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March 18, 2023

Dear Dr. Daniel Arribas-Bel,

Editor for Urban Data/Code, Environment and Planning B: Urban Analytics and City Science

I am writing to submit our research paper titled "*amazonULC: A Data Package with Urban Land Cover Classifications for a Selection of Cities in the Brazilian Amazon*" for your consideration. I am the lead and corresponding author, and a master's graduate student in the Division of Earth Observation and Geoinformatics at the National Institute of Space Research. My co-authors are Prof. Carolina M. D. de Pinho from the Center for Engineering, Modeling, and Applied Social Sciences at the Federal University of ABC, Prof. Silvana Amaral from the Division of Earth Observation and Geoinformatics at the National Institute of Space Research, and Prof. Antonio Paez from the School of Earth, Environment, and Society at McMaster University.

Our paper introduces the amazonULC R Data Package, which provides land cover classification maps for several cities in the Brazilian Amazon. The study areas cover approximately 1,200 km², including the municipal seats of Altamira (153 km²), Cametá (44 km²), Marabá (164 km²), Santarém (143 km²), and part of the Metropolitan Area of Belém (614 km²), all located in the state of Pará within the Brazilian Legal Amazon.

Land cover maps are valuable for urban planning in Amazonian cities, as they can help monitor urban sprawl, restrict construction in environmental protection areas, assist in urban zoning, and identify areas of high density, among other uses. While there is some research about urban areas in the Amazonian region, public managers still lack specific databases and cartographic publications for Amazonian cities, making such studies difficult to include in public policies.

In our study, we developed a classification model that used images from the WPM sensor of the CBERS-4A satellite and combined the GEOBIA approach, data mining techniques, and the random forest machine learning algorithm to identify land cover classes including "Shrub Vegetation," "Herbaceous Vegetation," "Water," "Exposed Ground," "High Gloss Cover," "Ceramic Cover," "Fiber Cement Cover," "Asphalt Road," "Terrain Road," "Cloud," and "Shadow." The results of our study are promising, with an overall accuracy level of 85% to 99% in the validation samples for the study areas.

We look forward to hearing from you and your expert reviewers. On behalf of my co-authors, I would like to thank you in advance for your attention.

Sincerely,

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