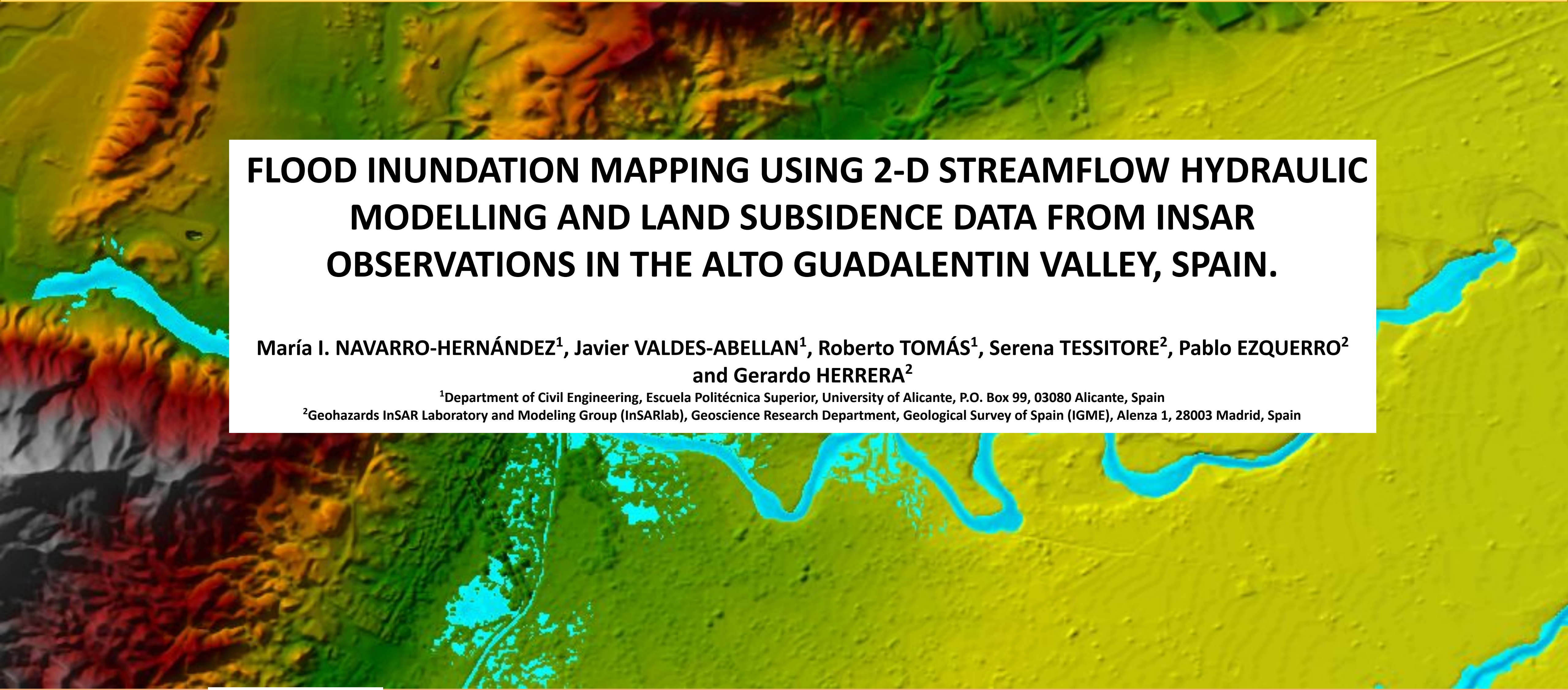

FLOOD INUNDATION MAPPING USING 2-D STREAMFLOW HYDRAULIC MODELLING AND LAND SUBSIDENCE DATA FROM INSAR OBSERVATIONS IN THE ALTO GUADALENTIN VALLEY, SPAIN.

