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Disentangling scattered charcoal assemblages for palimpsest dissection: Spatial analyses from El Salt Stratigraphic Unit Xb (Eastern Iberia)

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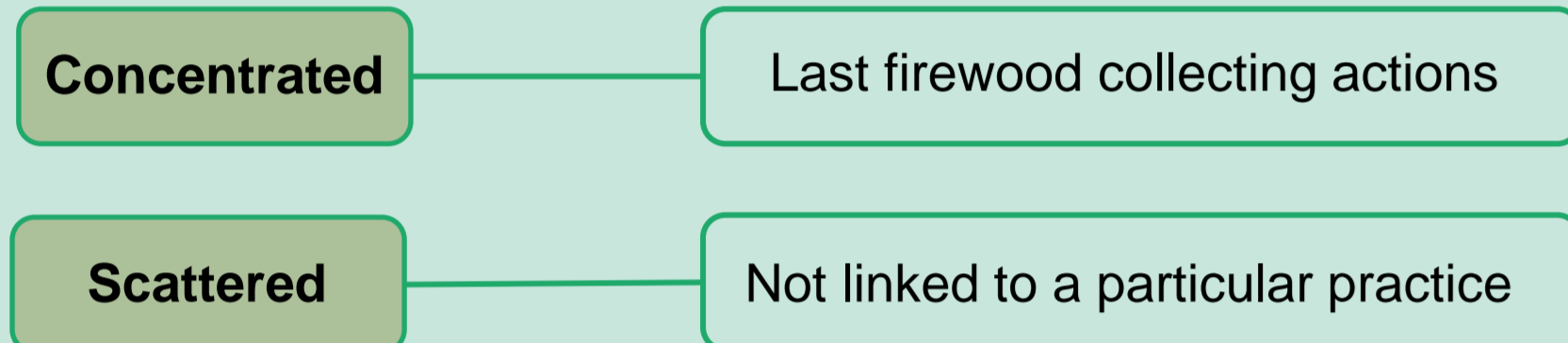
INTRODUCTION

Hearth-related accumulations are a common feature in Palaeolithic sites and their spatial characterization is fundamental to recognizing cultural processes involved in the formation of archaeological sites [1].



Charcoal analyses from Palaeolithic sites must take into account the palimpsest-like nature in order to provide significant implications for understanding firewood use and management by hunter-gatherer groups.

scattered vs. concentrated charcoal



Can we assess the possible origin of scattered charcoal assemblages?

STATE OF THE ART

Micromorphological studies:

- Black layers from combustion features could be linked with preceding activities [2]

Experimental studies:

- Anatomical alterations on charcoal by fungal activity visible after combustion [3]

Archaeological studies:

- Evidence of Neanderthal dead wood gathering applying the observation of fungal decay patterns and the fragmentation degree on charcoal [4]

Towards our better understanding of scattered charcoal assemblages:

