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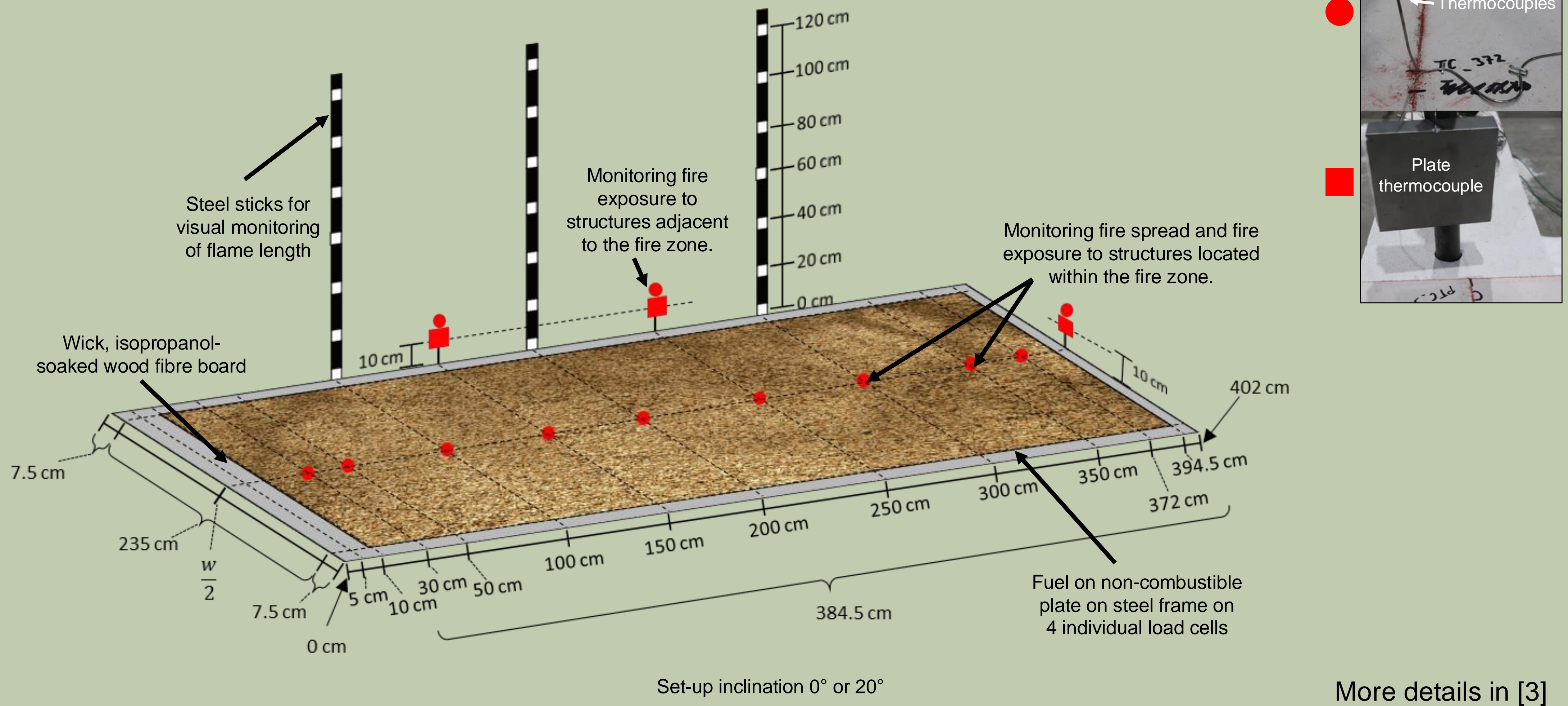
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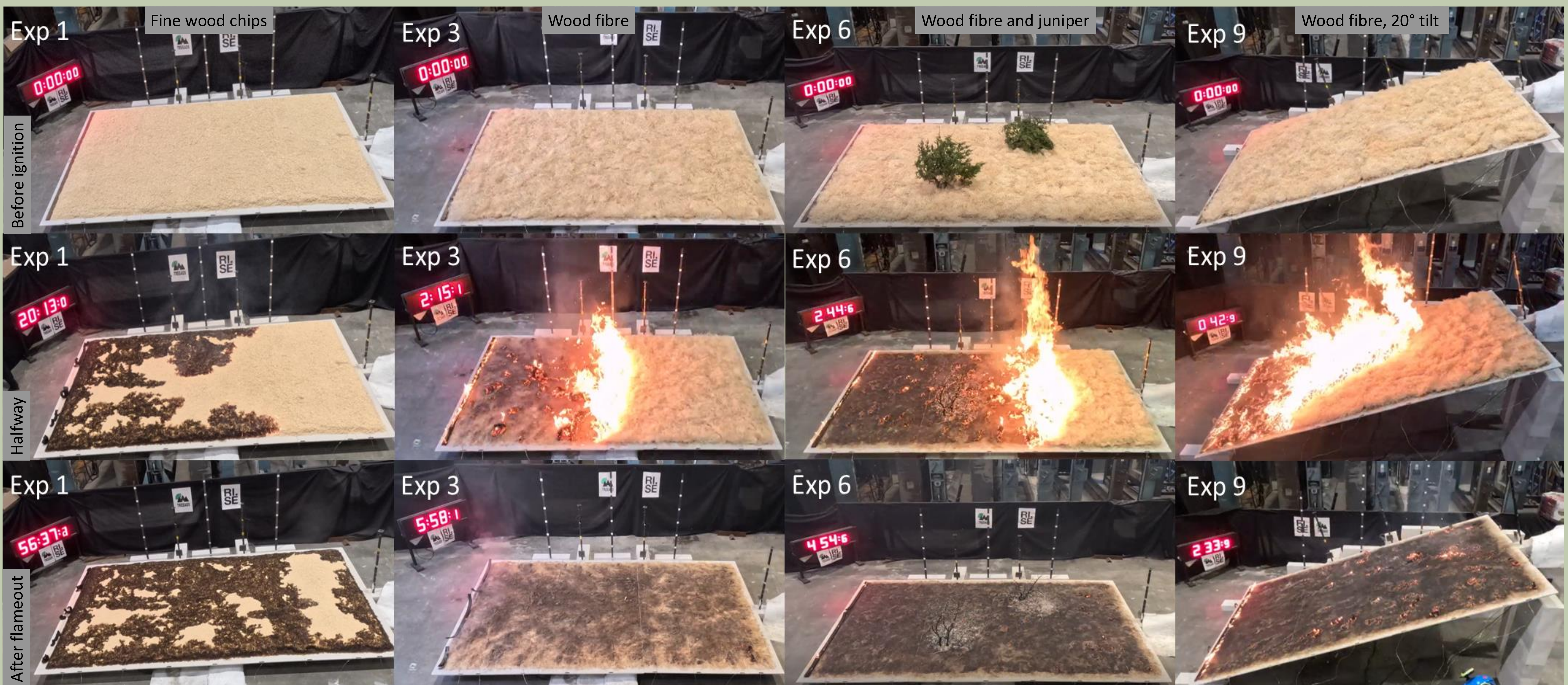
Wildfires in Scandinavia

