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Landslide Susceptibility Modeling of an Escarpment in Southern Brazil using Artificial Neural Networks as a Baseline for Modeling Triggering Rainfall

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Objectives

- Investigate the utility of a multitask Machine Learning approach to model landslide susceptibility and triggering rainfall
- Analyze the geomorphic plausibility of the generated models

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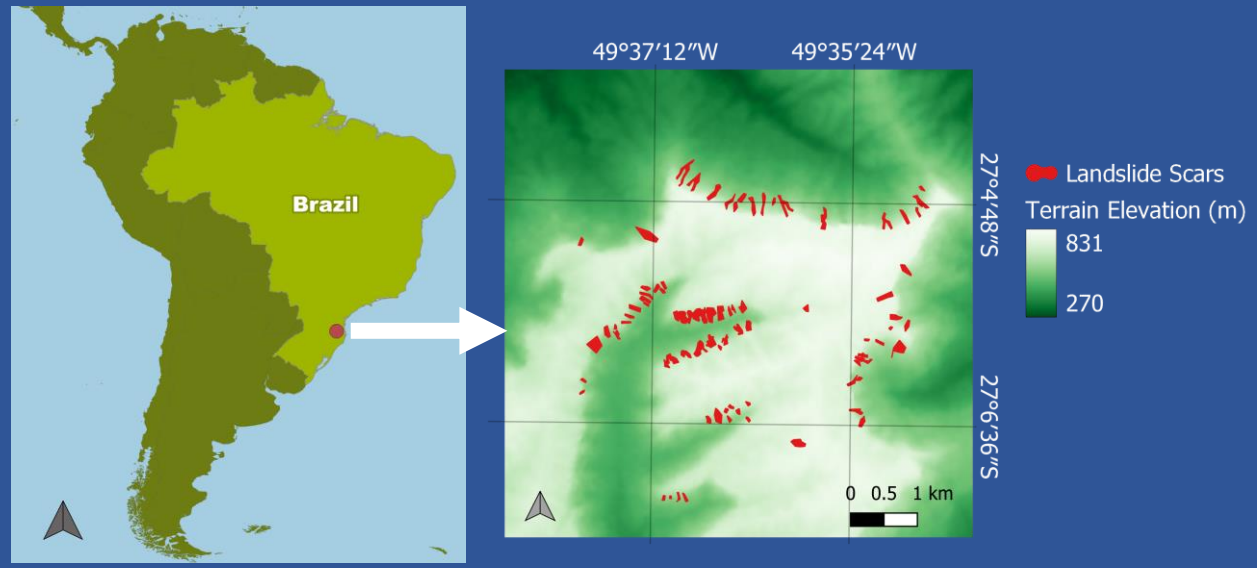
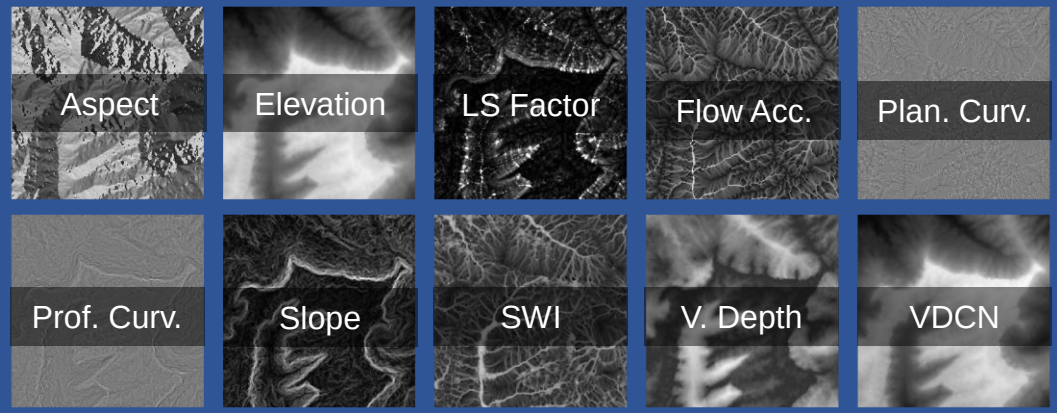
Study Area



