

Evaluation of OpenLisem and MohidLand models to simulate post-fire hydrological events

Marta Basso*¹, Jacob Keizer ¹, Diana Vieira²

*martabasso@ua.pt

¹ Centre for Environmental and Marine Studies (CESAM), Earth Surface Processes Team (ESP team), University of Aveiro, Aveiro 3810-193, Portugal

² European Commission, Joint Research Centre (JRC), Ispra, Italy



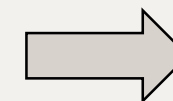
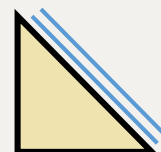
Why events?

Primary impacts

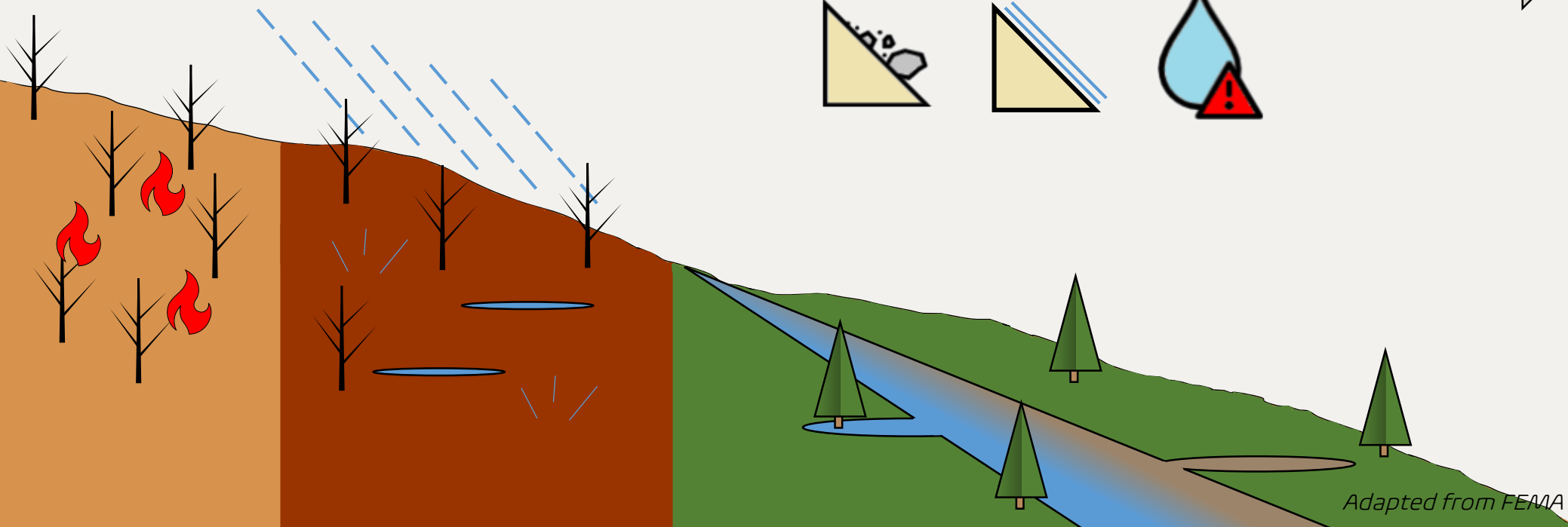
- Soil exposed to rainfall
- Soil properties affected

Secondary impacts

The impacts of wildfires on erosion and overland flow are more visible during rainfall events

