“Coupling wildfire spread and erosion models to quantify post-fire erosion in Northern Sardinia, Italy”

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Please note:

This talk will present the methods and results of the following manuscript:

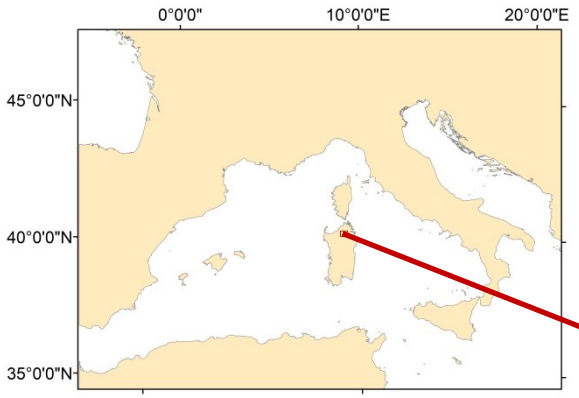
Salis, Del Giudice, et al. (2019) Coupling wildfire spread and erosion models to quantify post-fire erosion before and after fuel treatments. International Journal of Wildland Fire 28, 687-703. https://doi.org/10.1071/WF19034

Goals

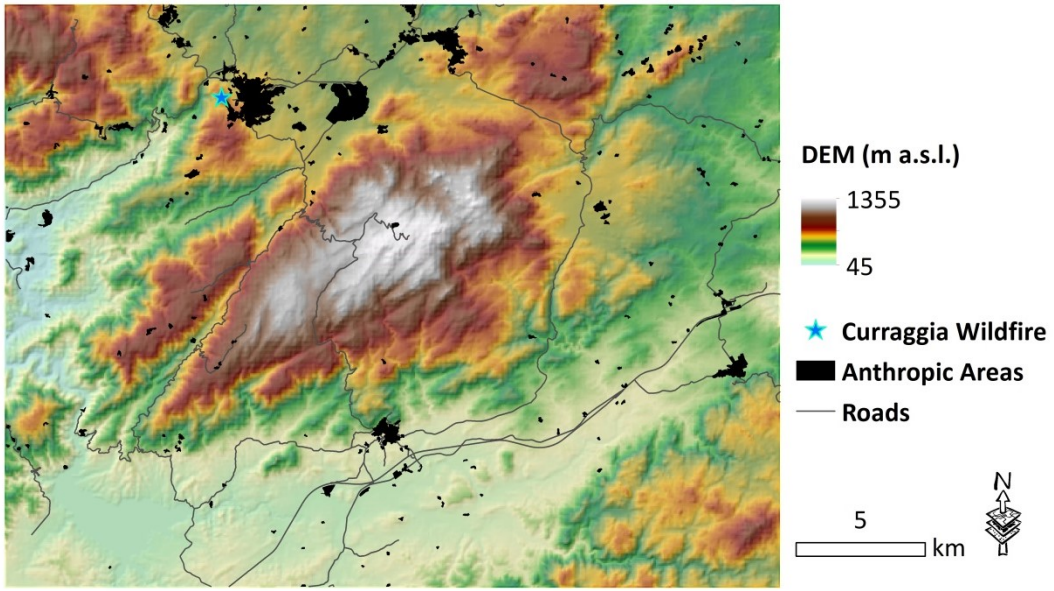
- To link the fire simulation modeling approach based on the application of the MTT algorithm (Finney 2002) with the Ermit modeling approach (Robichaud 2007) to characterize post-fire erosion in Northern Sardinia, Italy

- To investigate the potential of different fuel treatment strategies in modifying post-fire erosion

Methods: Study area - NE Sardinia, Italy (68,000 ha)



- About 20% of the area classified as EU Site of Community Importance
- Complex topography, Med climate, high susceptibility to post-fire erosion processes



- Natural vegetation mostly characterized by Q. ilex and Q. suber, and dense Mediterranean maquis (shrubs + forests = 70% of the area)

- The area was affected in July 1983 by the Wildfire of Curraggia (18,000 ha, 9 people killed)

Methods: Fuel Treatment alternatives

Treatments hypothesized the following fuel management operations in forest, shrublands and herbaceous pastures:

