

Review of: "New Method to Identify Potential Illegal Water Use Location by Using Remote Sensing and Neural Networks in Laguna de Aculeo, Chile"

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The introduction provides a comprehensive overview of the water scenario in Chile, addressing the complex issues of drought, water scarcity, and the impact of climate change on water resources.

This section digs into the specific context of Chile, outlining the role of the President in issuing water scarcity decrees based on hydrometeorological criteria. It also points out a significant challenge in the lack of monitoring tools for water usage and demand, hindering effective water management. This identifies an area for potential improvement in the country's water management infrastructure.

The scientific article provides a clear and well-structured explanation of the classification methodology applied to a satellite image captured in October 2021. The objective of accurately categorizing different features or objects is well-defined, contributing to the overall clarity of the study.

The use of the Iso Cluster Unsupervised Classification approach is appropriately justified, given its common application in remote sensing and image analysis. The paragraph effectively describes the data-driven nature of this method and its goal of partitioning the dataset into distinct groups based on inherent similarities.

The acknowledgment of the limitations of the unsupervised method and the unfeasibility of supervised fieldwork is well explained. The suggestion for potential future research using supervised methods shows a forward-looking approach to improving methodologies.

Although the data collection was during the dry season, there is only one weather station that covers 264 km² (catchment area). This could impose a bias on the results. Also, it was not mentioned the distance between the weather station and the area of interest (residential area). Thus, the authors assume that recorded precipitation from the weather station (maybe many kilometers from the station) is the same in the residential area.

The weather station is mentioned in the methods section, but data over the collected period was not shown in the results section.

The trend analysis suggests that NDVI values (0.99) were correlated with the MSI values (2.5) in specific areas, potentially indicating the use of water for sustaining green vegetation. However, in Figure 3 (land indexes), there are areas

near the residential zone (mountains) with either the same index value or similar ones.

The paper acknowledges the possibility of misclassifications, especially confusion with trees or bare ground. While this recognition is valuable, it points out a limitation in the methodology that may impact the accuracy of the results.

The mention of incorporating additional spectral bands for improving classification accuracy is a valid point, but the paragraph could provide more details on the potential bands to be considered or suggest avenues for future research in this area.

Although the paragraph mentions combining machine learning results with healthy pixel identification, it lacks a more in-depth discussion of the machine learning aspect and its role in the findings. A more detailed explanation of this integration would enhance the completeness of the study.

A notable contribution of this paper is the identification of a research gap in the Laguna de Aculeo region, in the absence of studies related to satellite information and the lack of a professional team within government authorities for remote sensing analysis. The developed methodology offers a high-resolution, remote assessment of extensive study areas. This study set the base for research methodologies and applications for future advancements and positive societal changes.