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Study area & Methodology

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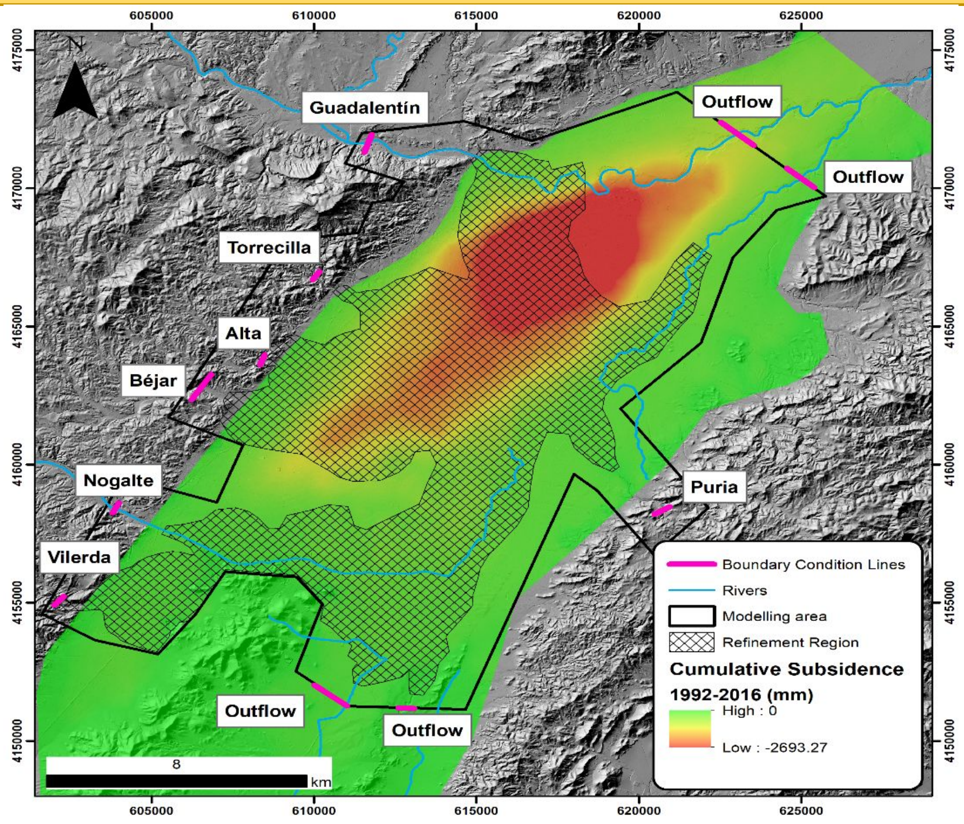
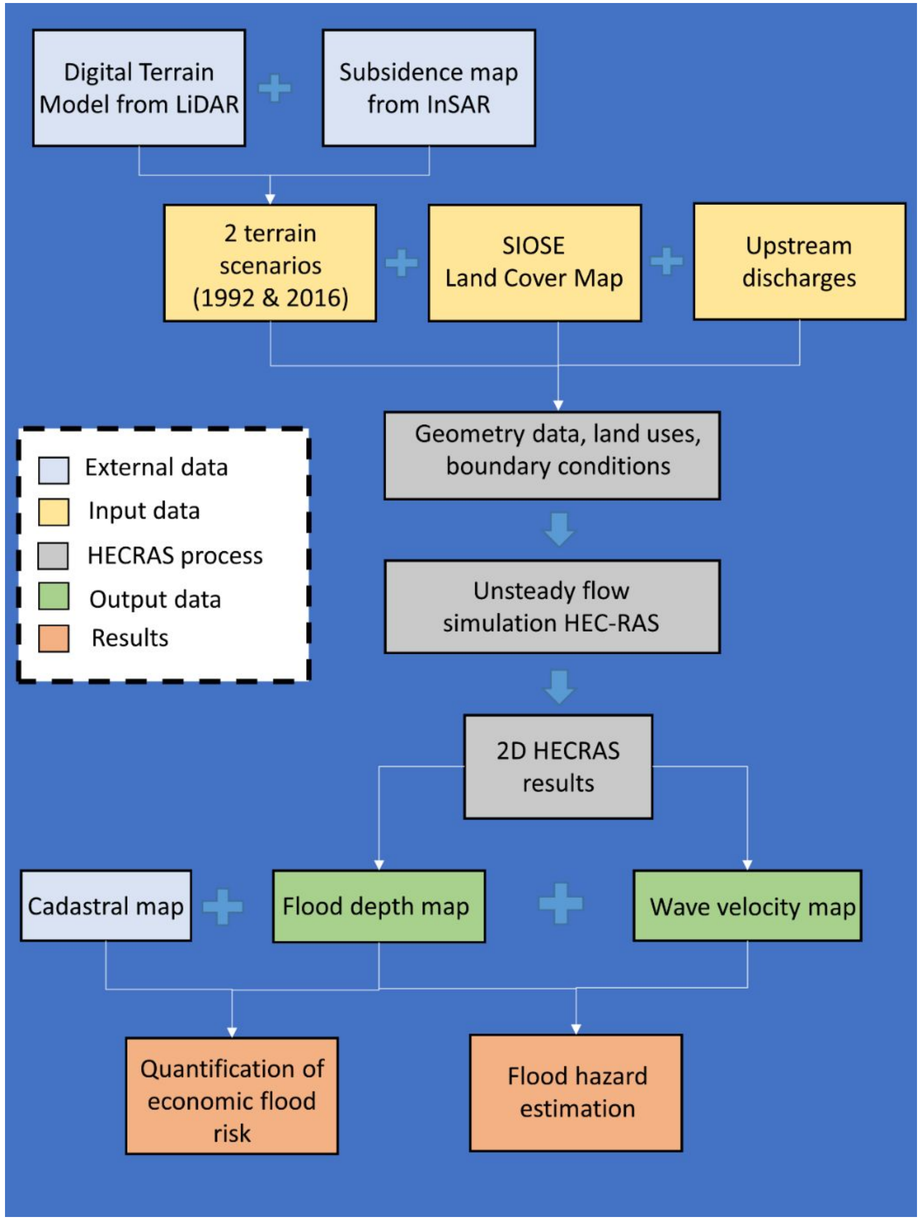
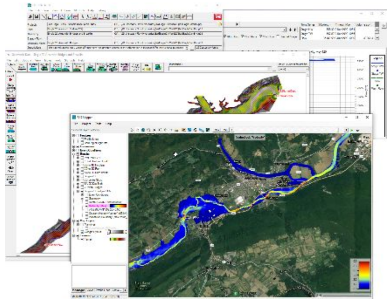
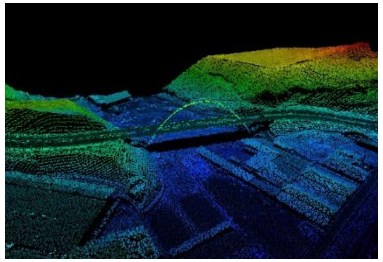