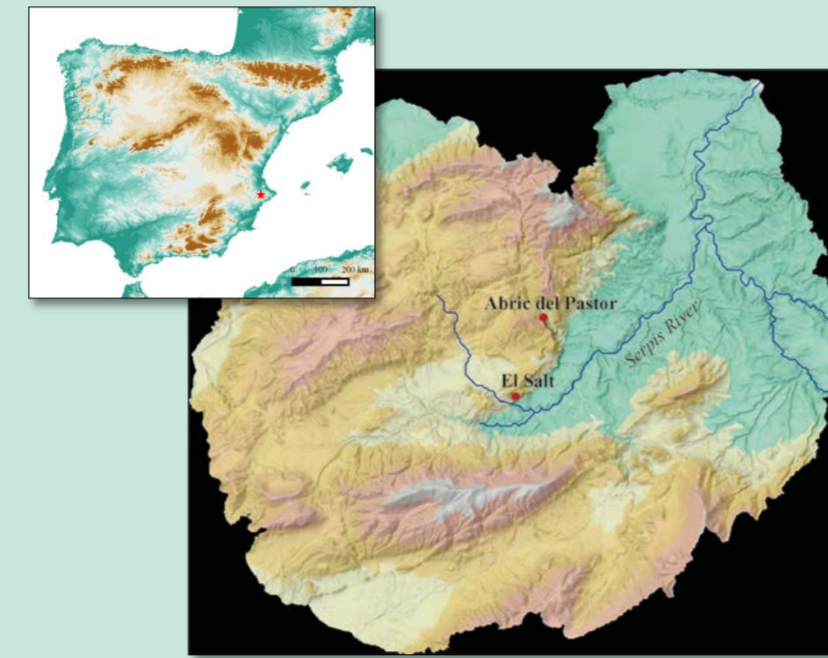
spatial data & charcoal

- How are charcoal size-classes spatially distributed?
- How are Alteration Levels (progressive intensities of fungal alteration) spatially distributed?

MATERIAL & METHODS

1 Geographical setting

El Salt (MIS 3) is a rock shelter located in Alcoy (Alicante, Eastern Iberia), a region with numerous valleys and natural corridors.



2 Charcoal sampling

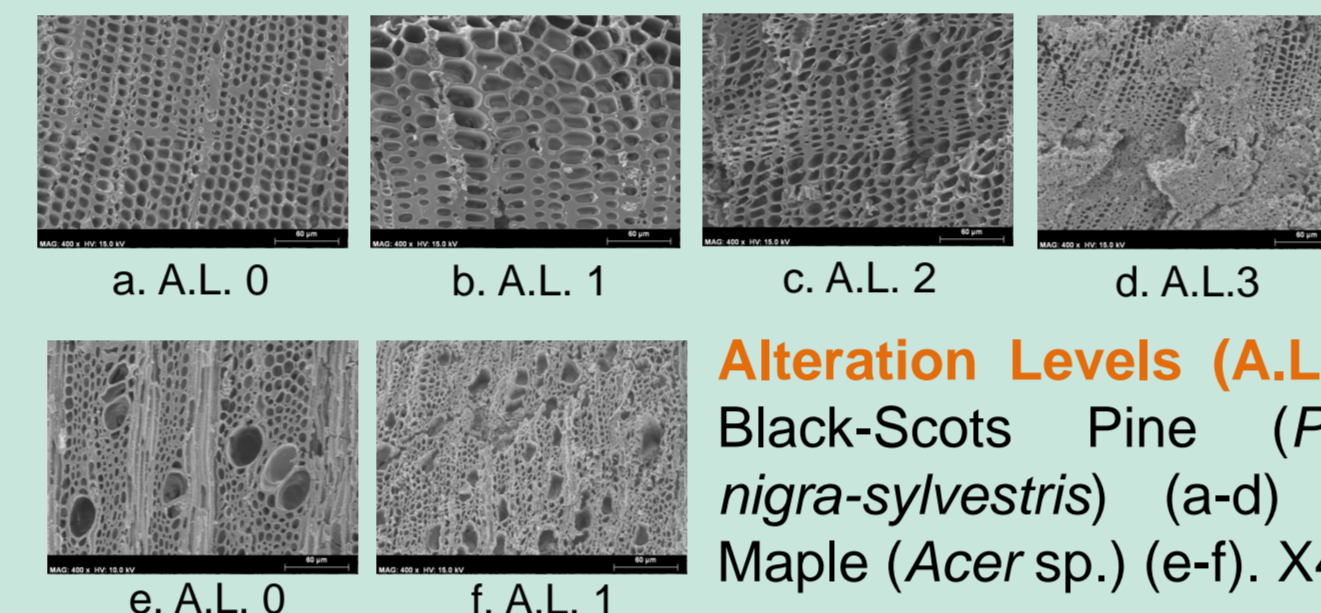


Systematic soil sampling of the entire excavated surface was conducted for water flotation to separate macrobotanical remains from sediments using meshes of 1 and 0.2 mm. The samples were air-dried separating the flotation residue from the large residue [5].

