

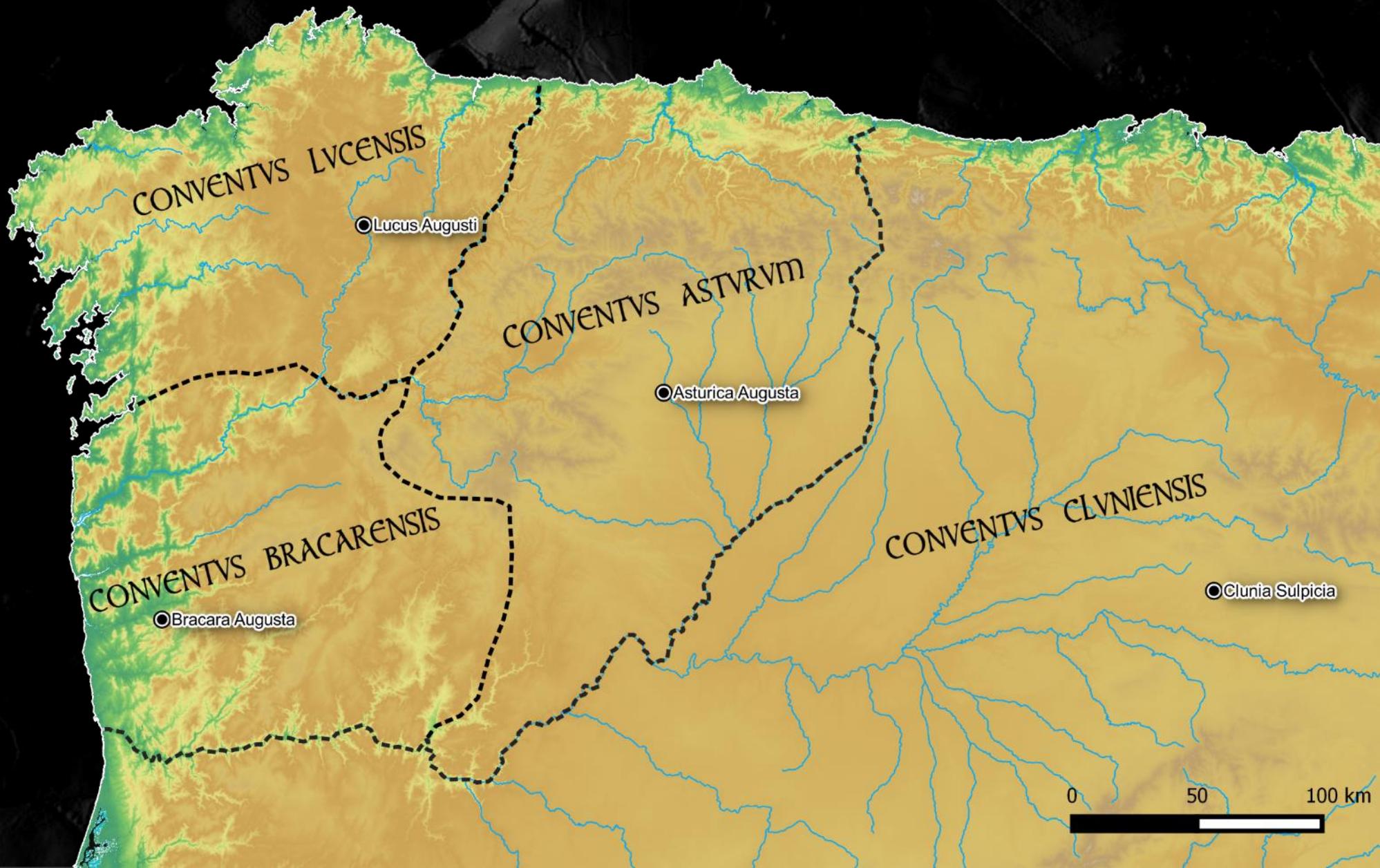


3º Encontro de Utilizadores QGIS Portugal
17-18 de Junho, 2016 - Porto

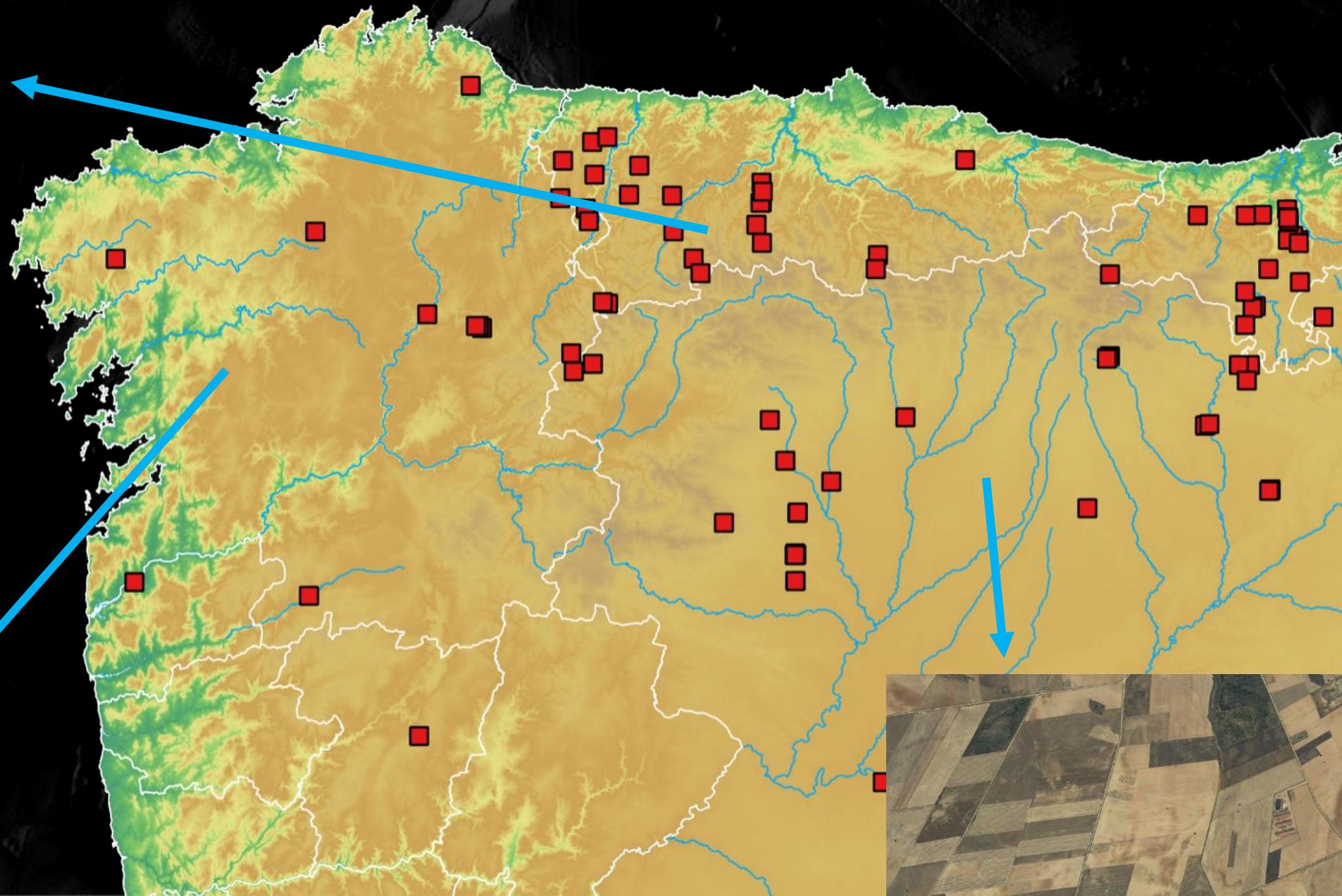
O uso combinado de LiDAR, QGIS e LASTools aplicado ao estudo de paisagens arqueológicas

João Fonte
Luis Gonçalves Seco

Geographical setting



Heterogeneous landscape



What are we searching for?



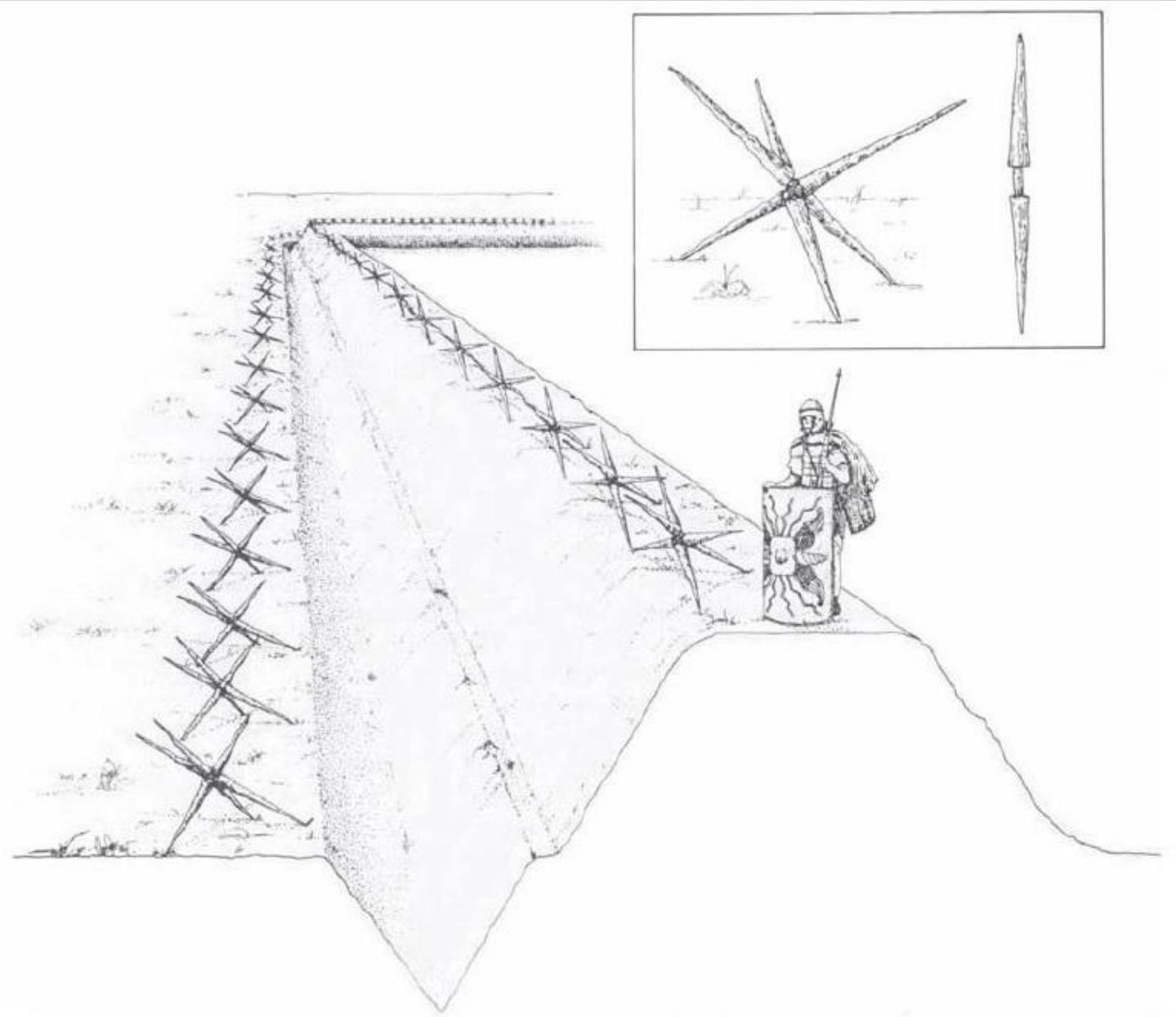
0 100 200 300 400 m



What are we searching for?



What are we searching for?



GILLIVER, C.M. 1993. "Hedgehogs, caltrops and palisade stakes", *Journal of Roman Military Equipment Studies*, 4 (p.52).