Data	Application
DEM 2.5 m	- Original Topography surface. - Slope energy calculation.
SAR Images (ERS, ENVISAT, COSMO-SkyMed)	Topography surface for 2016 and 1992 scenarios.
Land cover (SIOSE)	-CN calculation. -Manning´s coefficient (n). -Risk Analysis.
Water volume (Discharge)	Unsteady flow analysis.
Cadastral map	Risk analysis.

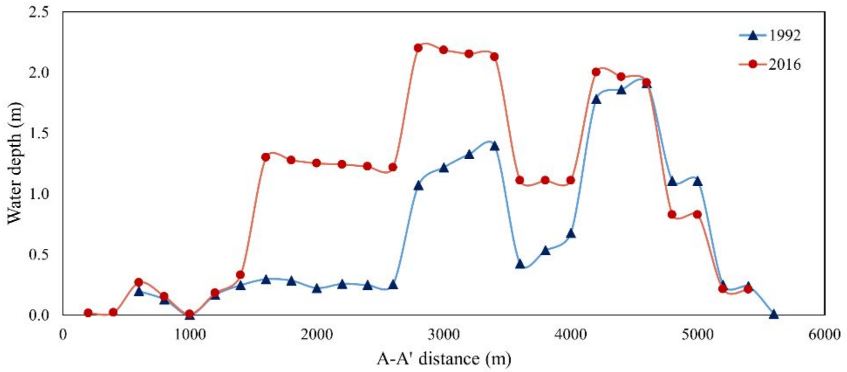


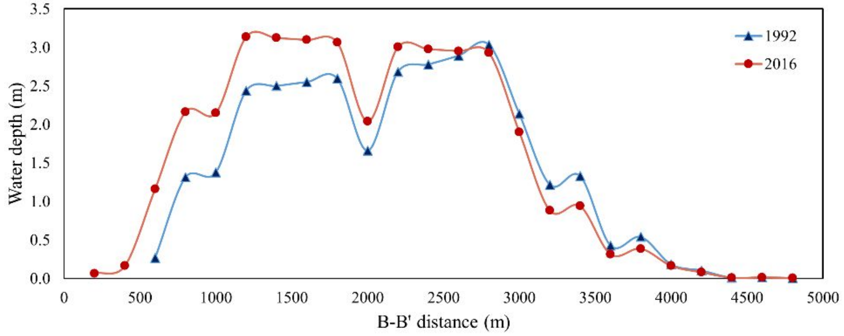




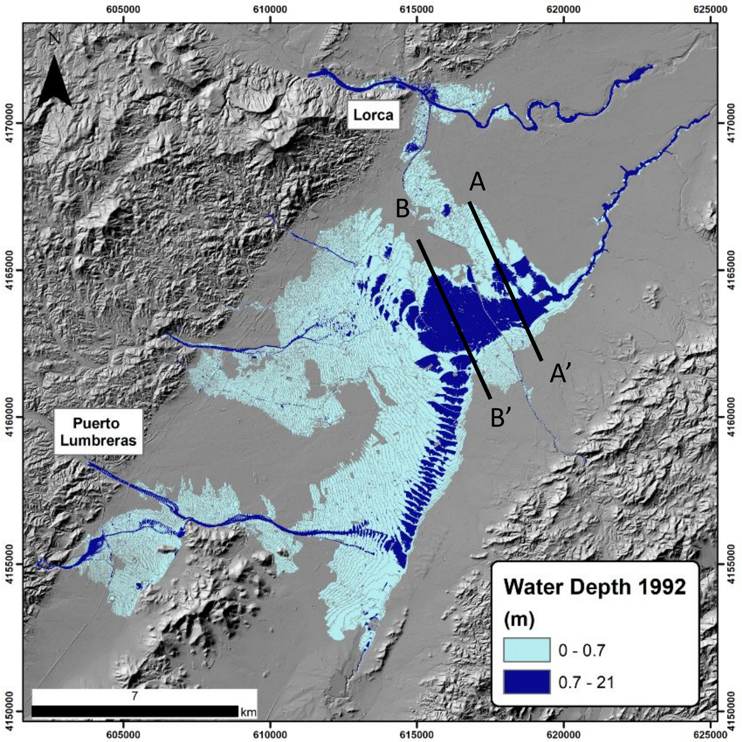
Results

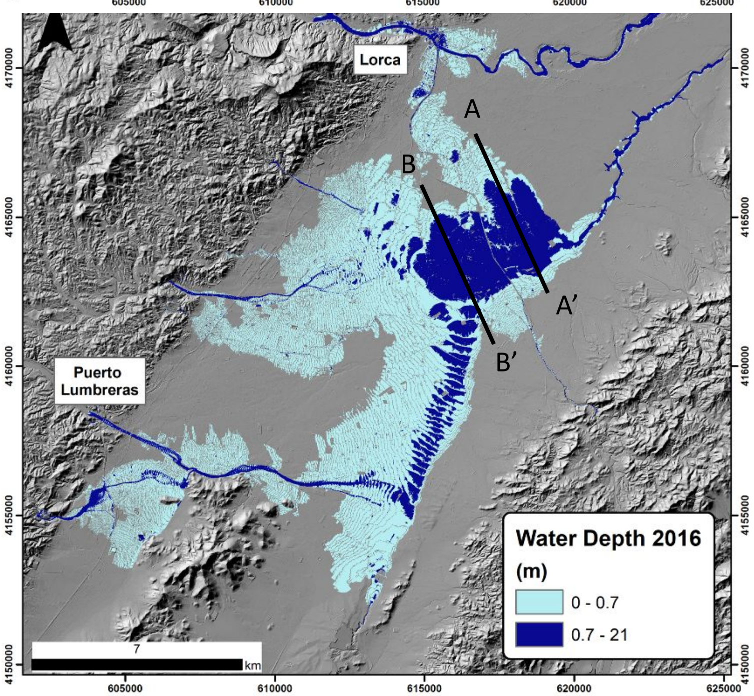
	Flooded area (km²)		
Water depth (m)	1992	2016	Difference
< 0.7	80.20	79.02	-1.18
> 0.7	21.16	24.38	3.22

