

*In search of the Roman army footprint in topography: historical and methodological considerations on the use (and the non-use) of airborne LiDAR in Northwest Iberia*

João Fonte

*José Manuel Costa García*

*Andrés Menéndez Blanco*

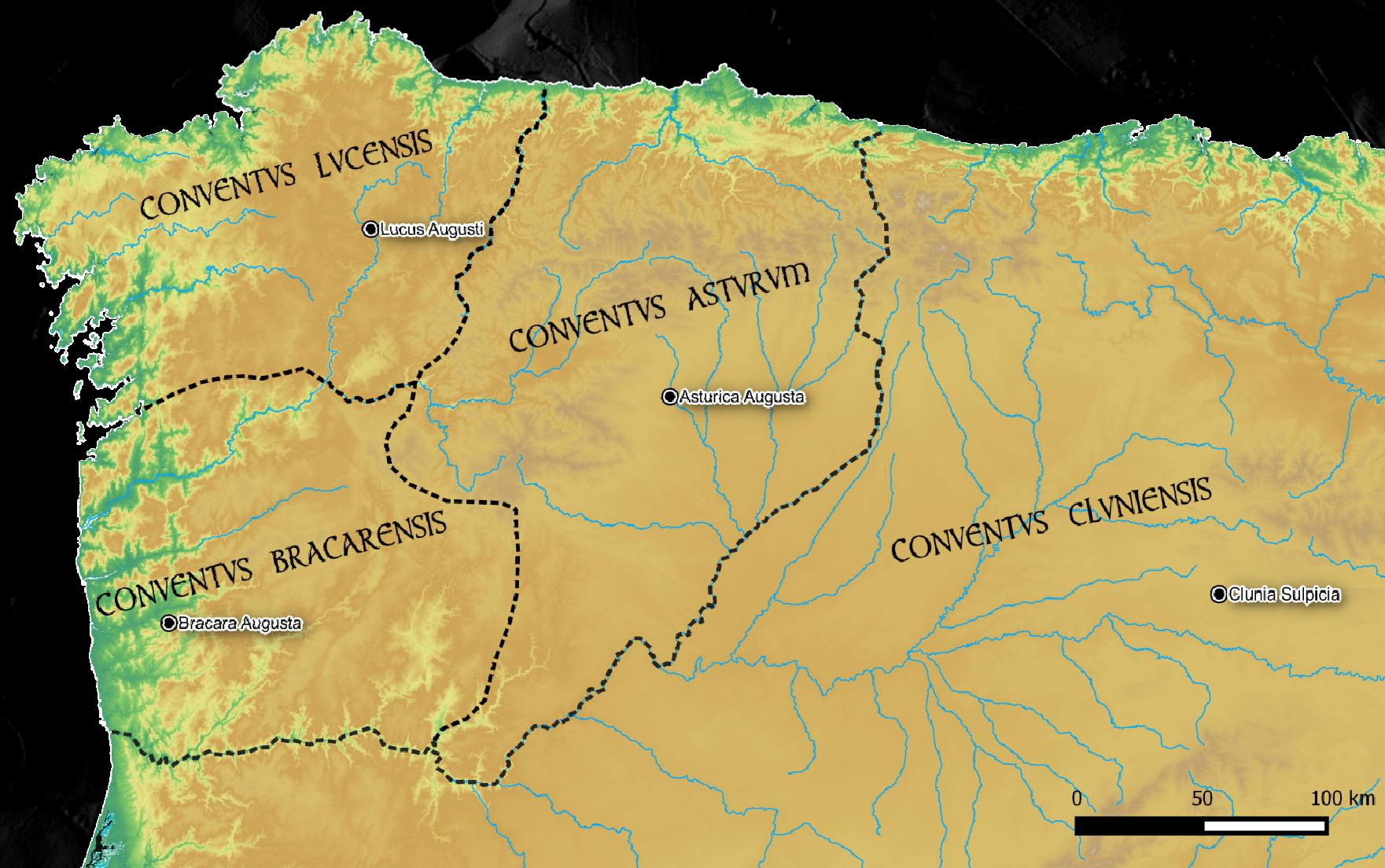
*David González Álvarez*

*Manuel Gago Mariño*

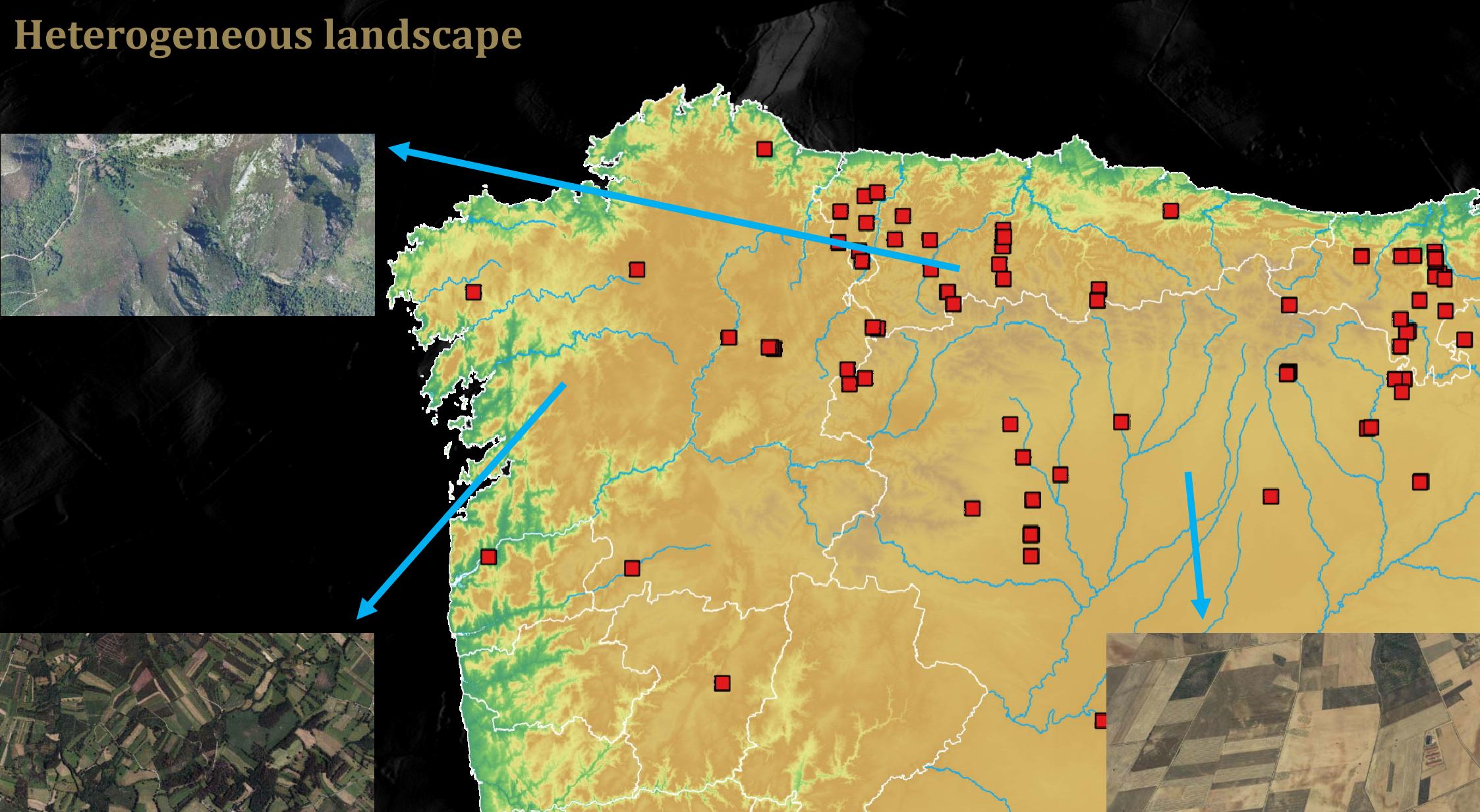
*Valentín Álvarez Martínez*

*Rebeca Blanco Rotea*

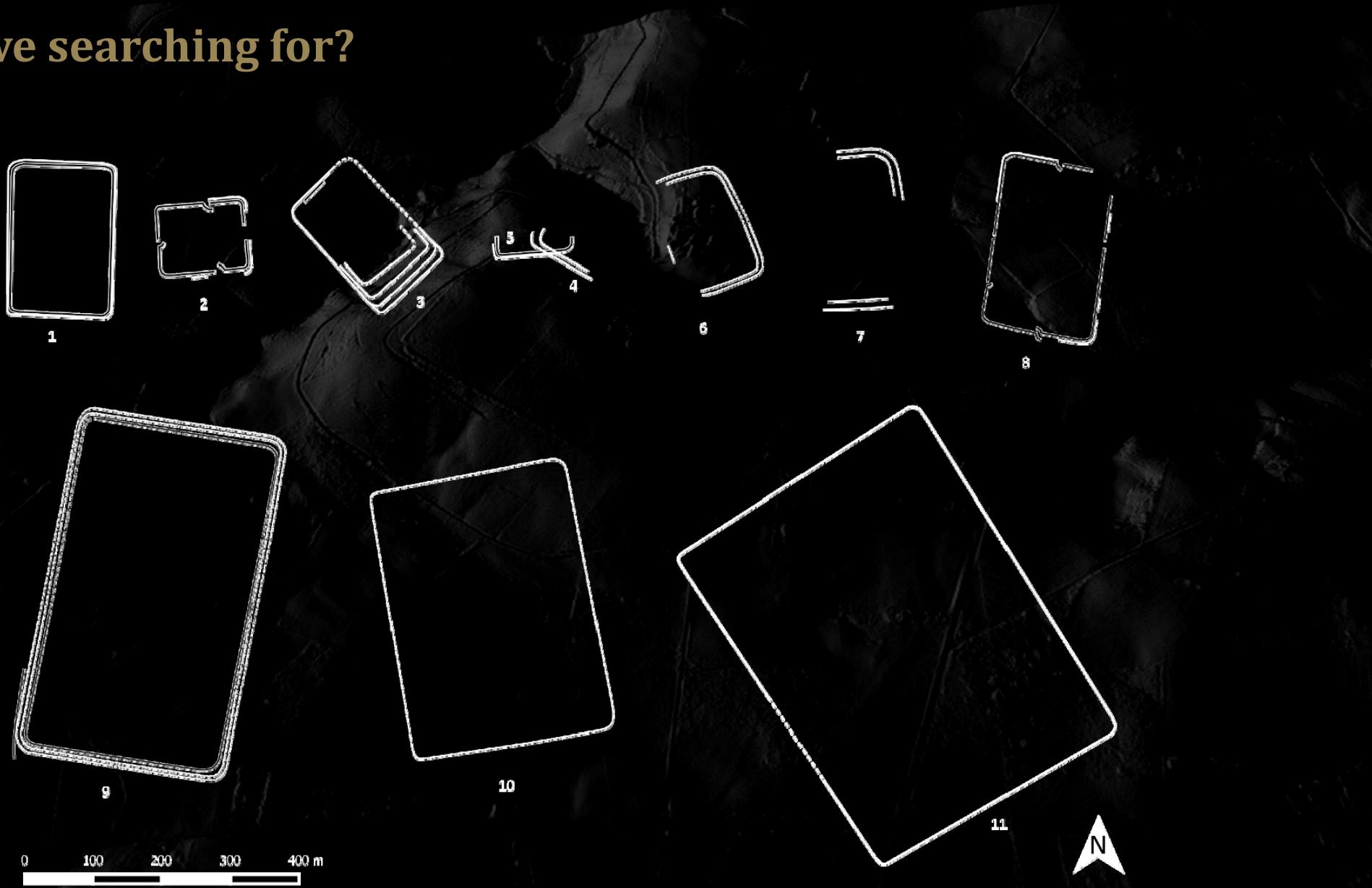
# Geographical setting



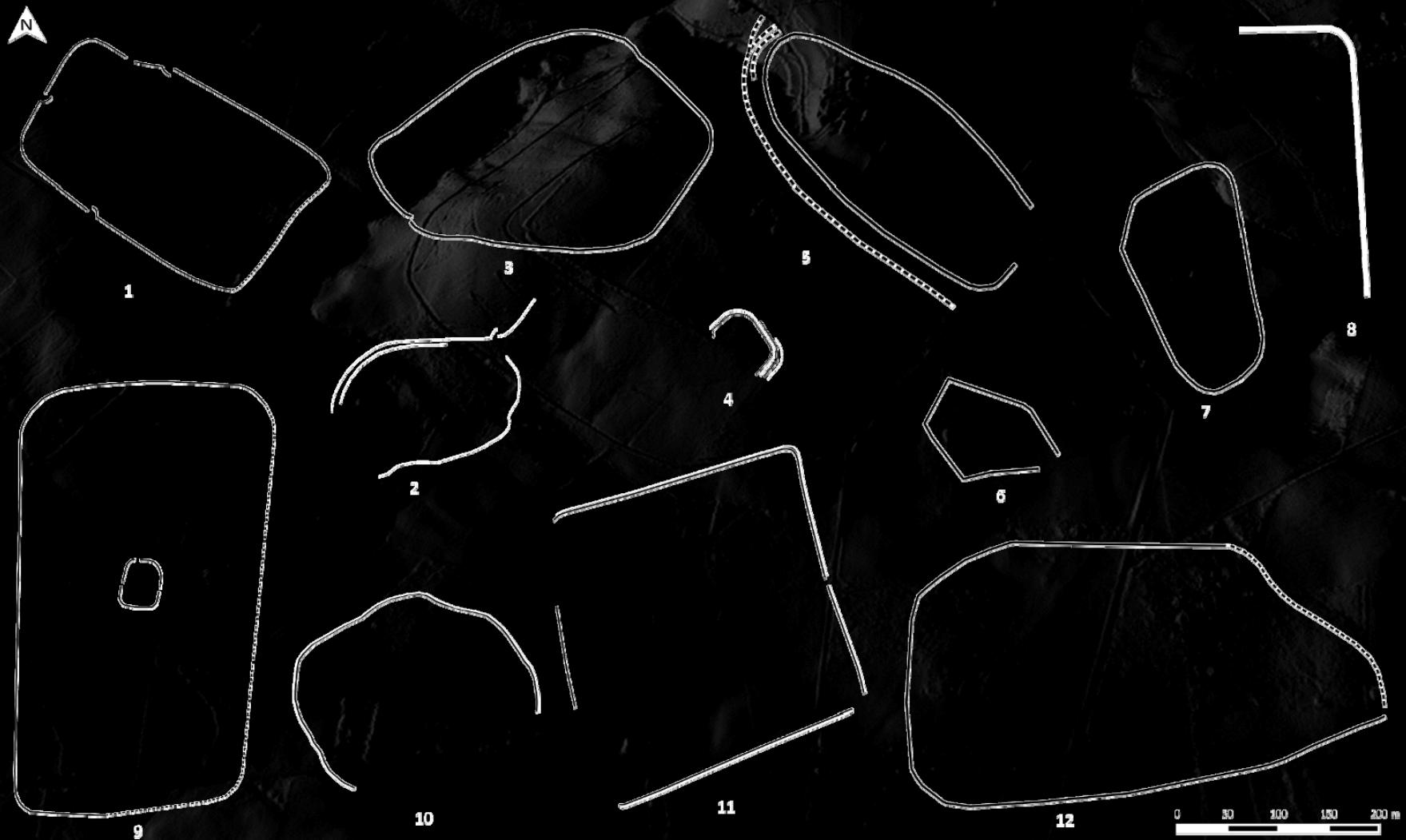
# Heterogeneous landscape



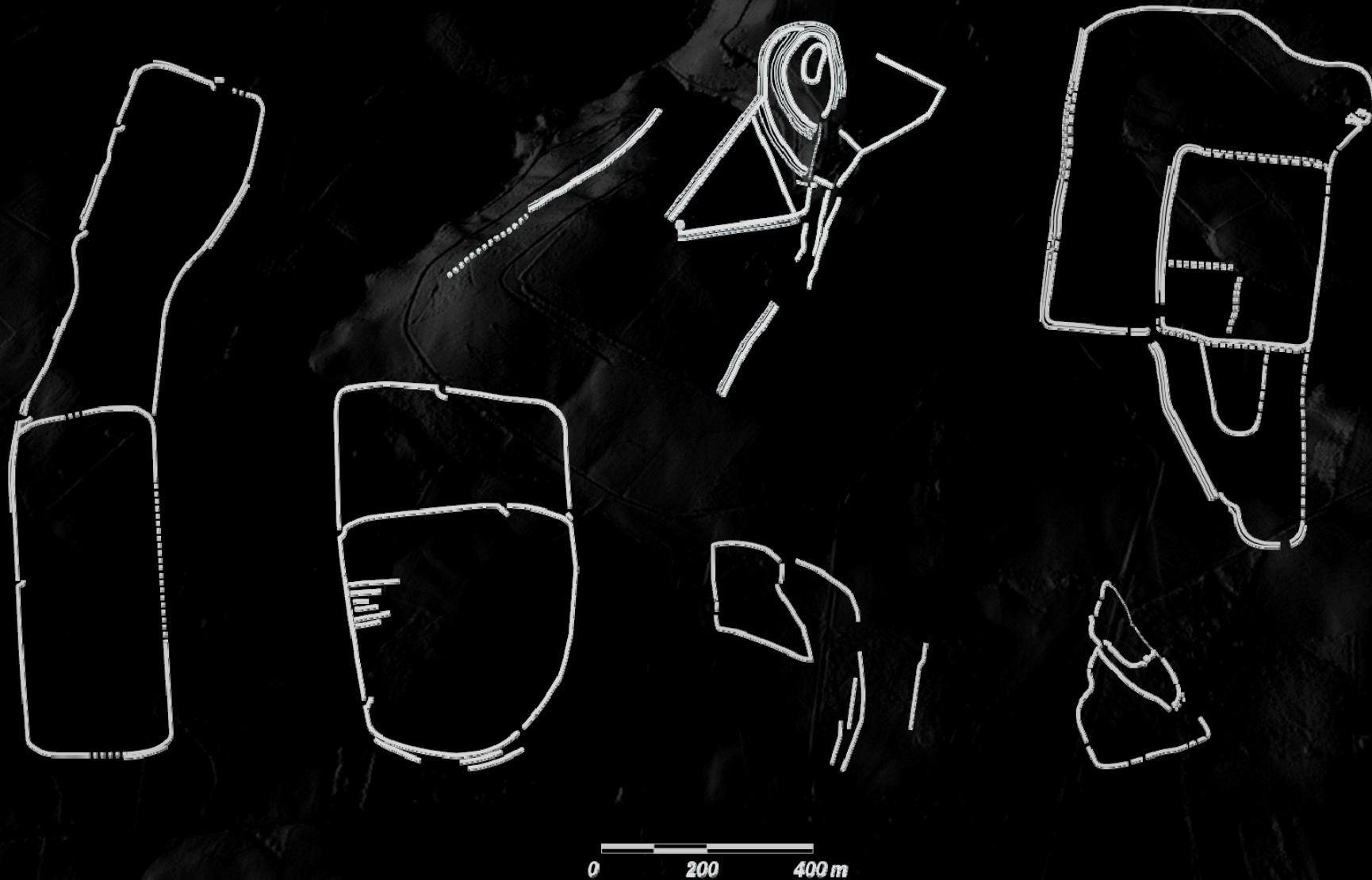
# What are we searching for?



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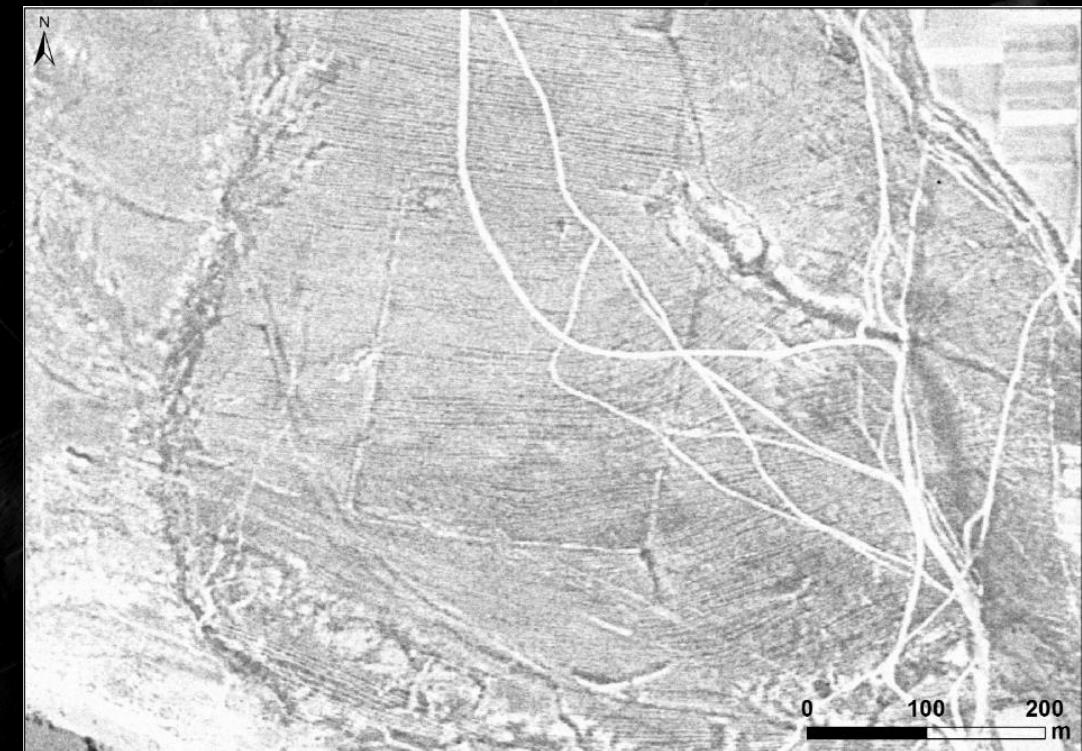


