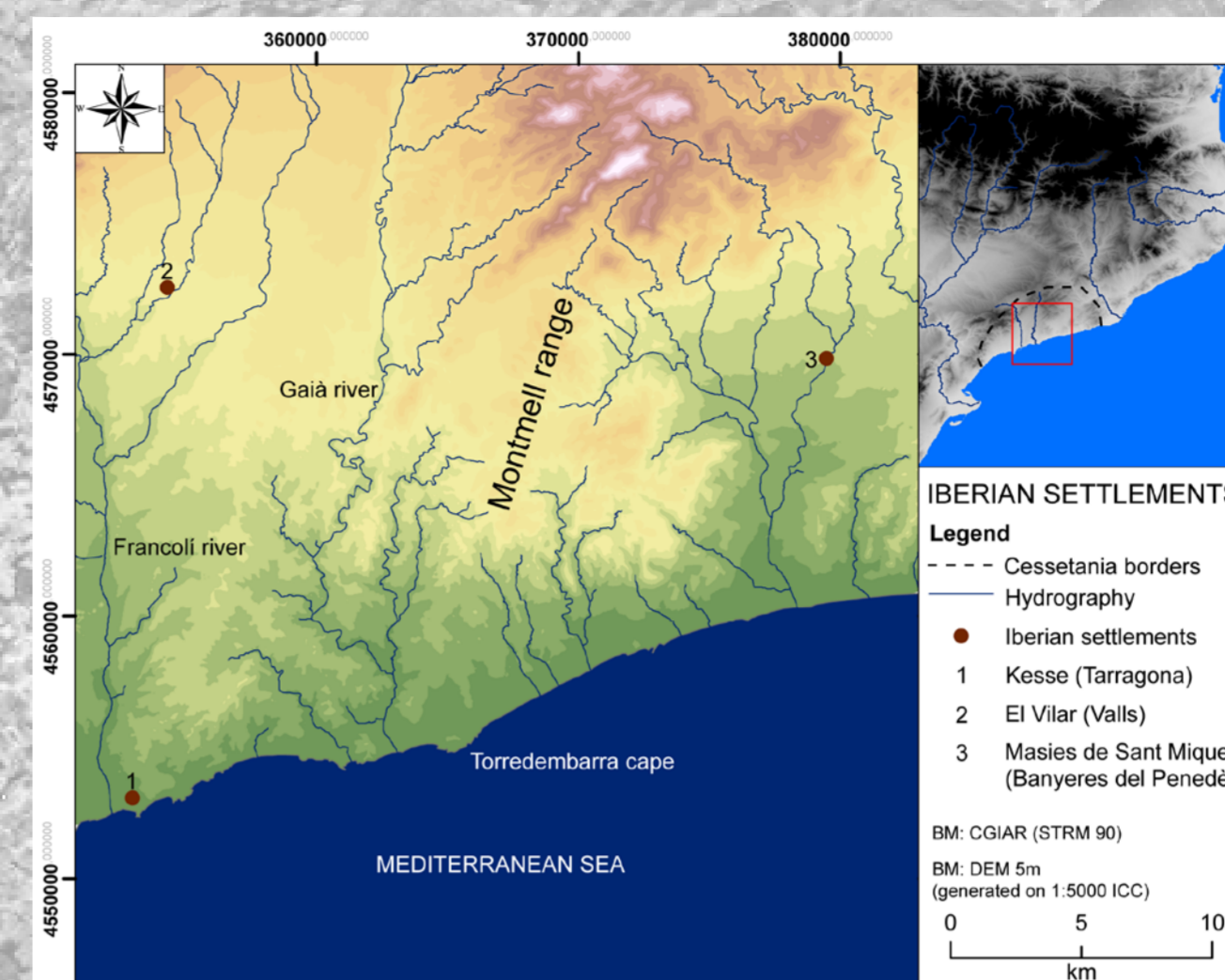