3 Botanical identification & fungal decay patterns analysis

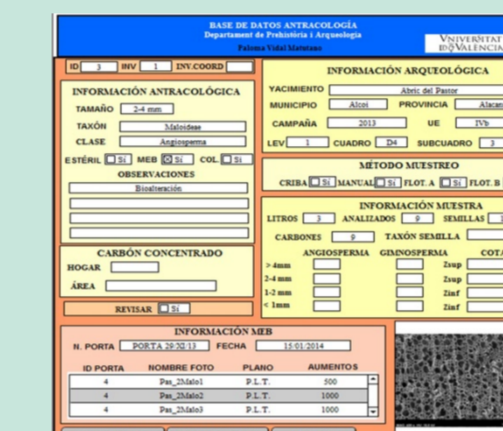
6 m² sampled area

2094 charcoal fragments



Alteration Levels (A.L.) in Black-Scots Pine (*Pinus nigra-sylvestris*) (a-d) and Maple (*Acer sp.*) (e-f). X400.

4 Charcoal spatial analysis



Anthracological data was recorded in a **Filemaker Database**. Charcoal density was calculated using **GIS software** (*Quantum GIS v.2.10.1* "Pisa") from the total of wood charcoal fragments per 50 x 50 cm excavation units (0.25 m²).

CONCLUSIONS

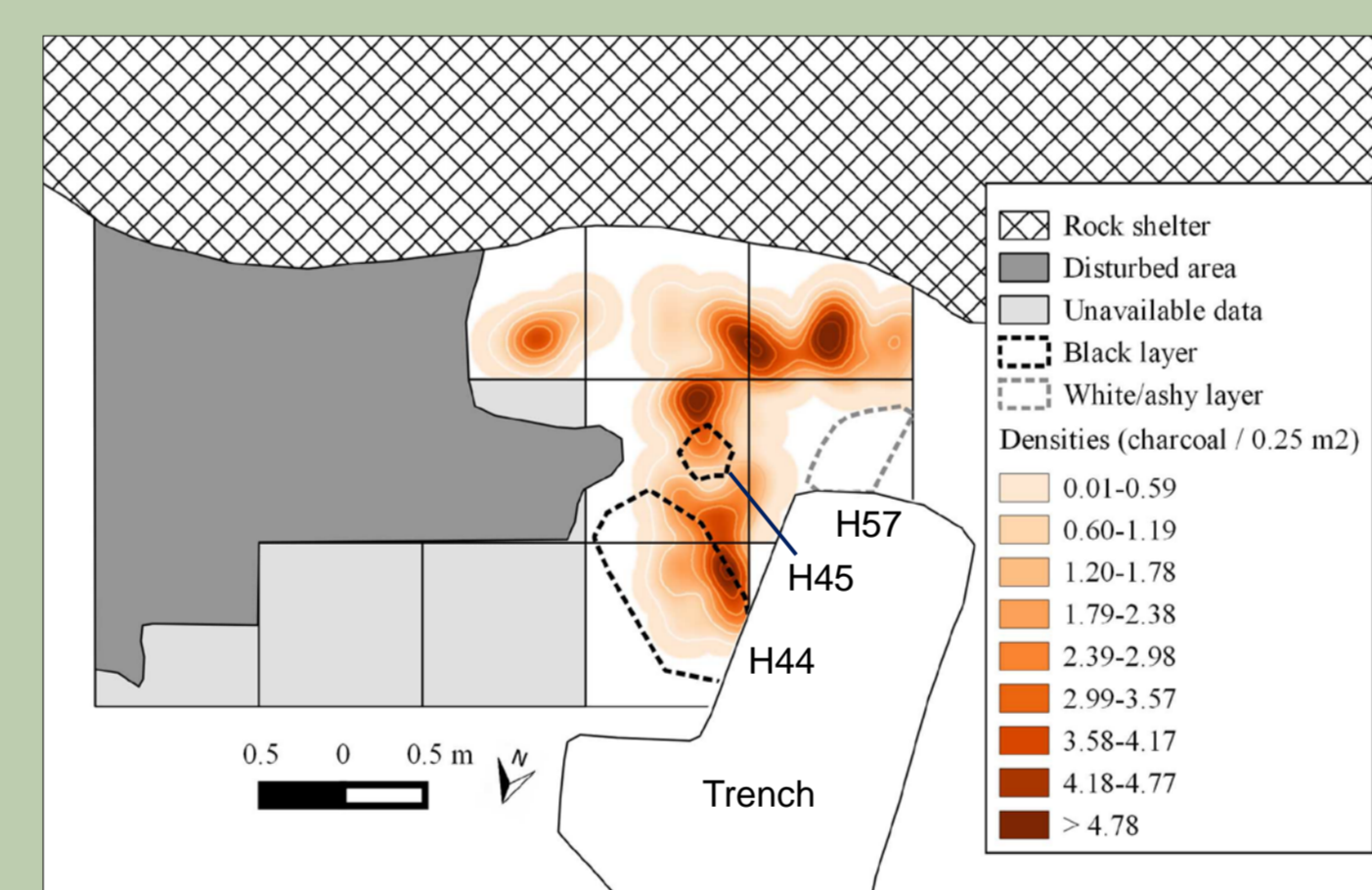
- Spatial analysis is a promising tool for **charcoal density** and **taxa distribution** visualization.
- GIS applied on charcoal distribution by size-classes and fungal Alteration Levels can provide further insight into the nature of the **last firewood used in combustion features**.
- Charcoal assemblages from black layers and scattered contexts should be spatially analyzed to obtain a more holistic **understanding of palimpsest deposits**.

