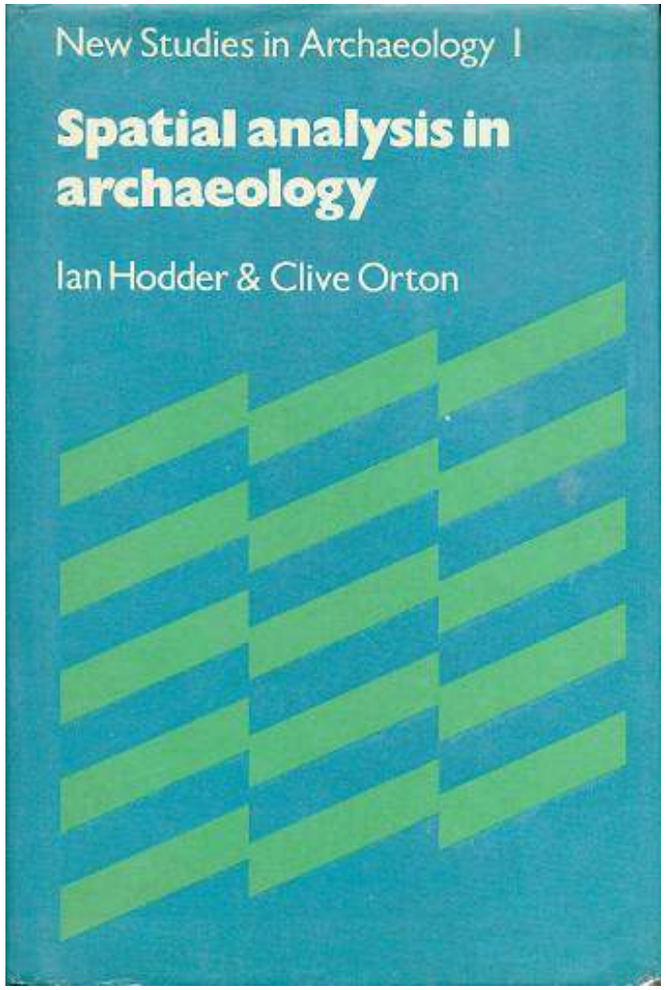
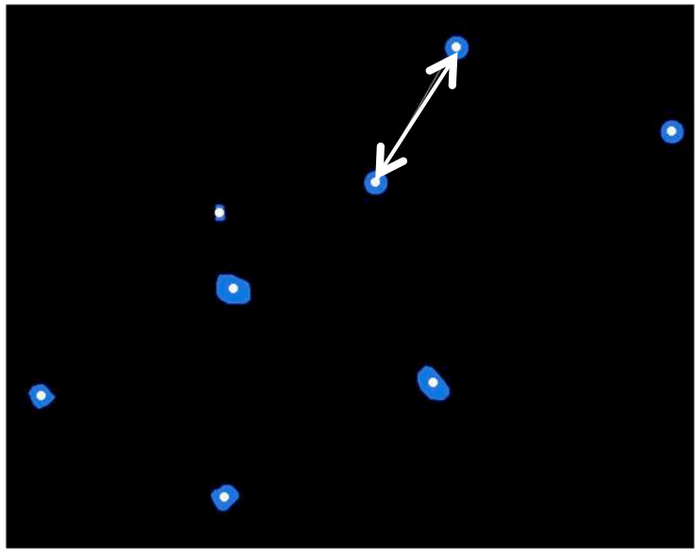
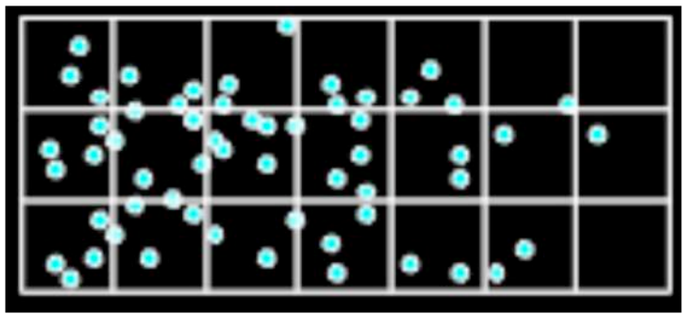
GIS in prostorska/ krajinska arheologija

