
2					
3					

e) Reference Commercial Information (Non-Binding)

The figures are estimates for market analysis purposes. They do not constitute an offer.

Item	Description	Estimated Unit Price	Currency	Remarks
1	Gateway			
2	Battery			
3	Solar panel			
4	Power adapter			
5	Converter/Transmitter/Node Device			
6	Electrical Conductivity (EC) Sensor			

Item	Description	Estimated Unit Price	Currency	Remarks
7	pH sensor			
8	Dissolved oxygen (DO) sensor			
9	ORP sensor			
10	Turbidity sensor			

Question	Answer
Do the prices include taxes?	
Do the prices include shipping and insurance to the delivery location?	
Estimated delivery time from the date of purchase	
Warranty offered (minimum one year from delivery) and what it covers	
Training provided (use, calibration, data logging, operation, and maintenance), either online or in person	
Language of manuals and technical support	
After-sales support and availability of replacement parts in the region	

f) Operation and maintenance

Question	Answer
Recommended calibration frequency for each sensor	
Required consumables and spare parts (calibration solutions, desiccant, among others)	
Expected service life of sensors, battery, and solar panel	
Battery life of the node and the gateway with the proposed configuration	
Maintenance that can be performed by a community member without advanced technical training	

g) Additional comments

Use this space to propose alternatives, clarify limitations, or provide information you consider useful for the project.

Comments