*Remote Sensing*  

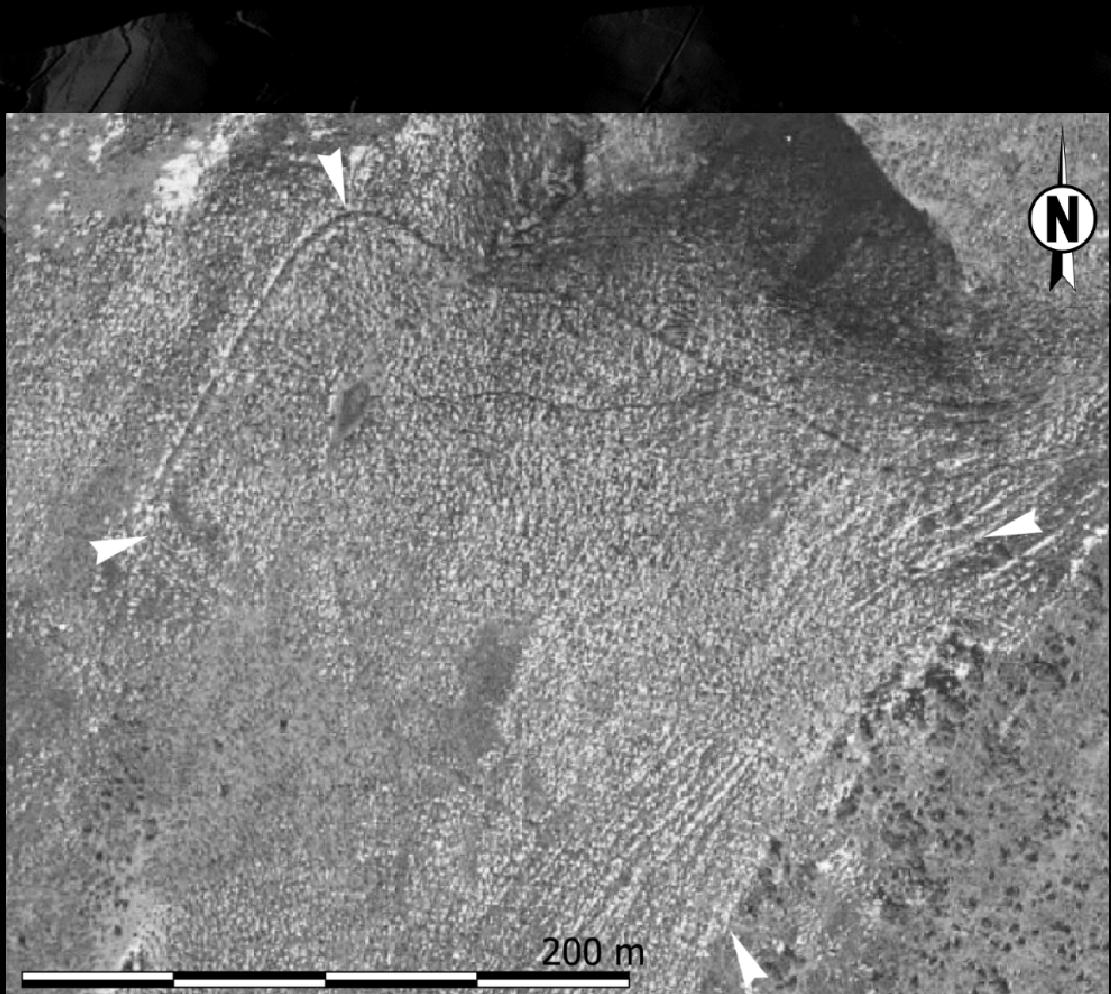
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*Searching for a cost-effective methodology*

# Historical aerial photos



Valdemeda (USAF-1957)

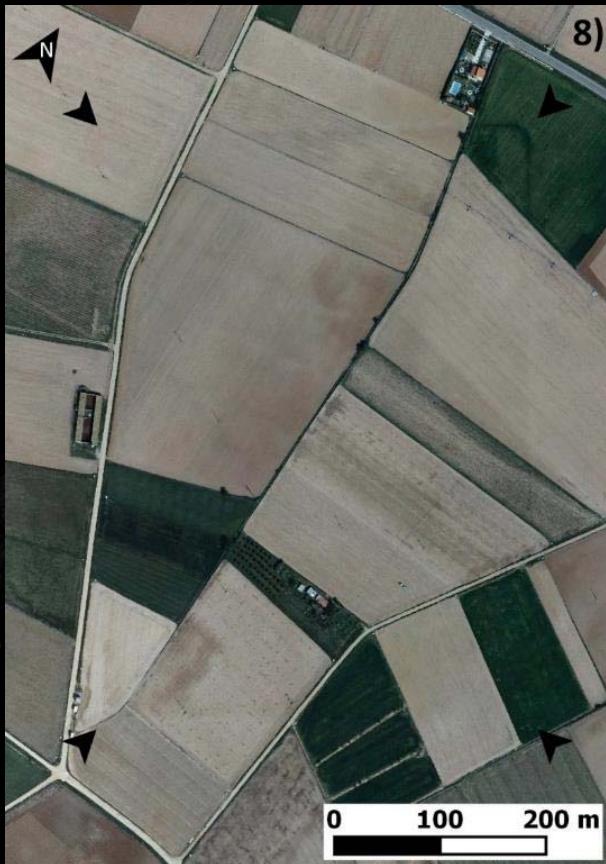


El Chao de Carrubeiro (Bual, Asturias) (Voo Interministerial, 1984)

Spain: Open data (<http://fototeca.cnig.es/>)

Portugal: Need to be purchase (<https://www.igeoe.pt/>)

# Satellite imagery and aerial photography



Villalazán (2006)



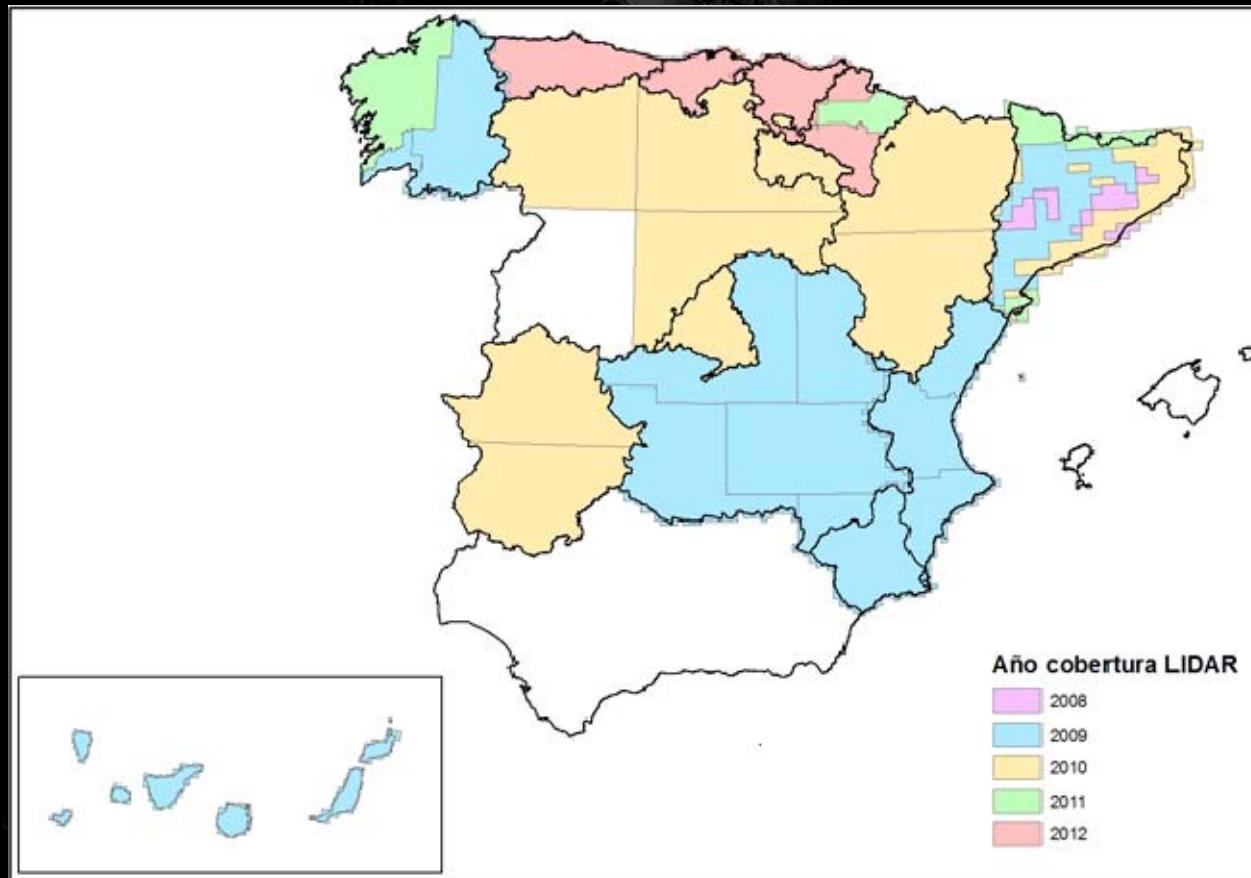
Castrocalbón 1 (2008)



Castrocalbón 4 y 5 (2008)

Spain: Open data (<http://pnoa.ign.es/>)  
Portugal: Open data (<https://www.igeo.pt/>)  
and Google Earth, ArcGISEarth...

