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ASSESSING REGRESSIVE EROSION EFFECTS: UNVEILING RIVERSIDE LAND USE LAND COVER CHANGES POST HYDROELECTRIC PROJECT CONSTRUCTION
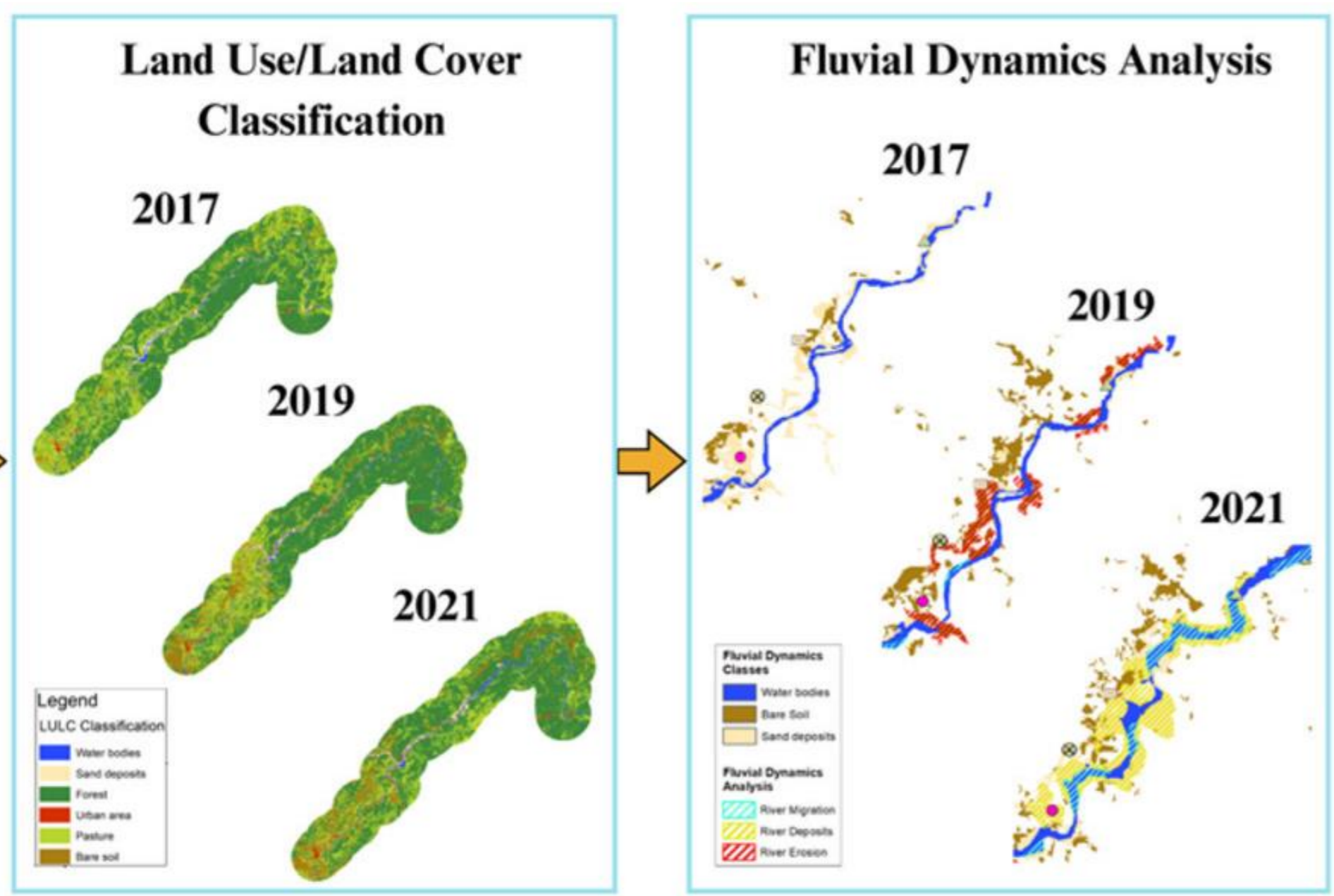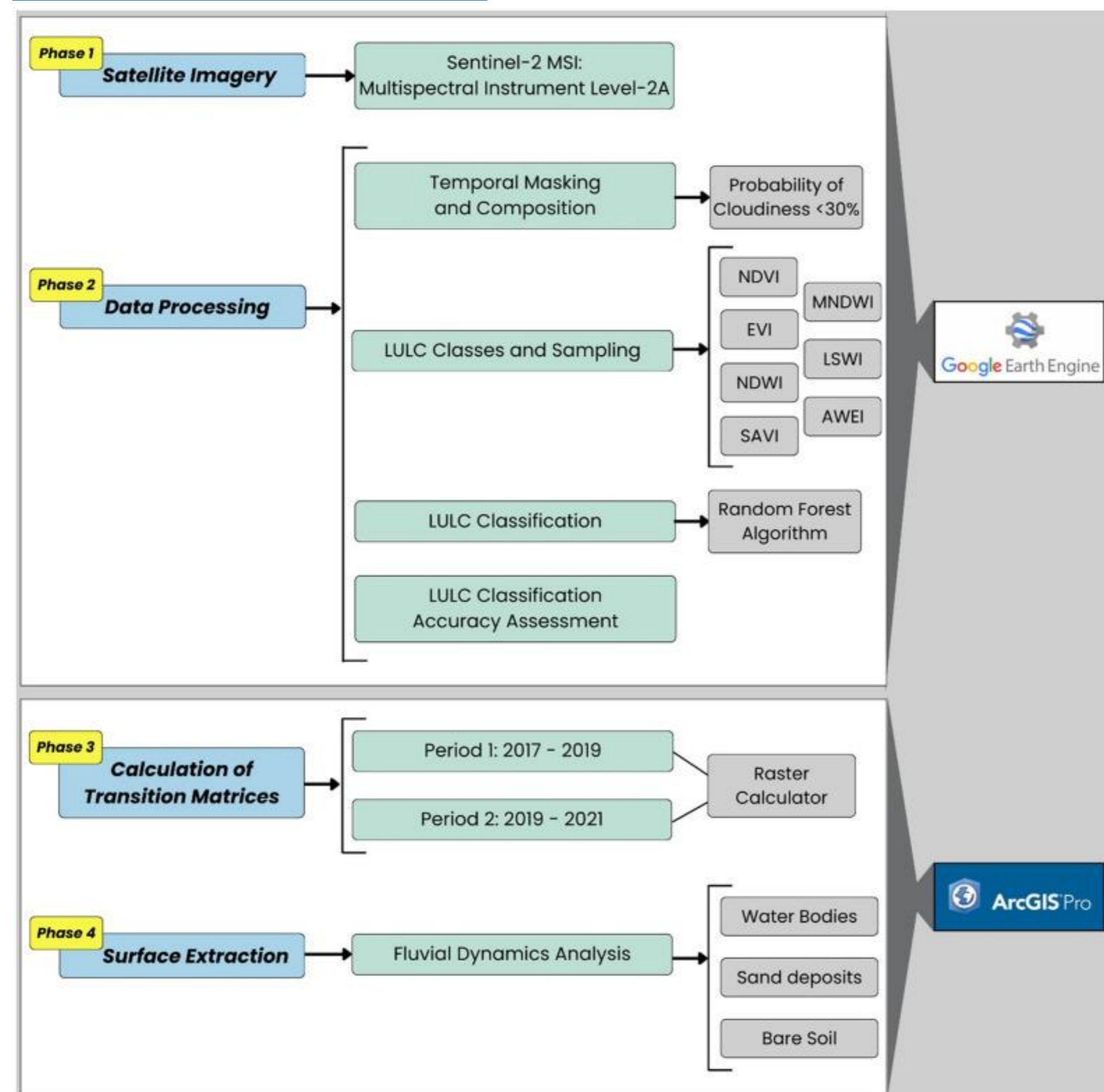
PROBLEM