RESULTS & DISCUSSION

Charcoal size plotting

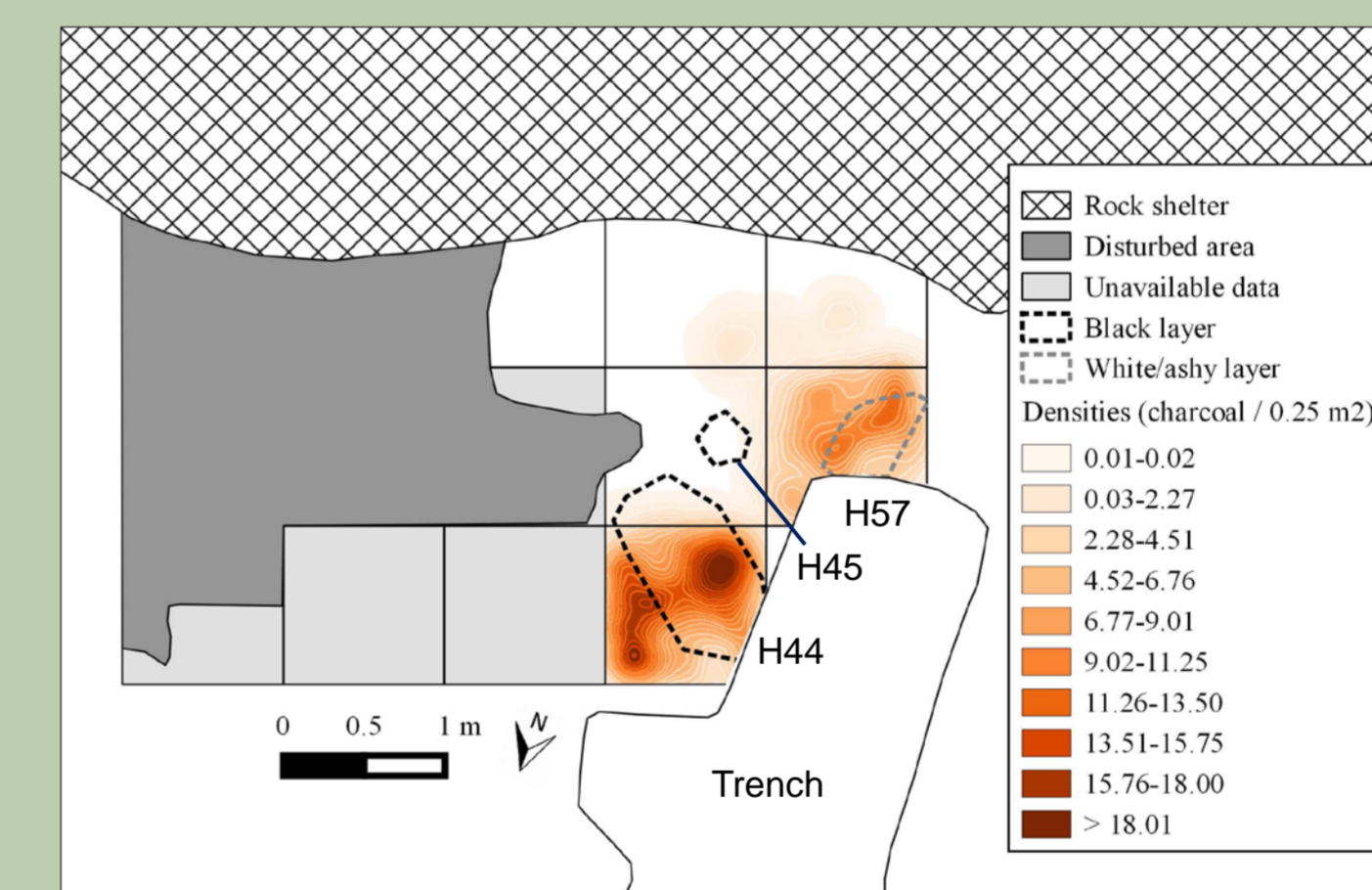
A differential spatial pattern by charcoal size-classes is observed. **Larger fragments** (> 4 mm & 2-4 mm) are spatially distributed **around feature H57**, while **smaller charcoal remains** (1-2 mm & < 1 mm) are concentrated **inside and close to the combustion features**.