# LiDAR data availability



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<http://pnoa.ign.es/coberturalidar/>

# LiDAR data download

Bienvenido | Welcome | Bienvenue

GOBIERNO DE ESPAÑA MINISTERIO DE FOMENTO INSTITUTO GEOGRÁFICO NACIONAL 

## Centro de Descargas

Centro Nacional de Información Geográfica

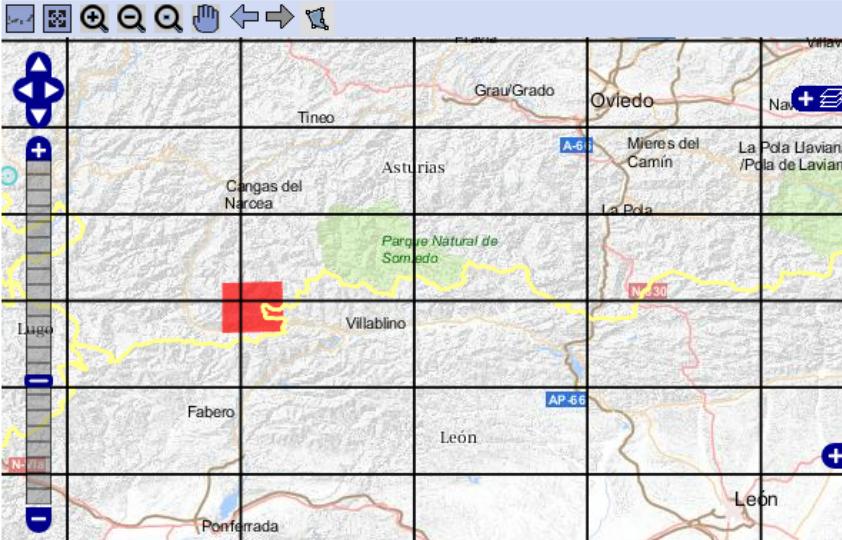


Nº Archivos: 0

Presentación Catálogo de productos Búsqueda en visor Búsqueda avanzada Equipamiento Geográfico de Referencia Nacional Ayuda

Centro de Descargas /Búsqueda en visor

Mapa Web contacto  YouTube



Posicionar en mapa

Localización por Nombre  
Topónimo o dirección

Localización Avanzada

Seleccionar producto a descargar

Listado de Productos del área mostrada en el visor  
Se listarán los productos incluidos total o parcialmente en el área mostrada actualmente en el visor.

Filtrar por productos: LIDAR (.laz 2x2 km)

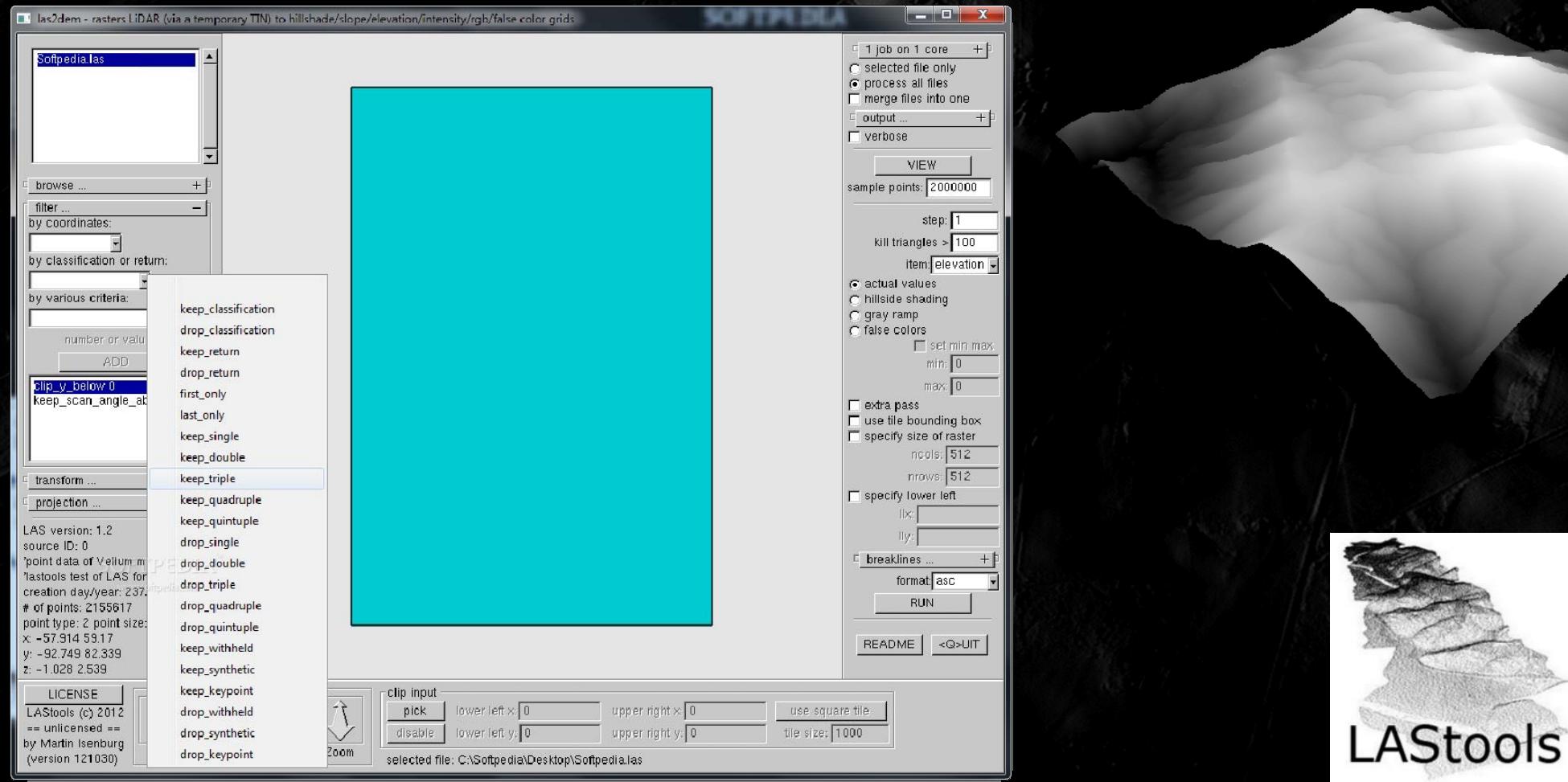
<http://centrodedescargas.cnig.es/CentroDescargas>

# LiDAR data workflow

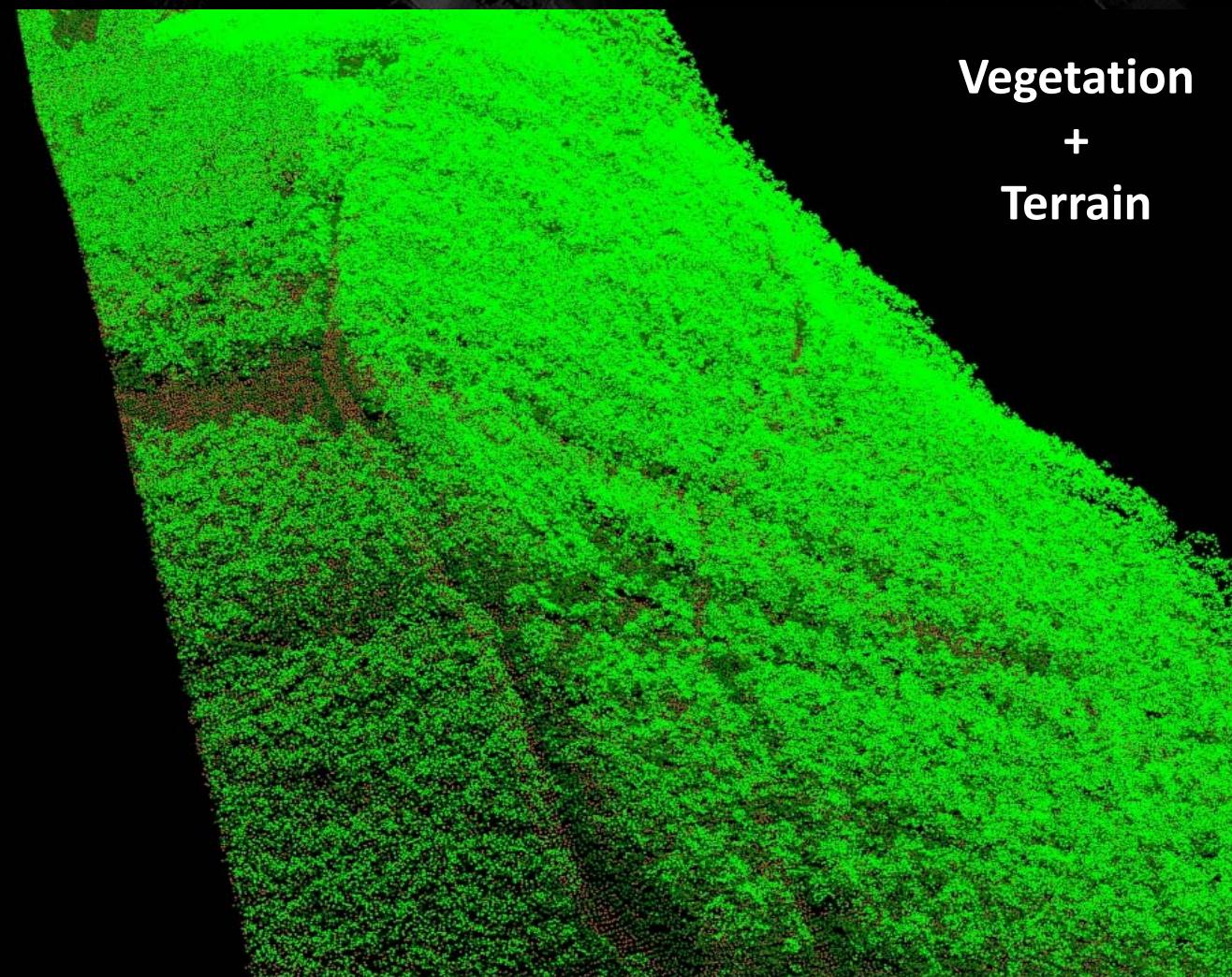
Visualization+ Classification + Interpolation



