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6th Forest Innovation Workshop

Application of SlideforMap for the hydrological risk assessment in sustainable managed forests

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Dates: 11-12 February 2025 | Location: Representation of the Free State of Bavaria to the European Union, Rue Wiertz 77, 1000 Brussels



<http://www.forestinnovation.eu/>



BIOSEIFORTE

Biodiversity and Ecosystem Services In Forest and Territory



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Main project activities



- the analysis of land use changes over the years;
- the assessment of biodiversity and productivity of the forest;
- the analysis of slope stability and quantification of forest mitigation effects.

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SlideforMAP (*ecorisq.org*)

SlideforMAP software^[1] is based on a physical probabilistic model^[2] that allows assessing the slope stability considering the effect of trees' root reinforcement.

1. van Zadelhoff et al., 2022.
2. Murgia et al., 2022.

ecorisQ
INTERNATIONAL ASSOCIATION FOR NATURAL HAZARD RISK MANAGEMENT

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Benefits of membership
Who can become a member?
Membership fee
How to apply?

TOOLS OF OTHER ORGANISATIONS

- BASEMENT (Basic simulation environment for computation of environmental flow and natural hazard simulation)
- FLOW-R (Flow path assessment of gravitational hazards at a regional scale)
- ... and many more.

Login as a member to see the complete overview.

Tools

- BankforNET - Bank erosion assessment tool
- ELine - Tool for indicating mass movement runout zones
- FINT - Tool for detecting trees in surface models
- RockavELA - Energy line based rock avalanche model
- RockforNET - Rapid rockfall forest assessment tool
- RockFreq - Predict rockfall & block volume scenarios
- Rockyfor3D - 3D Rockfall modelling
- SlideForce - Landslide runout modelling tool
- SlideforNET - Landslide forest assessment tool
- ▼ SlideforMAP - Shallow landslide simulation at regional scale

SlideforMAP (bèta version) is a probabilistic model to assess shallow landslide probability on a regional scale with an explicit focus on vegetation scenarios. SlideforMAP uses a finite slope stability calculation that includes the role of root reinforcement both lateral and basal, and soil compression at the toe. SlideforMAP generates a large number of randomly positioned landslides on the raster with randomly generated soil properties, soil thickness, and landslide area to compute the probability of failure at the regional scale. Root reinforcement can be taken into account by either using single-tree detection data available for 10 different tree species, or a land-use raster.

SlideforMAP is freely available for all members of the association! [Become a member](#) or [login as a member](#).

- SOSlope - Local scale, shallow landslide disposition modelling tool

SlideforMAP - Input data

- morphology,
- catchment area,
- intensity value of a critical rainfall event,
- soil properties and depth,
- landslide area distribution,
- vegetation cover:
 - land cover classes,
 - trees position and dimension.

SlideforMAP GUI

Input Data

DEM

Catchment Area

Output Path

Hydrology

Rainfall Rainfall Correction Factor Rain Catchment Area Threshold

Saturated Thickness Fraction

Soil Properties

Soil Type Properties Soil Type Raster

Soil Thickness Value Raster

Soil Thickness Types Soil Thickness Type Raster

Soil Earth Pressure Force Activation

Landslide Area Distribution (Inverse Gamma)