Larger fragments (> 4 mm & 2-4 mm)



Could the spatial location of the larger charcoal remains be related to **social practices linked to feature H57** (hearth cleaning and management)?

Smaller fragments (1-2mm & < 1 mm)

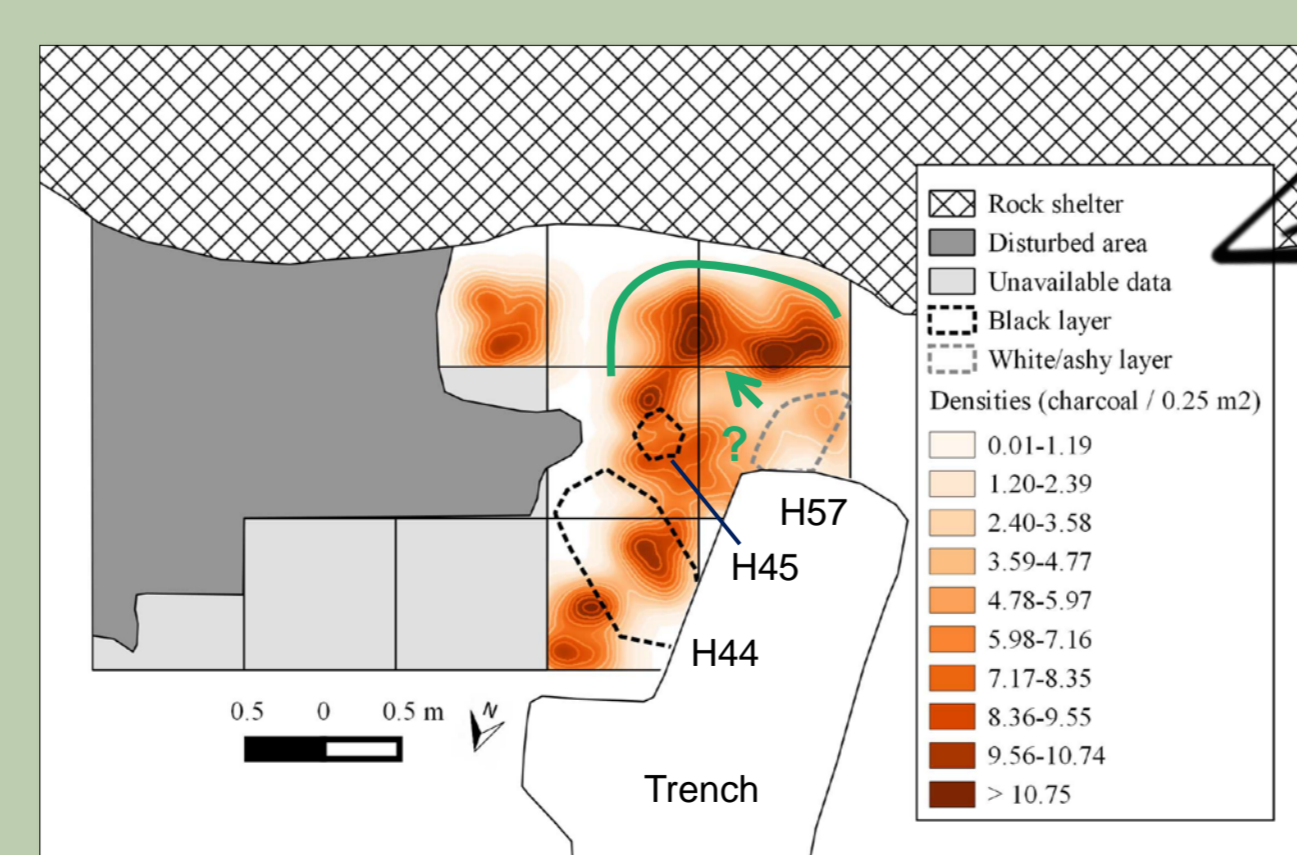