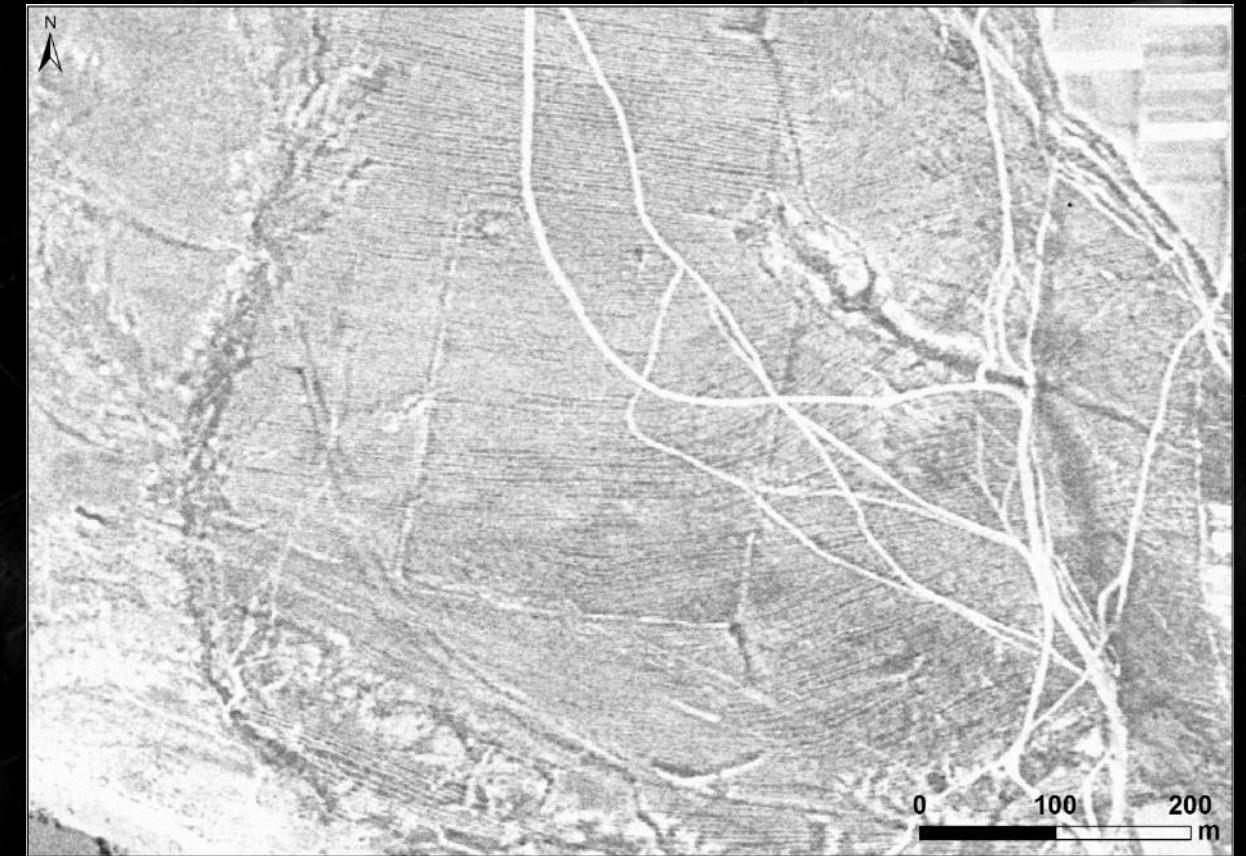


A black and white aerial photograph showing a landscape of agricultural fields. The fields are delineated by dark, winding contour lines that follow the contours of the land. The terrain appears to be hilly or mountainous, with the fields extending from the base up towards the peaks. The lighting creates strong shadows, emphasizing the relief of the land and the geometric patterns of the fields.

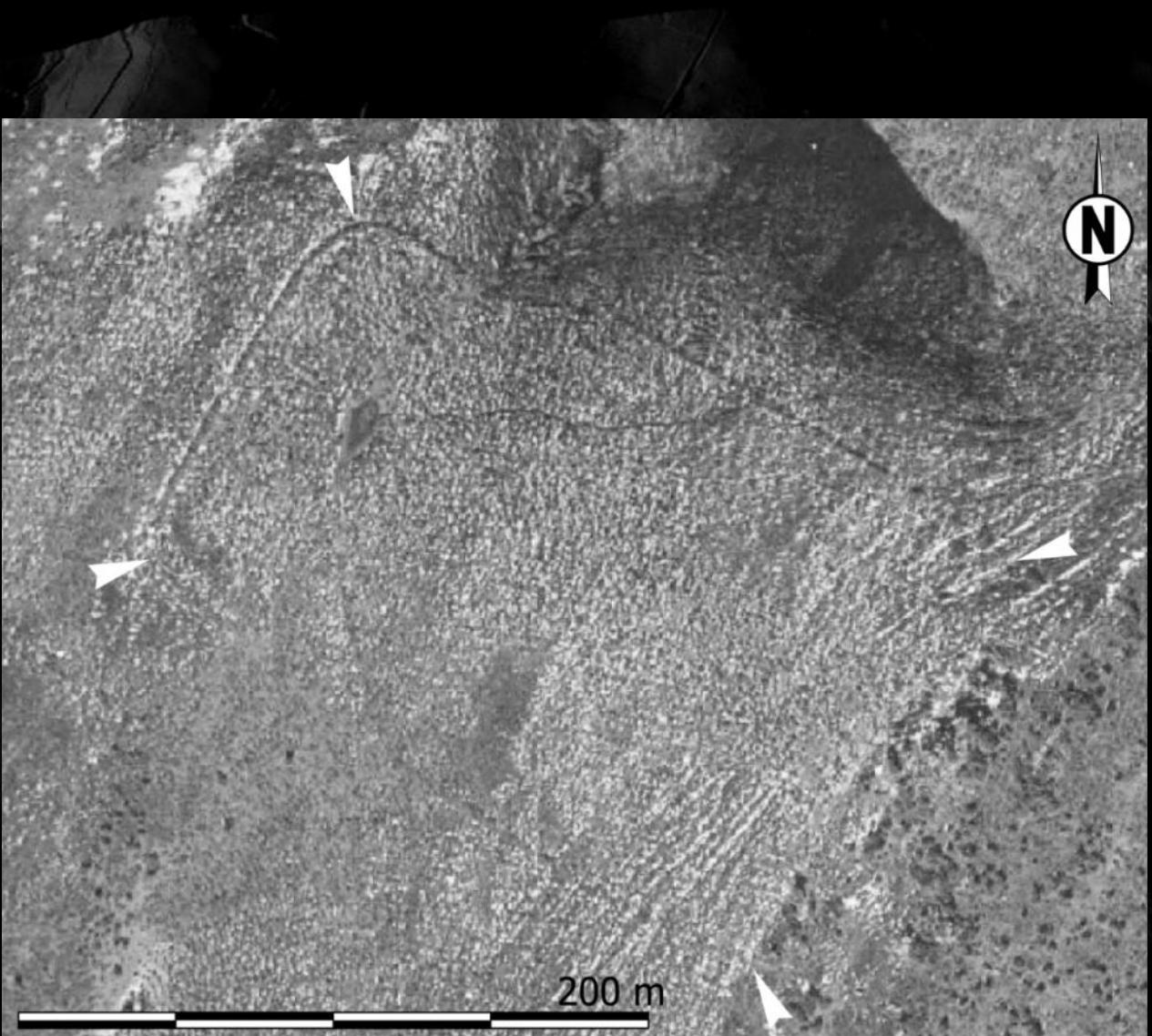
Remote Sensing

Searching for a cost-effective methodology

Historical aerial photos



Valdemeda (USAF-1957)



El Chao de Carrubeiro (Voo Interministerial, 1984)

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

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

Aerial photos and satellite imagery



Granda das Xarras (PNOA 2004)

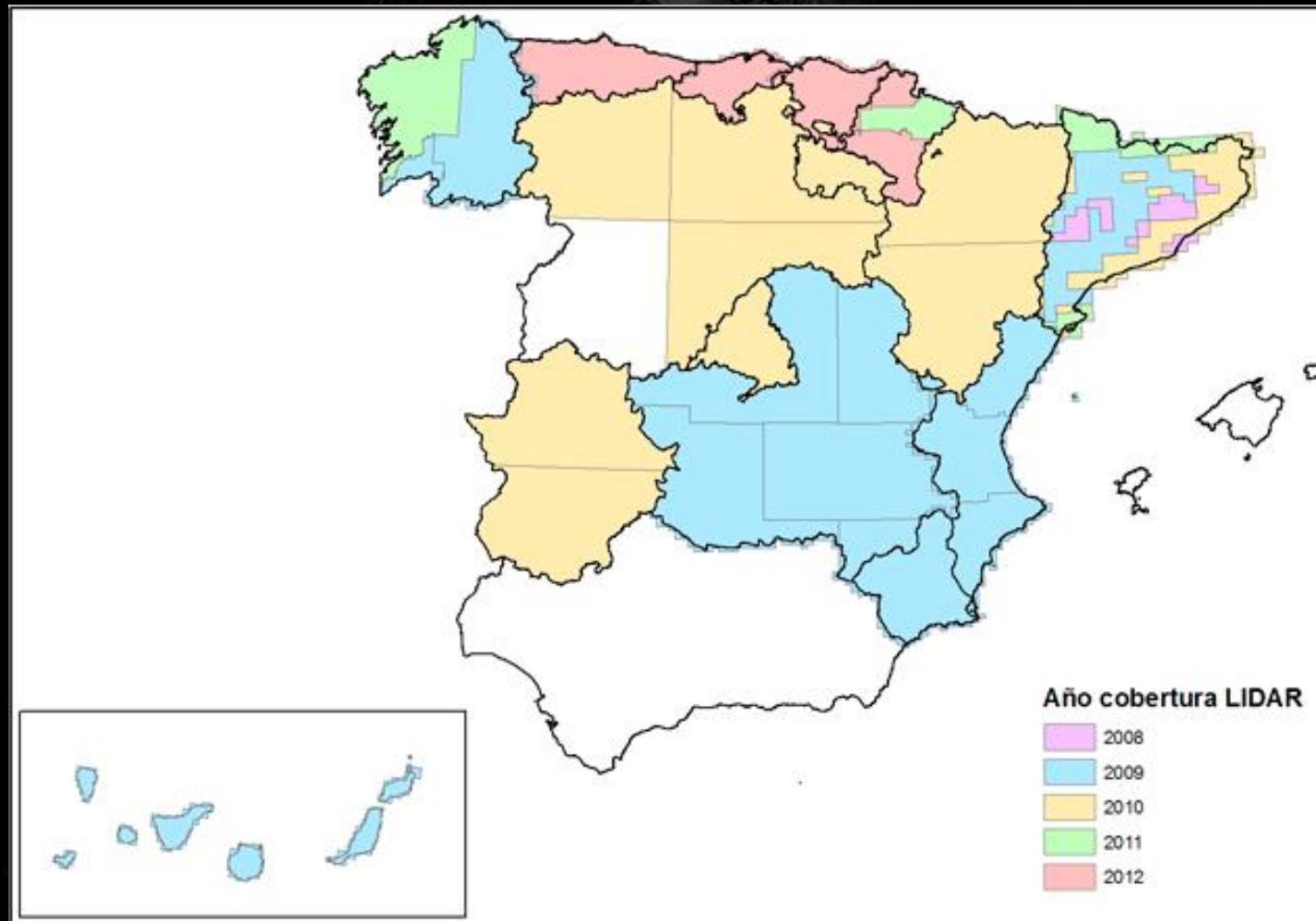


Castrocalbón (PNOA 2008)

Spain: Open data (<http://pnoa.ign.es/>)

Portugal: Open data (<https://www.igeo.pt/>)
and Google Earth, ArcGISEarth...

LiDAR data availability



LiDAR data download

Bienvenido | Welcome | Bienvenue

GOBIERNO DE ESPAÑA MINISTERIO DE FOMENTO INSTITUTO GEOGRÁFICO NACIONAL cnig

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

Posicionar en mapa

Localización por Nombre
Topónimo o dirección

Localización Avanzada

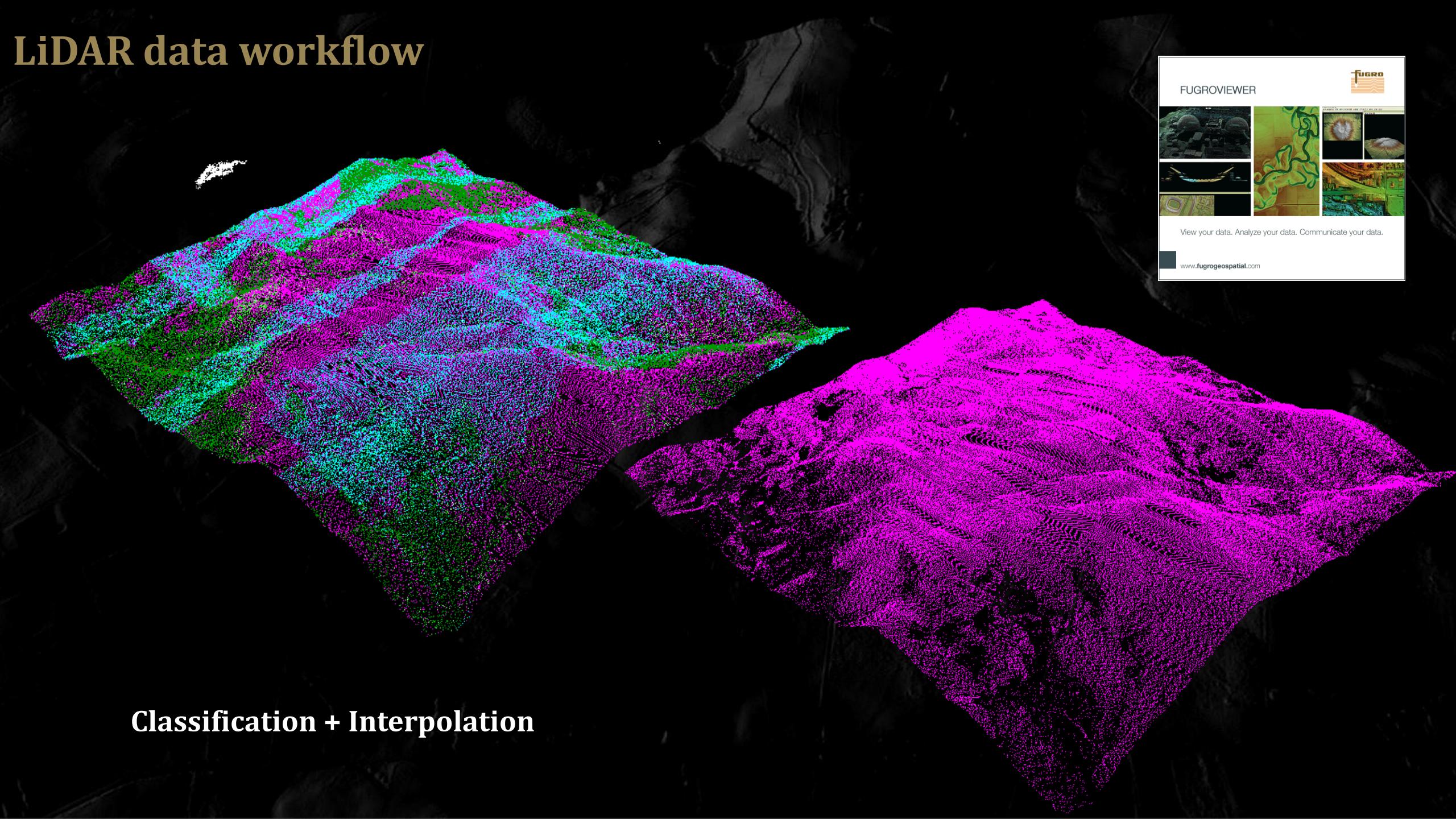
Seleccionar producto a descargar

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)