# LiDAR data workflow



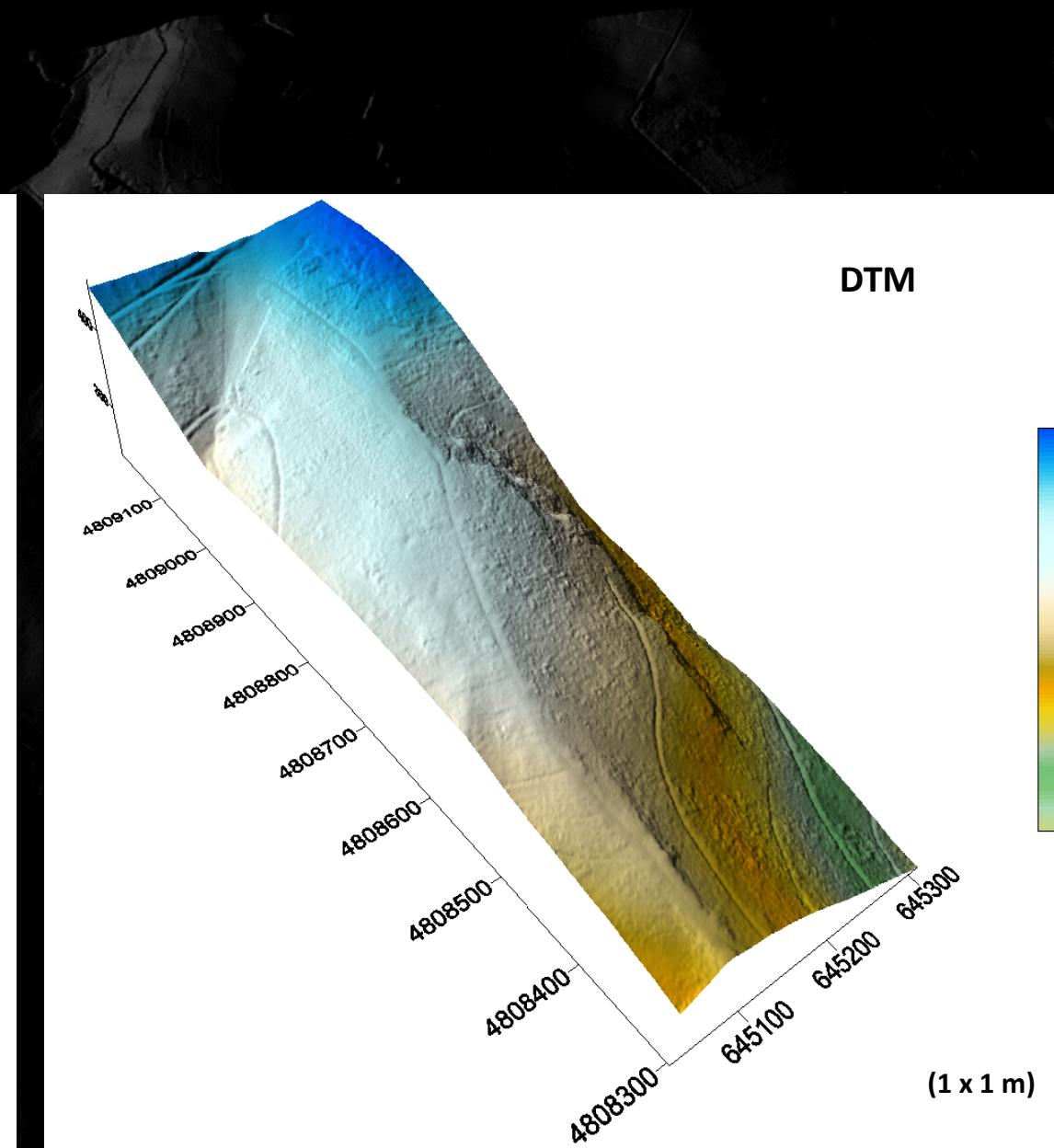
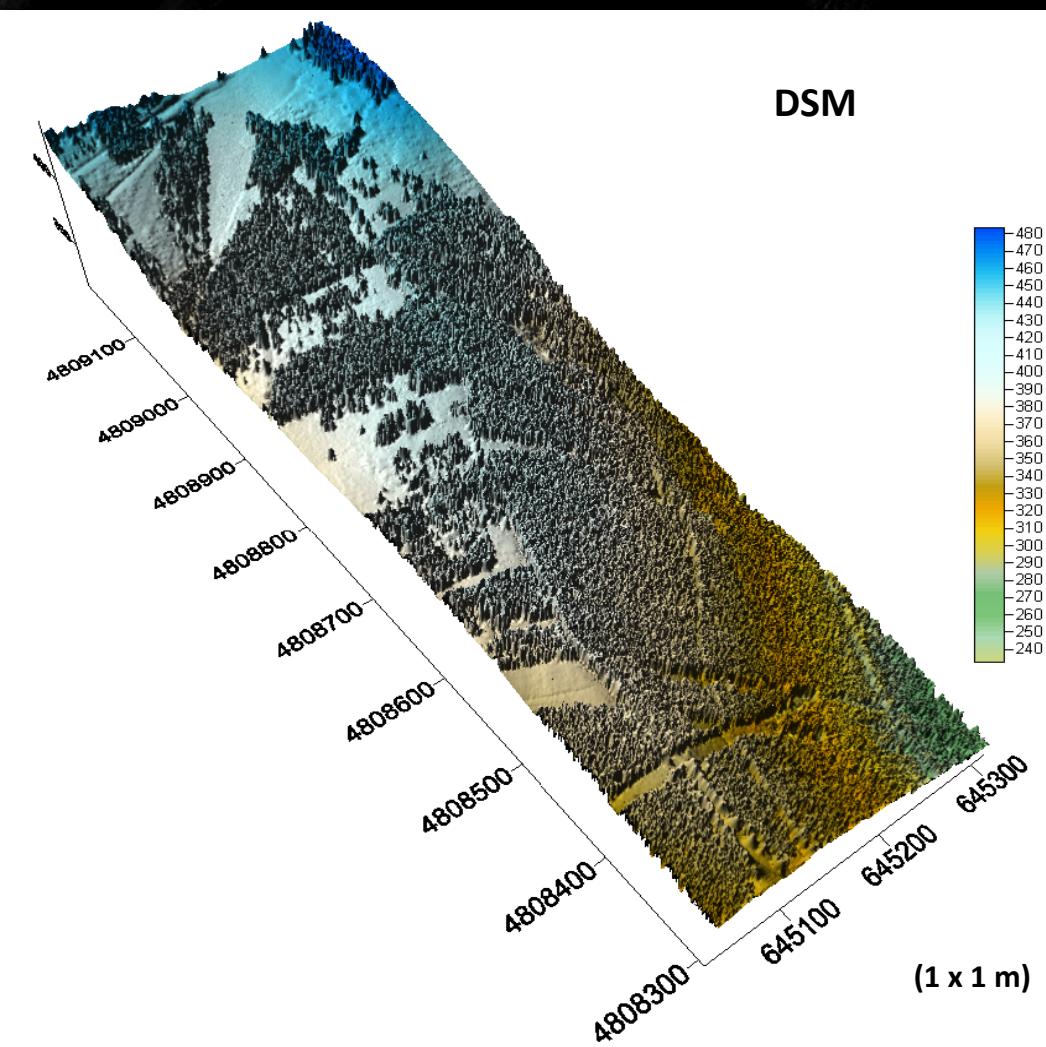
# LiDAR data workflow



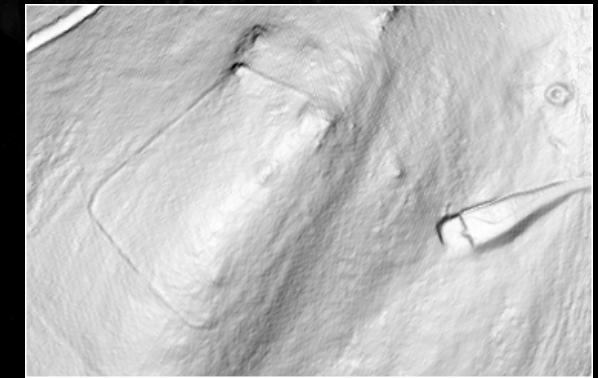
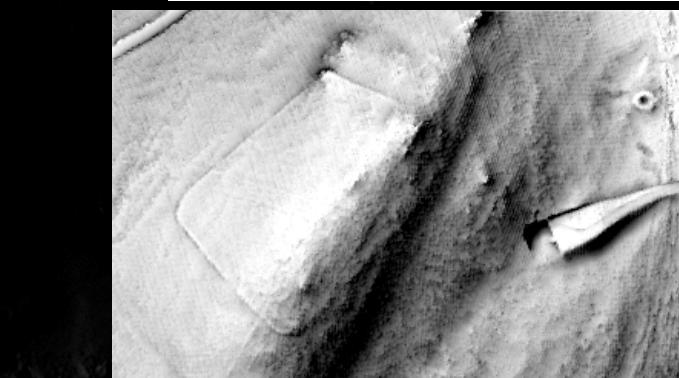
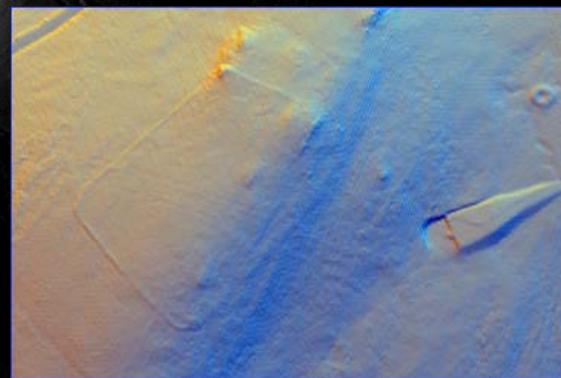
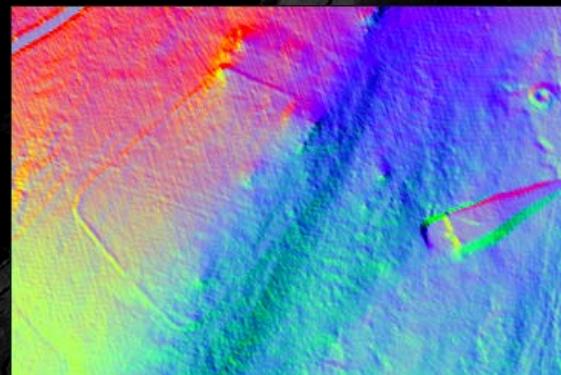
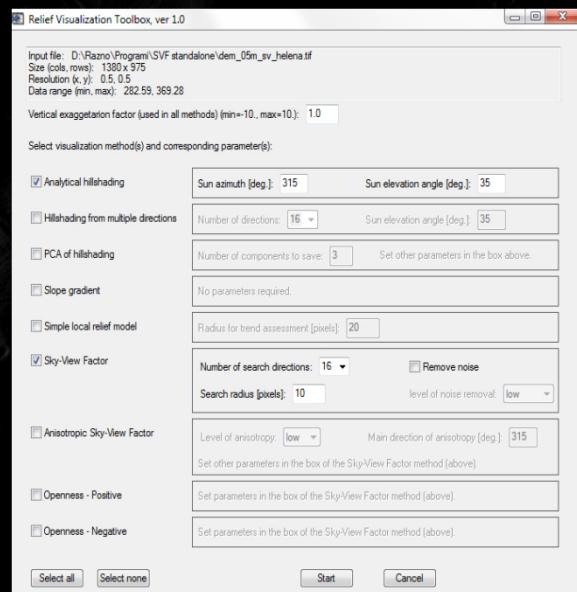
# LiDAR data workflow



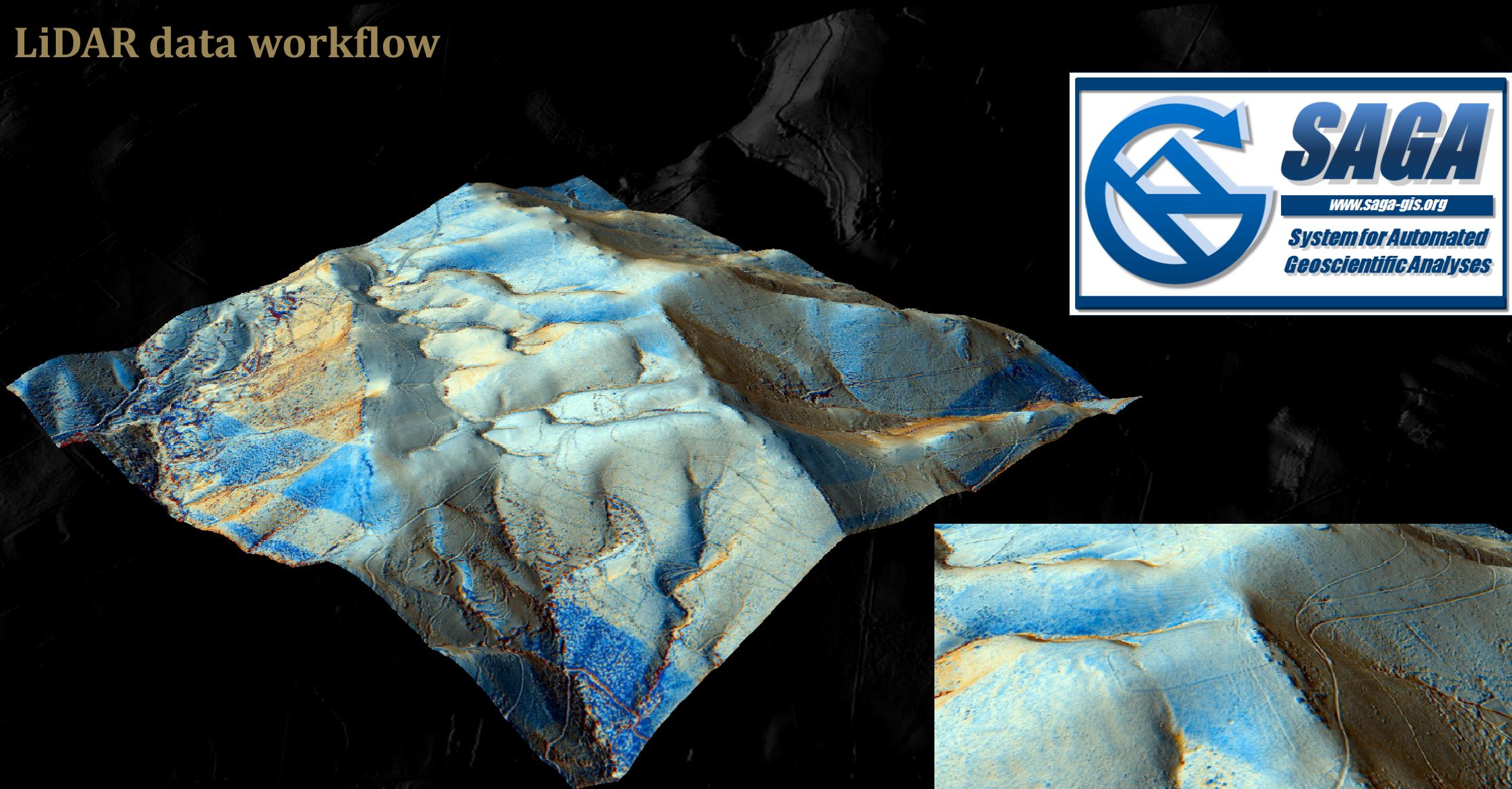
# LiDAR data workflow



# LiDAR data workflow



# LiDAR data workflow



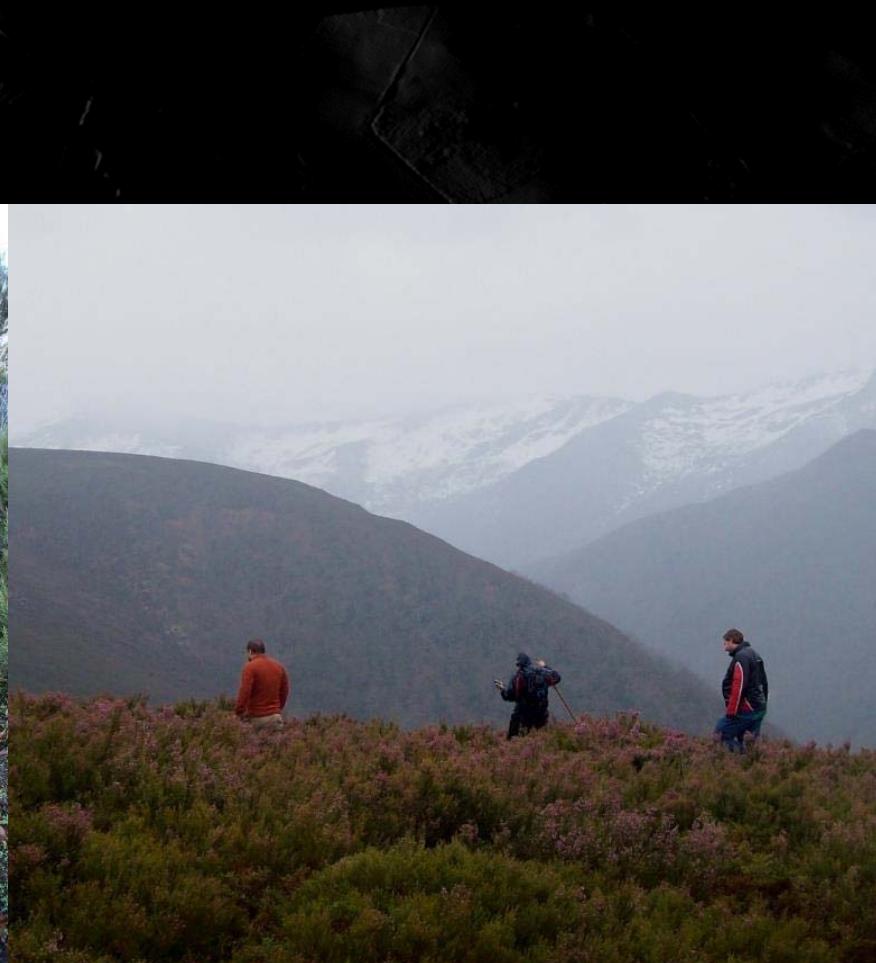
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SagaGis: <http://www.saga-gis.org/en/index.html>