Shape Factor Scale Factor S-Factor

Landslide Density

Max Landslide Area

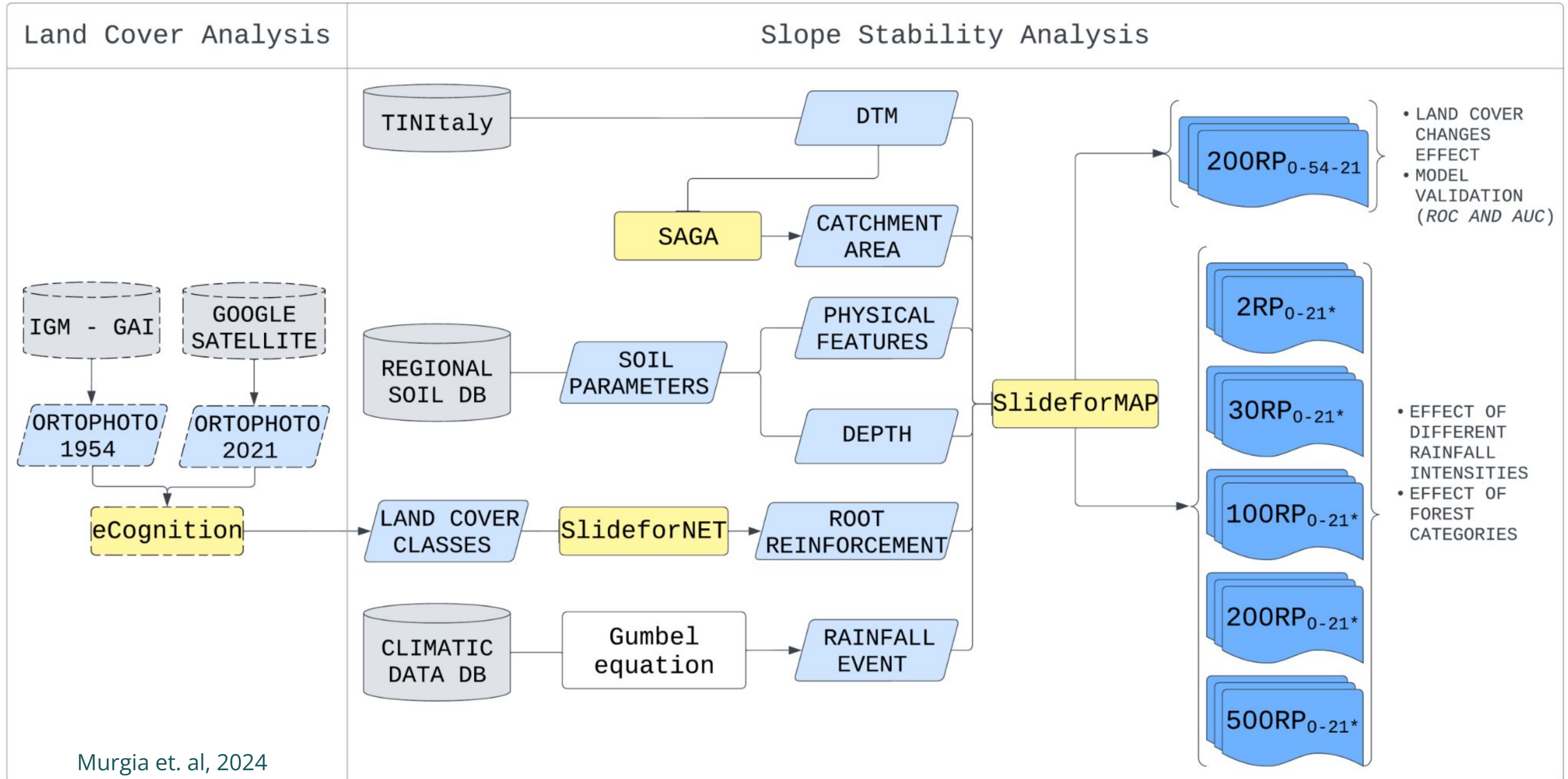
Vegetation

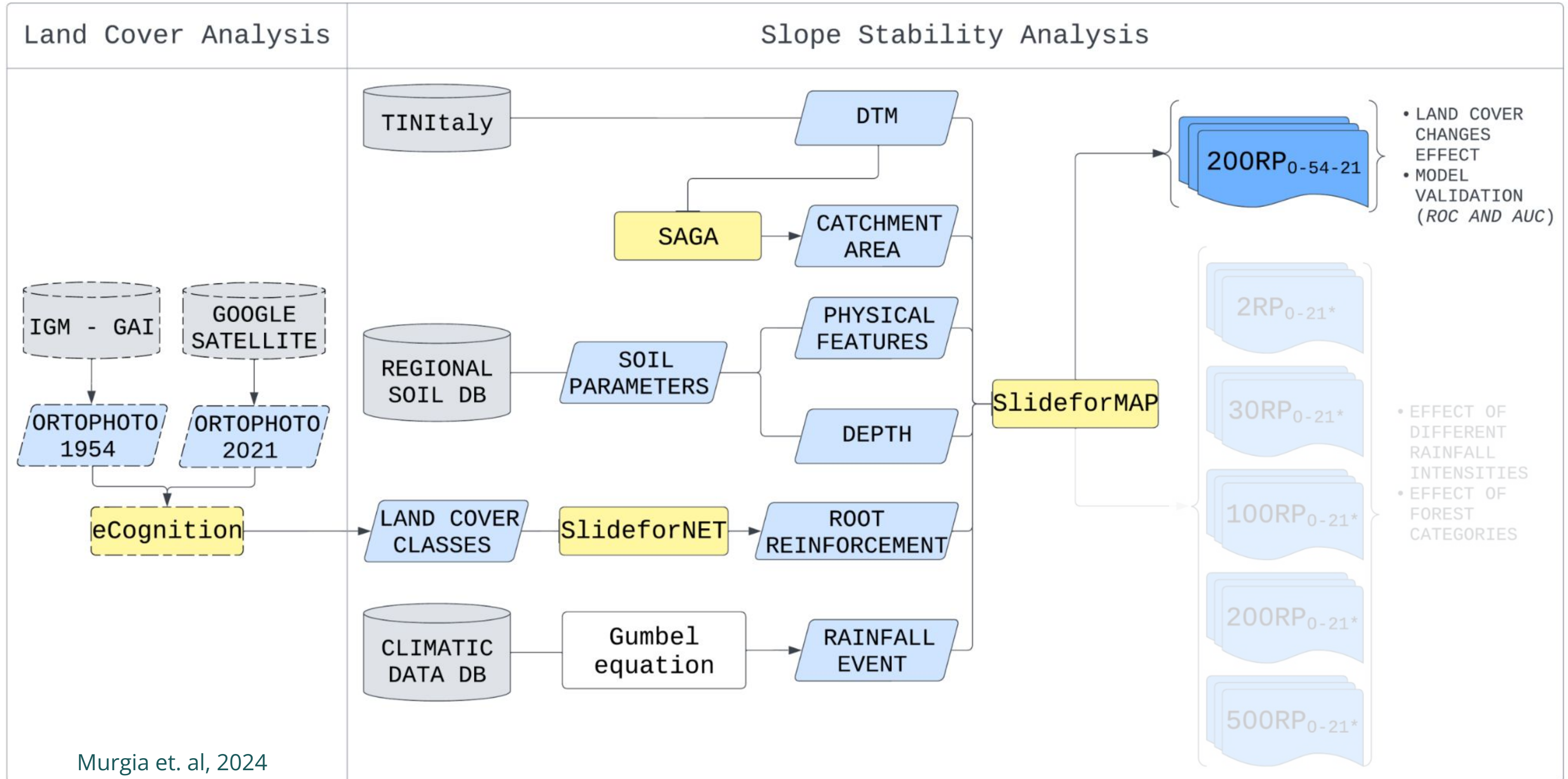
No Vegetation