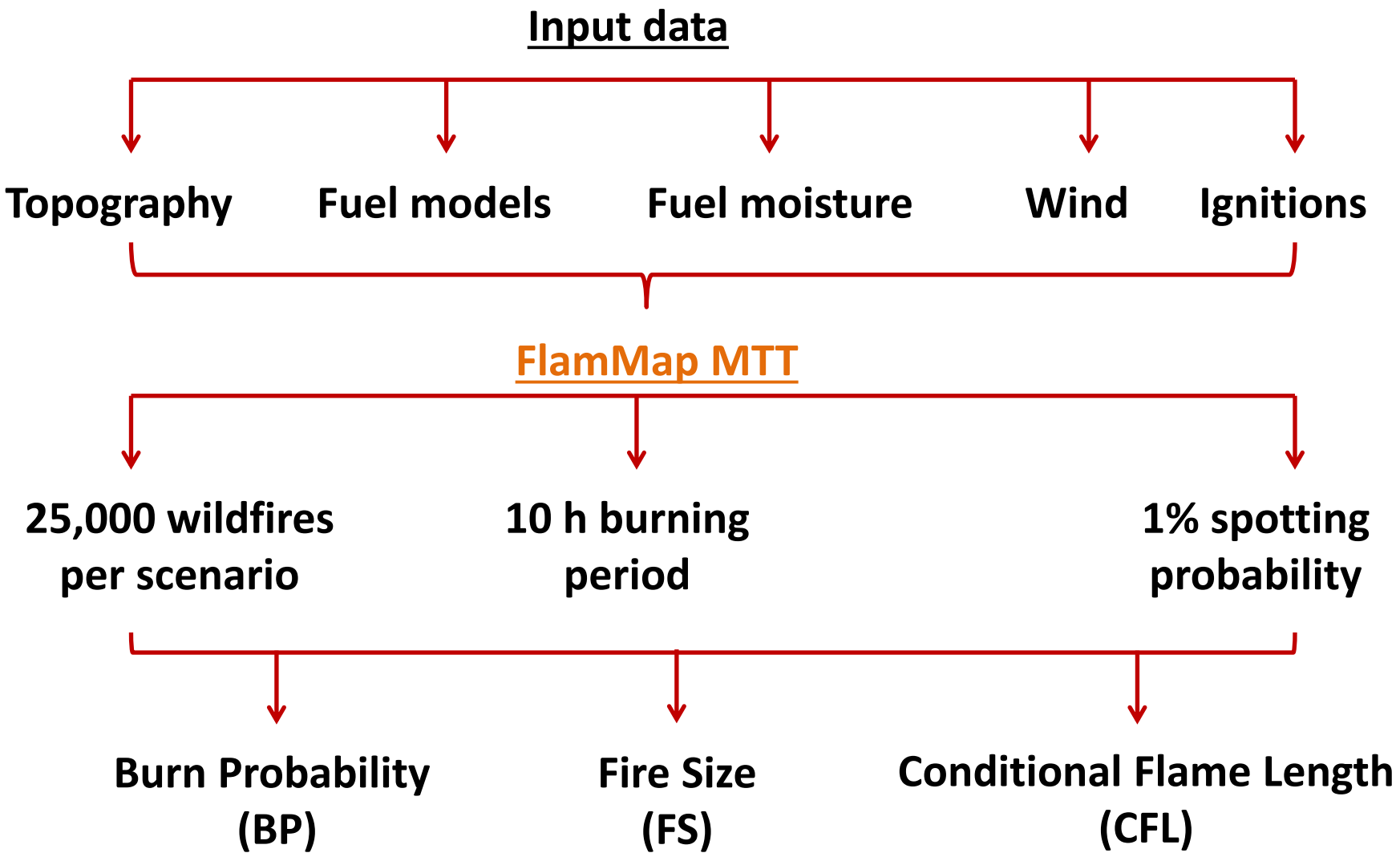
- **pruning of the lowest branches**
- **removal of dead fuels and part of the understory for shrublands, forest understory, and herbaceous pastures**

We tested 3 fuel treatment alternatives :