# Photogrammetry



# Prospection

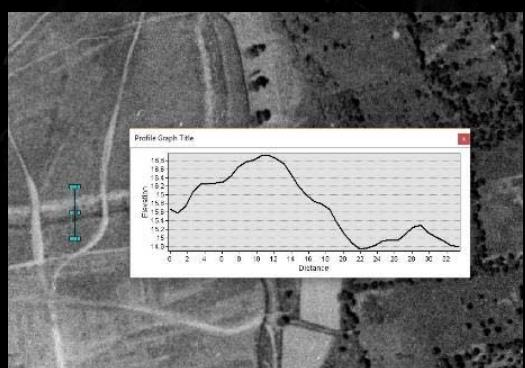
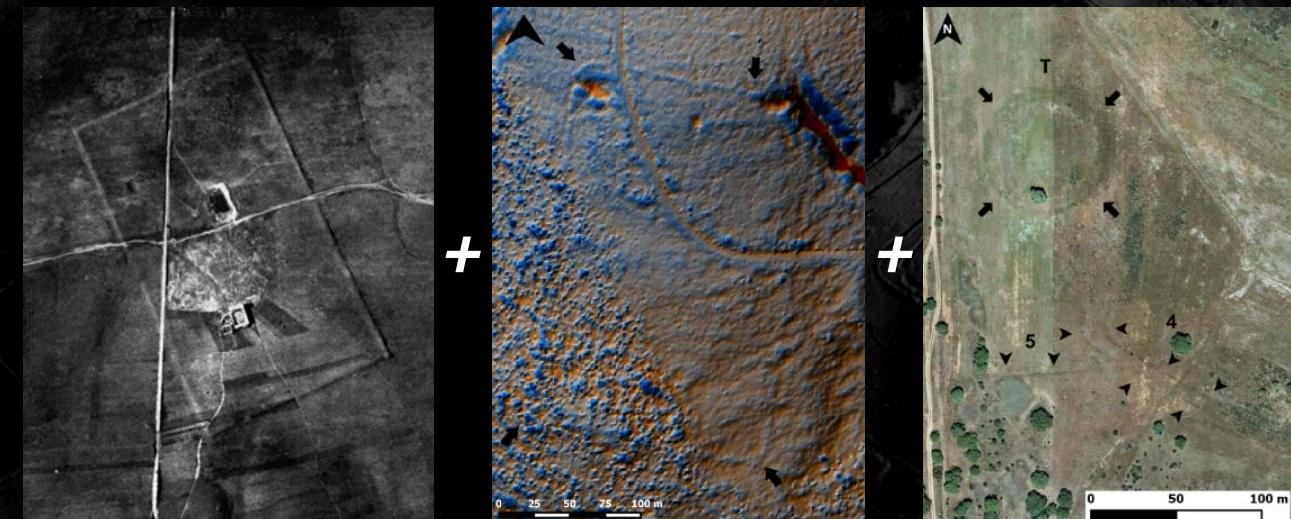


*"Al final, siempre tienes que enviar a la infantería"*

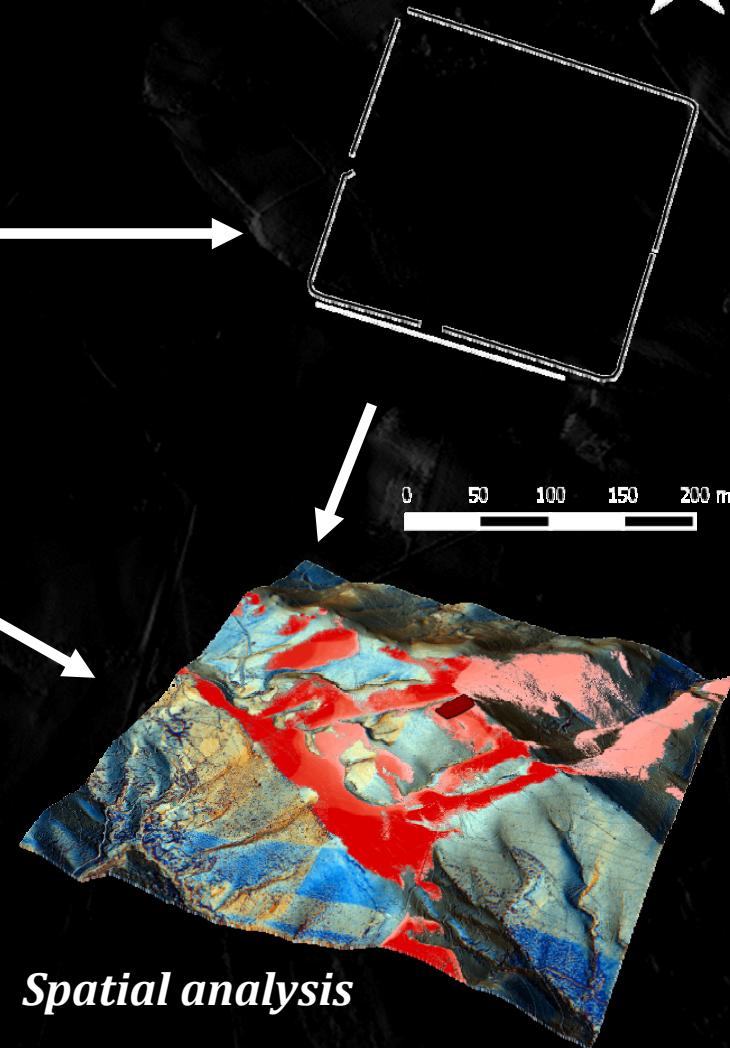
*V. Mayoral*

# Data combination

*Morphological and typological characterization*



*Spatial analysis*

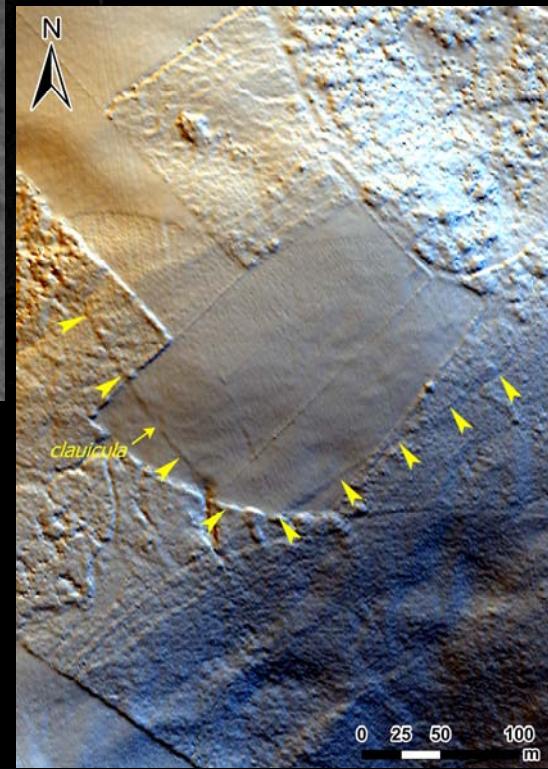
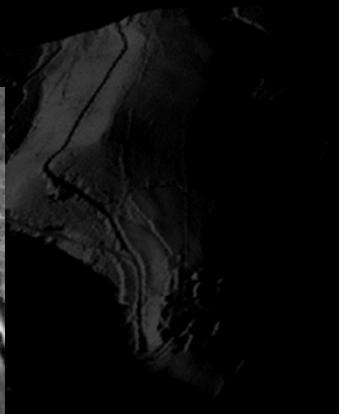
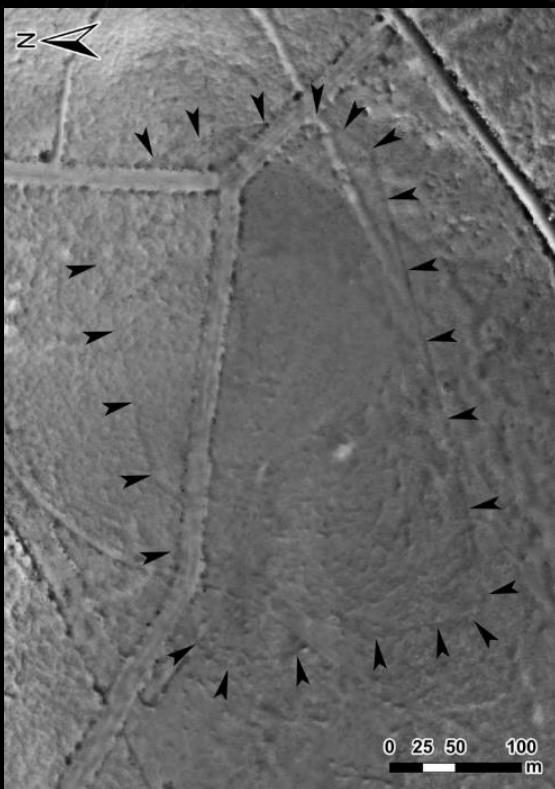
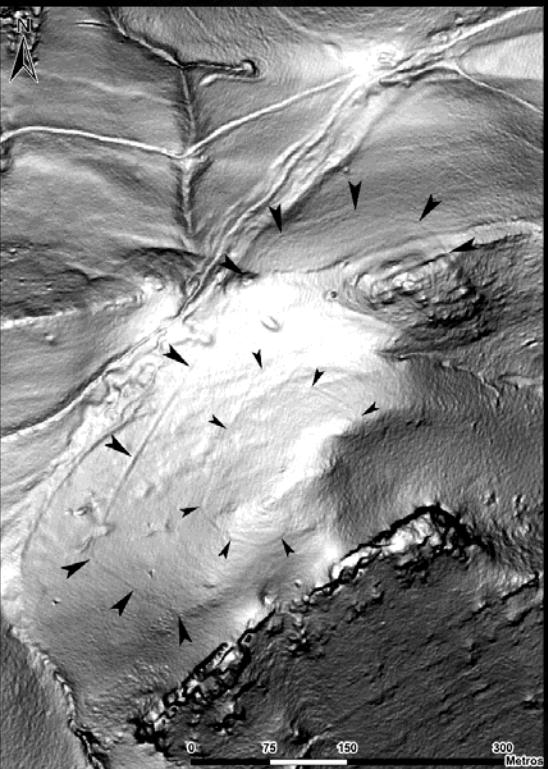


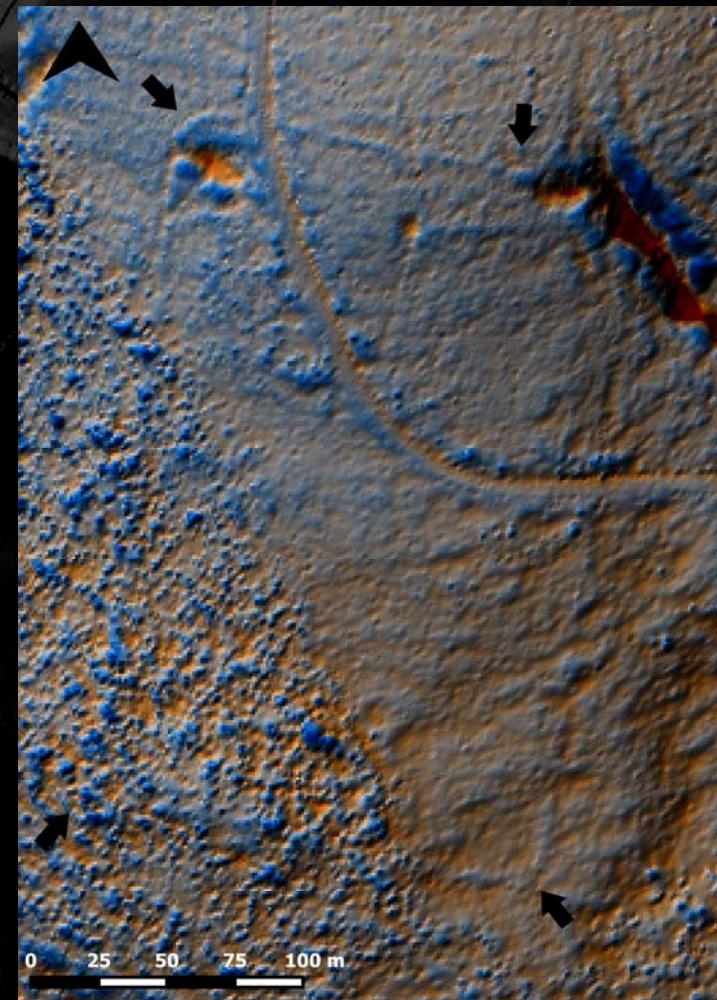
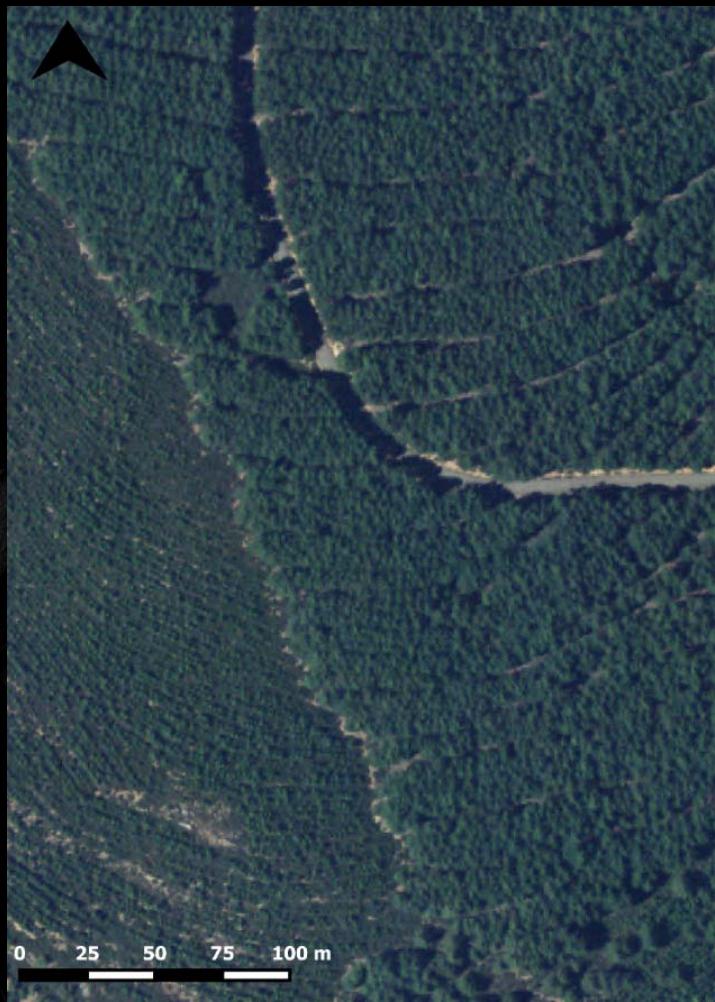