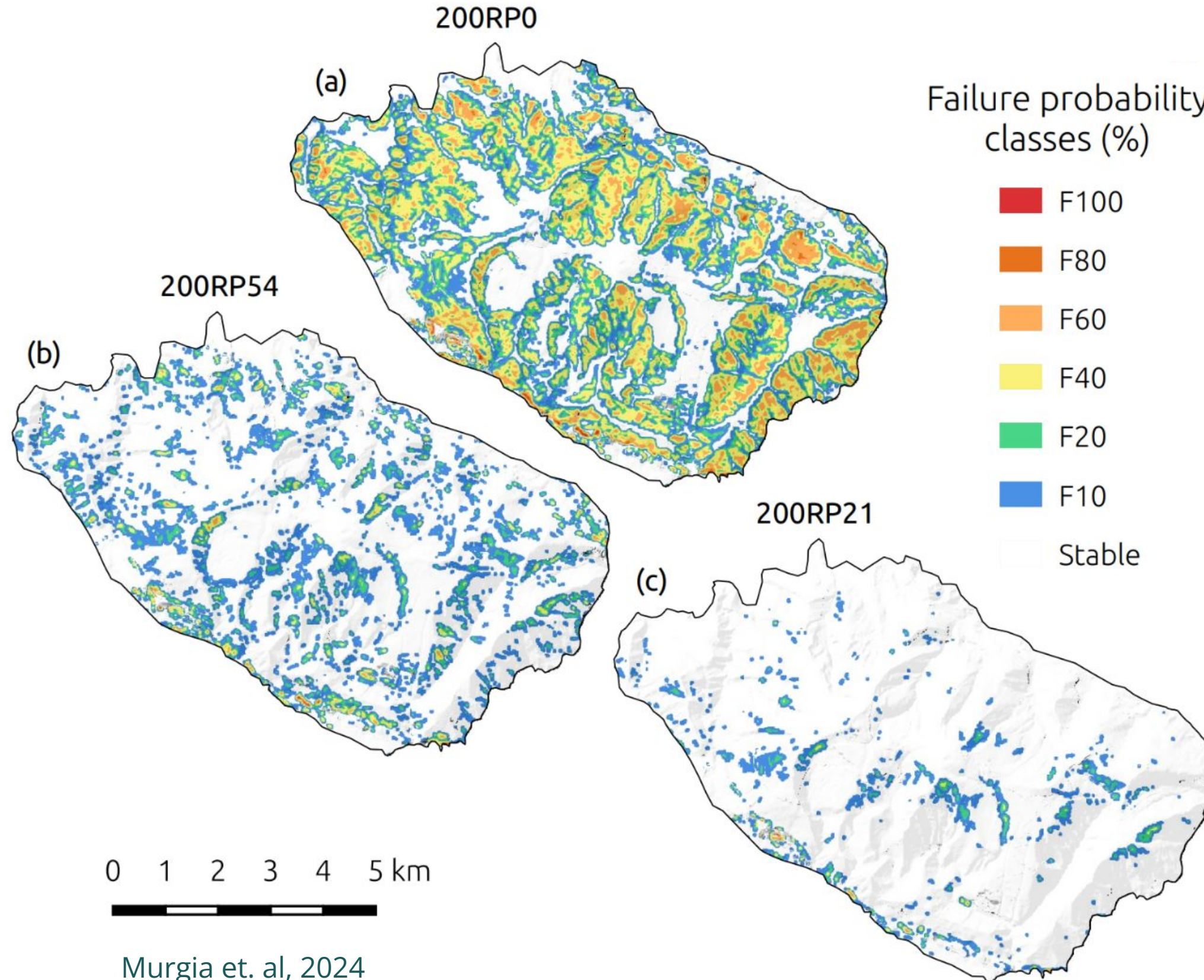
Constant Lateral Root Reinforcement

Tree File