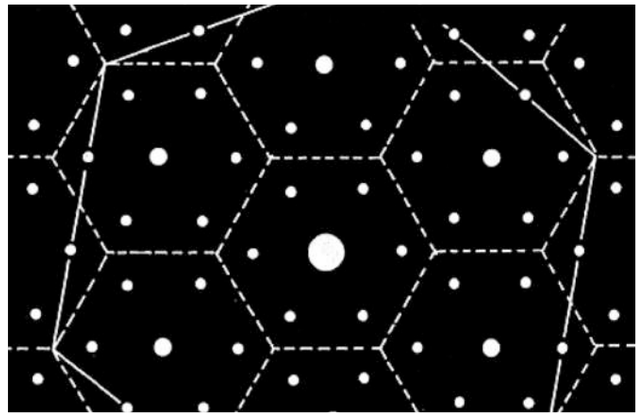


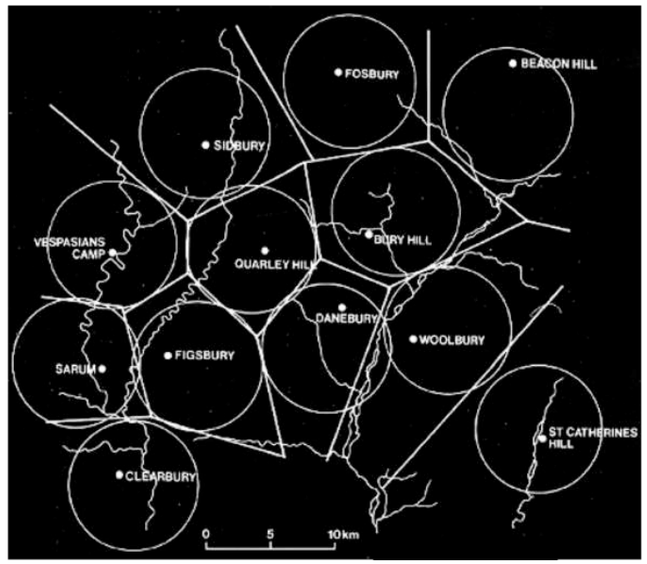
(1967)





Nearest neighbour distances and quadrat counts





Christaller models, buffers and Thiessen polygons

Vincent Gaffney and Zoran Stančič

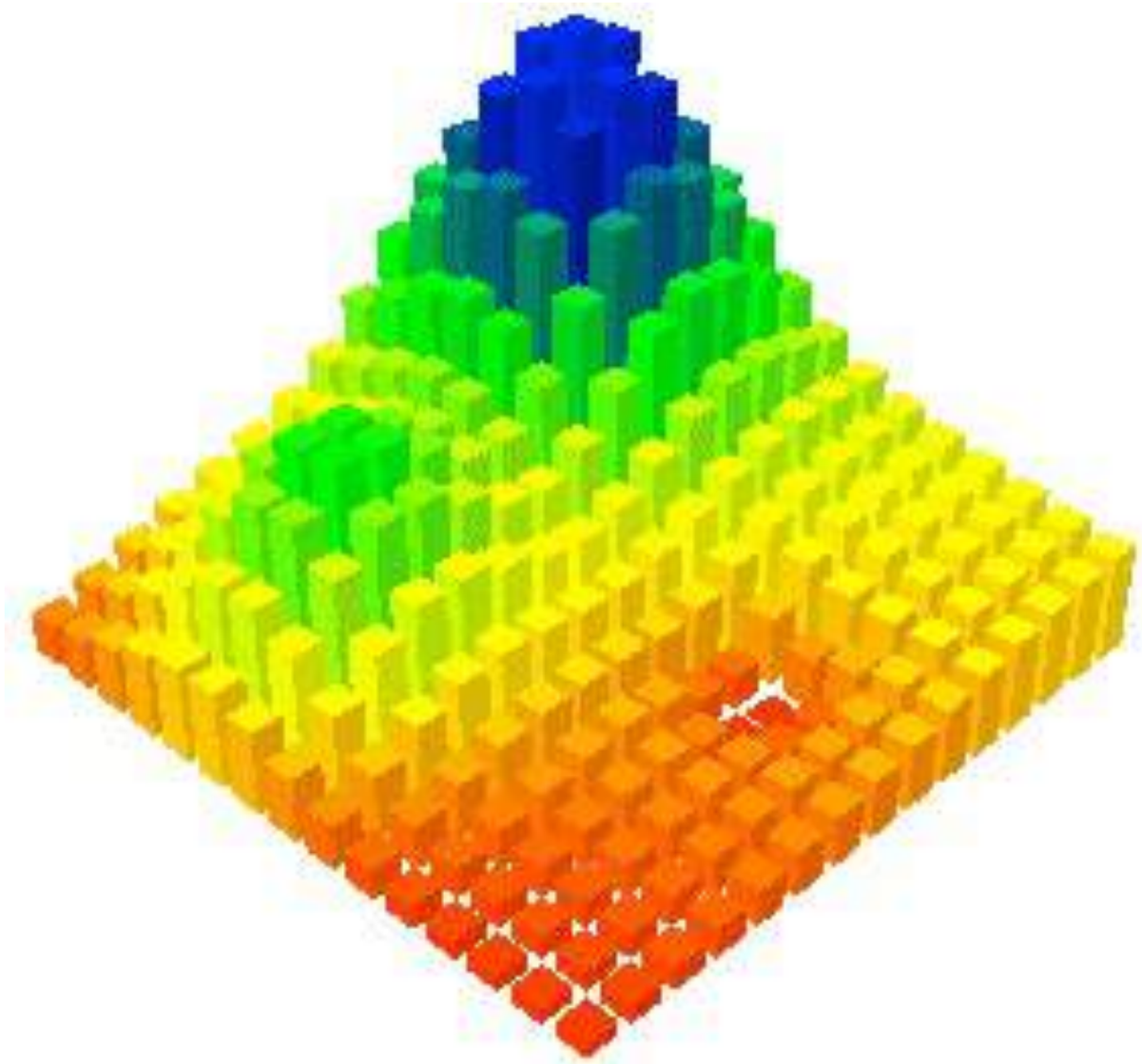
GIS approaches to regional analysis: A case study of the island of Hvar