## *Some brief results*

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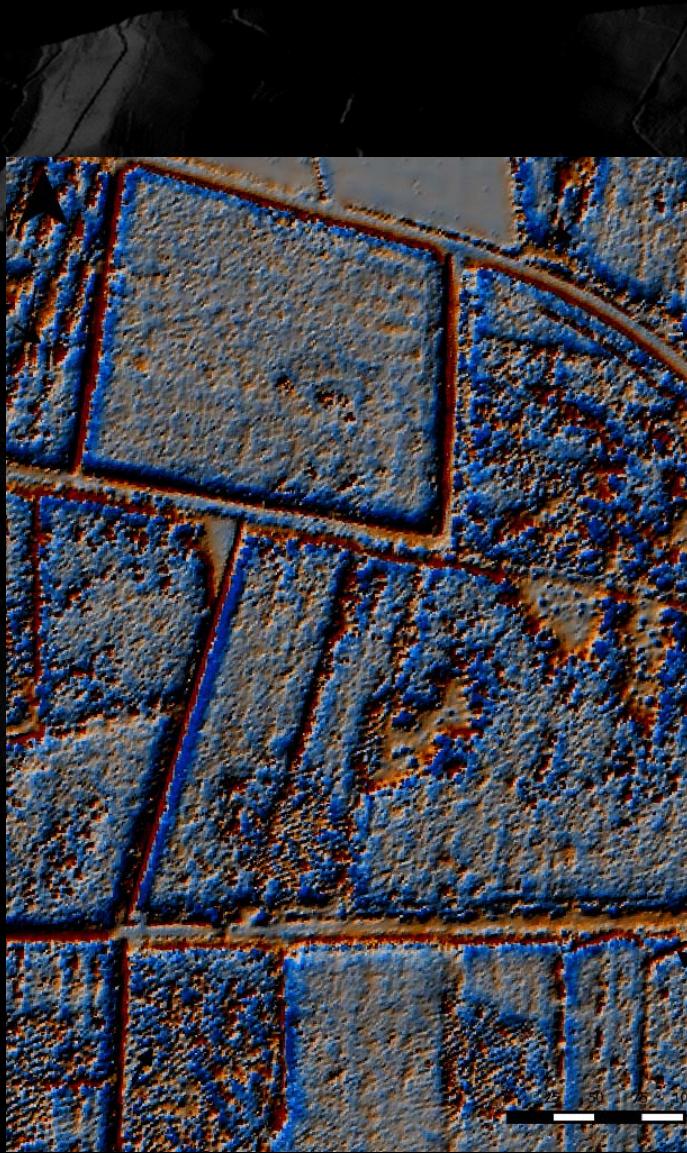
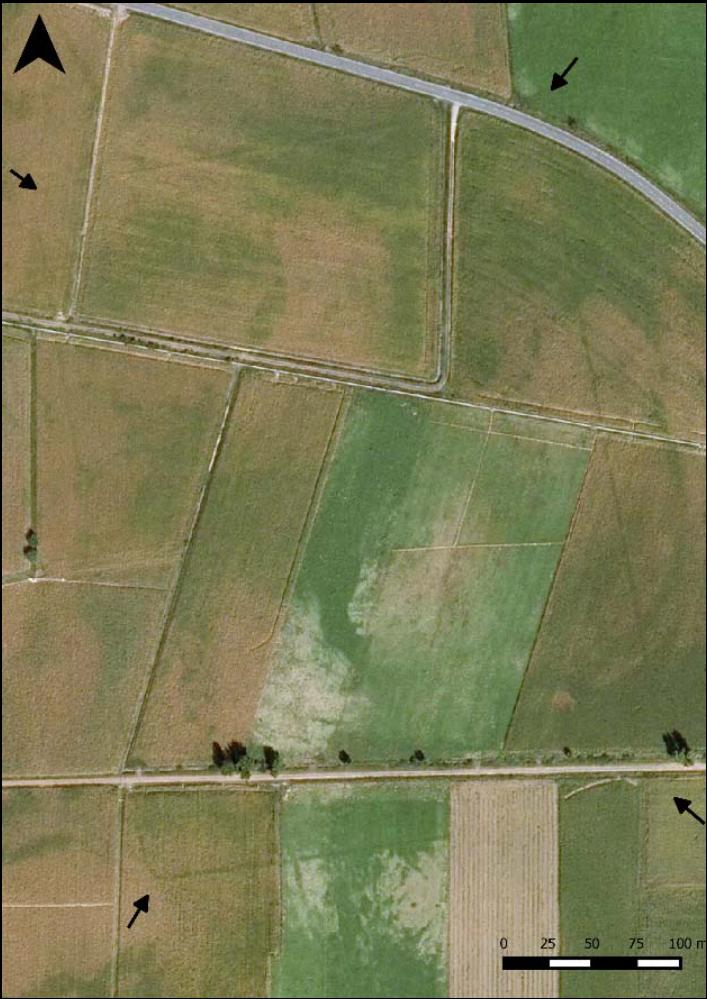
# LiDAR