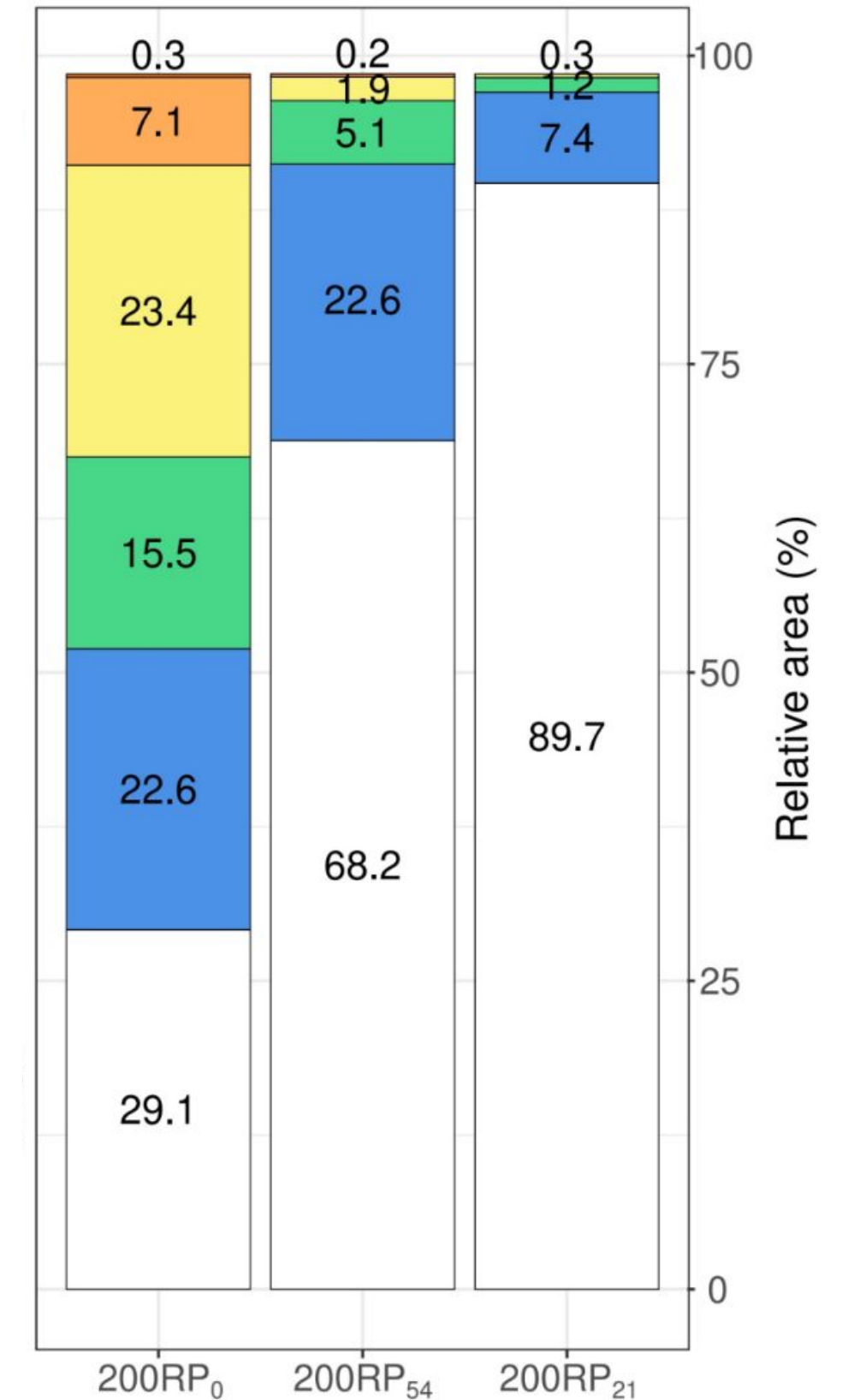
Land Use Raster Lateral Root Reinforcement (CSV)