The map shows a region in Northern Spain, including parts of Asturias, León, and Gijón. Labeled towns include Tineo, Grau/Grado, Oviedo, Mieres del Camín, La Pola Ullaviana / La Pola de Llaviana, Cangas del Narcea, Villabino, Lugo, Fabero, León, and Ponferrada. Roads A-66, AP-66, and N-630 are visible. A green polygon indicates the 'Parque Natural de Somiedo'. The map interface includes standard zoom and navigation controls.

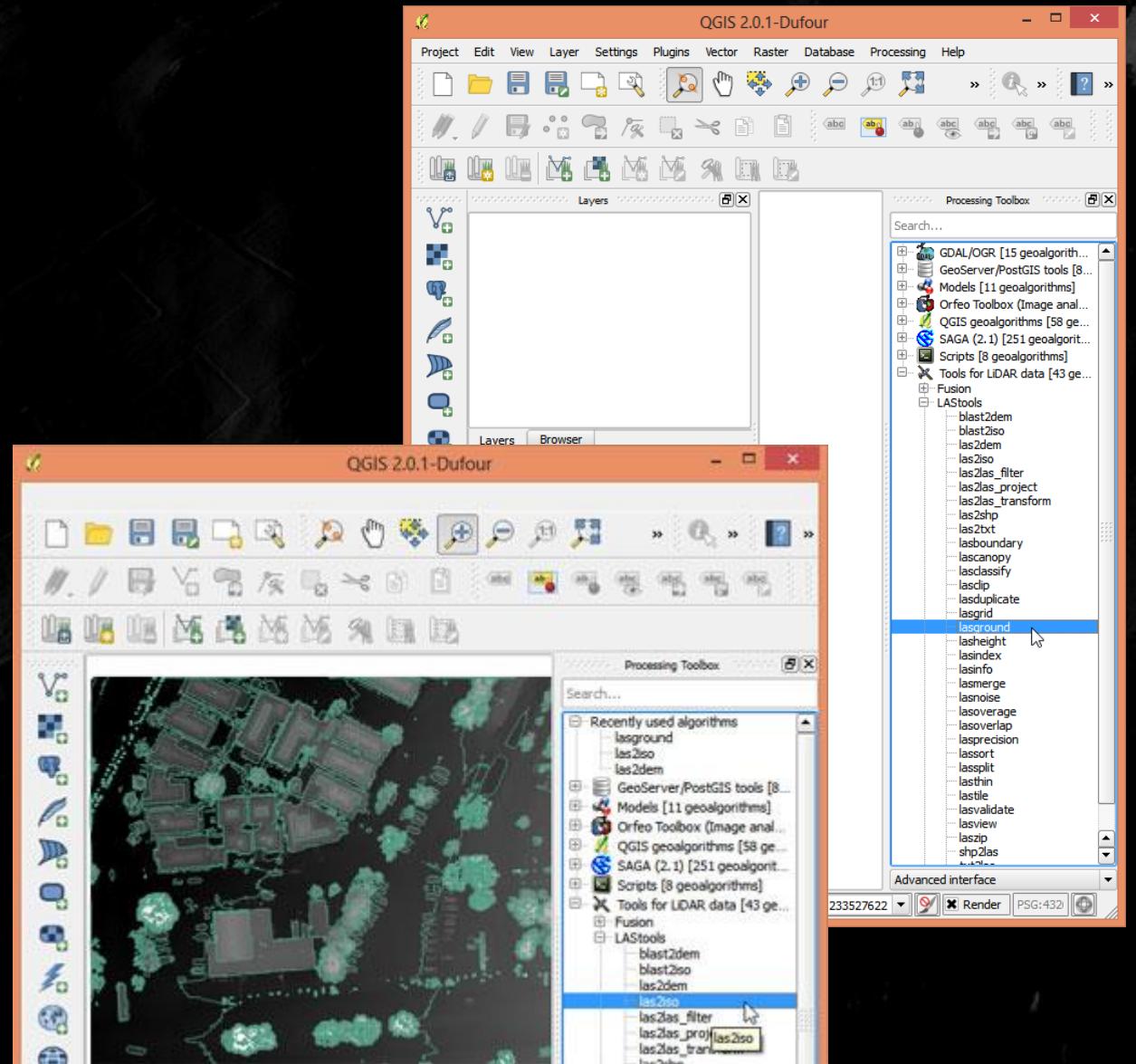
LiDAR data workflow



Classification + Interpolation

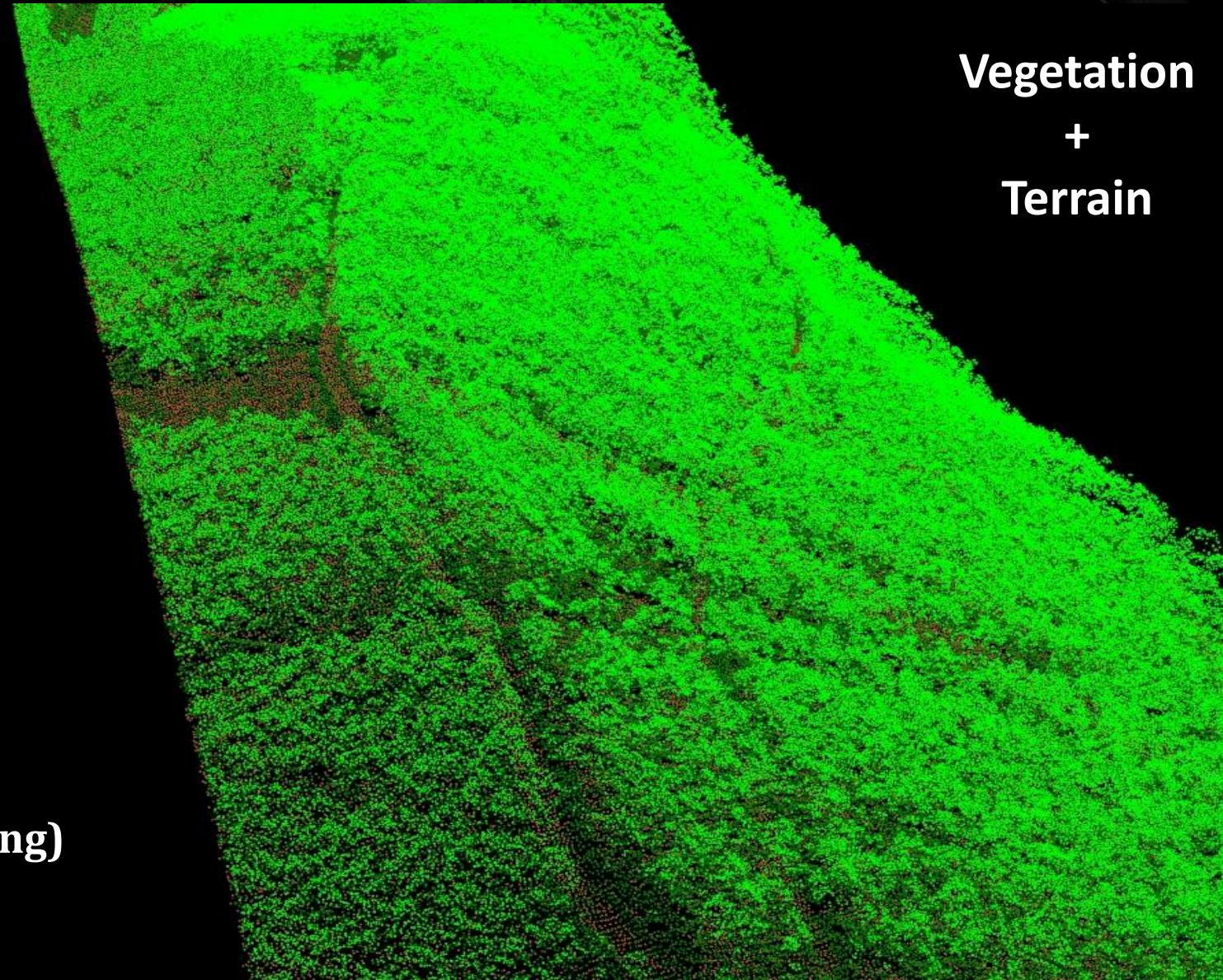


LiDAR data workflow



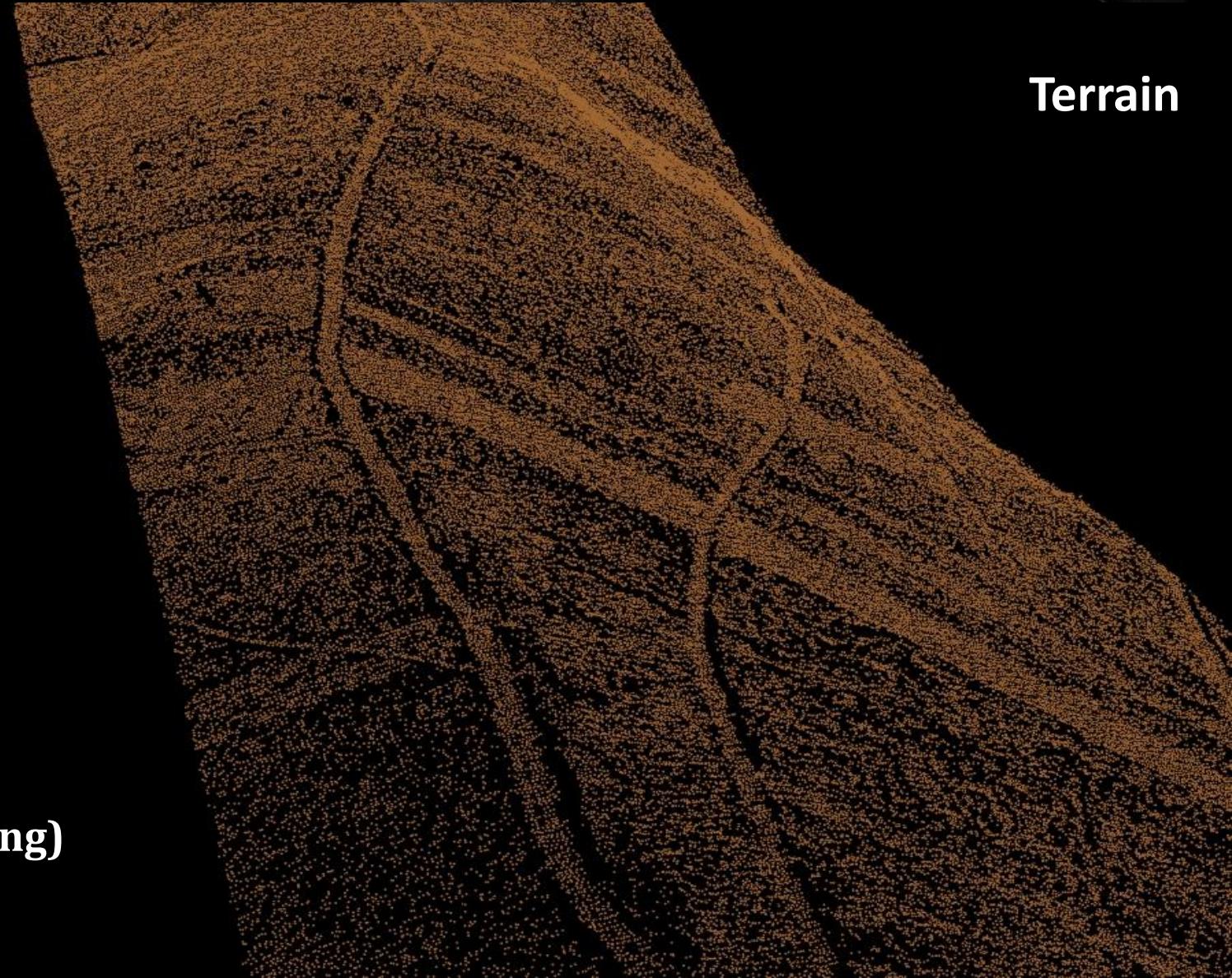
LiDAR data workflow

Classification (Filtering)