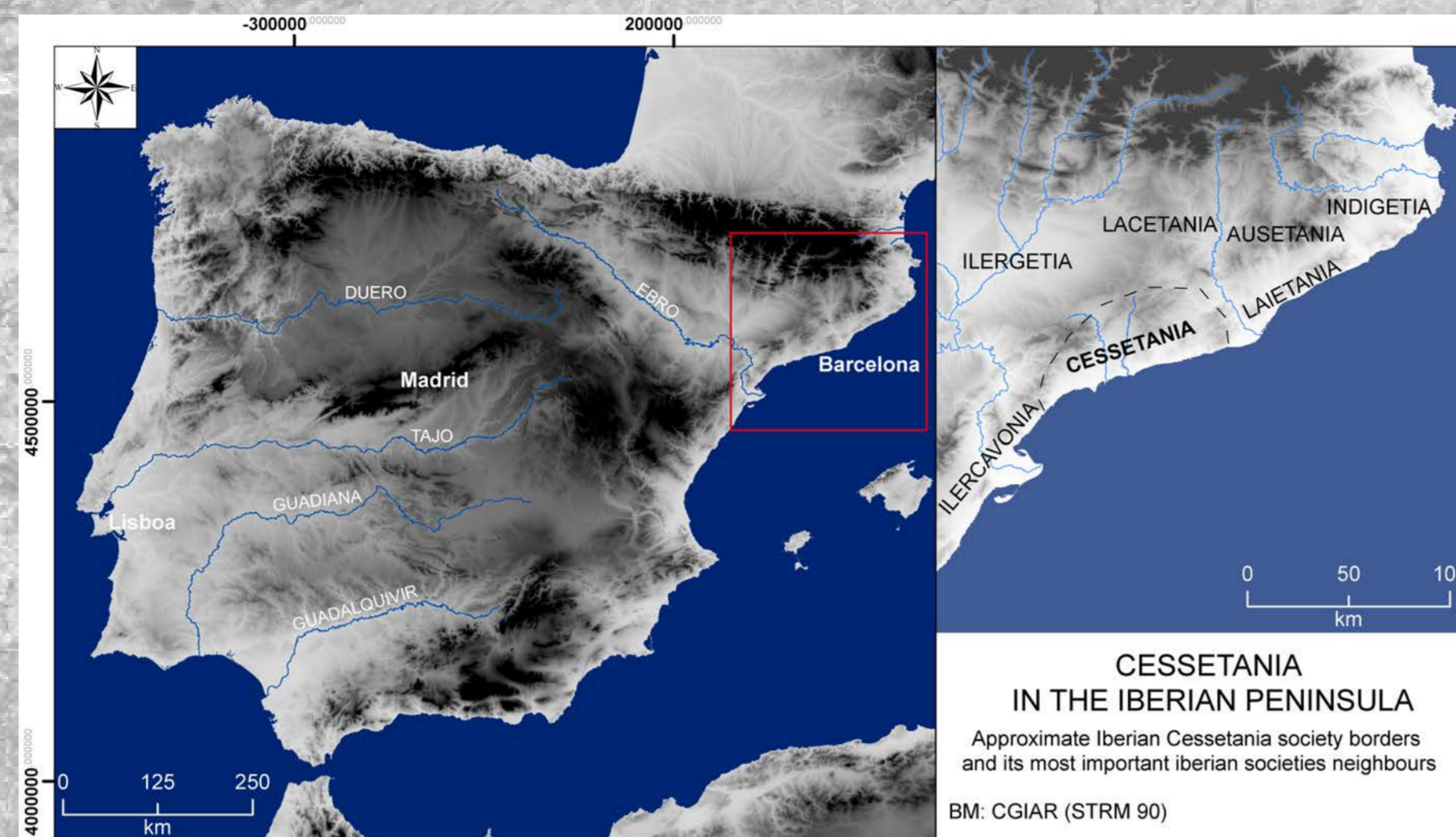