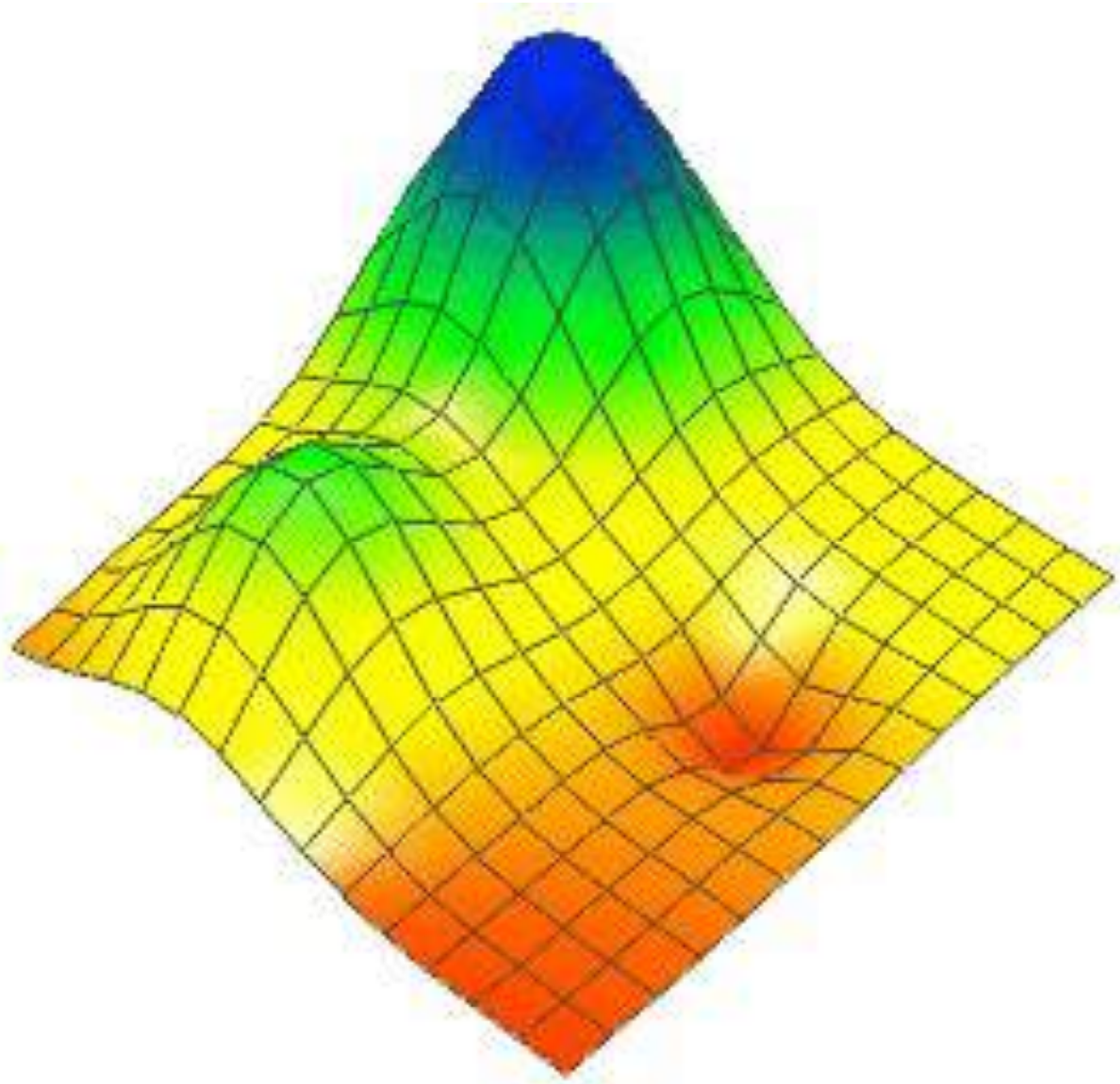
preface by Kenneth Kvamme