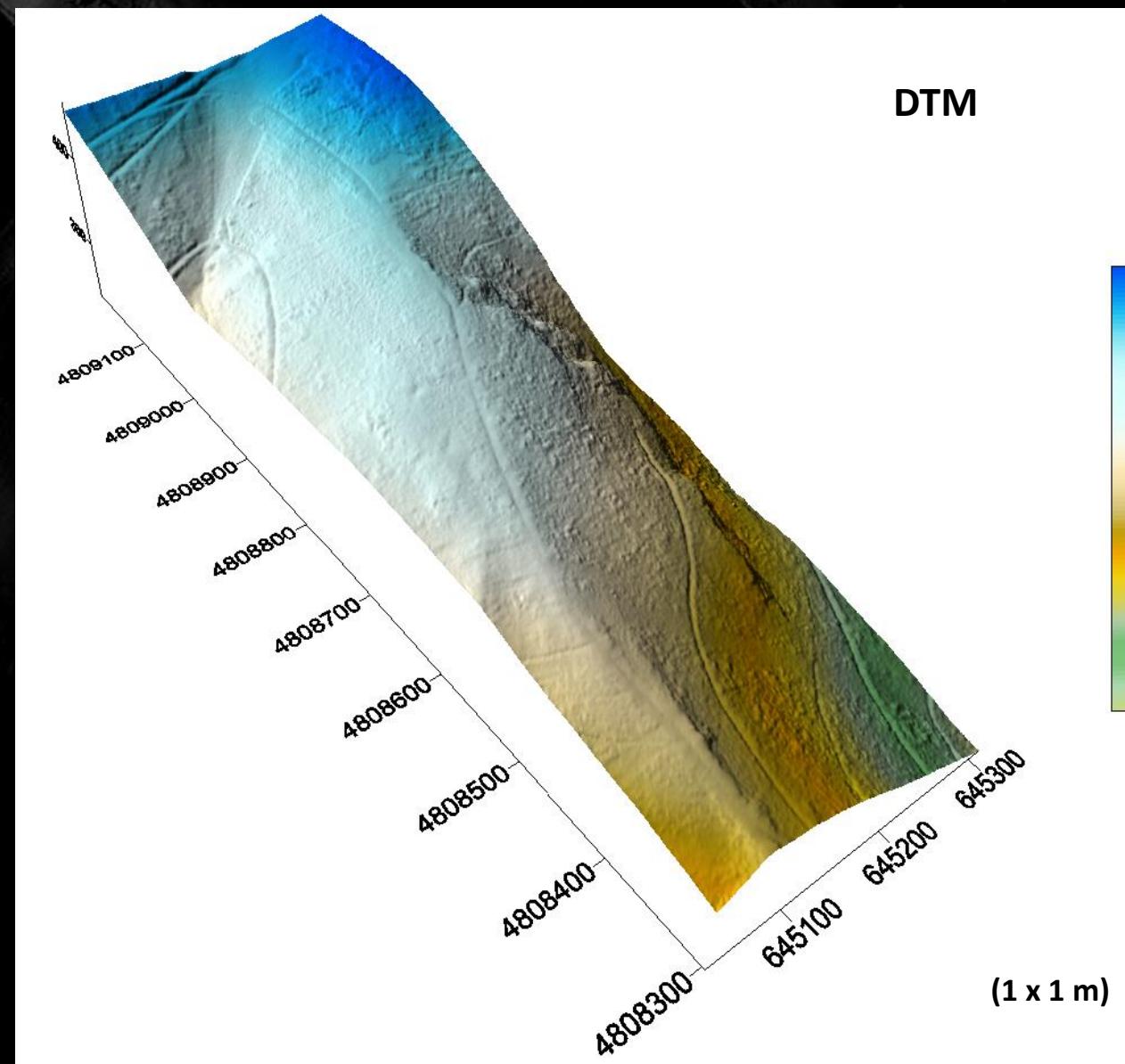
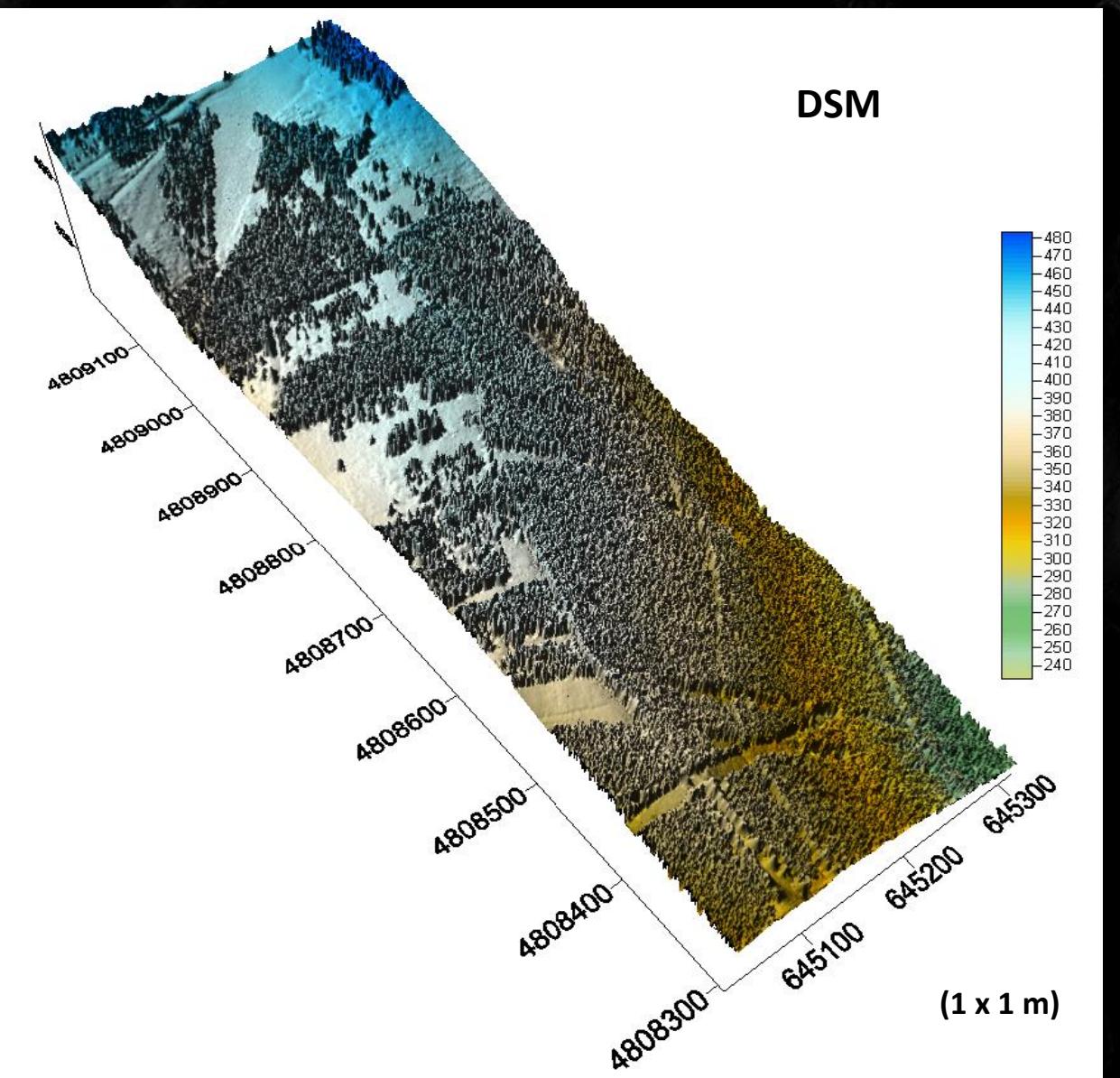
LiDAR data workflow

Classification (Filtering)

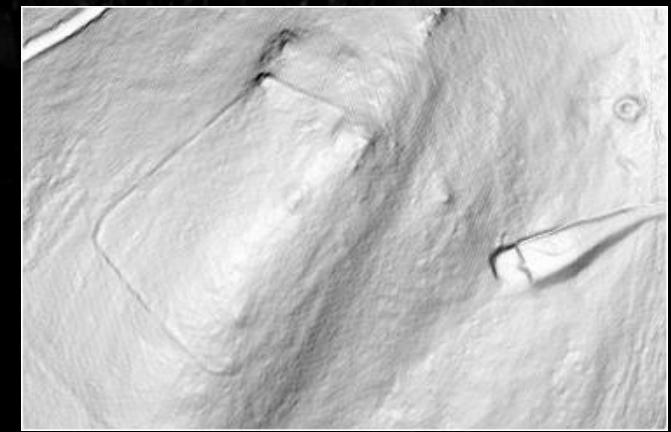
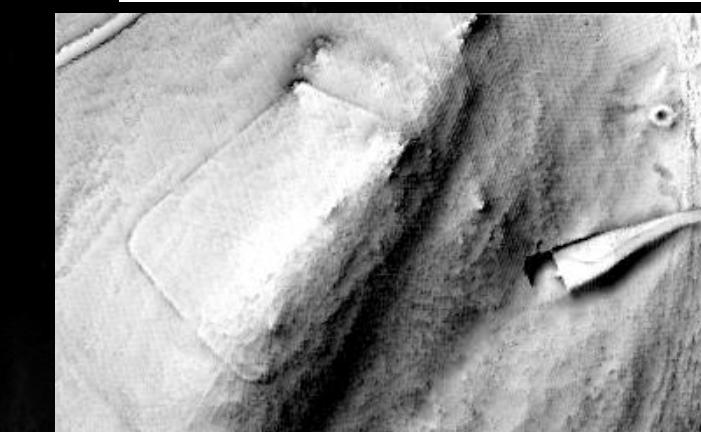
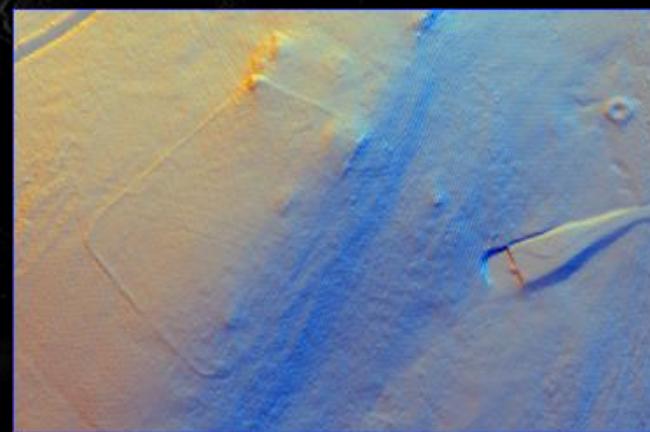
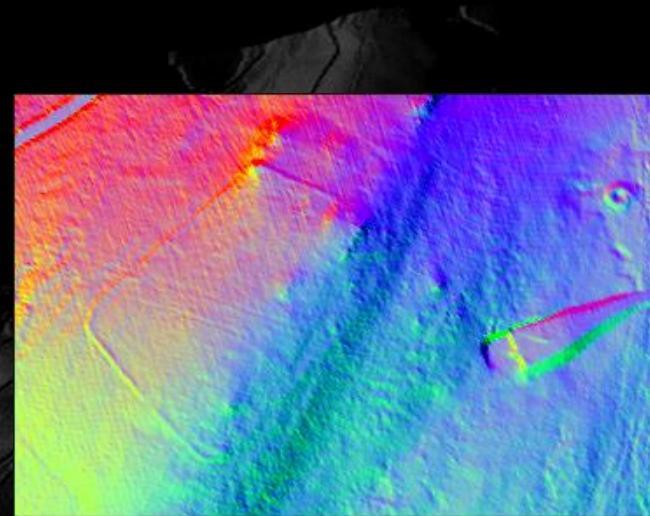
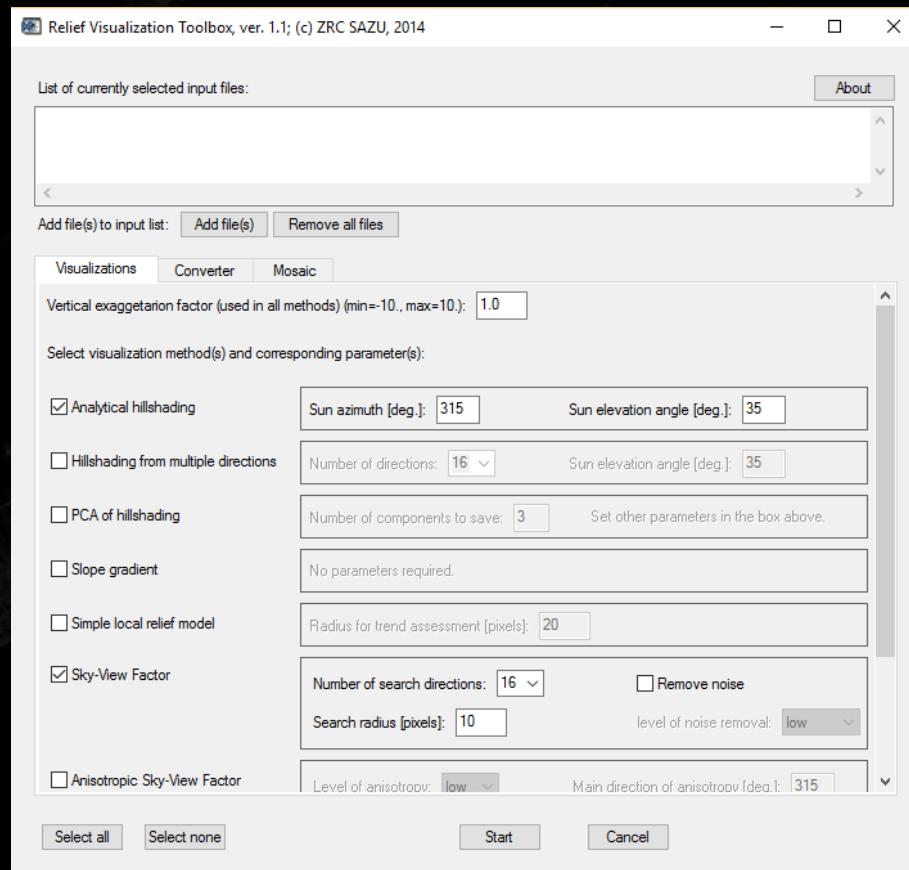


