

IPL Project (IPL-Number) Annual Report Form

**Period of activity under report
from 1 January 2024 to 31 December 2024**

1. Project Number and Title: Slope monitoring of San Eduardo landslide in Colombia using multiple techniques

2. Main Project Fields

Select the suitable topics. If no suitable one, you may add new field.

(1) Technology Development

A. Monitoring and early warning B. Hazard Mapping, Vulnerability and Risk Assessment

(2) Targeted Landslides: Mechanisms and Impacts

A. Catastrophic Landslides

(3) Capacity Building

B. Collating and Disseminating Information/ Knowledge

(4) Mitigation, Preparedness and Recovery

A. Preparedness

3. Name of Project Leader

Affiliation: Guillermo Ávila, Full Professor Civil and Agricultural Engineering, National University of Colombia

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Core members of the Project: Carlos Rodríguez, Carol Murillo and Julio Colmenares

4. Objectives (5 lines maximum)

- Comparing multiple monitoring techniques for large slope movements
- Stablishing the conditional and triggering factors of the San Eduardo Landslide in Colombia
- Modelling large displacements of the landslide using Material Point Method and validate the numerical results with the current instrumentation and multiple remote sensing technics.
- Identifying the key elements for early warning systems in large area landslides

5. Study Area the San Eduardo Landslide covers about 600 ha in is located in the central Andean region of the Colombian republic.

6. Project Duration 3 years

7. Report

- 1) Progress in the project: The ICL project was resumed on September 2025 after a pause of about 11 months due to the departure of a doctoral student who was the main person working on it. After reinitiating the project, we acquired some equipment for measuring deformations with optical fiber in order to complement inclinometers and local deformations monitoring. For this purpose, work has been done on the experimental setup in the laboratory with this technique. We have also been working on a detailed analysis of geotechnical information related to the large landslide (boreholes, geophysical data and laboratory results), reviewing available monitoring data of piezometers and inclinometers and analyzing rainfall information.
- 2) Planned future activities or statement of completion of the Project: We plan to advance in the IPL Project finishing the laboratory fiber optic monitoring setup. This is an important local capacity building in research and we hope it will contribute to the more extensive developments in the monitoring technics. Additionally, we plan to assemble all the available cartographic and thematic information of the San Eduardo Landslide in a GIS model, acquire satellite images to make Interferometric In-Sar analysis of the landslide area and initiate the geotechnical displacements modeling, using material point method,
- 3) Beneficiaries of Project for Science, Education and/or Society Direct beneficiaries will be the community near to slope in San Eduardo, department of Boyacá, Colombia (163 people) composed by 60 farmer families. The National System of Disaster Risk Management due improvement in the knowledge of initial signs of large landslide processes in colluvial Colombian deposits and the proposal of and early warning system with multiple monitoring technics. The academic community considering the new insights on large landslides on colluvial deposits, especially its behavior during and post failure event. That includes the National University with a strengthening in research network of the of Civil Engineering Department.
- 4) Results: as indicated, the project was suspended for about 11 months so we may not report concrete results in this period.

Note:

- 1) If you will change items 2-6 from the proposal, please write the revised content **in Red**.
- 2) Please fill and submit this form to **ICL Network** <icl-network@landslides.org>
- 3) Reporting year must be one or two years (Maximum).