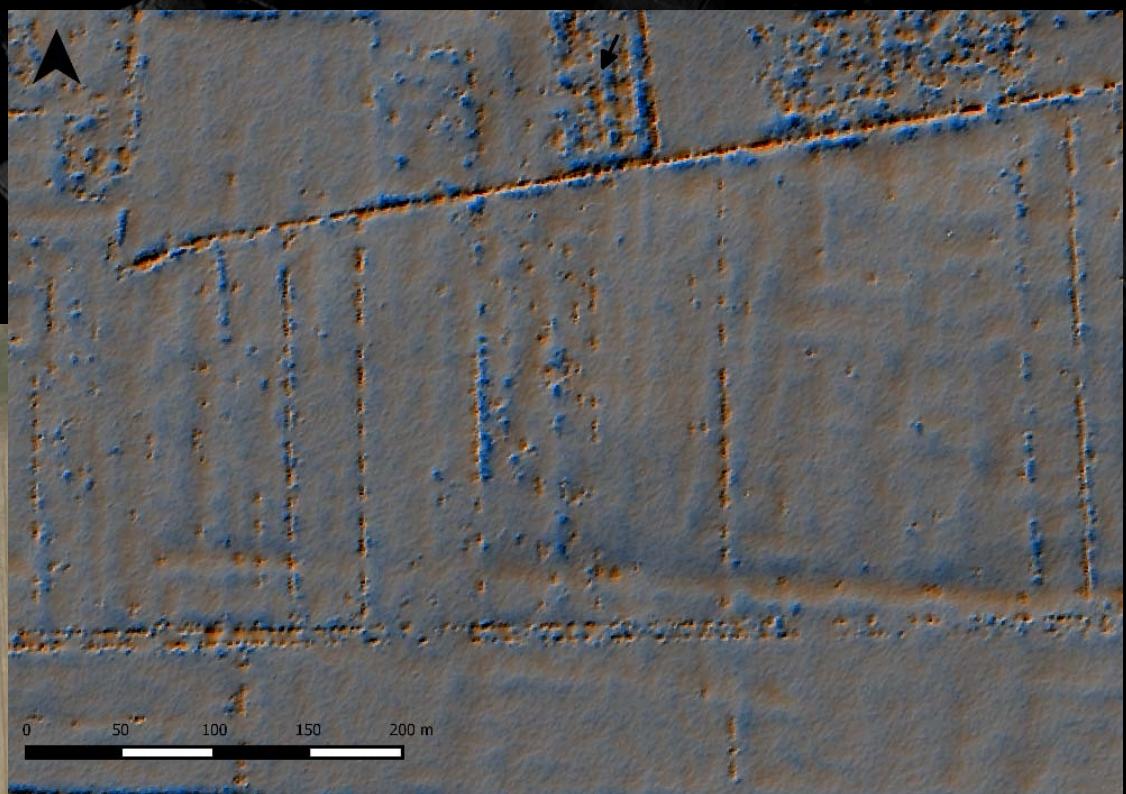
*Valdemedea*

# LiDAR?



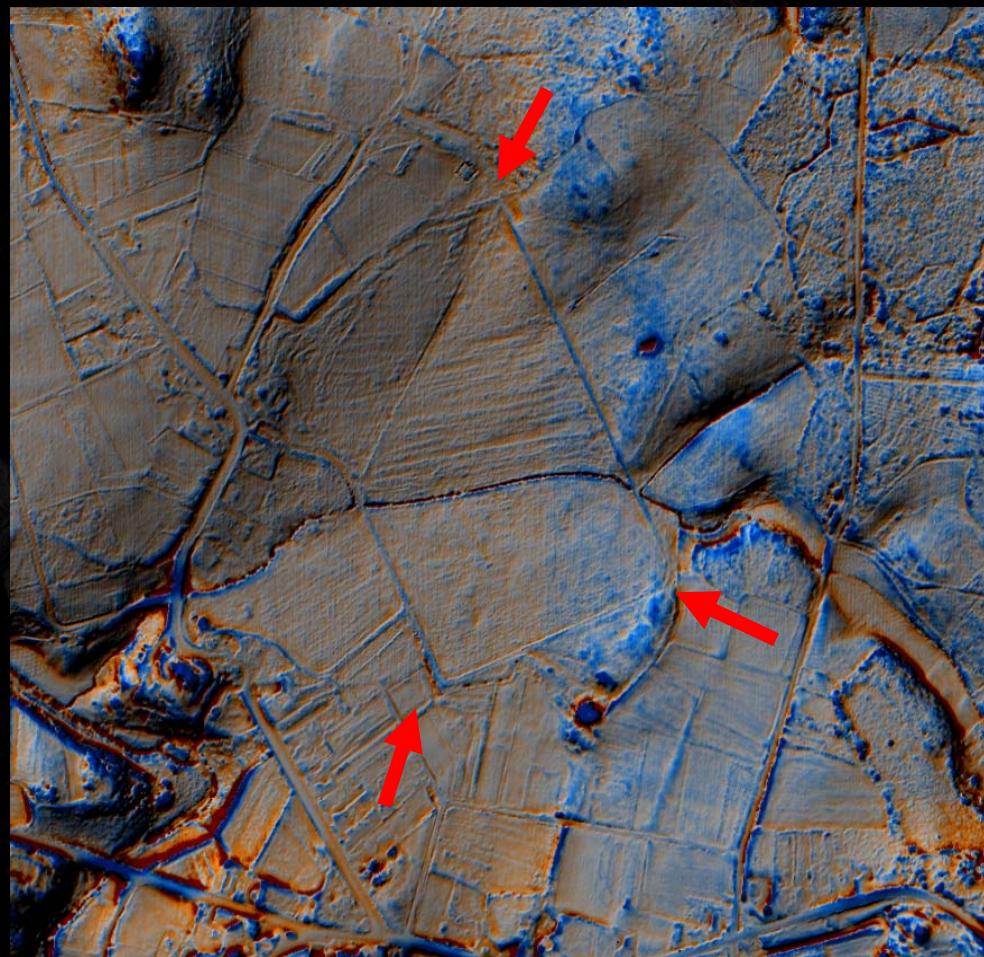
*Huerga de Frailes, León*

# LiDAR?



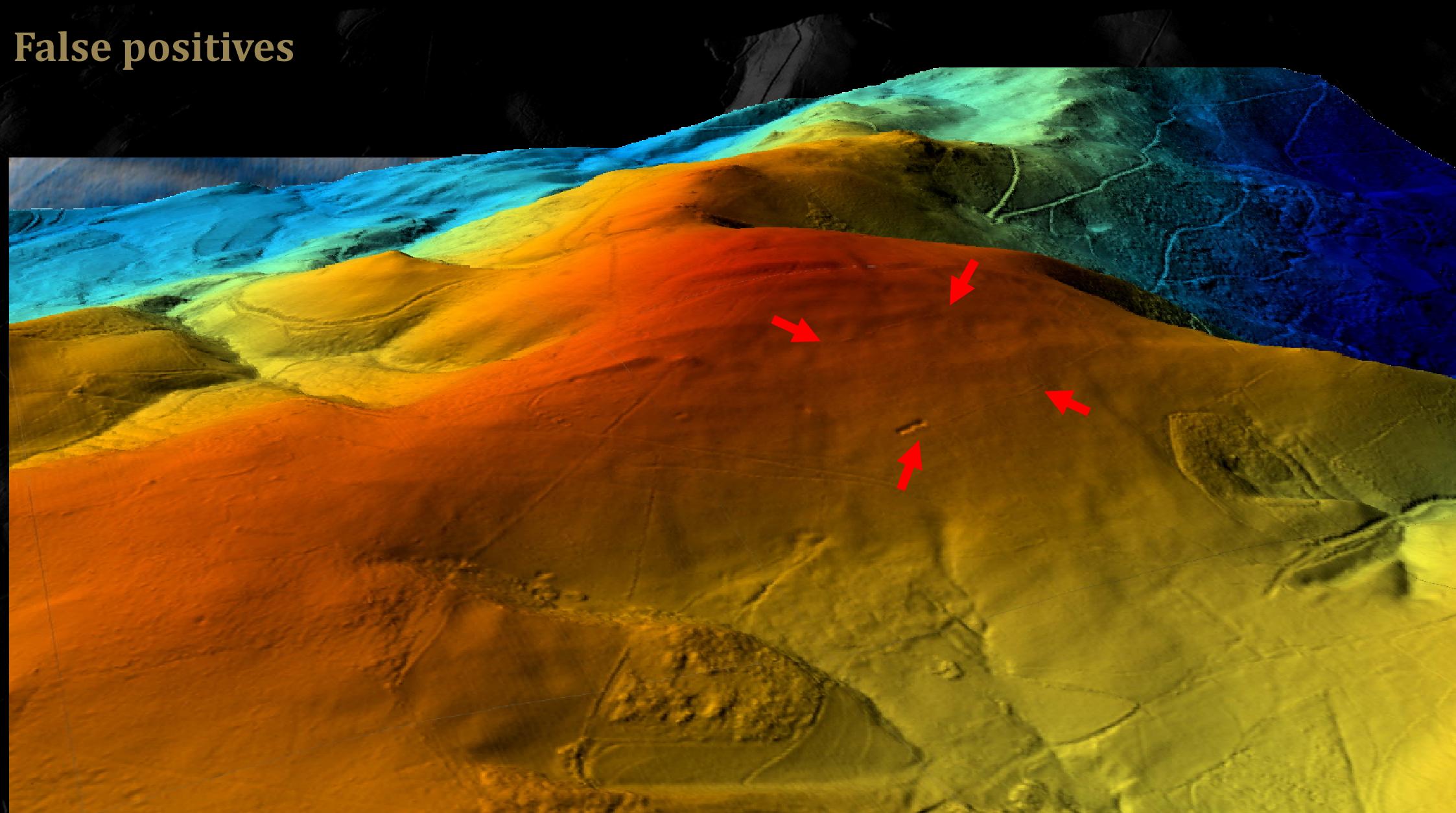
*Villamontán de Valduerna (León)*

## False positives



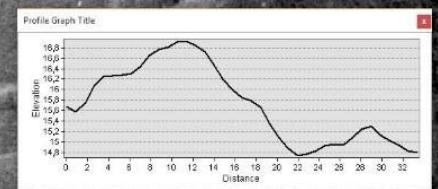
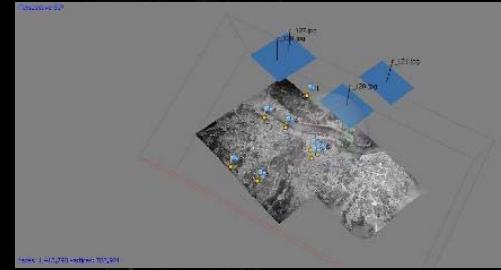
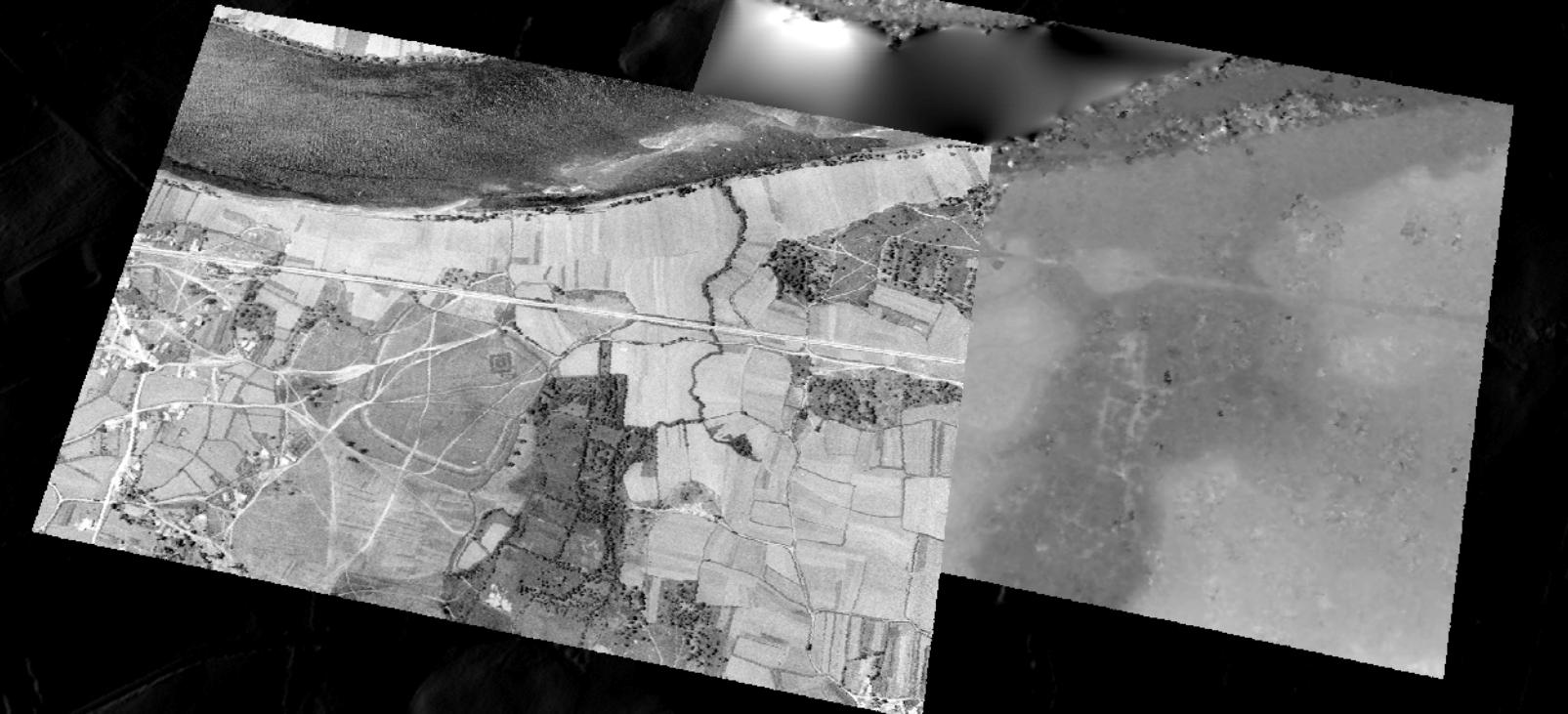
*Berdeogás (Dumbría, A Coruña)*

## False positives

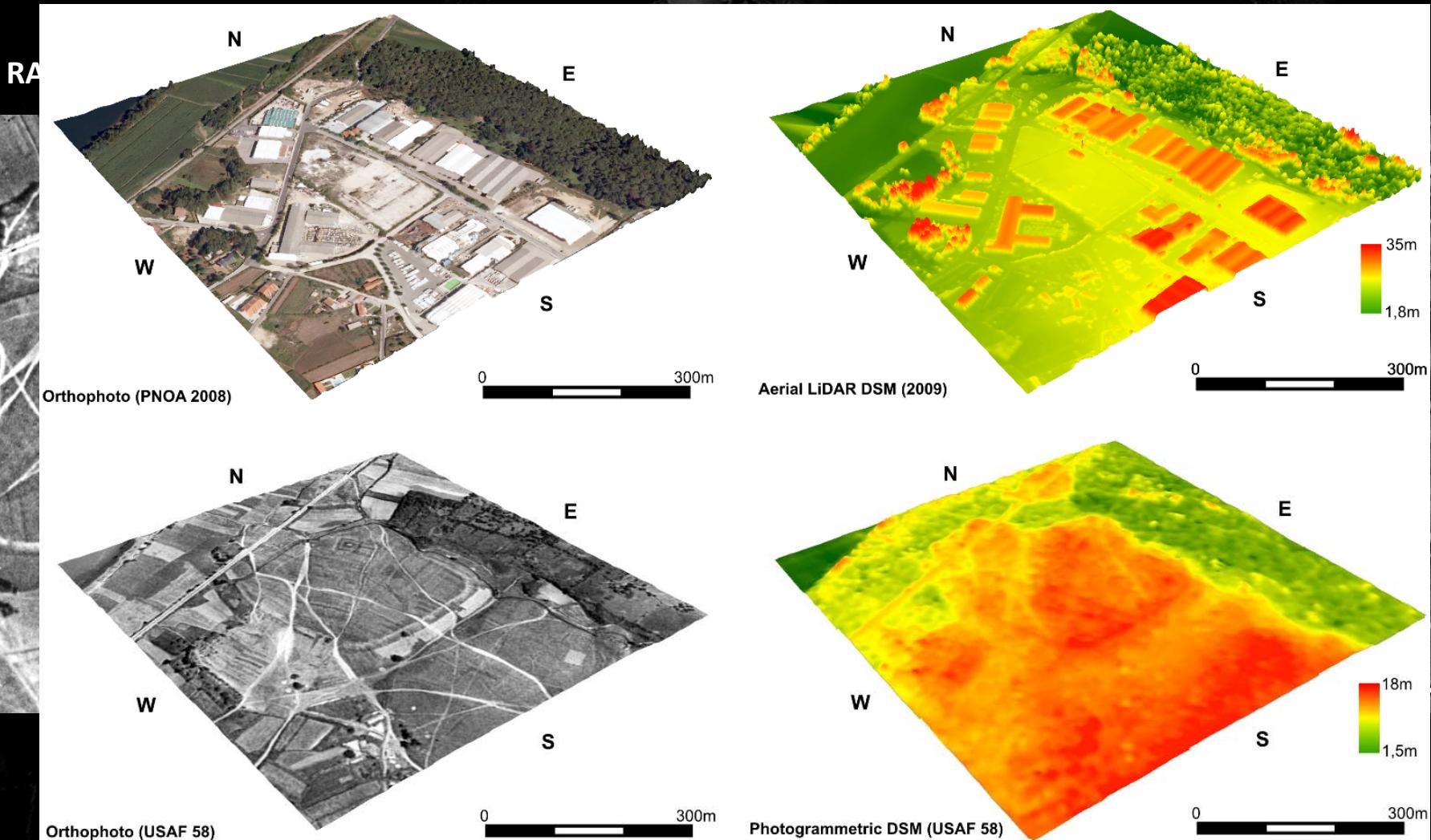


# Photogrammetry

*Campos (Vila Nova de Cerveira, Portugal)*



## FOTOGRAFETRÍA

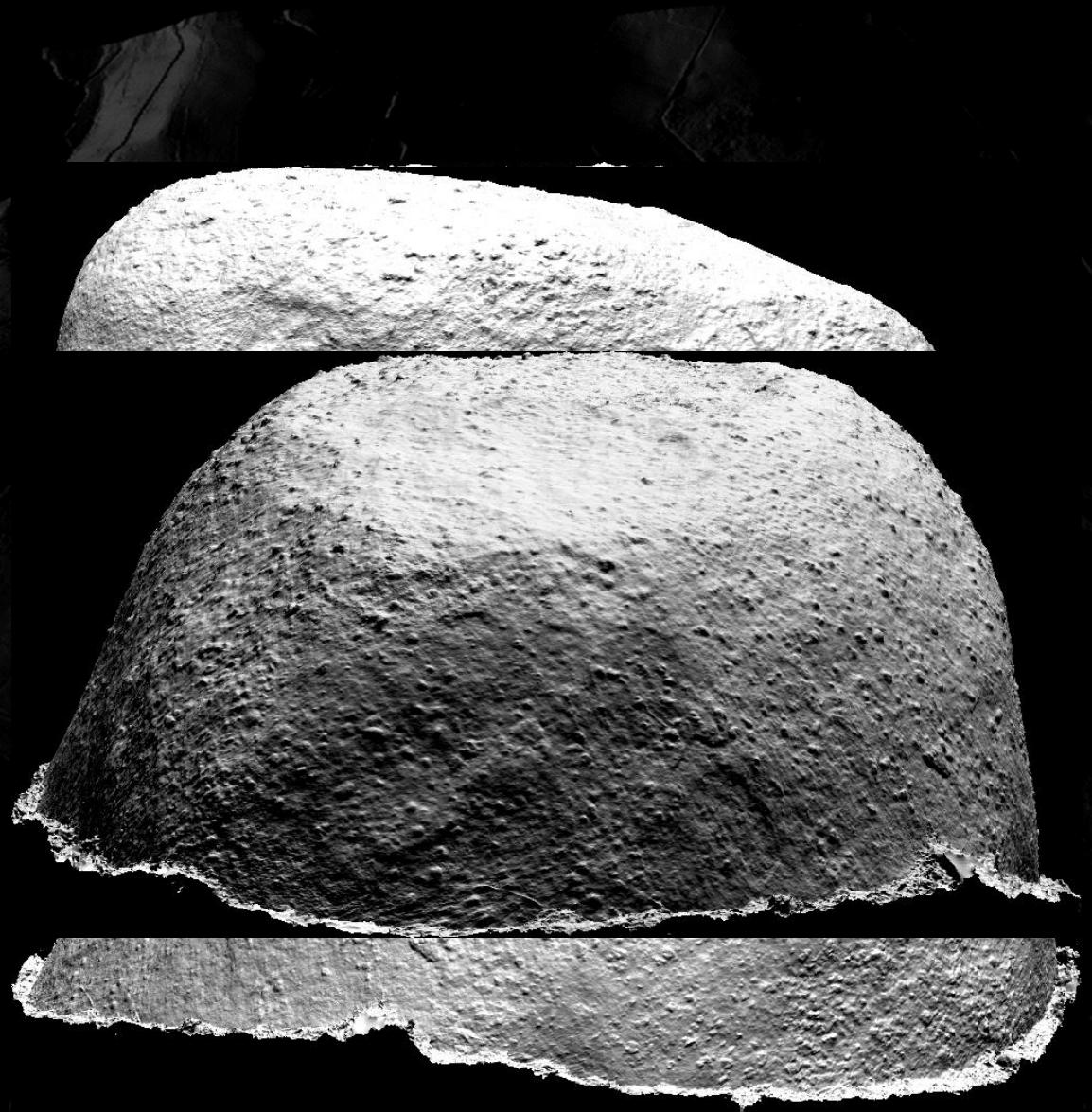
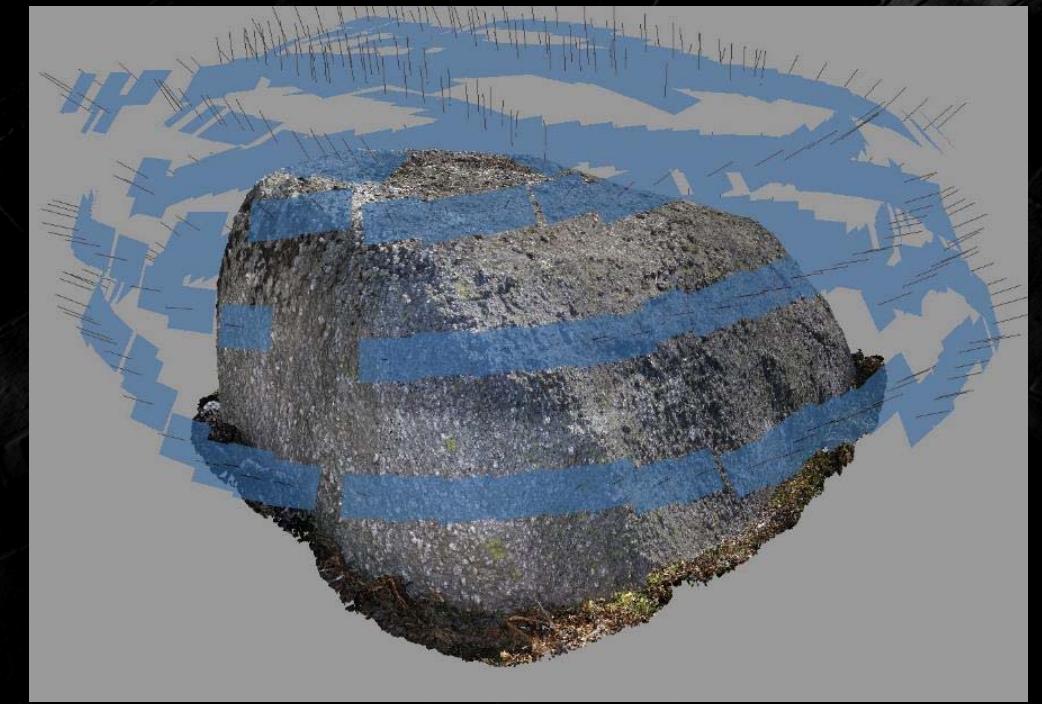