Terrain

LiDAR data workflow

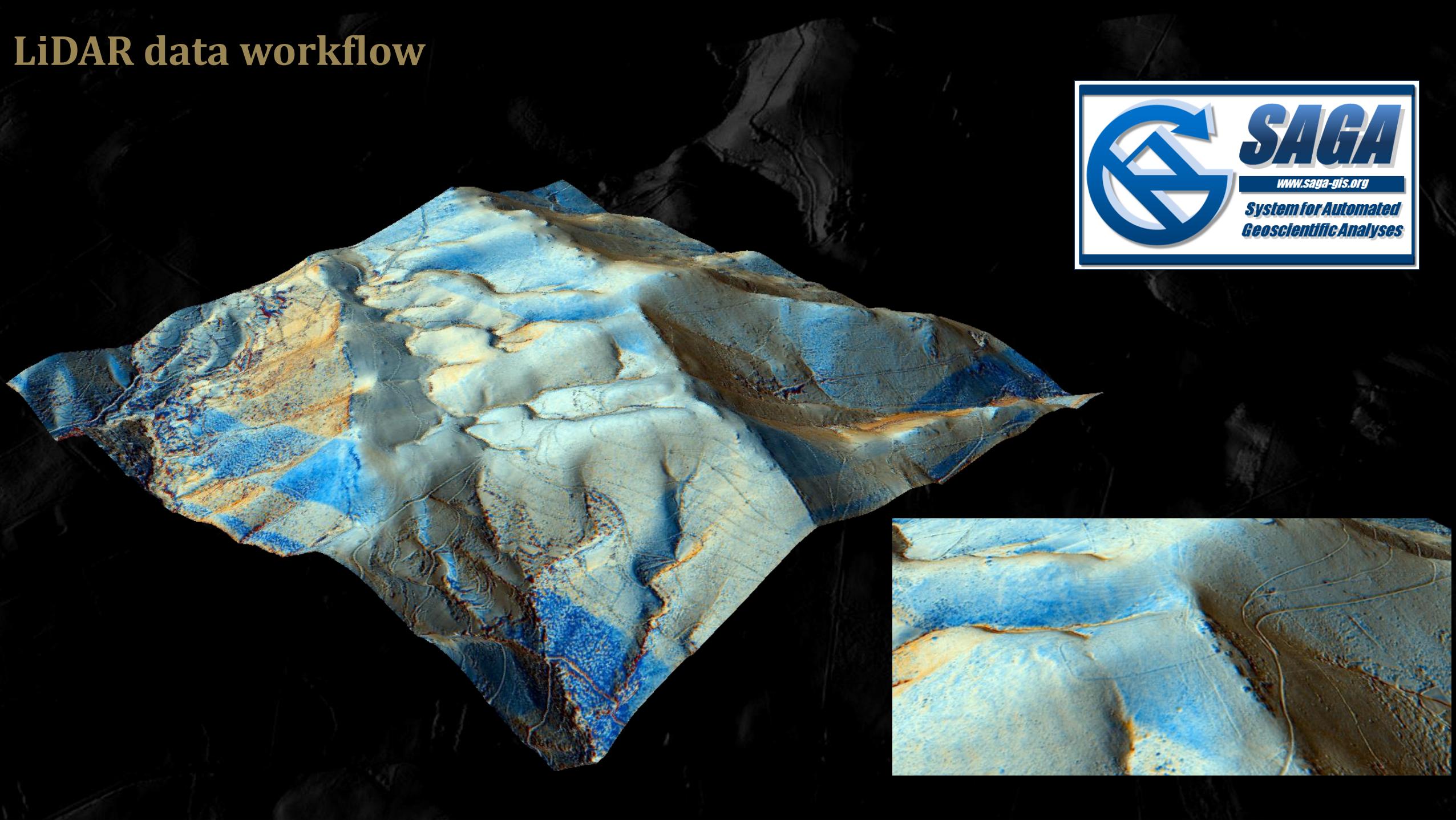


LiDAR data workflow

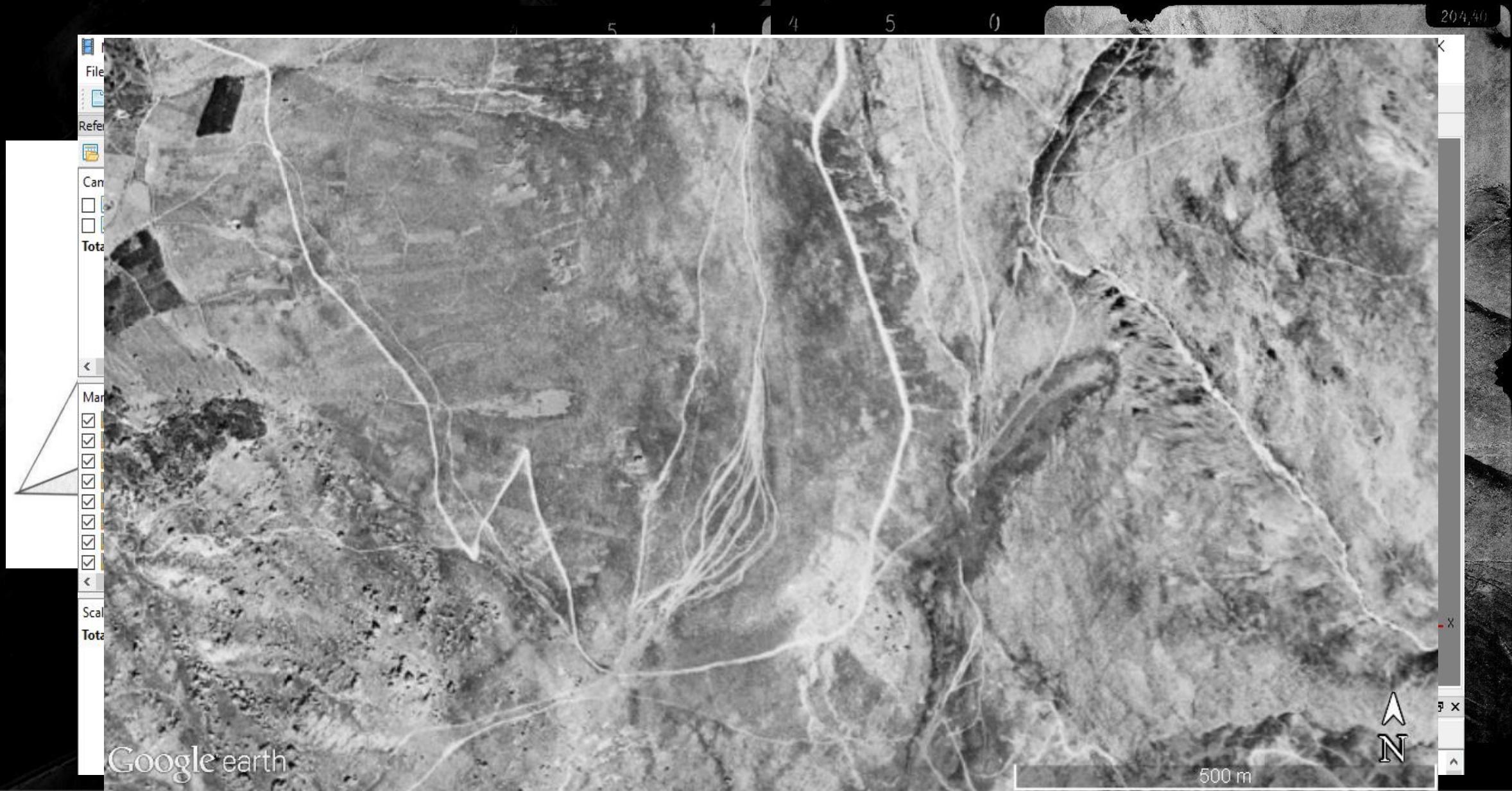


Visualization techniques

LiDAR data workflow



Photogrammetry



Prospection



“Al final, siempre tienes que enviar a la infantería”