Wildfires in Scandinavia are predicted to become more frequent and severe [1,2], necessitating a deeper understanding of the fire behaviour in scenarios unique to local conditions. Therefore, the Norwegian Pilot in the EU-funded wildfire project TREEADS focuses on understanding fire dynamics and fire spread mechanisms inherent for Norwegian wildfires and develop a relevant and scalable lab test method to document the fire resilience of materials against wildfires.

Experiments



More details in [3]



Results and discussion

Significant differences were observed in the fire dynamics and burn patterns of the different cases. Wood fibre had higher flame lengths and faster rate of spread than fine wood chips, explained by differences in fuel bed volume density. Introducing juniper further increased flame length, as also observed in wildfires in nature, where juniper is a known *ladder species* from forest floor fires to canopy fires [4]. Fine wood chips had surface charring and unburned patches, similar to Scandinavian needle-dominated forest floors, while wood fibre showed a more intense and uniform fire front like grass fires or *Vaccinium*-dominated forest floors. An inclination of 20% increased rate of spread for wood fibre by a factor of 4-5, the flame length by ~50% and more than doubled the fireline intensity, complying to general rule of thumbs [5]. Ongoing work aims to identify relevant fuels and test conditions for Scandinavian wildfires, and how to best document the exposure level for nearby structures in wildland-urban interface zones. More details in [3].

Experiment/fuel	#1 Chips dense	#2 Fibre	#3 Fibre	#4 Fibre on Chips	#5 Chips on Fibre	#6 Fibre + Juniper
Fuel load (MJ/m ²)	80	12	12	46	46	16
Mass loss (%)	6	100	100	26	100	96
Rate of spread w/std.dev** (m/min)	0.12-0.24	1.1±0.19	1.0±0.08	1.0±0.11	0.36-0.67	1.2±0.12
Fire Intensity (kW/m)	7-13	215	215	183	25-119	307
Max. flame length (m)	0.05	0.80	0.80	0.50	0.2	1.0 (2.5*)
Experiment/fuel	#7 Chips less dense	#8 Fibre + Juniper	#9 Fibre, tilt	#10 Fibre, tilt	#11 Chips less dense, tilt	
Fuel load (MJ/m ²)	67	16	12	12	67	
Mass loss (%)	9	95	100	100	10	
Rate of spread w/std.dev** (m/min)	0.09-0.23	1.4±0.20	4.7±1.47	5.0±2.29	0.21-0.43	
Fire Intensity (kW/m)	3-11	379	594	700	11-43	
Max. flame length (m)	0.05-0.07	0.80 (3.0*)	1.2-1.5	1.2-2	0.05-0.1	

*Juniper flame length. **Values from temperature data or *range* from visual observations of the irregular fire front.

TREEADS Facts

Starting Date: 1 December 2021
Project Duration: 42 months
Call Identifier: LC-GD-1-1-2020
Budget: € 20M



Link to TREEADS Partners

References

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- [3] Aamodt E et al., Development of large lab-scale fire dynamics experiments relevant for Scandinavian wildfire behaviour, *Journ. of Physics Conf. Series*, 2024 (accepted manuscript). *Some photos used here are from this paper.*
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Acknowledgments

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