Could the concentration of the smallest remains be due to **charcoal fragmentation derived from fire processes** (H57 and H44)?

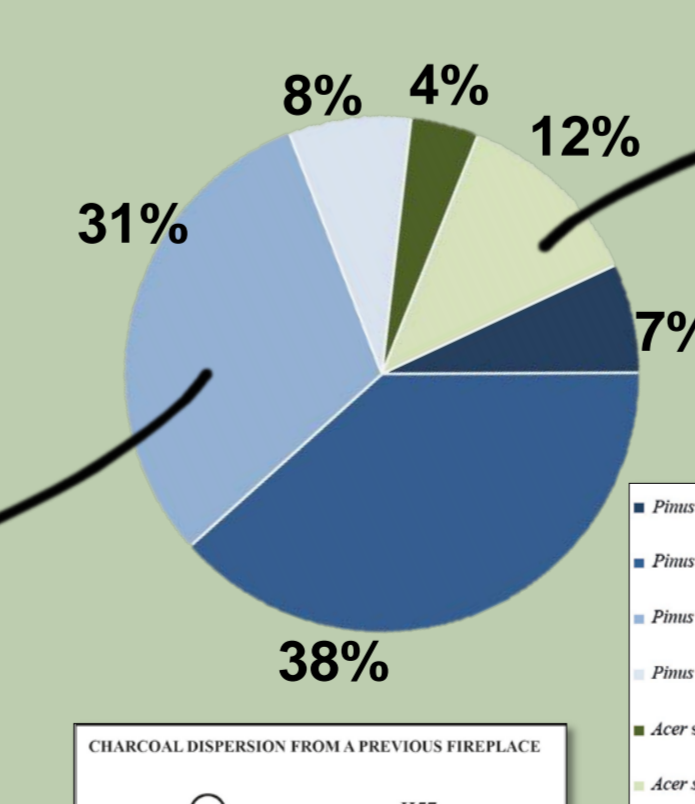
Fungal alterations plotting

Spatial distribution of degraded *Pinus nigra-sylvestris* and *Acer sp.* scattered fragments could be linked to its **spread from feature H57**.