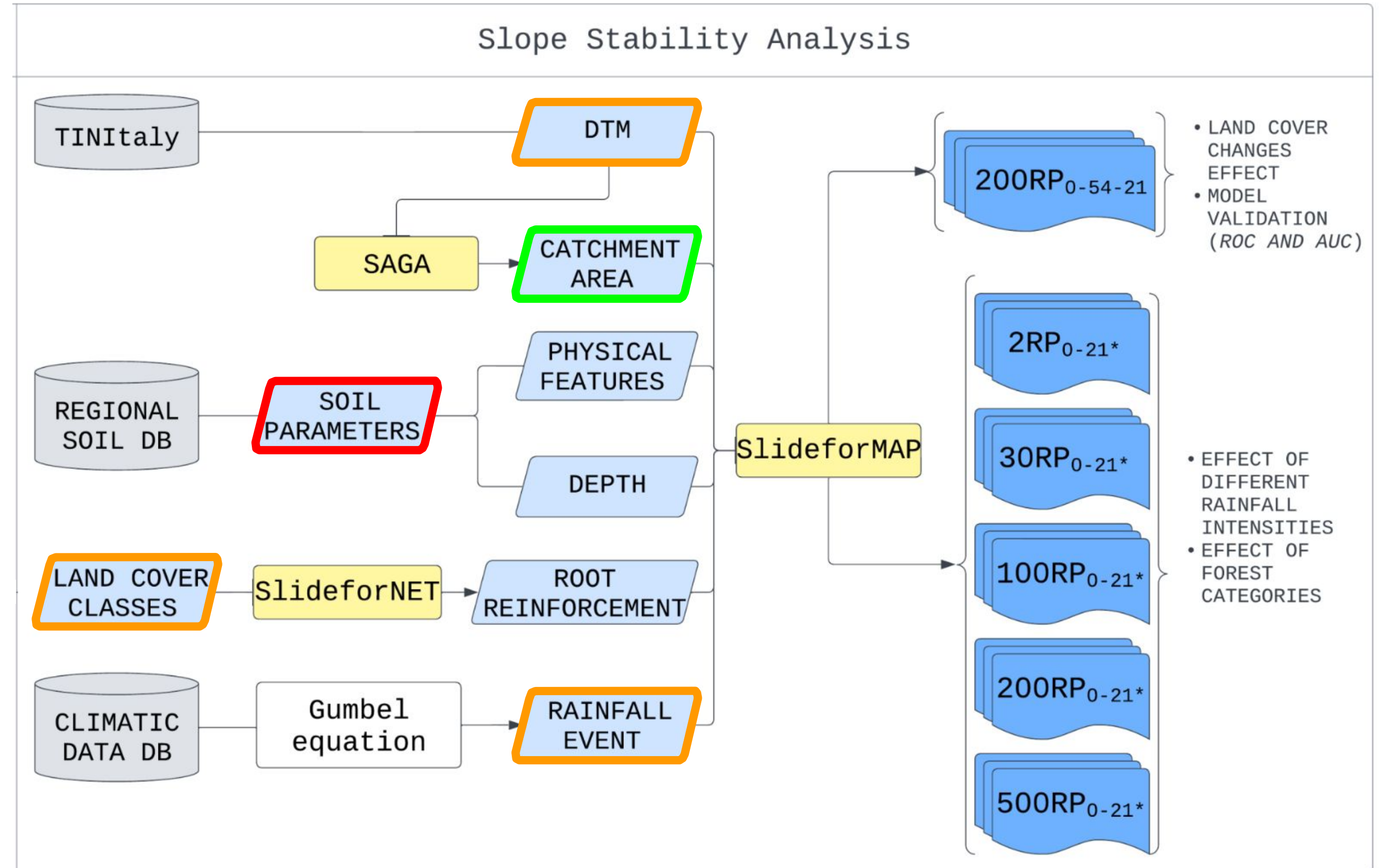


Murgia et. al, 2024

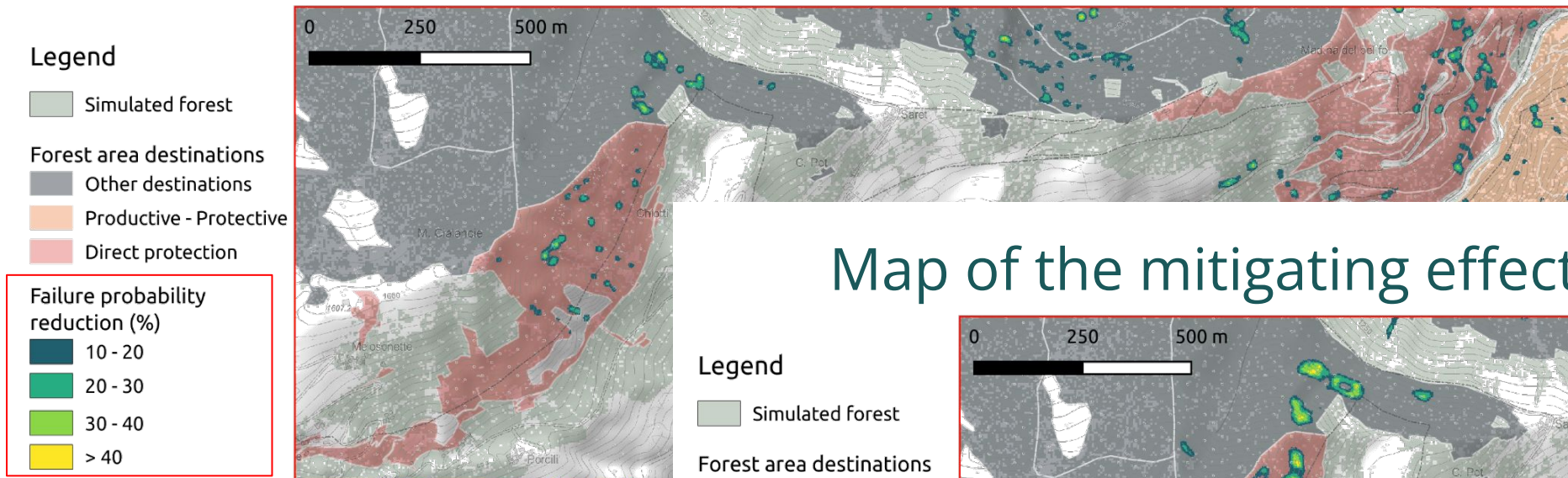


