Date of Submission	1 June 2025

IPL Project (IPL-261) Annual Report Form

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

1. **Project Number and Title: IPL-261 World-wide-web-based Landslide Observatory (W3bLO)**

2. **Main Project Fields – (1) Technology Development**

3. **Name of Project Leader – Professor Matjaž Mikoš**
   Affiliation: University of Ljubljana, UNESCO Chair on Water-related Disaster Risk Reduction
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   Core members of the Project: Jošt Sodnik, PhD (UL FGG), Nejc Bezak, PhD (UL FGG), Mateja Jemec-Auflič, PhD (Geological Survey of Slovenia–GeoZS), Mitja Jermol, MSc (IRCAI – International Research Centre on Artificial Intelligence, Institute Jožef Stefan, Ljubljana, Slovenija – under auspices of UNESCO), Joao Pita Costa, PhD (IRCAI, IJS).

4. **Objectives -** Development of a web-based Landslide Observatory, capable of collecting/ presenting a nearly now-casted information on the present status of selected indicators relevant for landslide risk reduction at the global scale. For its development Artificial Intelligence (AI) techniques will be applied (e. g. Deep Learning, other algorithms), and selected large databases with data from public domain. The observatory is a first step towards building of a Digital Twin of Landslide Risk Assessment.

5. **Study Area -** Global scale using different on-line satellite data (i.e., Sentinel) and large web databases.

6. **Project Duration -** 3 years (July, 2022 – June, 2025) with a possibility to prolong it for another 1 year.

7. **Report**

1) Research activities in 2024 have been divided into: i) WP I – Development of AI tools and techniques to be used for Landslide Observatory, ii) WP 2 – Building up the observatory using available and curated open datasets and filtered news feeds.

   The first draft version of the observatory has been successfully published on the web in December 2024. In 2025, the full version will be published (WRDRR, 2025) and the observatory

will be tested in Slovenia and elsewhere, where publicly available databases in different languages can provide sufficient data for its validation. Furthermore, other ICL members will be invited to support the development in its final phase to provide data, and test the observatory in their country and language. Till the end of the project, the global web landslide observatory's further development to cover other natural disasters, such as droughts and/or floods will be taken into consideration. For this, a new IPL project proposal will be elaborated.

2) Beneficiaries of Project for Science, Education and/or Society – By supporting informed decision-making and timely action, the observatory contributes directly to several United Nations Sustainable Development Goals (SDGs), including Goal 6 (in water-related disasters), Goal 11 (on the resilience of Sustainable Cities and Communities), and Goal 13 (on Climate Change Preparedness). The global web Landslide Observatory is also a contribution to the IHP-IX Program (2022-2029) on Science for a Water Secure World in a Changing Environment, and to the Kyoto Landslide Commitment 2020. The global web Landslide Observatory is also a contribution to the new governance, asked by the last Global Assessment Report on Disaster Risk Reduction.

3) Results – two written open access articles and several web pages with the Landslide Observatory

   a. Pita Costa, J. et al. (2024) Towards improved knowledge about water-related extremes based on news media information captured using artificial intelligence. International Journal of Disaster Risk Reduction 100, 104172, https://doi.org/10.1016/j.ijdrr.2023.104172

   b. Mikoš, M. and Pita Costa, J. (2025) Developing Global Web Landslide Observatory to Support Sustainable Development and Landslide Risk Reduction. accepted for publication in Progress in Landslide Research & Technology, Vol. 4, Issue 2, 8p.

   c. WRDRR Chair (2025) Global Web Landslide Observatory. Available at: https://www.unesco-floods.eu/landslide-observatory/