# SIMULATED PATHS, REAL PATHS? THE STUDY CASE OF IBERIAN CESSETANIA (IRON AGE SOCIETY)

## INTRODUCTION

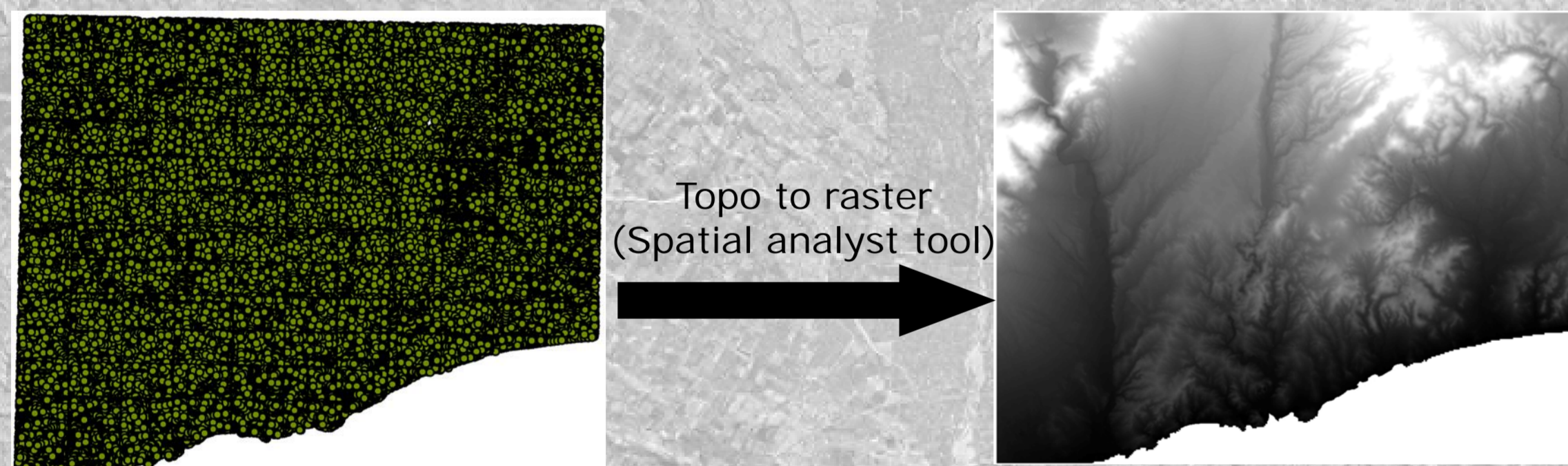
Cessetania was one Iberian early state located at north-east of the Iberian Peninsula (1). Early states appeared as a result of the Last Bronze age societies evolution to most complex and hierarchy kind of settlement, developed from 6th century BC to 2nd century BC. Our aim is to study possible ancient paths in the Cessetania. In order to do this, we have chosen three important Iberian settlements (2 and 3), and we have tried to calculate LCR by some different methods. We have searched coincidences with real historical paths (that we knew mostly from Middle Ages). Our purpose was in one hand to prove the plausibility of the simulated paths, and in the other hand to research into the possibility that these historical paths could be reminiscent of ancient paths.



## METHODOLOGY

Software: ArcGIS 10

1. Generate 5x5 DEM from 1:5000 Topographic Map ICC (point)



2.a. Calculate Cost Surface from four classical algorithms

### Hiker

$$V = 6e^{-(3.5s + 0.05)} \quad V = \text{Velocity } s = \text{slope}$$

### Silva & Pizzolo

Effective Friction = stated friction  $[f]$

$$f = \cos^k \Delta \alpha$$

$k$  = user defined coefficient (foot movement  $k = 2$ )

$\Delta \alpha$  = difference angle between the direction of the movement that incurs the maximum friction and the direction of movement being considered.

### Pandolf

$$M = 1.5W + 2.0(W+L)(L/W)^2 + N(W+L)(1.5V^2 + 0.35V \cdot \text{abs}(G+6))$$

$L = 4 \text{ kg}$     $V = 5 \text{ km/h}$     $N = \text{Terrain factor (rivers)}$