Data accessibility and findability

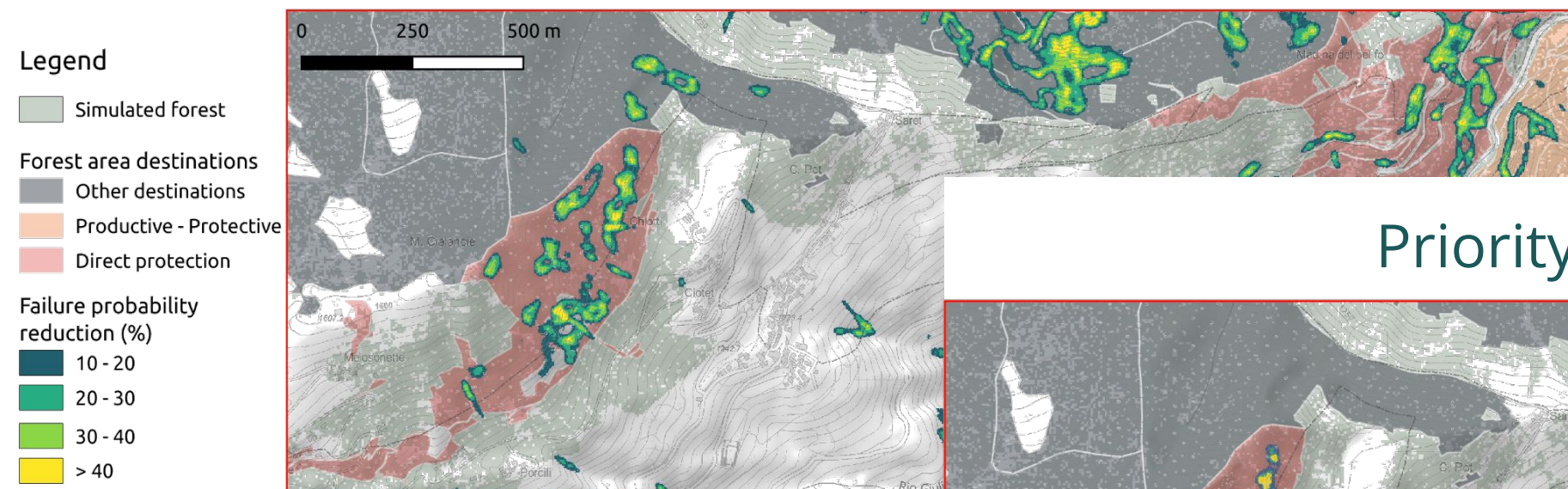
- Easy
- Challenging
- Really challenging!