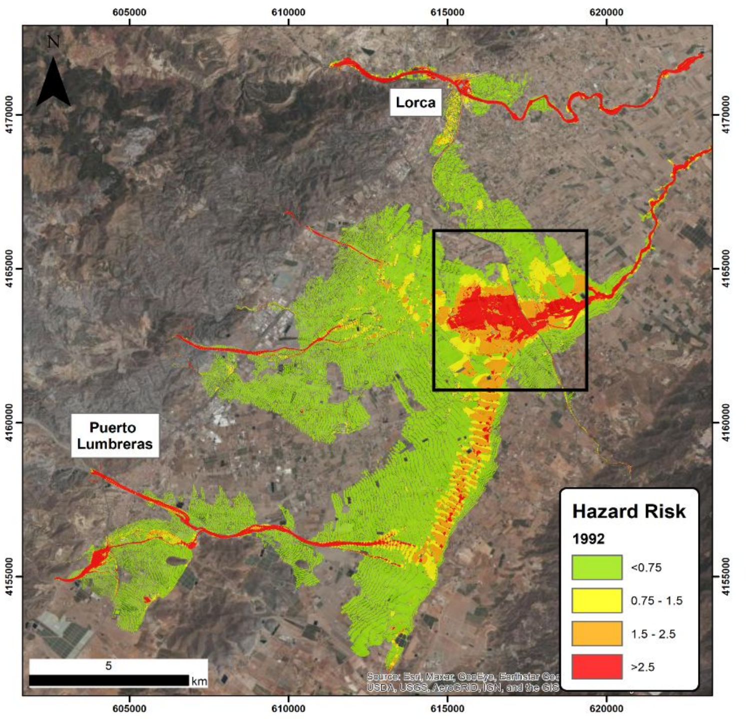


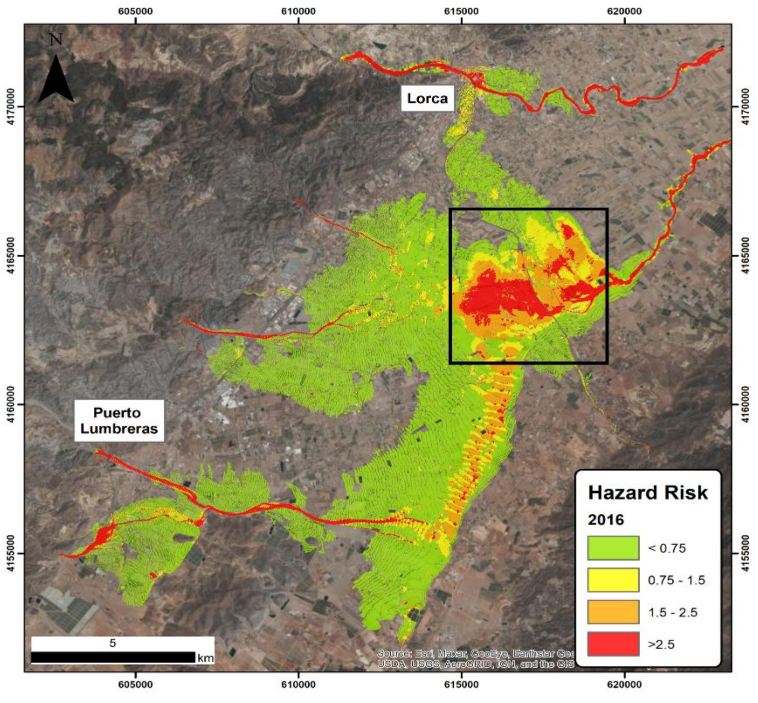


Classification	Hazard risk area (km²)		
	1992	2016	Difference
Low	74.63	73.13	-1.50
Moderate	8.95	9.40	0.45
High	7.92	10.31	2.39
Extreme	9.40	9.93	0.53









Conclusion

- The simulated results show an increase in the inundation area of approximately 3.22 km^2, especially for the areas with a depth higher than 0.7 raising by 15.21%.
- The velocity maps also reveal an increase in the centre of the valley, which has been identified as the critical zone.
- Changes in the flood patterns suggest that the inundation area is expanding and migrating towards NW in agreement with the trend of the highest subsidence domain.

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