In Ecuador, the Coca Codo Sinclair Hydroelectric Project (CCSHP) provides 34 % of the country's energy demand. However, since its inauguration in 2016, regressive erosion in the Coca River has accelerated, causing the collapse of the San Rafael waterfall in 2020 and damage to oil and electricity infrastructure.

MAIN OBJETIVE

This study aimed to assess the effects of regressive erosion along the Coca River through changes in land use and land cover (LULC) to identify the impact of CCSHP operations on migration, deposition, and river channel erosion during 2017–2021.
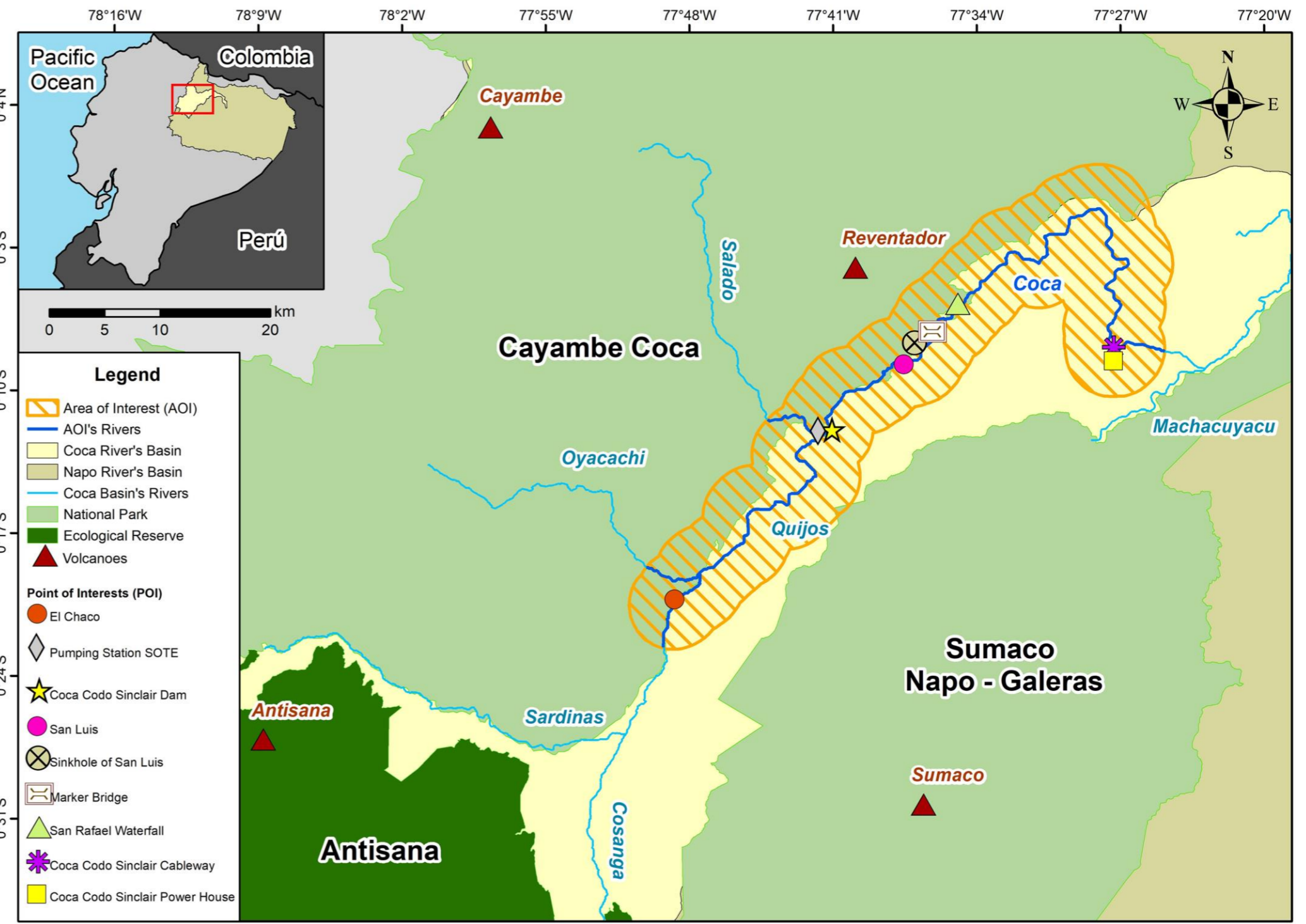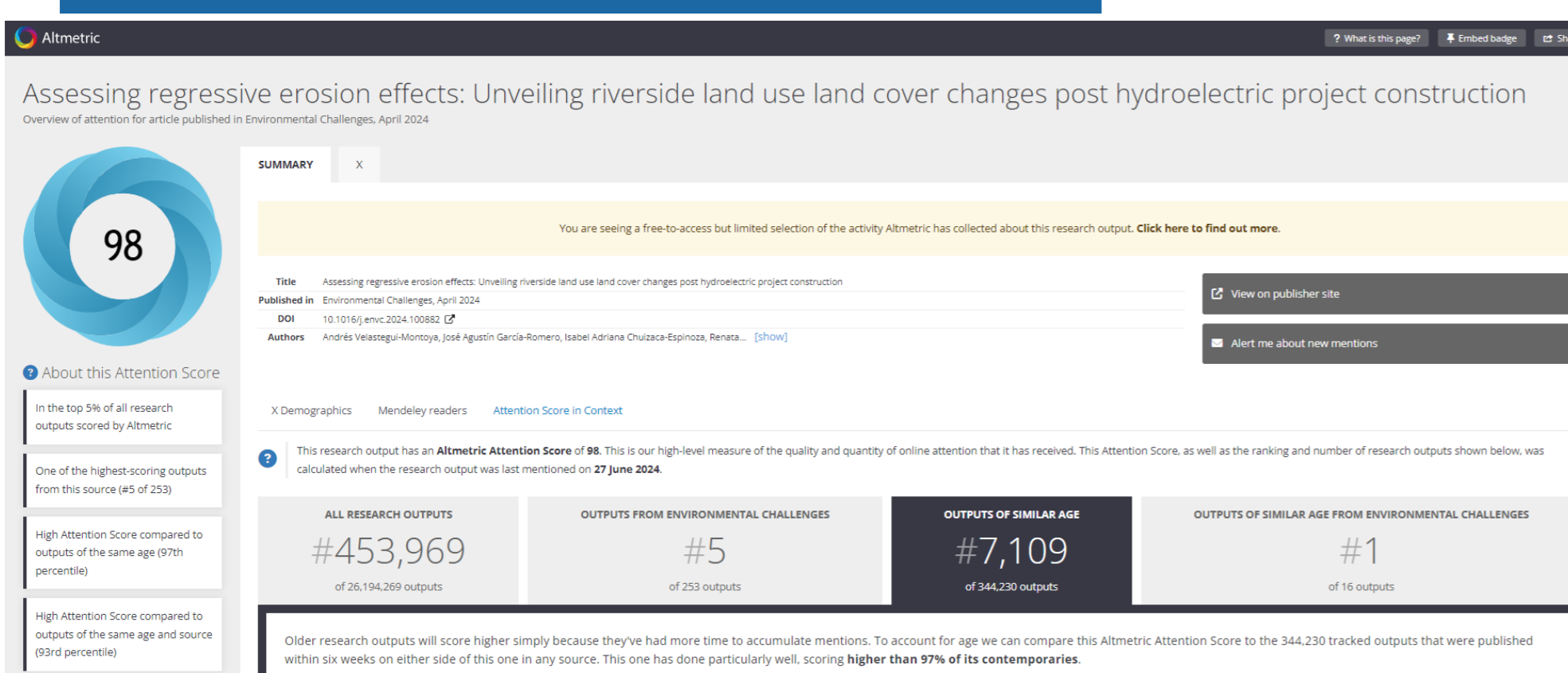

PROPOSAL

RESULTS

The results showed that between 2017 and 2019, the extent of water bodies and bare soil increased by 258.58 ha (25 %) and 5195.45 ha (71 %), respectively. Meanwhile, between 2019 and 2021, the extent of sand deposits increased by 387.71 ha (42 %).

Multi-temporal analysis of the Coca River fluvial dynamics within the AOI.

CONCLUSIONS

- These changes reflect an acceleration of regressive erosion since the construction and implementation of the CCSHP, information that can be used as an initial tool to analyze the impact of hydropower in the upper Amazon and strengthen environmental protection and risk management policies.

- The regressive erosion in the Coca River is linked to the CCSHP activities, which substantially contribute 34 % of the total electrical energy consumed in Ecuador.

ACKNOWLEDGMENTS