



“GENIUS: Satellite Monitoring Platform for City Management and Planning”

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More than 50% of people worldwide live in cities with upward projections. Ensuring health, public safety, and maintaining a high quality of life is a challenge within cities due to the accelerated growth of urbanization, climate change, and the limited resources available for urban management and planning. Strategies for sustainable urban planning are a need that has become relevant worldwide. The concept of a Smart City is presented as an approach that integrates many inputs from different sources to make decisions based on reliable and updated information, considering, for example, environmental monitoring. However, capturing the spatiotemporal variability of processes within the city requires a significant investment in time and resources, especially for medium-sized cities in Latin America, where little information is available. Earth Observation based on open-access information offers essential opportunities to obtain information of interest, contributing to cities' physical and environmental characterization. Satellite sensors allow cities to be characterized in terms of the presence and state of vegetation, surface temperature, changes in the urban footprint, level of luminosity, and atmospheric pollution, among other parameters. This ongoing project is progressing with a web platform containing urban-environmental indicators derived from satellite images to support intelligent planning and management of sustainable development strategies in the city. The platform is currently undergoing pilot development in the city of Quilpué, Valparaíso Region, with the potential for scaling to other territories at the regional and national levels. Preliminary findings with satellite data reveal adverse trends in surface temperature, vegetation health, and air quality in Quilpué City, which are currently undergoing validation with on-site data. Efforts were focused on merging socio-economic and environmental data to pinpoint areas with vulnerable populations. Despite the emphasis on environmental variables, gaps exist in analyzing population exposure to these factors due to outdated demographic information. This underscores the importance of nature-based solutions to exposure variables such as air quality, surface temperature, and proximity of green areas, which could be addressed by governance risk management and public policy planning. This approach offers substantial potential for informed decision-making and risk mitigation strategies.