Terrain Attributes:



DEM: ASF DAAC 2015, ALOS PALSAR_Radiometric_Terrain_Corrected_high_res; Includes Material © JAXA/ METI 2007. DOI: 10.5067/JBYK3J6HFSVF

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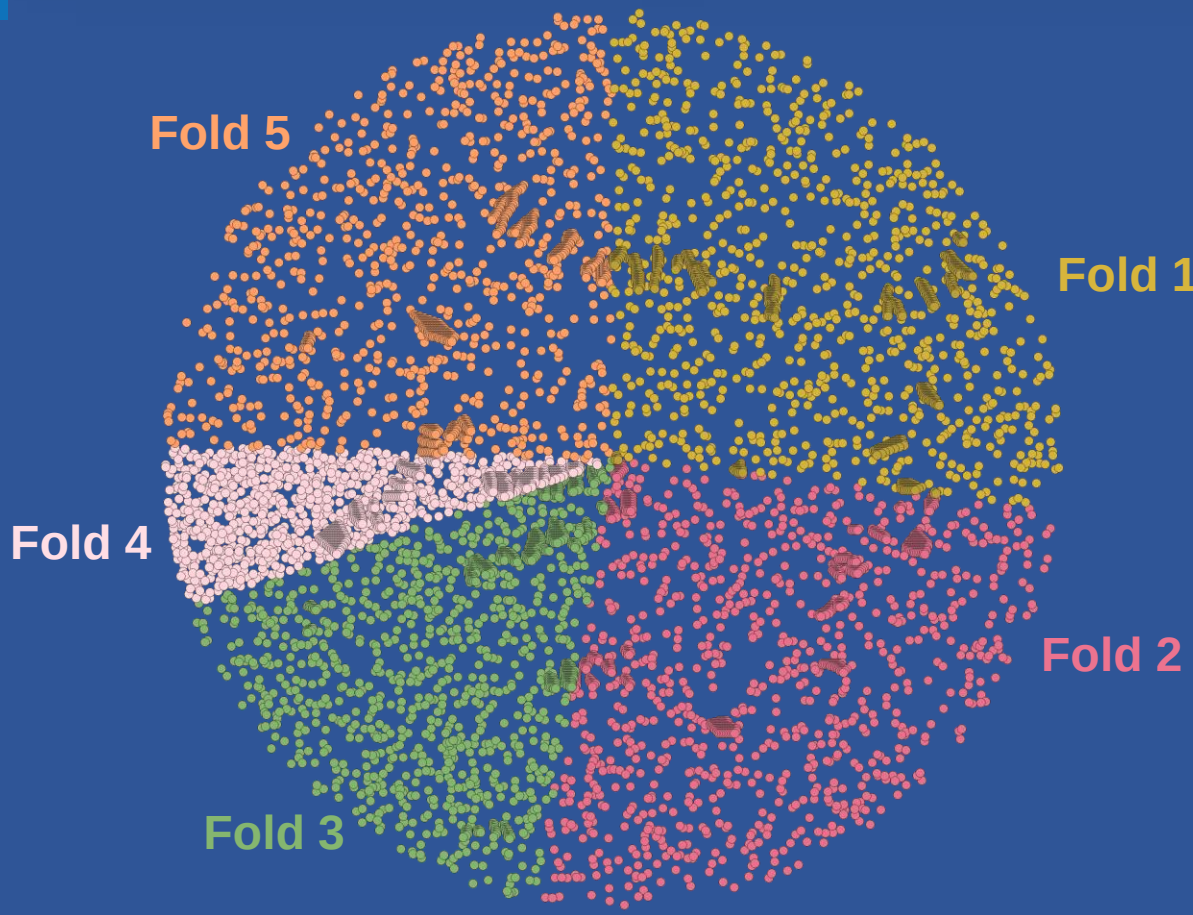
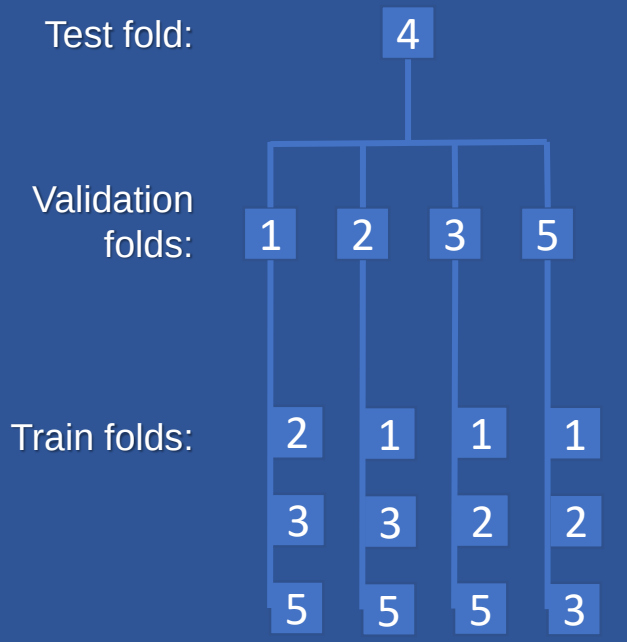
Spatial Cross-Validation



