

### 5.13 Institute of Hydrology, Meteorology and Environmental Studies (IDEAM - Fundación Natura)

<p><b>Partners</b></p>	 
<p><b>Main objective</b></p>	<p>Join efforts to update the national cartographic information of land cover in biennial periods and close the gap of standardized methods of quantification and monitoring of Greenhouse Gases -GHG, through the use of frontier technology and the analysis, interpretation and modeling of spatial, ecological and climatic data of strategic ecosystems in Colombia, that allows to enable national TC+I initiatives in carbon based on natural climate solutions and the diversification of the ecosystem portfolio for the development of mitigation and compensation initiatives.</p>
<p><b>Scopes</b></p>	<ol style="list-style-type: none"> <li>1. Apply and adopt technologies that streamline the processing, interpretation and analysis of data on changes in land cover for decision-making in mitigation and compensation initiatives.</li> <li>2. Interpret and analyze the existing spatial data acquired in the agreement for the generation of updated cartographic information of land cover, of the country for the periods 2020 and 2022 and coverage of the Andean and Orinoquía regions for the period 2024 and the analysis of change of land cover 2018 - 2020 and 2020 - 2022.</li> <li>3. Technically guide the development of carbon quantification and monitoring protocols in strategic ecosystems (mangrove, Andean forest, wetland, gallery forest, grasslands) and identify the GHG mitigation potentials of these ecosystems, aligned with decarbonization and national climate goals of easy access and consultation for extensive use.</li> <li>4. Expand knowledge on GHG mitigation potentials of experimentally validated natural climate solutions in strategic ecosystems (mangrove, Andean forest, wetland, gallery forest, grasslands) and improve monitoring and capture methods for the consolidation of the National Monitoring Reporting and Verification System.</li> </ol>
<p><b>Ecosystems on which actions are developed</b></p>	<p>The national territory is addressed spatially with a priority focus on the following strategic ecosystems:</p> <p>Caribbean Region (Mangroves; wetlands)          Middle Magdalena Region (wetlands; Andean forest)          Northeastern Andes Region (Andean forest; paramo; peatlands)</p>

	Orinoquia Region (grasslands; gallery forest)
<p style="text-align: center;"><b>Social participation scenarios</b></p>	<ol style="list-style-type: none"> <li>1. TRAINING: Training strategy in Natural Climate Solutions, climate change, monitoring, new technologies and others</li> <li>2. PARTICIPATORY MONITORING: Participation model for the registration of data of technologies and techniques implemented in the field, and follow-up to actions in the field,</li> <li>3. ECONOMIC ALTERNATIVA: People from the community hired for specific actions of the agreement.</li> </ol>
<p style="text-align: center;"><b>Main results</b></p>	<ol style="list-style-type: none"> <li>1. Expansion of the state of the art of knowledge in GHG mitigation potentials of natural climate solutions in strategic ecosystems (mangrove, Andean forest, wetland, gallery forest, grasslands).</li> <li>2. Conceptual, methodological and operational definition in the co-formulation of carbon quantification and monitoring protocols in strategic ecosystems priority for ECOPEPETROL.</li> <li>3. Publication and dissemination of data on emissions and removals of Greenhouse Gases - GHG of coverage changes and estimation of emissions of the historical reference period defined for the national Forest Emissions Reference Level-NREF (in forest).</li> <li>4. Map of Earth cover and its changes for 2020; Earth cover change map 2018-2020; technical reports map coverage period 2020; and application website with statistical data of coverage updated to 2020 and data change 2018-2020.</li> <li>5. Generation of data on emissions and removals of Greenhouse Gases (GHG), which includes:             <ol style="list-style-type: none"> <li>a. Databases of forest cover changes 2018 - 2023, and progress in non-forest cover changes 2018 - 2020</li> <li>b. Documented update of forest baseline emission estimation and analysis of emissions and removals from other covers</li> <li>c. Description of the methodological levels determined for the estimation of activity data and emission factors that will be used in the protocols formulated with ECOPEPETROL allies and evaluation of applicability in the National Monitoring, Reporting and Verification System</li> <li>d. Consolidation of GHG emission reduction potentials of natural climate solutions in strategic ecosystems priorities for ECOPEPETROL</li> <li>e. Biennial Transparency Report-BTR document with progress in the identification of GHG mitigation potentials of ecosystems of interest.</li> </ol> </li> <li>6. Report of the results of the incorporation of technological improvements and methodologies in the generation of the land cover map of Colombia.</li> <li>7. Earth cover maps and land cover change including:             <ol style="list-style-type: none"> <li>a. Earth Cover Map 2022</li> <li>b. Earth cover map for the Andes and Orinoquia regions 2024</li> <li>c. Earth Cover Change Map 2020-2022</li> <li>d. Technical reports of the 2022 map and change maps, and statistical application with updated data.</li> </ol> </li> <li>8. Analysis of greenhouse gas emissions and removals with databases of emissions/removals of changes to the national level of forest cover 2018 - 2024, and</li> </ol>

non-forest cover 2018 - 2020 (and progress 2020- 2022) and estimation of emissions of the reference scenario incorporating emissions and removals from other coverages at the national level, period 2018 - 2022;

9. Detailed technical information on the technical guidance for the construction of the protocols developed by ECOPETROL's allies, which must present the guidelines and methods that can be used in the National Monitoring, Reporting and Verification System in the short term; the improvement plan for the medium- and long-term incorporation of higher methodological levels; the consolidation of the GHG mitigation potentials of the natural climate solutions identified and validated in the ecosystems of interest by ECOPETROL allies; and, the BTR delivered to the United Nations Framework Convention on Climate Change -UNFCCC with advances in the identification of the GHG mitigation potentials of the ecosystems of interest.