$W = 60 \text{ kg}$     $G = \text{Slope}$

### Van Leusen

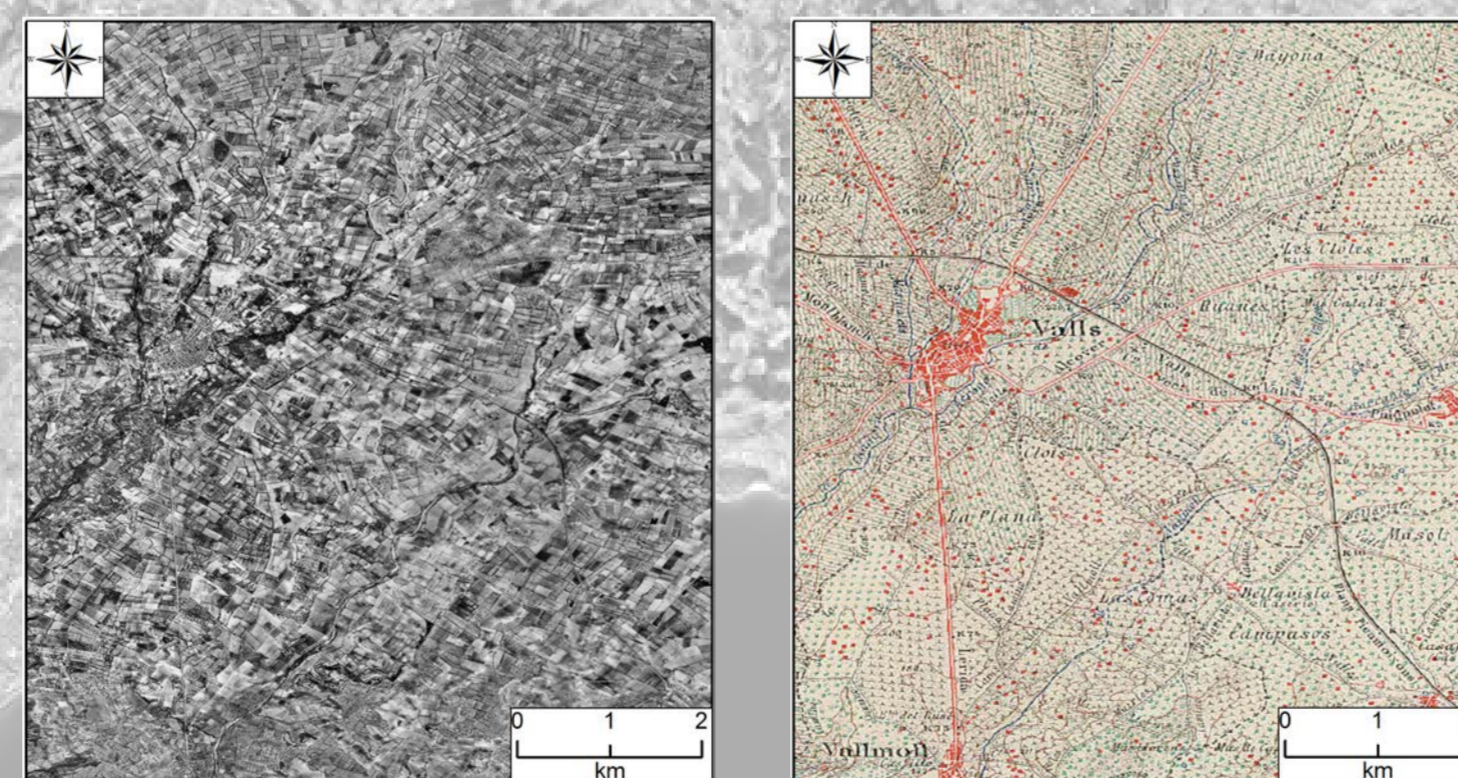
$$M = 105.483 + 255.44N + 124.32NG$$

Adapted algorithm from Pandolf.

$W = 70 \text{ kg}$     $L = 4 \text{ kg}$     $V = 4.8 \text{ km/h}$     $N = \text{Terrain factor (rivers)}$     $G = \text{Slope}$

