Vulnerability maps to fires and droughts in Castilla y León (Spain), addressing forest resilience

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Introduction

The vulnerability of the region of Castilla y León (Spain) and its Case Study Site to fires and droughts was assessed based on both empirical and modelled data.

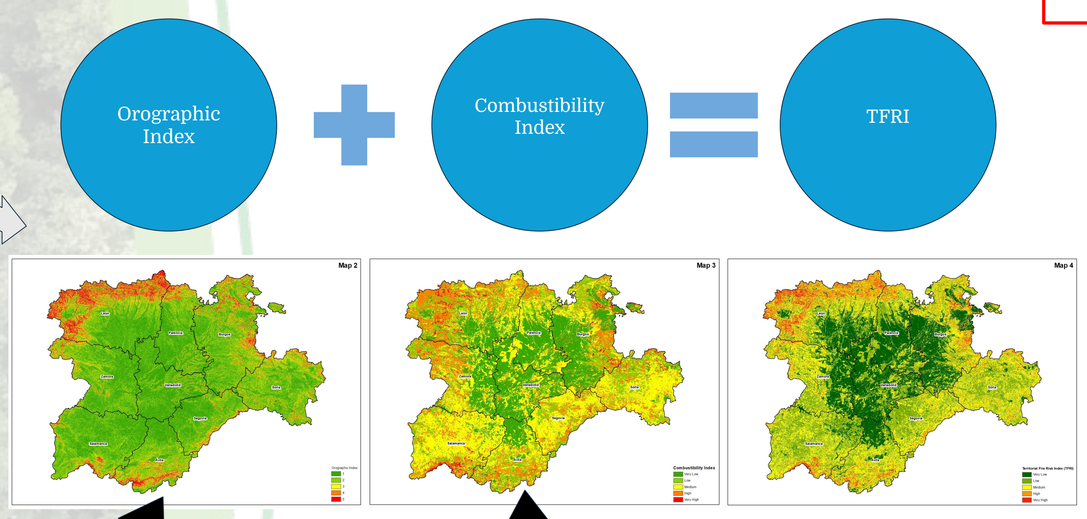
We mapped forest vulnerability indices for spatial identification of potential/priority management areas vulnerable to fires and droughts by national forest data, LiDAR data and multiespectral images.

These maps have the potential to be used in forest management planning.

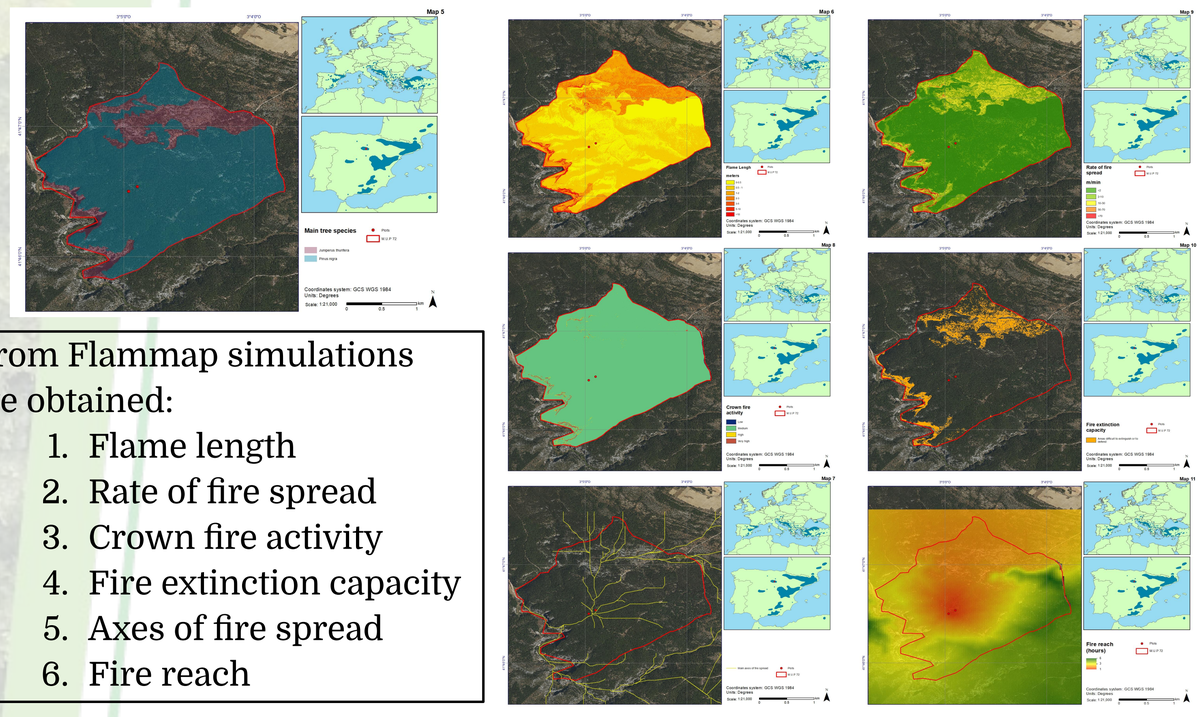
Vulnerability maps to fires

a) **Territorial Fire Risk Index** (TFRI). All Castilla y León.

b) **Fire propagation Index**. Stand level (MUP72 Cañón del río Lobos, Soria).



Fire propagation Index. Stand level (MUP72 Cañón del río Lobos, Soria).