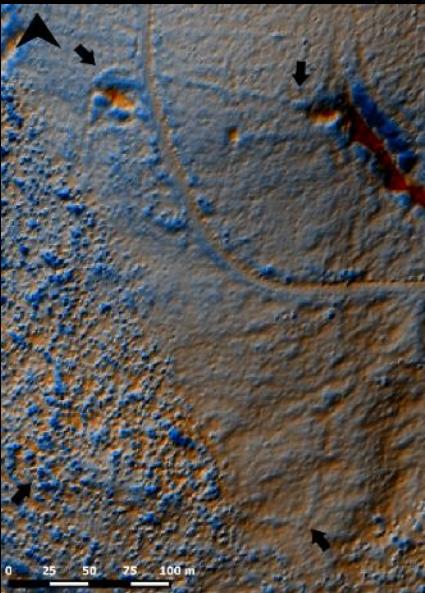
V. Mayoral

Data combination

Morphological and typological characterization



+



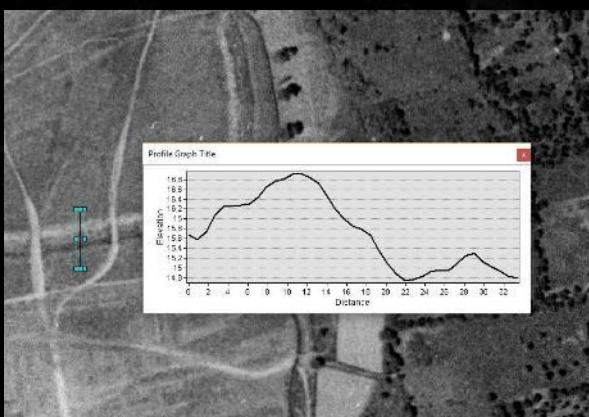
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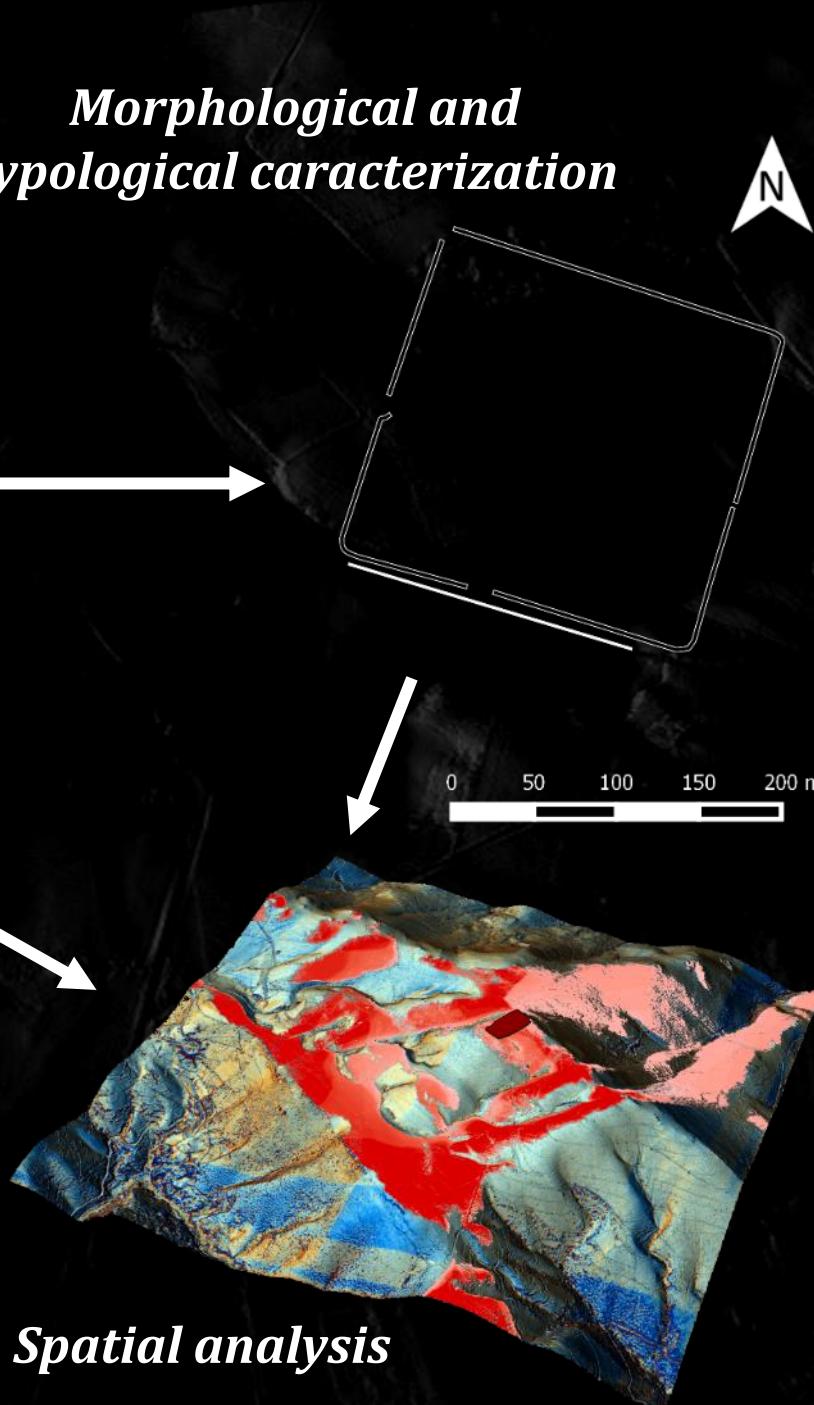
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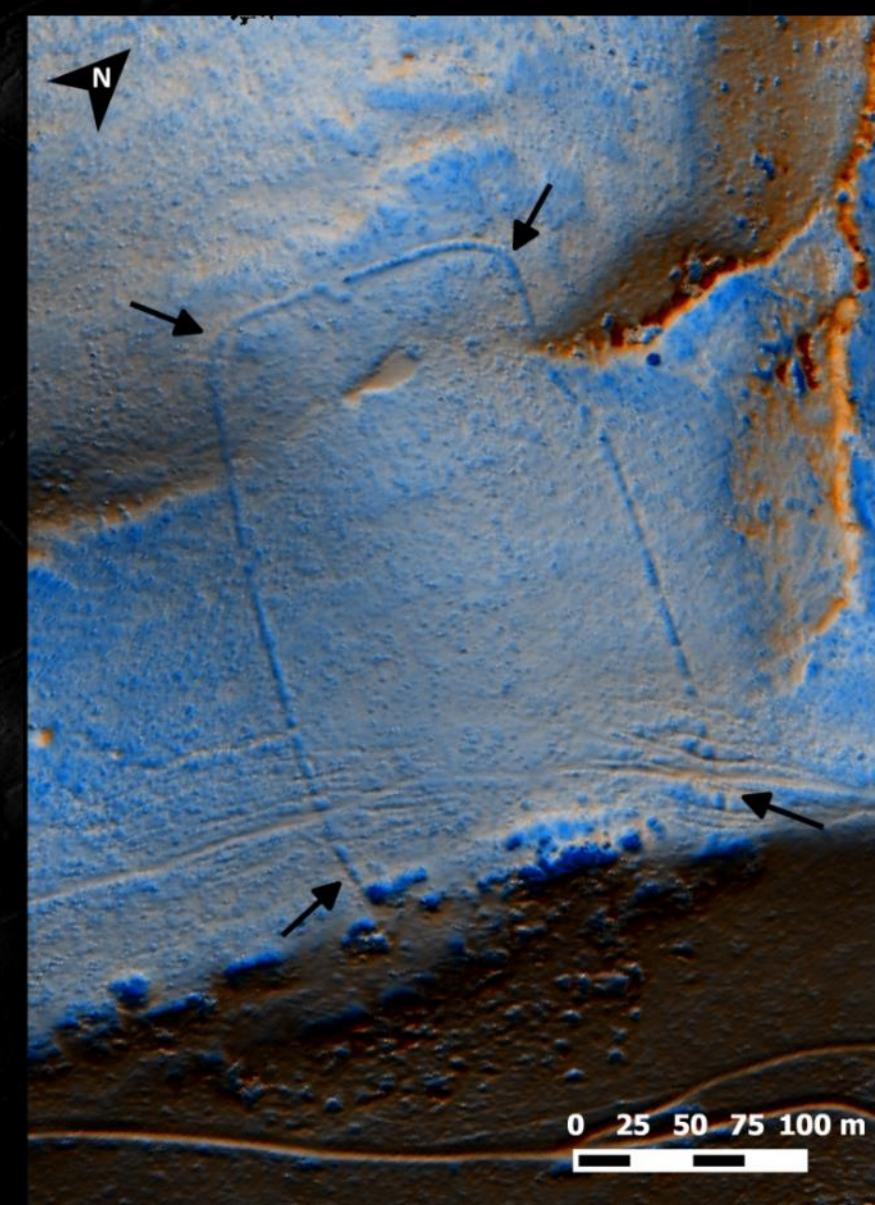
Spatial analysis