2.b. Historical paths research

- Ancient aerial photography and maps



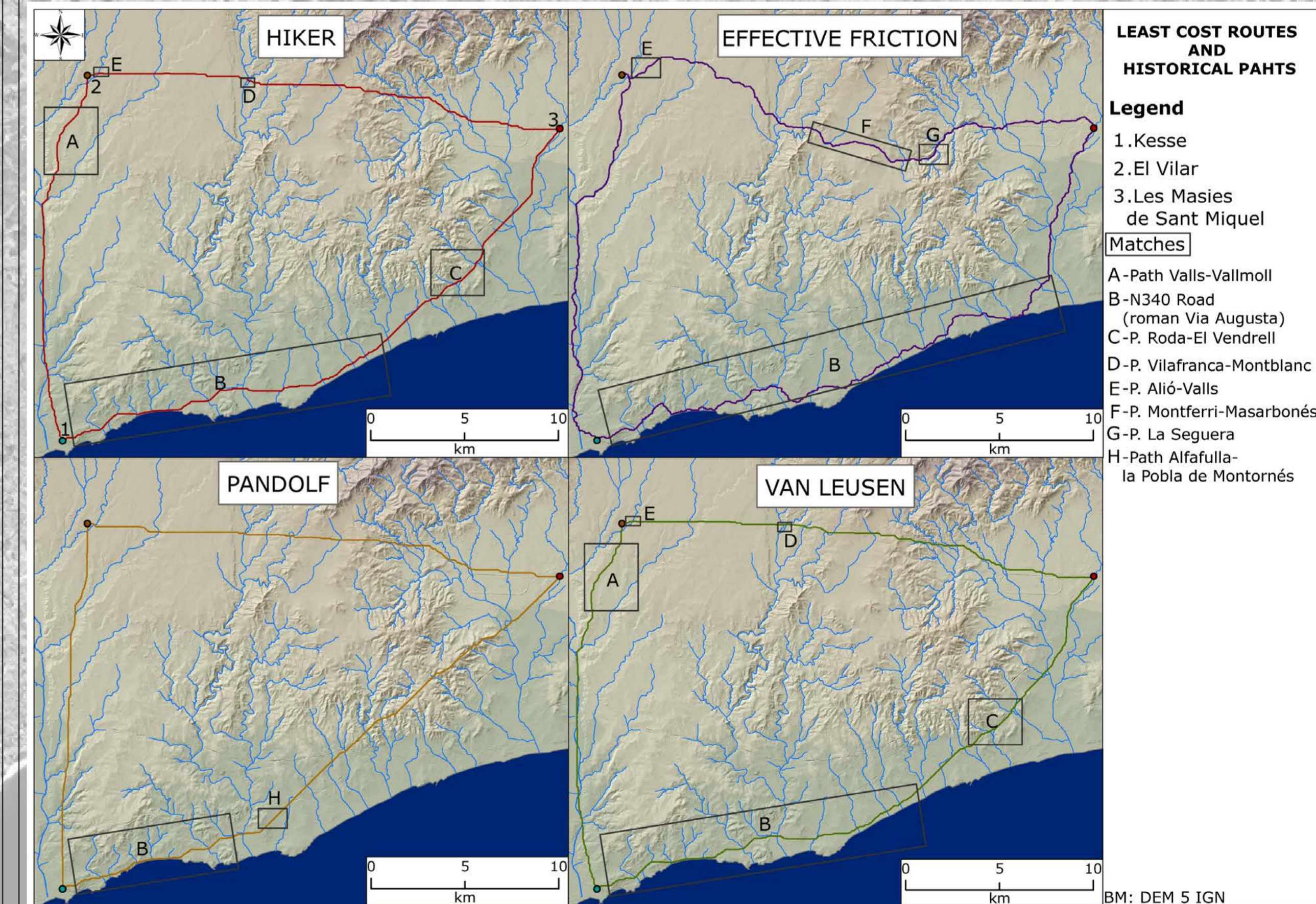
Valls (Tarragona) zone

(Left: American flight 1956 ICC Right 1:50.000 First edition IGN)

- Ancient paths books

- Archivistic research

## RESULTS



## CONCLUSIONS

This initial research has generated few results and a lot of questions. We will carry on working to search other LCR model, which adapts better to the particularities of irregular Mediterranean landscape, with important altitude differences in short distances and short watercourses. In the other side, the study of the historical paths has some difficulties. We can precise so well the existence of certain paths from medieval age, but it is complicated to argue clearly that they could be older. We also used a DEM that was not precise enough to meet the needs of our investigation, therefore, in the future we will use a more appropriate kind of DEM. Despite all these difficulties, in the different LCR models we have found some coincidences, especially along the coast, therefore, we believe our research approach is right and a more developed work could obtain better results.