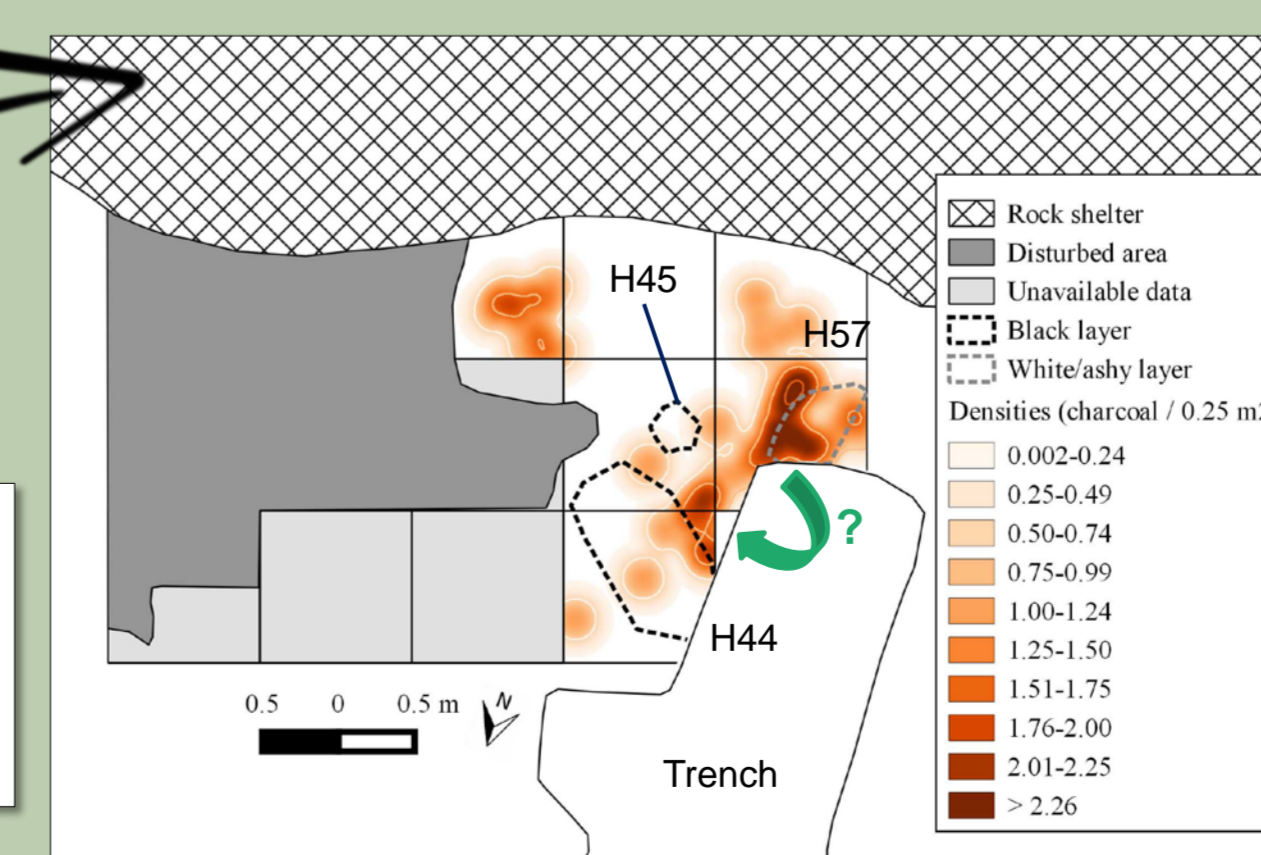
Pinus nigra-sylvestris charcoal remains Alteration Level 2



H57 firewood remains



Acer sp. charcoal remains Alteration Level 1



Charcoal fragments from **black layers** of features H44 and H45 may be deposited during **previous combustion events** (e.g. H57)

REFERENCES

- VAQUERO, M., PASTÓ, I., 2001. The definition of spatial units in Middle Palaeolithic sites: the hearth-related assemblages. *Journal of Archaeological Science* 28, 1209–1220.
- MALLOL, C., HERNÁNDEZ, C.M., CABANES, D., SISTIAGA, A., MACHADO, J., RODRÍGUEZ, Á., PÉREZ, L., GALVÁN, B., 2013. The black layer of Middle Palaeolithic combustion structures. Interpretation and archaeostratigraphic implications. *Journal of Archaeological Science* 40, 2515–2537.
- HENRY, A., THÉRY-PARISOT, I., 2014. From Evenk campfires to prehistoric hearths: charcoal analysis as a tool for identifying the use of rotten wood as fuel. *Journal of Archaeological Science* 52, 321–336.
- VIDAL-MATUTANO, P., HENRY, A., THÉRY-PARISOT, I. Dead wood gathering among Neanderthal groups: charcoal evidence from Abric del Pastor and El Salt (Eastern Iberia), submitted for publication.
- VIDAL-MATUTANO, P., HERNÁNDEZ, C.M., GALVÁN, B., MALLOL, C., 2015. Neanderthal firewood management: evidence from Stratigraphic Unit IV of Abric del Pastor (Eastern Iberia). *Quaternary Science Reviews* 111, 81–93.

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