



Subregional Centre
for Cooperation
on Biodiversity



Google Earth Engine



REGIONAL BIODIVERSITY WORKSHOP

Earth Observation for Monitoring and Reporting Of Ecosystems & Biodiversity

Implementing the Kunming-Montreal Global Biodiversity Framework

HUMBOLDT INSTITUTE

July 21 – 25, 2026

CBD Subregional Technical and Scientific Support Centre

Organised by the Humboldt Institute in partnership with Google, Wilpa Capacity Development, UNEP-WCMC, and UNDP

Background and Rationale

Latin America and the Caribbean holds 40–60% of global biodiversity and is home to six of the ten most megadiverse countries on Earth. Despite this extraordinary wealth, the region faces persistent and growing pressures: habitat loss, land use change, invasive species, pollution, and a rapidly changing climate. Meeting the commitments of the Kunming-Montreal Global Biodiversity Framework (GBF) by 2030 requires not only political will but also robust technical capacity, the ability to collect, analyze, interpret, and act on biodiversity data at national and regional scales.

The Alexander von Humboldt Biological Resources Research Institute, in its role as the CBD Subregional Technical and Scientific Support Centre for Latin America, conducted a regional survey across twelve GBF parties. Results consistently show that the countries attending this workshop identify geospatial tools, ecological connectivity assessment, ecosystem baseline development, and monitoring capacity as their most urgent technical needs, corresponding directly to GBF Targets 1, 2, 3, 4, and 11.

This workshop responds to those expressed needs. It brings together remote sensing specialists from six countries to learn, practice, and adapt a set of freely-available, cloud-based tools that directly support GBF implementation: Google Earth Engine (GEE) scripts for ecosystem mapping and biodiversity monitoring and the Red List of Ecosystems (RLE) assessment workflow. A final field day in a Colombian national park grounds the technical learning in a real landscape condition.

Workshop Objectives

- Introduce and apply Google Earth Engine scripts and workflows for ecosystem classification, land cover monitoring, and biodiversity indicator generation relevant to GBF Targets 1–4 and 11.
- Build hands-on capacity with the IUCN Red List of Ecosystems (RLE) open-source assessment workflow, from data preparation through to published national assessment outputs.
- Build hands-on capacity to customize Ecosystem Integrity Index using Satellite Embeddings (led by UNEP-WCMC).



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- Facilitate peer learning and experience exchange among remote sensing specialists across six countries, identifying shared data gaps and regional cooperation opportunities.
- Connect Earth observation tools directly to each country's GBF national reporting and NBSAP implementation needs.
- Provide a field-based validation experience linking satellite data interpretation to on-the-ground ecosystem conditions.

Participating Countries and Regional Context

The eight countries attending represent a range of biomes, institutional capacities, and GBF implementation stages. They are Colombia, Chile, México, Uruguay, Paraguay, Brasil, Bolivia y Perú.

Tools and Platforms

All tools used in this workshop are freely available and accessible. Participants will work with:

- Google Earth Engine (GEE): Cloud-based geospatial analysis platform for large-scale satellite data processing
- RLE Assessment Workflow: Open-source R/GEE/Python pipeline for national Red List of Ecosystems assessments

Prerequisites

A pre-workshop setup guide will be circulated two weeks before the event. Day 1 will include a set-up session to resolve any access issues before technical sessions begin.

Participants should have:

- Basic familiarity with GIS and remote sensing.
- Basic familiarity with programming (JavaScript, Python).
- Access to the internet and a computer.
- A Google Cloud project registered for Earth Engine: follow the [quickstart guide](#).
- A GitHub account.



DAY 1 - Tuesday, July 21, 2026

Objective of day 1: Introduction to Biodiversity Monitoring and Google Earth Engine.