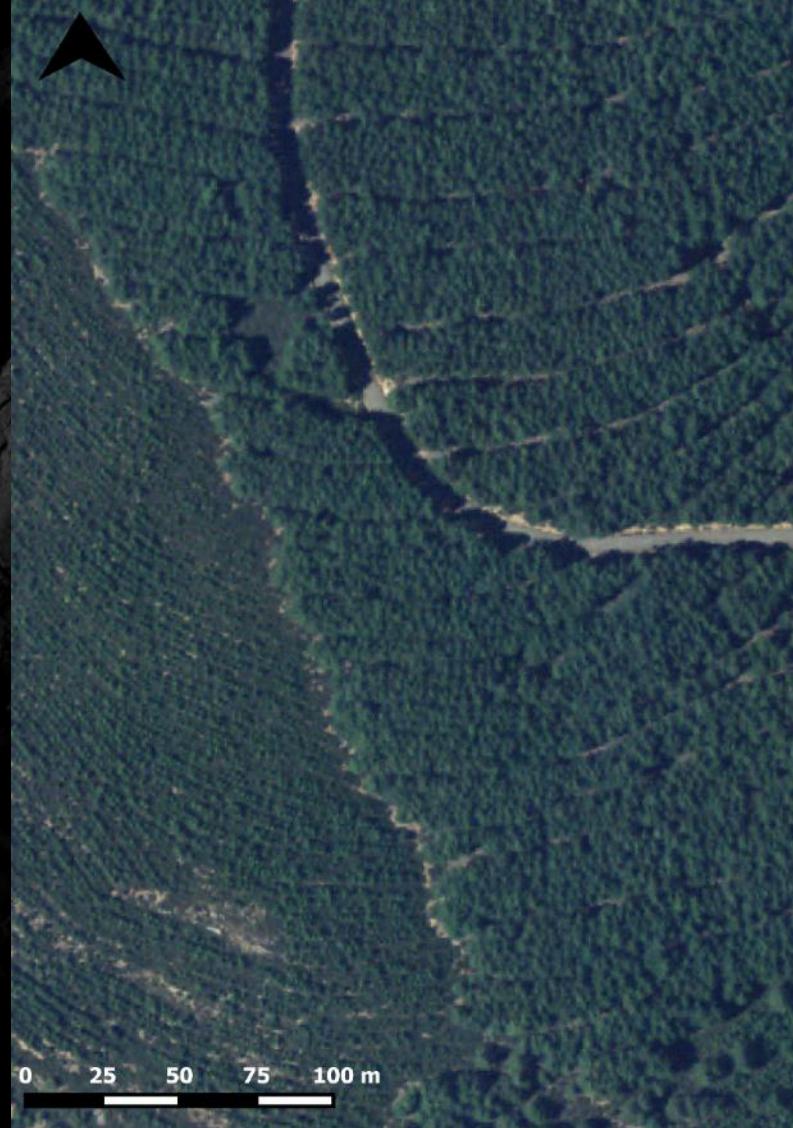


Some brief results

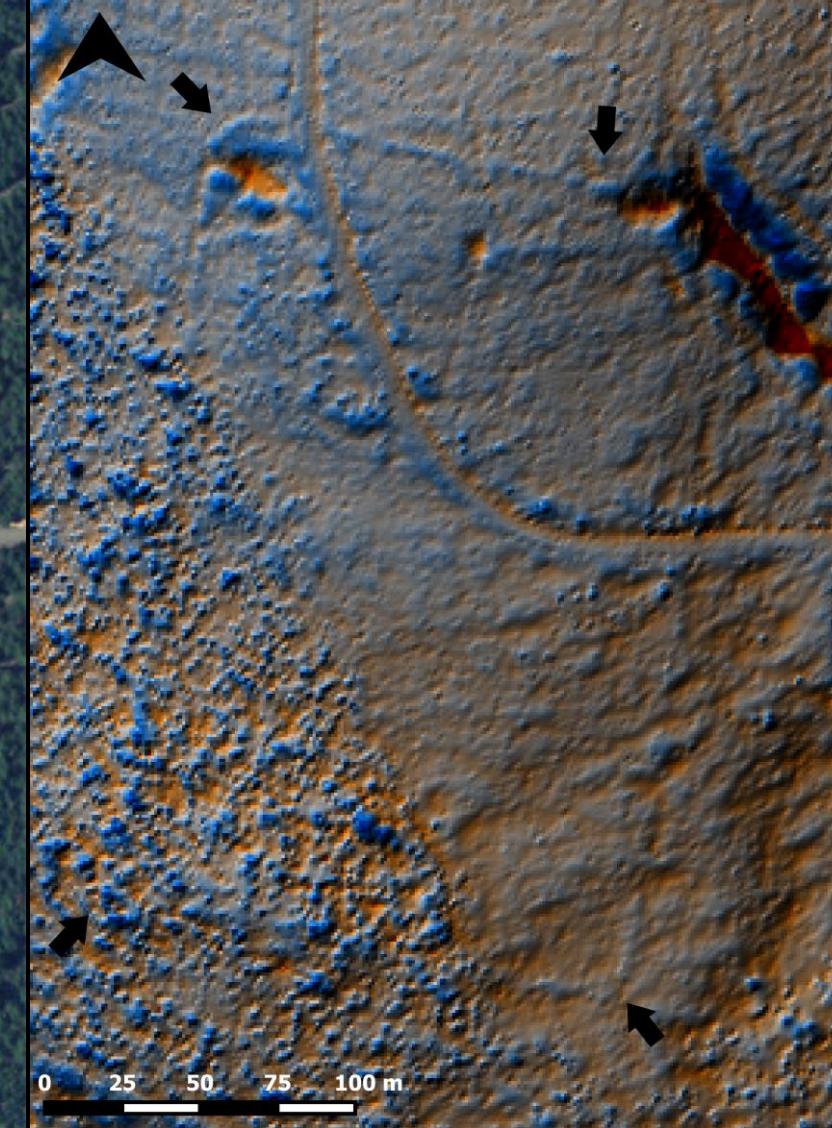
LiDAR



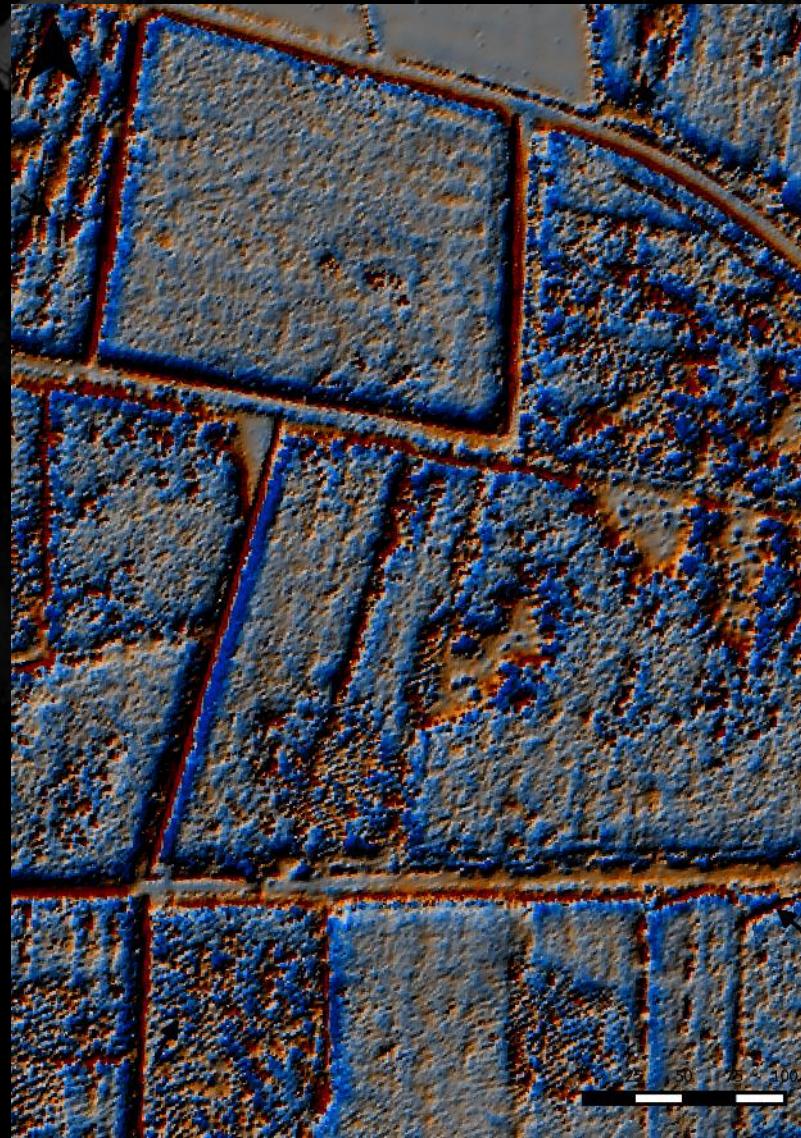
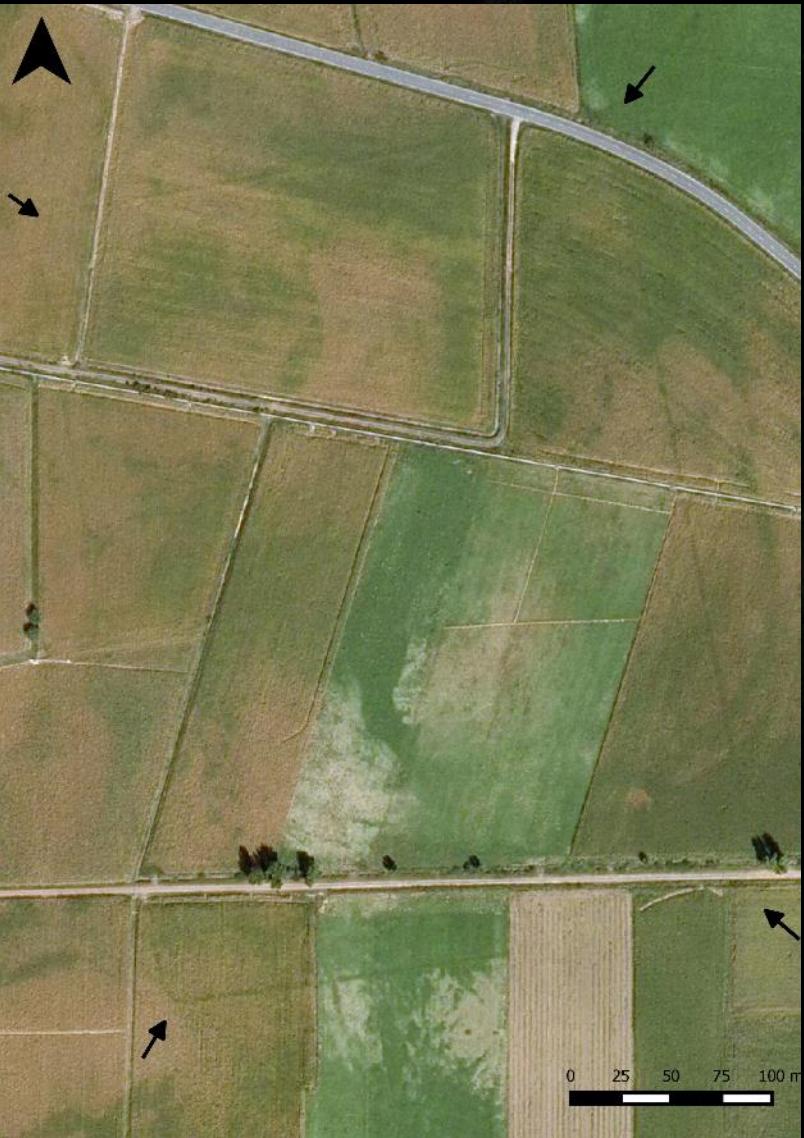
El Chao de Carrubeiro (Asturias)



Valdemedina (León)



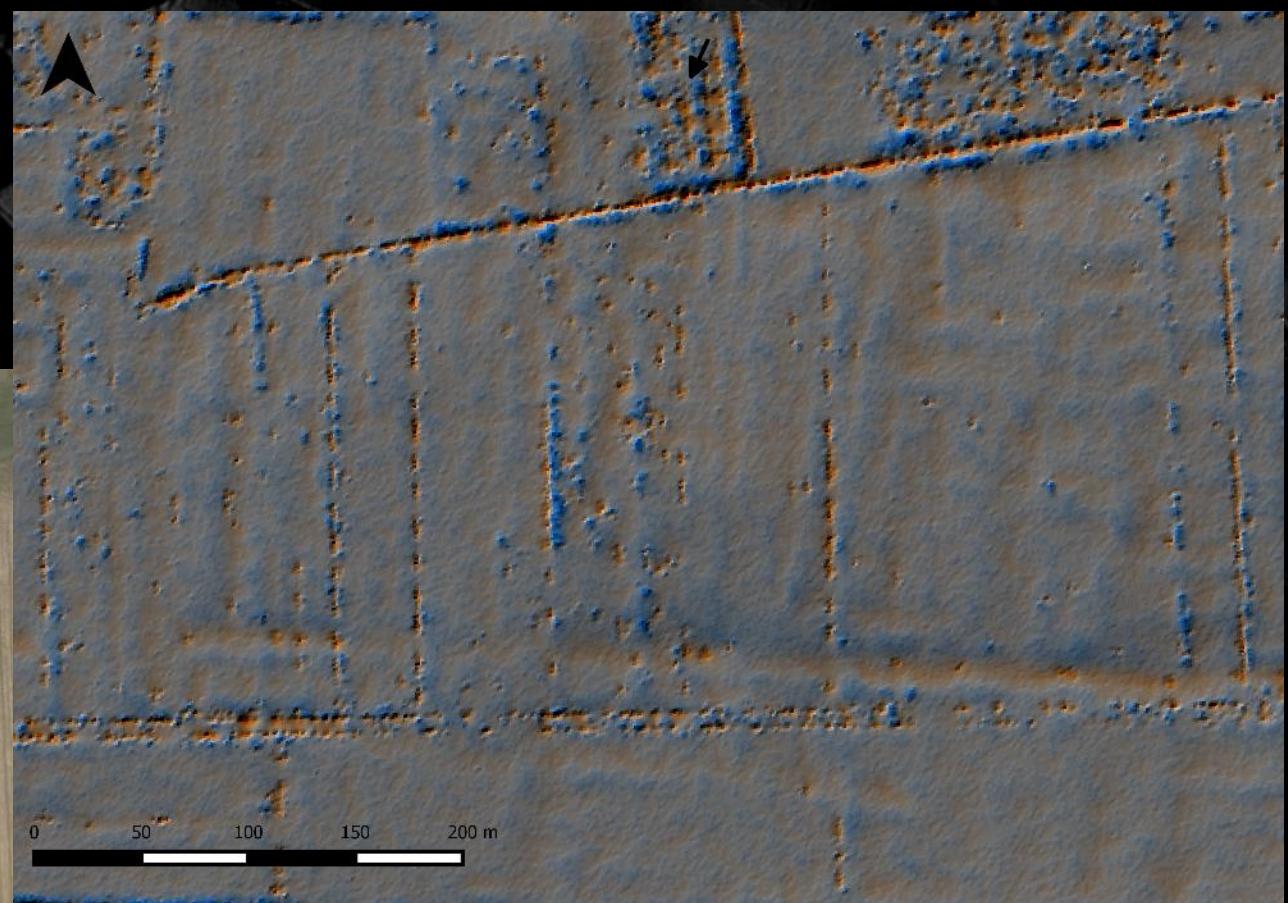
LiDAR?



Huerga de Frailes (León)

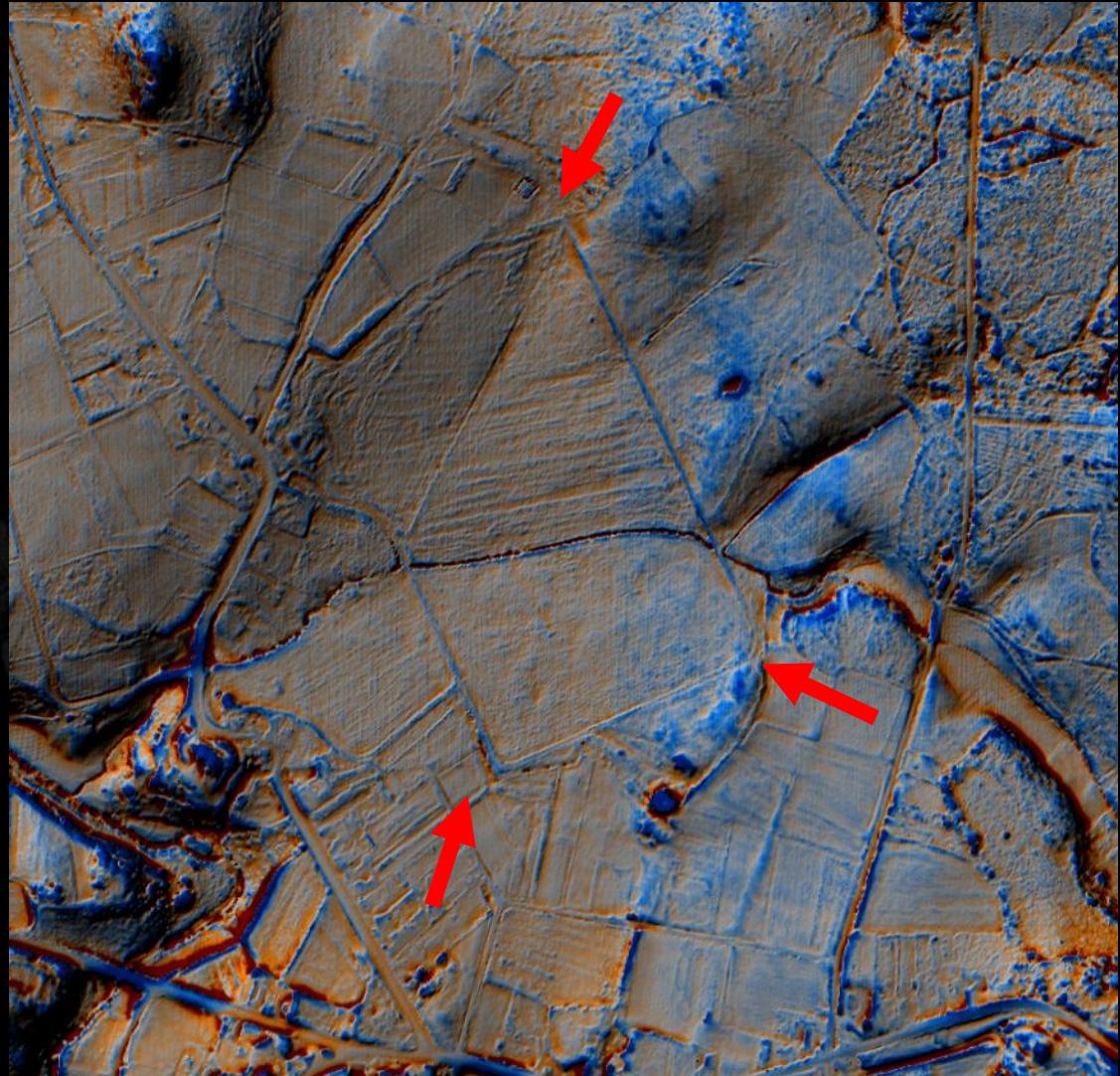
LiDAR?