Example



20 combinations

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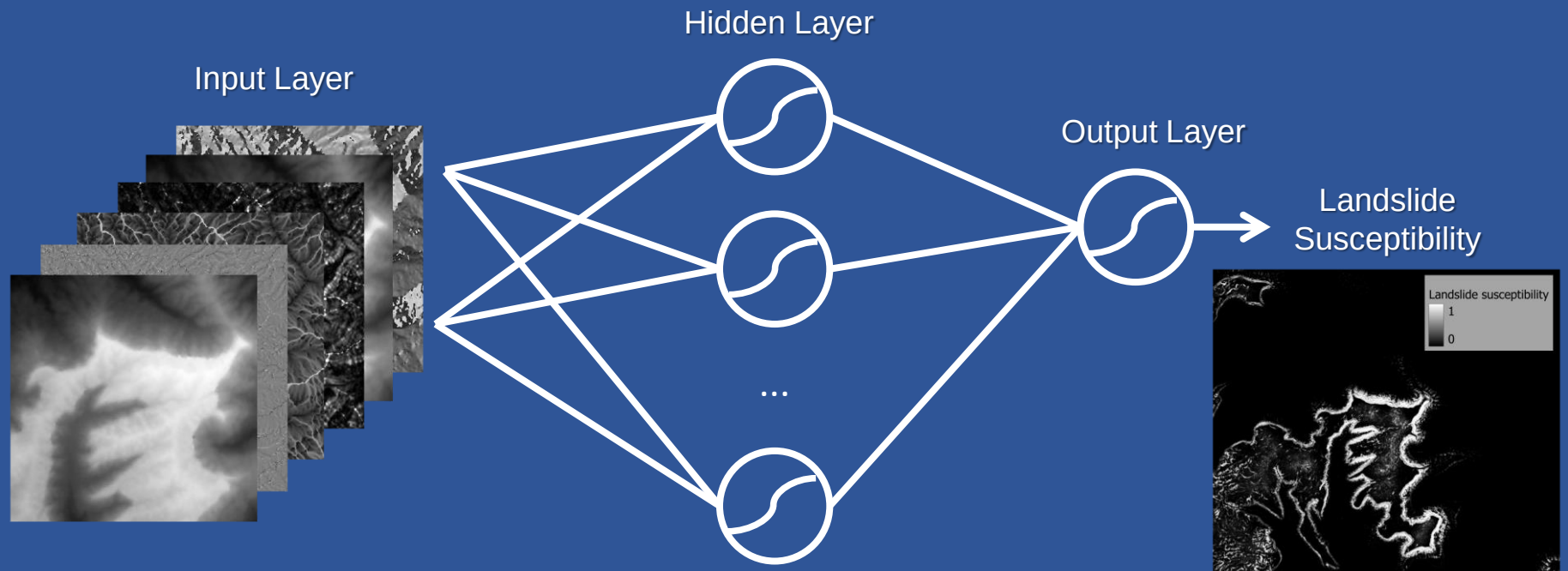
Artificial Neural Networks