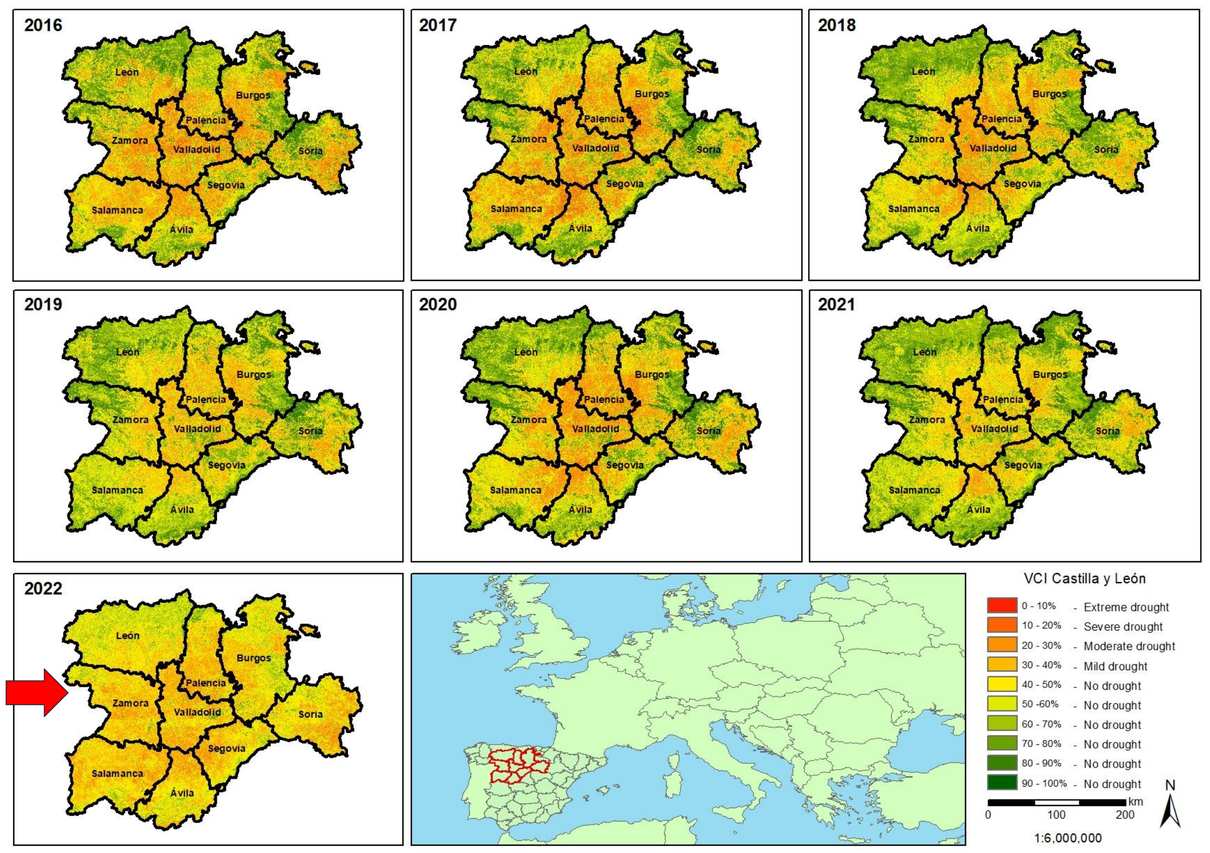


From Flammap simulations we obtained:

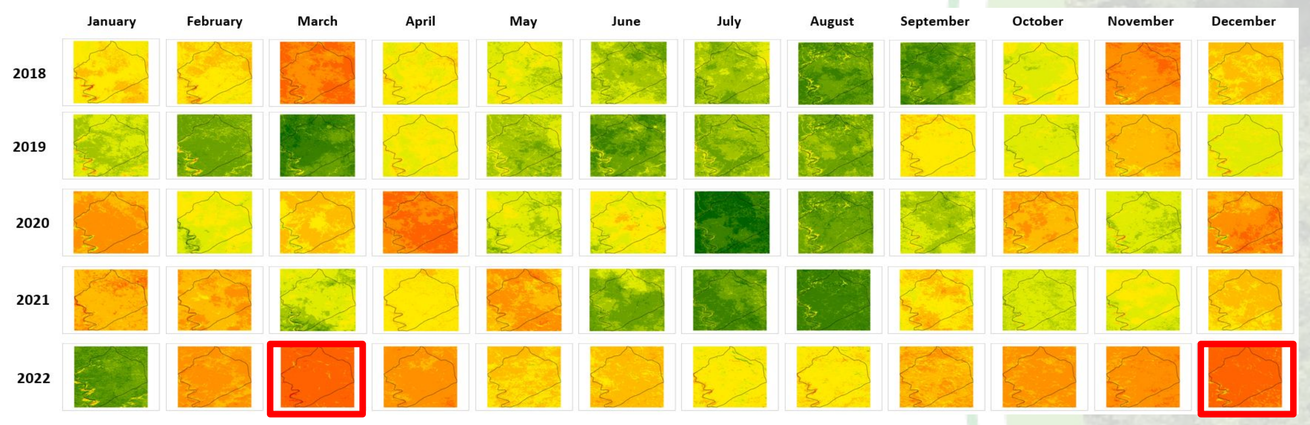
1. Flame length
2. Rate of fire spread
3. Crown fire activity
4. Fire extinction capacity
5. Axes of fire spread
6. Fire reach

Vulnerability maps to droughts

Vegetation Condition Index (VCI) Castilla y León



VCI Stand level (MUP72 Cañón del Río Lobos, Soria).



- Drought stress levels in fall have increased last 5 years compared to previous years.
- Uncommon severe droughts in March and December 2022.

Conclusions

1. TFRI is useful to identify priority management areas.

2. VCI detects droughts and determines their onset.

3. Risk maps and fire simulations can help planning forest fire prevention, control and emergency plans.

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