Moderator: Sylvia Wilson and Paula Paz	
07:45	Registration
08:00–08:30	Welcome and Official Opening Presenter: <i>Gisele Didier / Tanya Birch / Sylvia Wilson</i>
08:30–09:00	Participant Introductions, Ice Breaker, and expectations Presenter: <i>Sylvia Wilson</i>
09:00–10:45	Country Panel (10 min presentations from each country) Presenter: <i>All country teams</i>
10:45–11:00	Coffee Break
11:00–12:00	The Kunming-Montreal GBF: What Remote Sensing Can and Cannot Do Overview of the 23 GBF targets with a focus on the eight most directly supported by Earth observation, Targets: • 1 (spatial planning) • 2 (ecosystem restoration), • 3 (30x30), • 4 (threatened species), • 8 (climate-biodiversity integration), • 11 (ecosystem services), • 14 (biodiversity mainstreaming), and • 21 (open biodiversity data). Regional survey findings on capacity gaps across the six attending countries are presented and discussed. Presenter: <i>Lina Sanchez and Luis Fernando Urbina, Instituto Humboldt</i> Introduction of the regional assessment and identified gaps for Target 1. Presenter: Diana Pulido.
12:00–13:00	Lunch
Moderator: Natalia Cordoba	
13:00–14:00	Introduction to Google & Earth Engine for Biodiversity Google's involvement in Nature Protection & North Star

	Conceptual overview of the suite - Google Earth, GEE, EE Apps Satellite Embedding, Biodiversity Indicators in EE Data Catalog. Demonstration of the Global Ecosystems Atlas & Google's role Presenter: <i>Tanya Birch, Google</i>
14:00–14:30	Setup and Access Validation Verification of GEE accounts. Walk through: account login, opening the GEE Code Editor. Presenter: <i>Tanya Birch, Google</i>
14:30–15:00	Coffee Break
15:00–16:30	Exploring National Biodiversity Data in GEE Introduction to the first set of GEE scripts. Loading and visualising national land cover, deforestation, biomass datasets, global layers, and country-specific datasets. Participants explore their own country's data in GEE (some for the first time) in a structured way. Presenter: <i>Paula Paz / Manuel Custodio</i>

DAY 2 - Wednesday, July 22, 2026

Objective day 2: Ecosystem Mapping, Change Detection, and Biodiversity Monitoring with Google Earth Engine

Moderator: Gabriela Hernández	
08:00–08:15	Recap and Day 2 Objectives Brief review of Day 1 outputs. Presenter: <i>Paula Paz</i>
08:15 – 09:15	Ecosystem Classification & Change Detection in Google Earth Demonstration of the ecosystem classification pipeline: satellite embeddings, the ecosystem classifier, ecosystem classification (IUCN GET or custom classes) in Google Earth, and how to incorporate ancillary national data to produce an ecosystem map. Presenter: <i>Tanya Birch</i>
09:15–09:45	Coffee Break
09:45–12:00	Ecosystem Change Detection Hands on exercise: Running Change Detection for a Pilot Ecosystem using embedding. Presenter: <i>Paula Paz and Manuel Custodio</i>

12:00–13:00	Lunch
Moderator: Manuel Custodio	
13:00–14:00	MapBiomass Session Introduction to MapBiomass, use of baseline data for restoration, and monitoring of national restoration goals through progress indicators Presenter: <i>Adriana Rojas - MapBiomass</i>
14:30–15:30	Ecosystem Integrity Index (EII) Introduction to EII, the methodology, a timeseries and customizing the EII using Satellite Embedding dataset in Earth Engine Apps. Presenter: <i>Calum Maney - UNEP / UNEP-WCMC</i>
15:30–15:45	Coffee Break
15:45–16:30	Biodiversity Indicators Discussion of data requirements, limitations, and how each country can adapt these scripts to national species lists and protected area layers. Presenter: <i>Manuel Custodio / Paula Paz</i>

DAY 3 - Thursday, July 23, 2026

Objectives of day 3: Advanced GEE Scripts and Country Red List Ecosystem Tool & Integration.