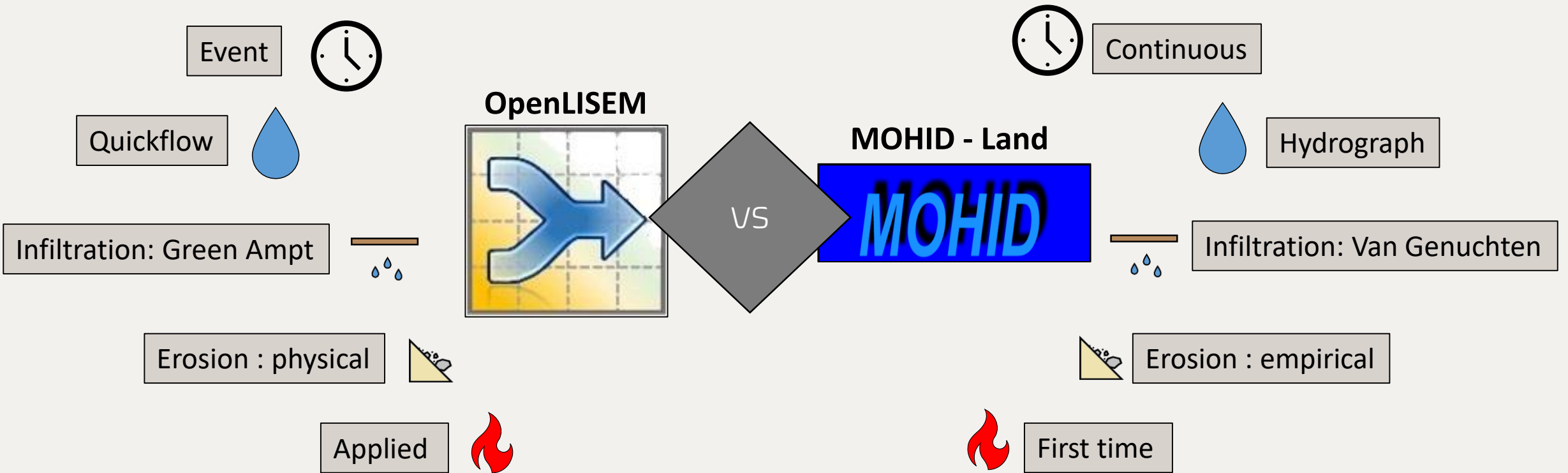


Simulations at high temporal detail

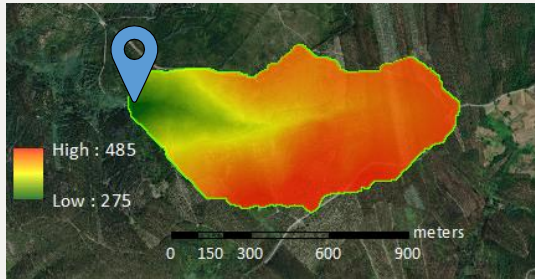


Adapted from FEMA

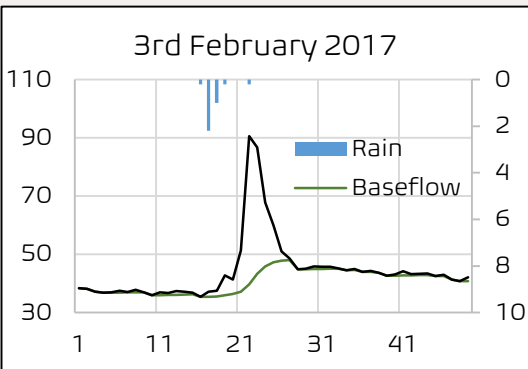
Objective



Methodology



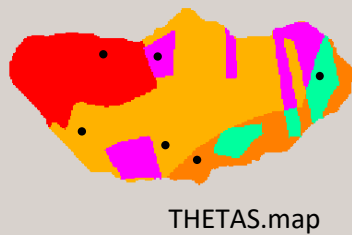
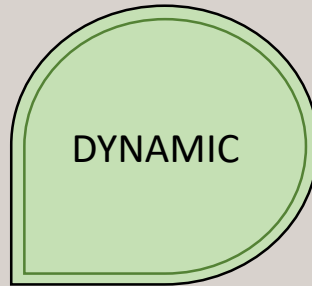
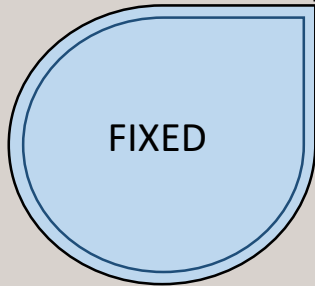
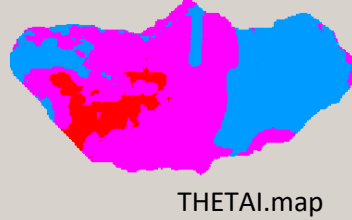
EVENT SELECTION