nh: chosen by confidence intervals of AUC on the validation set

- AUC between 0.82 and 0.93

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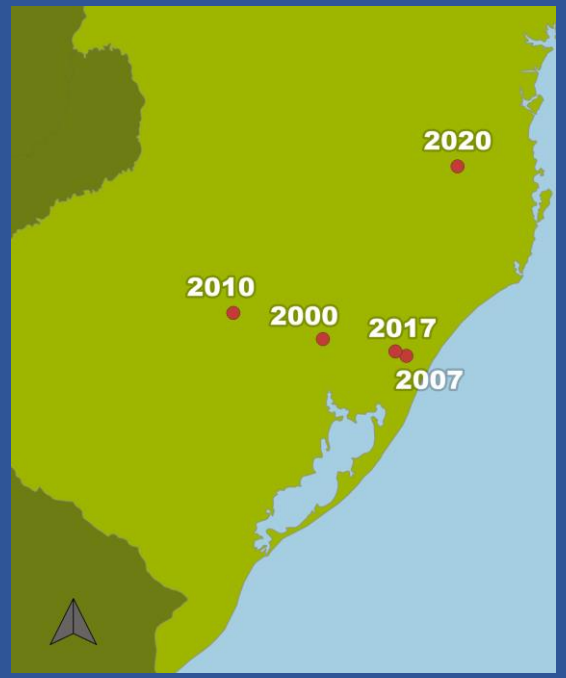
Susceptibility and Triggering Rainfall



Terrain Attributes → ANN →
- 3-day Antecedent Rainfall
- Landslide Susceptibility

Avg. nh: 12.10 [1 - 40]
Avg. AUC: 0.90 [0.82 - 0.97]
Avg. MAE rain.: 32.8 mm [9.5 mm - 50.4 mm] (26.0%)

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Susceptibility and Triggering Rainfall

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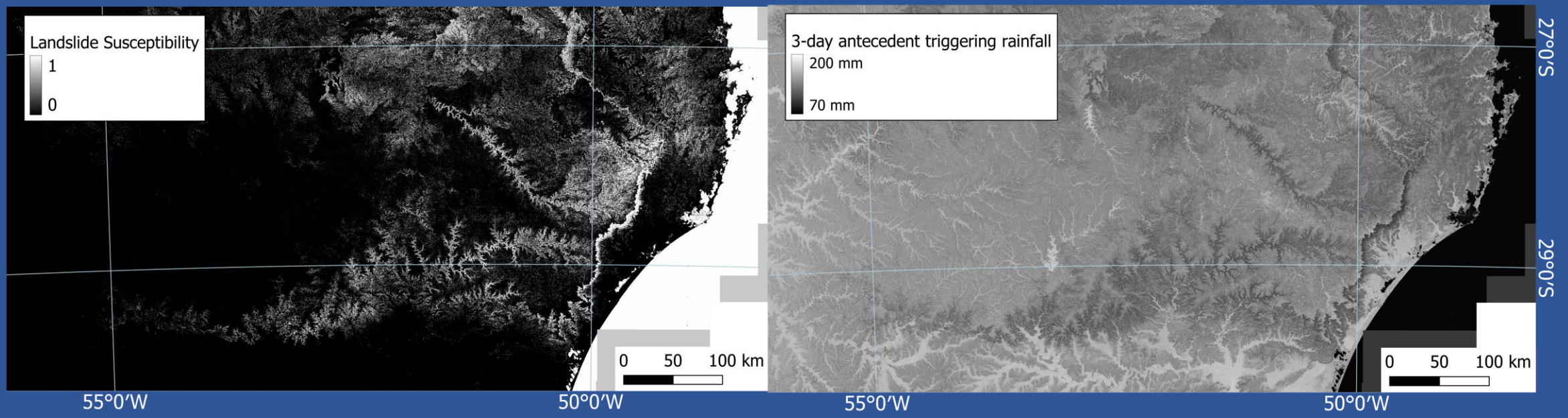

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