Moderator: Sylvia Wilson	
08:00–08:30	Recap Review of Day 2 outputs. Each team confirms the status of their national ecosystem dataset: format, extent, and completeness. Presenter: <i>Walter Garcia Suabita - Humboldt</i>
08:30–09:30	Carbon Biomass Baselines using embedding Hands-on Presenter: <i>Paula / Manuel</i>
09:30–10:00	Coffee Break
10:00–12:00	Species distribution modelling Hands-on Presenter: <i>Elkin Noguera, Elkin Tenorio, Humboldt</i>
12:00–13:00	Lunch
Moderator: Paula Paz	
13:00–14:00	Introduction to the IUCN Red List of Ecosystems

	Conceptual overview of the RLE: the five criteria, assessment categories (Collapsed, Critically Endangered, Endangered, Vulnerable, Least Concern), and how the RLE compares to and complements the Red List of Species. Overview of RLE assessments already completed in Latin America, with specific reference to Colombian and Peruvian experiences. Connection to GBF Targets 2 and 4. Presenter: <i>Maria Cecilia Londoño, Humboldt</i>
14:00 - 14:30	RLE Workflow Overview: Open Tools and Infrastructure Introduce Red List Index Assessments GitHub process at a high level. Presenter: <i>Tyler Erickson</i>
14:30–14:45	Coffee Break
14:45–16:30	RLE Demo: Colombia Country-Scale Run Technical walkthrough of the Red List of Ecosystems (RLIe) calculation workflow. Hands-on exercises Presenter: <i>Tyler Erickson</i>

DAY 4 - Friday, July 24, 2026

Objectives of day 4: Country Red List Ecosystem Tool & Integration, and Country Outputs & Regional Roadmap.

Moderator: Sylvia Wilson	
08:30–09:00	Recap and Morning Objectives Review of Day 3 national RLE progress. Presenter: <i>Luis Romero - Humboldt Institute</i>
09:00–10:30	Working groups to starting national assessments Teams work in parallel to begin a national RLE assessment repositories for a demo country. Hands-on exercises Presenter: <i>All country teams / facilitated by Google and Wilpa</i>
10:30–10:45	Coffee Break
10:45–12:30	Working groups to starting national assessments Continue the practical exercise by running the <i>rle-assessment-report</i> R/GEE integration workflow for a demo country Prepare a presentation Presenter: <i>All country teams</i>

Moderator: Gabriela Hernández

12:00–13:30	Lunch
13:30–15:00	Country Team Presentations: Outputs and Lessons Learned Each country team presents (10 minutes each): their GEE ecosystem classification output; the status of their national RLE repository; and one key technical challenge they encountered and how they addressed it. Presenter: <i>All country teams</i> Comms: <i>interviews to participants.</i>
15:00–15:30	Coffee Break
15:30 –16:20	Next Steps and Cooperation Facilitated a session to design a post-workshop regional cooperation plan. Presenter: <i>Diana, Carlos, Rodrigo, and Gabriela</i>
16:20 – 16:30	Closing and logistics for the field day <i>Carlos Noguera</i>

DAY 5 - Saturday, July 25, 2026

Objectives of day 5: Provide a field trip experience in PNN Chingaza that links satellite data interpretation to on-the-ground ecosystem conditions, allowing participants to observe páramo ecosystems firsthand and ground the week's technical learning in a real landscape context.

05:00	Departure from Bogotá (Hotel Tequendama) to PNN Chingaza
07:00–07:30	Arrival Piedras Gordas & Breakfast 20 min induction, restrooms, registration, and insurance forms.
07:30–10:30	Departure to Monterredondo (3 hrs)
10:30–11:30	Arrival to Monterredondo and Presentation Presentation on monitoring organized by representatives of National Parks of Colombia. Presenters: Hernán Serrano and Pedro Camargo.
11:30–12:00	Lunch
12:00–14:00	Suasie Trail Guided walk along the Suasie Trail, observing páramo ecosystems and connecting the workshop's satellite data interpretation to on-the-ground conditions.
14:00	End of trail and return to Bogotá Closing of the field trip and departure back to Bogotá, marking the end of the workshop.