(Cellís Sánchez et al. 2015)



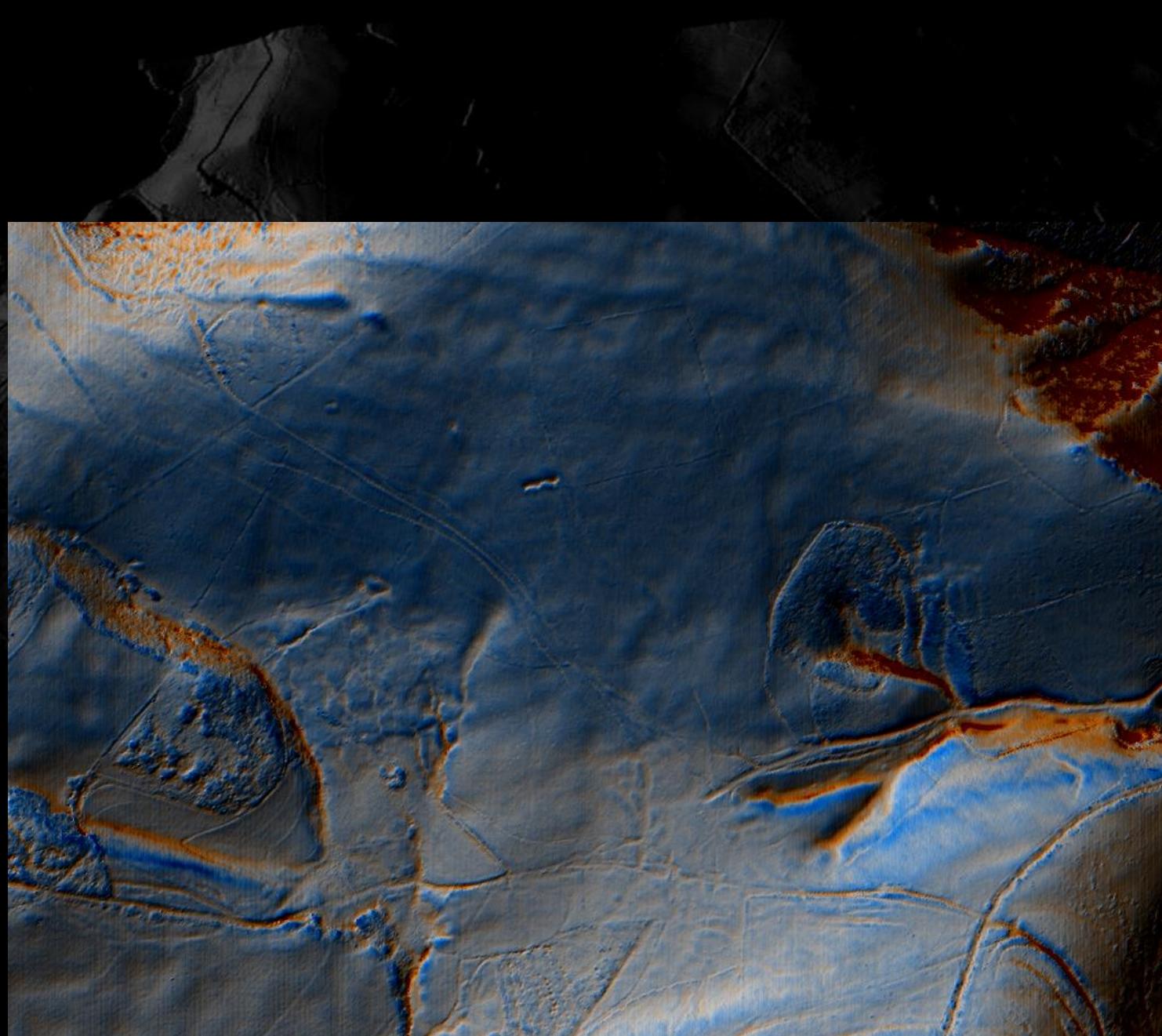
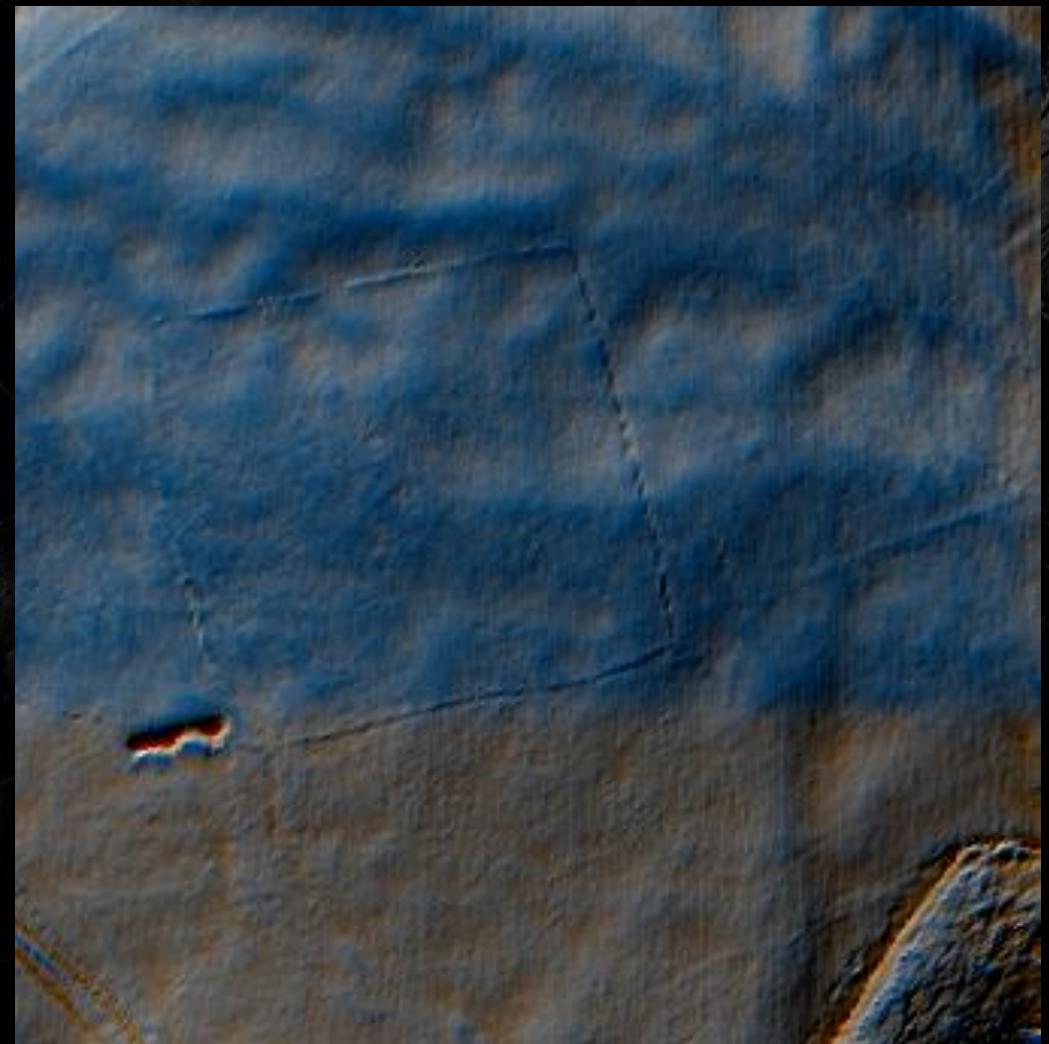
Villamontán de Valduerna (León)

False positives

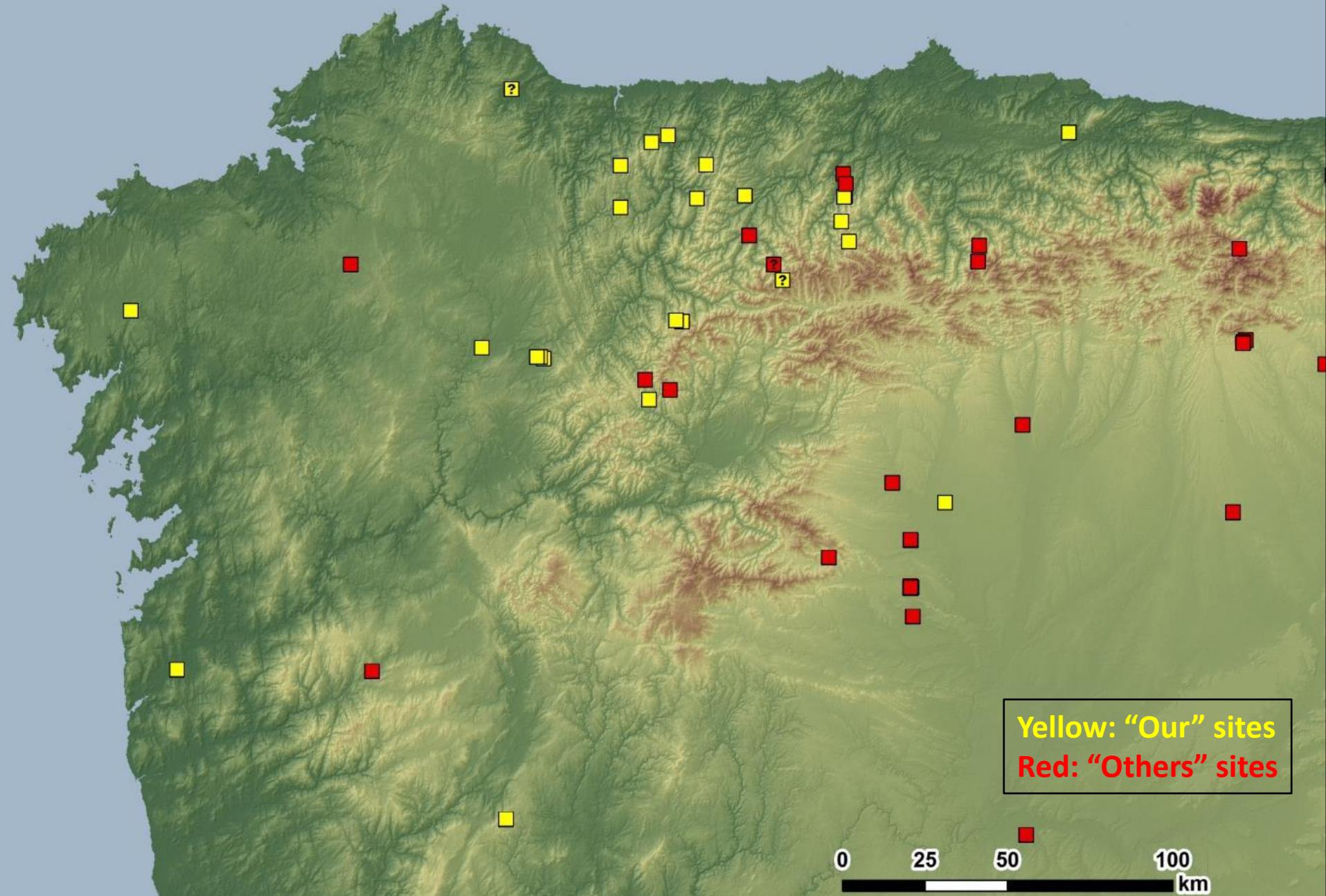


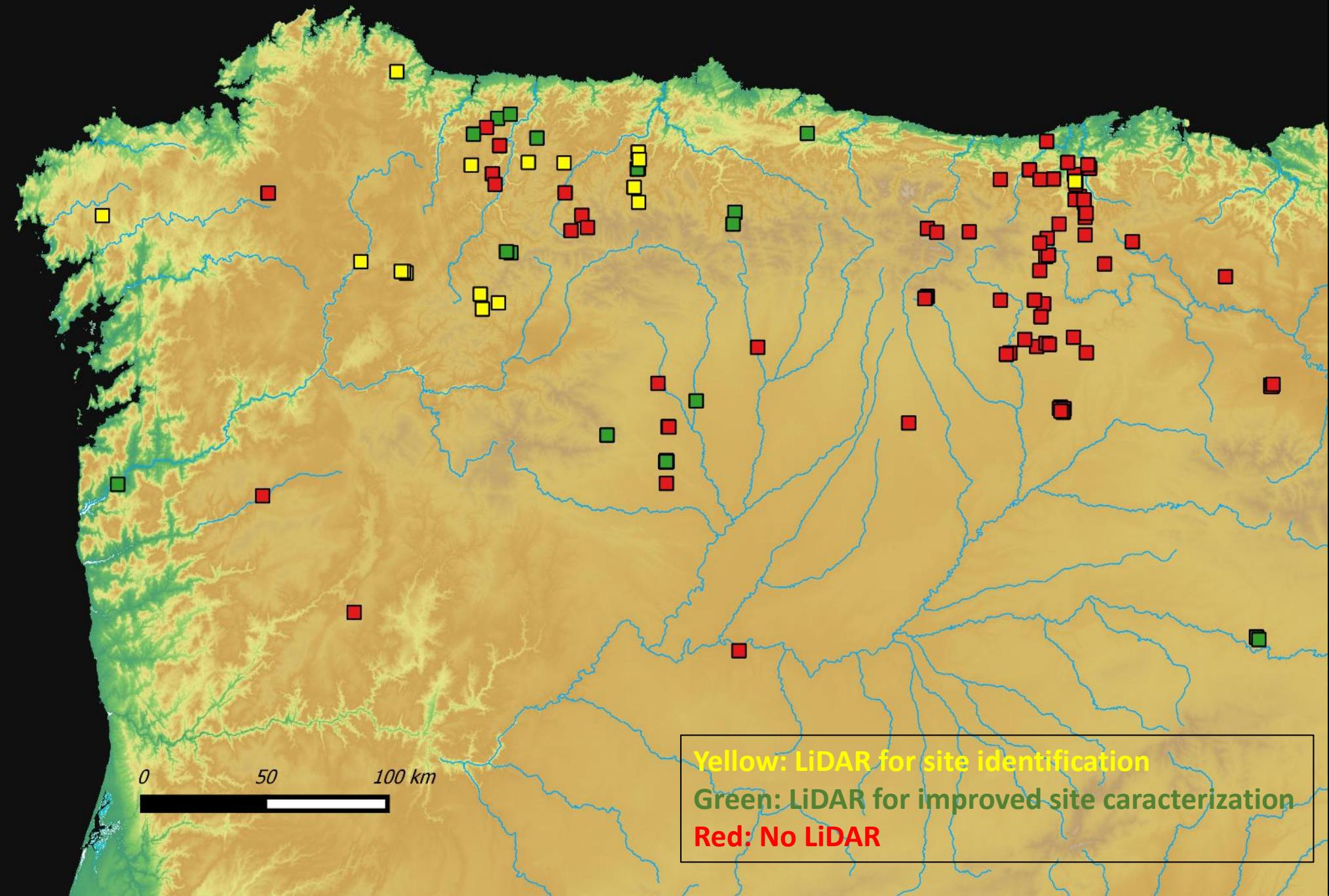
Berdeogás (A Coruña)

False positives



Estelo (Lugo)





ROMAN



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