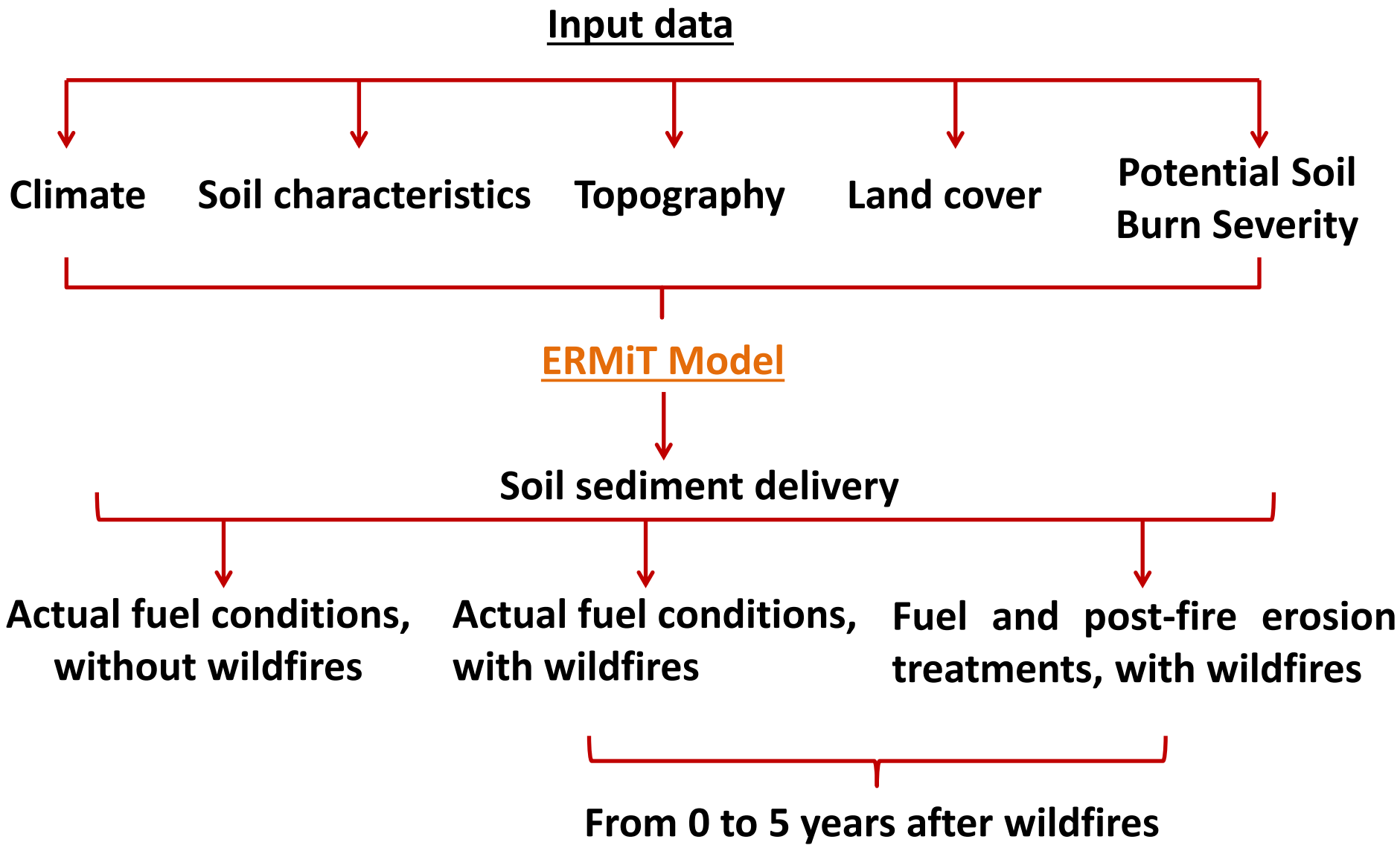
- **nearby Wildland Urban Interfaces (WUI)**
- **nearby Roads (ROAD)**
- **randomly located (RAND)**

We treated 15% of the landscape

Methods: Wildfire modeling approach



Methods: Post fire erosion modeling approach



Main results

- **Spatial location of fuel treatments influence spatial variation of burn severity, and therefore also post-fire sediment delivery is spatially affected**
- **Post-fire sediment delivery varied among and within the fuel treatment scenarios tested.**
- **The treatments realized nearby roads were the most efficient.**
- **Post-fire sediment delivery was also affected by of other factors such as exceedance probability, time since fire, slope, fire severity and vegetation type.**

Main results

- **The proposed approach permits to obtain spatial information on the areas characterized by high severity and burn probability, which can suffer the most relevant impacts in terms of soil erosion after a wildfire event**

For more details please refer to:

Salis, Del Giudice, et al. (2019) Coupling wildfire spread and erosion models to quantify post-fire erosion before and after fuel treatments. International Journal of Wildland Fire 28, 687-703. https://doi.org/10.1071/WF19034


Thank you