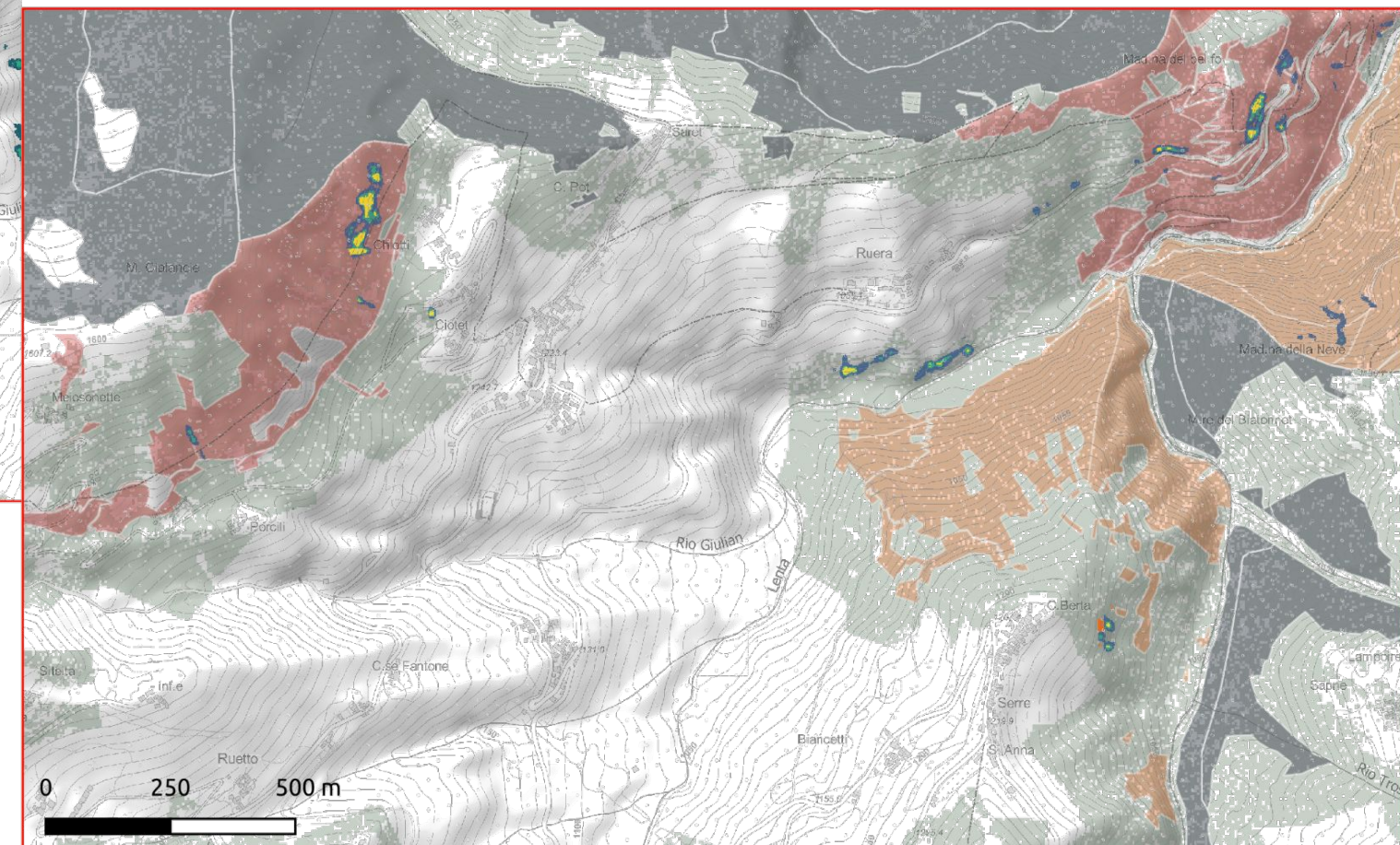
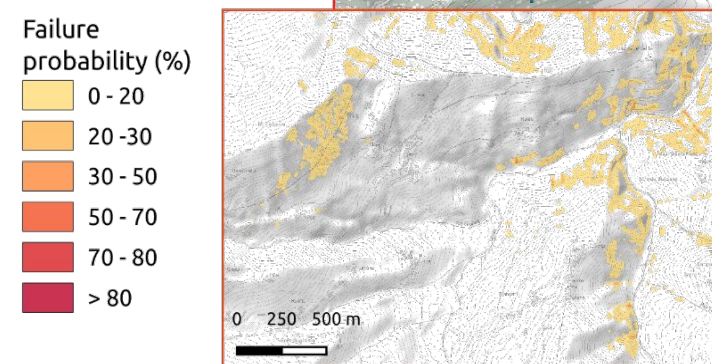
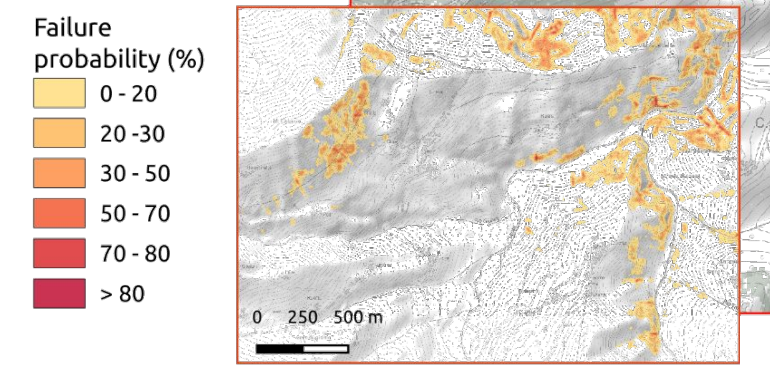
Map of the mitigating effect of the actual forest



Map of the mitigating effect of the actual forest



Priority management maps



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Thank you

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