# Photogrammetry

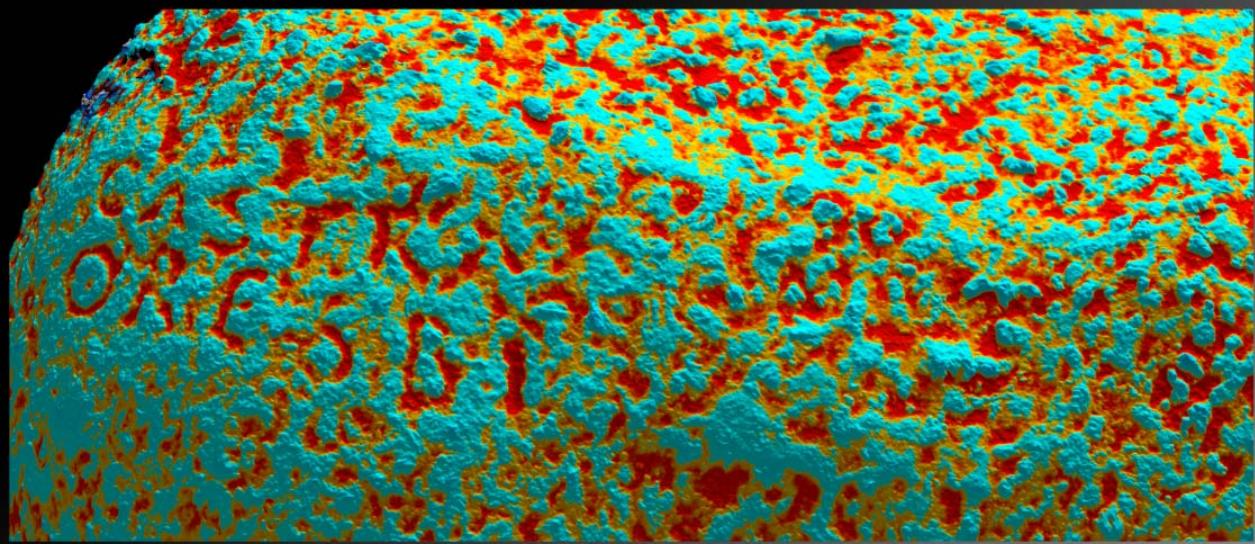
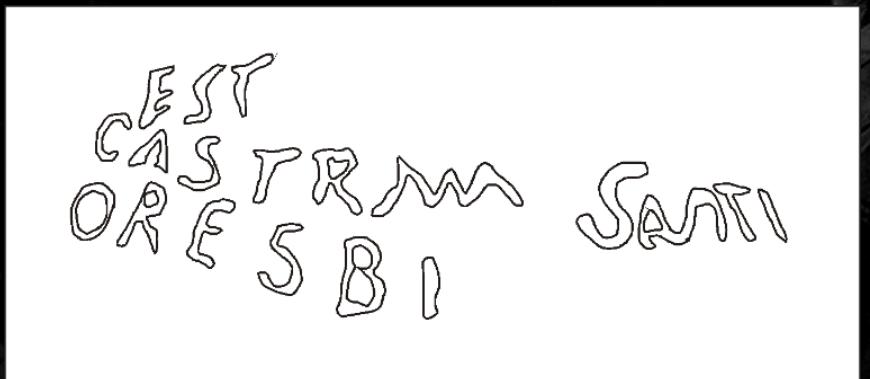
*“Castra Oresbi” (Baião, Portugal)*



# Photogrammetry

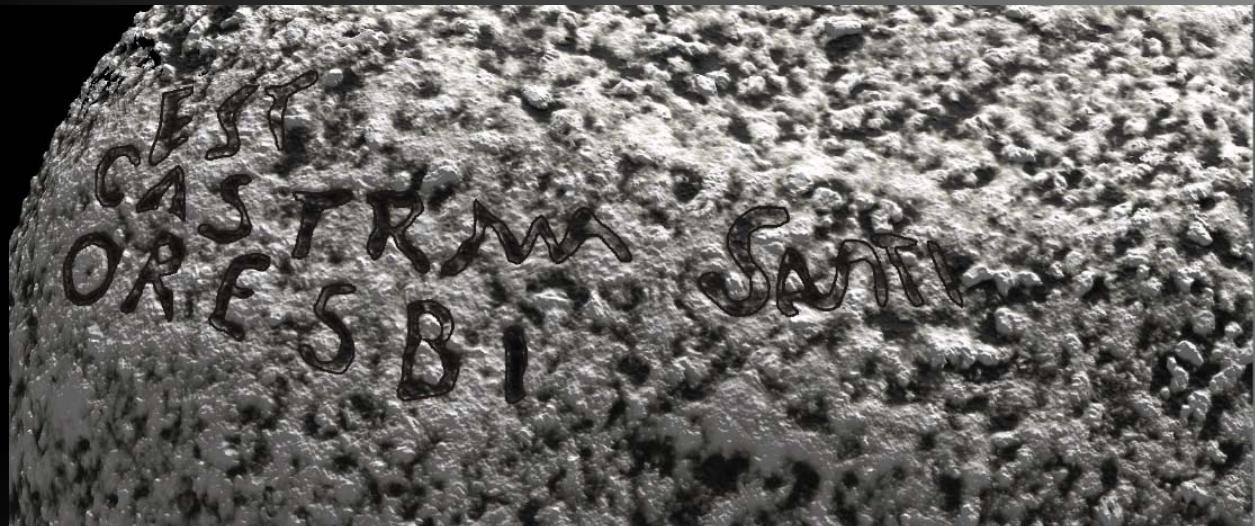


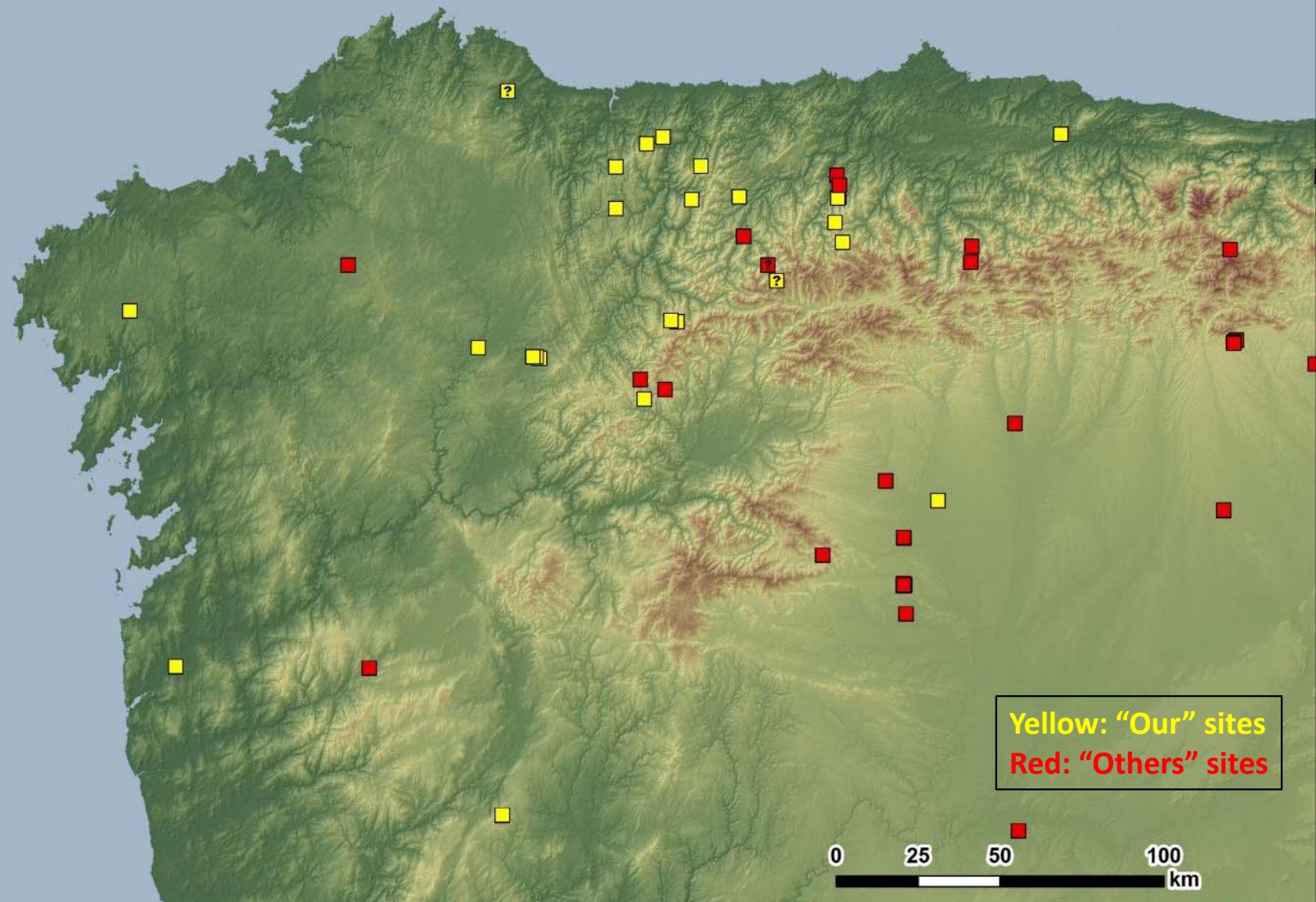
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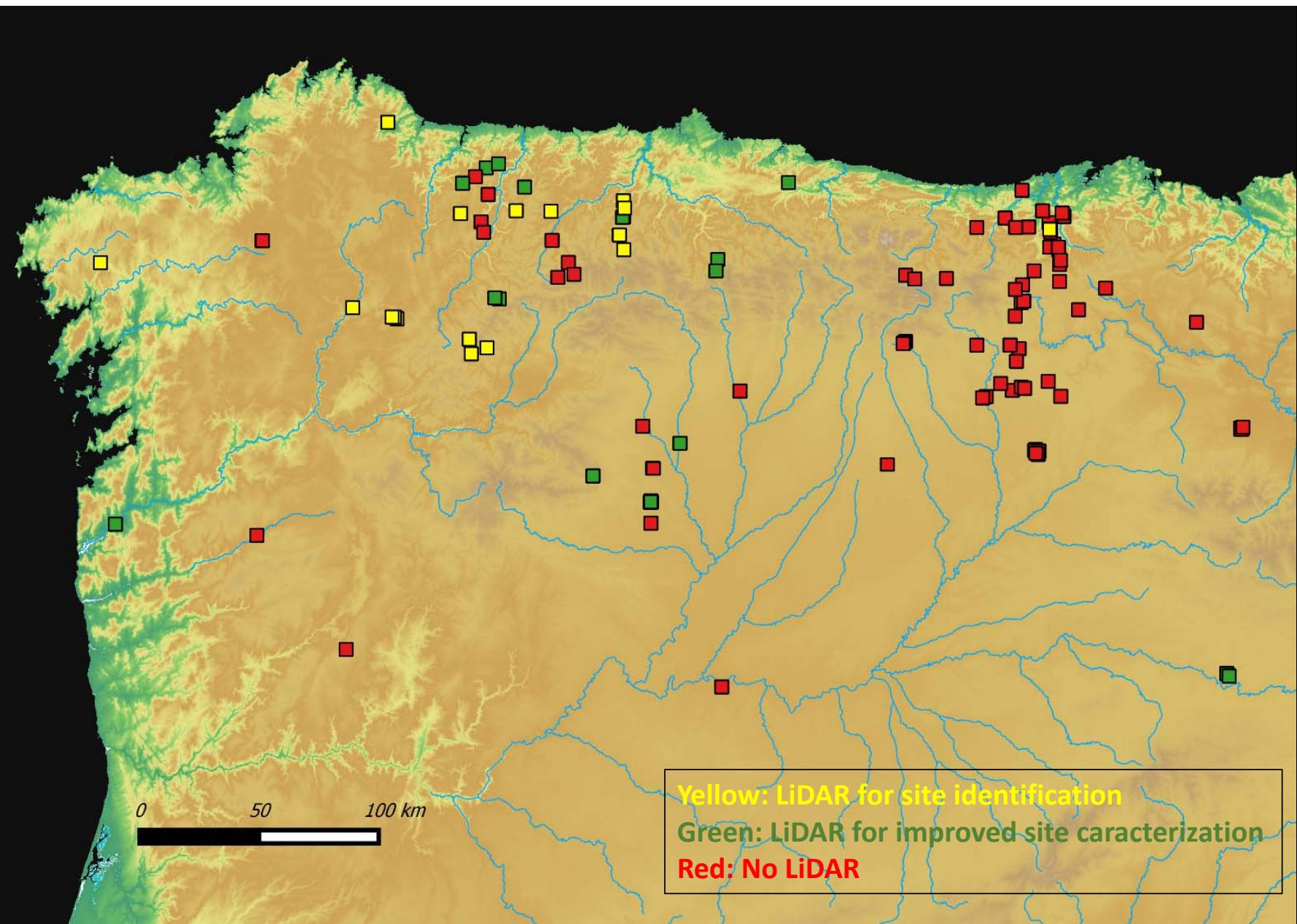


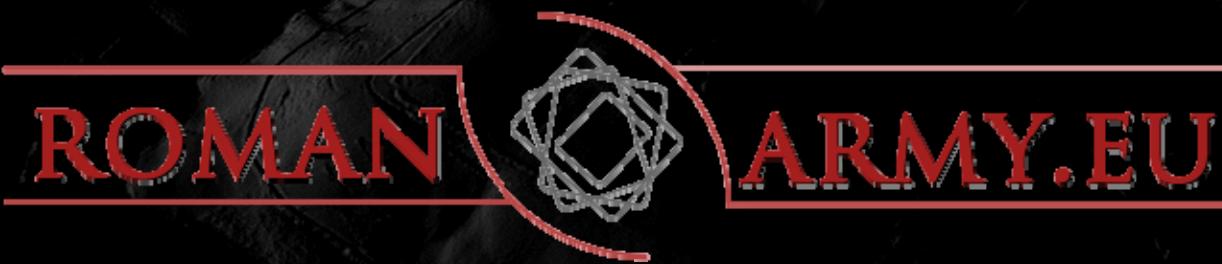
*Est  
Castrum Santi  
Oresbi*

(MRM, © Hugo Pires)









*<http://romanarmy.eu>*

*<https://www.facebook.com/romanarmynw>*