Peaks $> 7 \text{ L s}^{-1}$
1 hour without rainfall

INPUT DATA

constant
variable



Burn severity

Burn severity

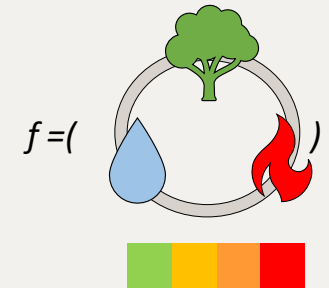
Saturated hydraulic conductivity (K_{sat})

Manning n (n)

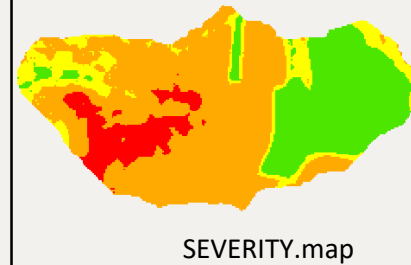
7 events

Autocalibration

Range (K_{sat}, n)



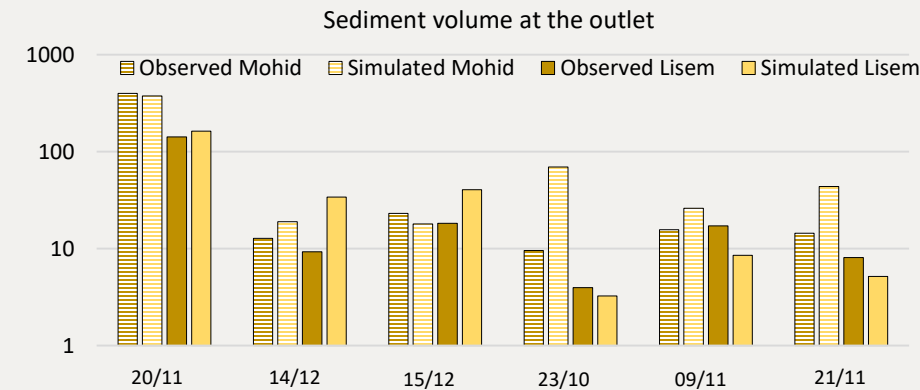
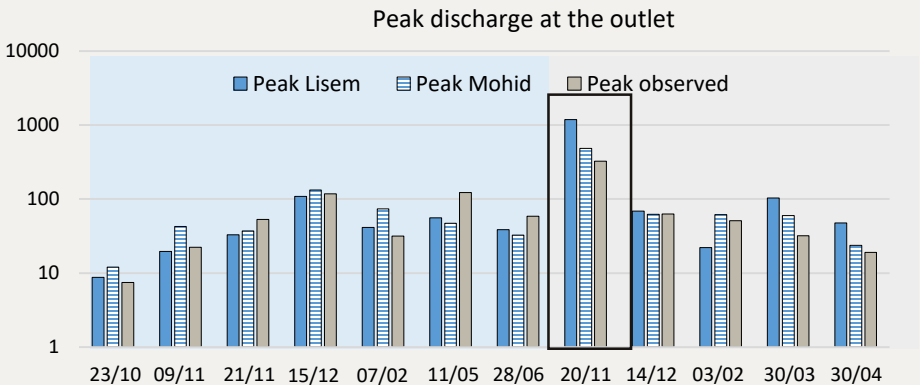
CALIBRATED



5 events

Validation

Which model performs better?



			Total discharge		Peak discharge		Time peak	
			R2	NSE	R2	NSE	R2	NSE
C	A	L	0.68	0.23	0.7	0.55	0.97	0.95
V	A	L	0.98	<0	0.98	<0	0.99	0.98



			Total discharge		Peak discharge		Time peak	
			R2	NSE	R2	NSE	R2	NSE
C	A	L	0.8	0.72	0.68	0.67	0.98	0.96
V	A	L	0.99	0.65	0.99	0.85	1	1

			Sediment volume		Peak sediment		Time peak	
			R2	NSE	R2	NSE	R2	NSE
C	A	L	1	0.88	1	0.25	0.99	0.96
V	A	L	1	0.22	0.99	0.60	0.98	0.94

			Sediment volume		Peak sediment		Time peak	
			R2	NSE	R2	NSE	R2	NSE
C	A	L	1	1	1	0.22	1	0.72
V	A	L	0.95	<0	0.1	0.62	0.97	0.82



THANK YOU FOR YOUR ATTENTION



martabasso@ua.pt



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[0000-0002-1732-2933](https://www.cesam.ua.pt/0000-0002-1732-2933)



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