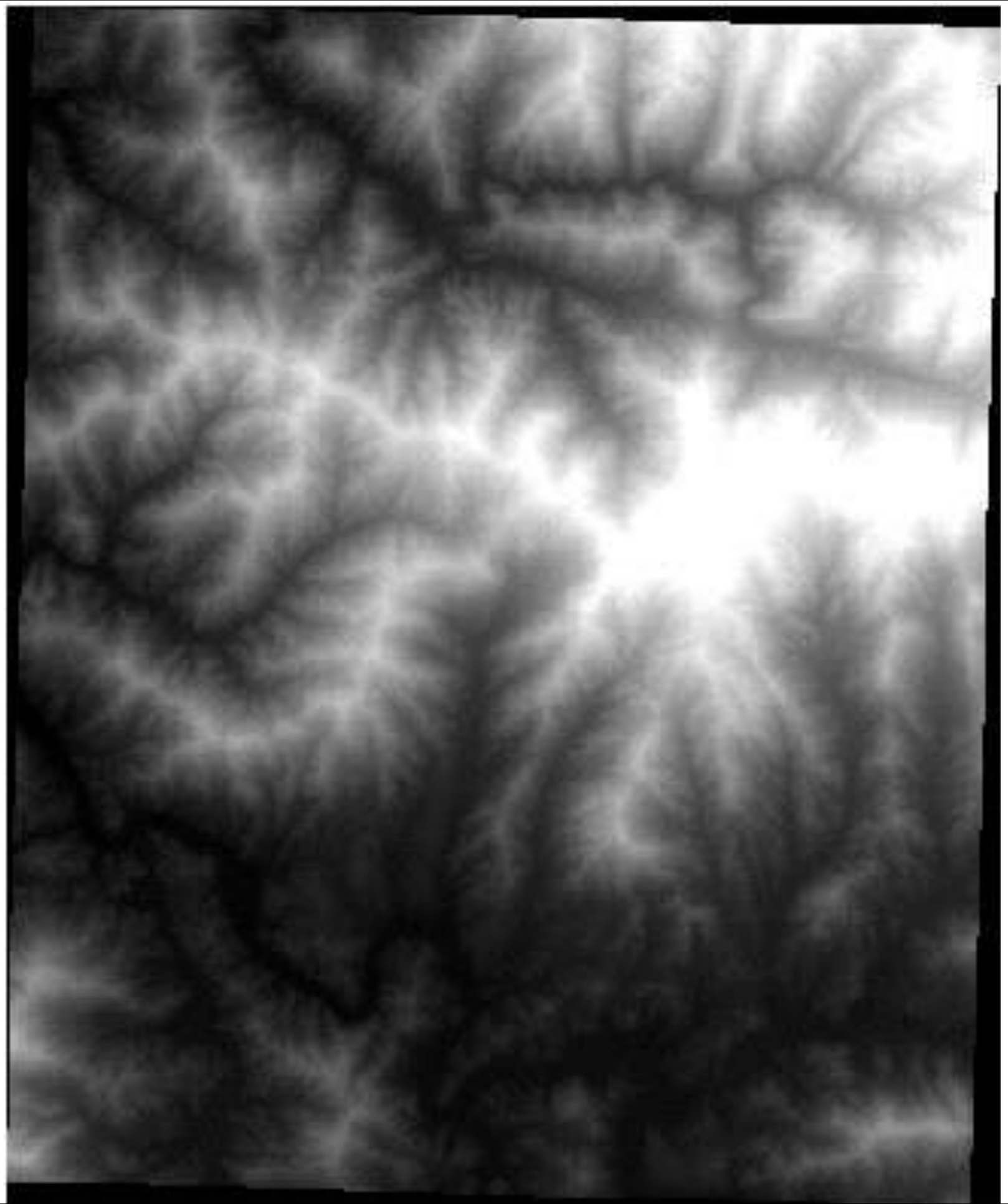
Ljubljana
1991

How raster DEM actually looks

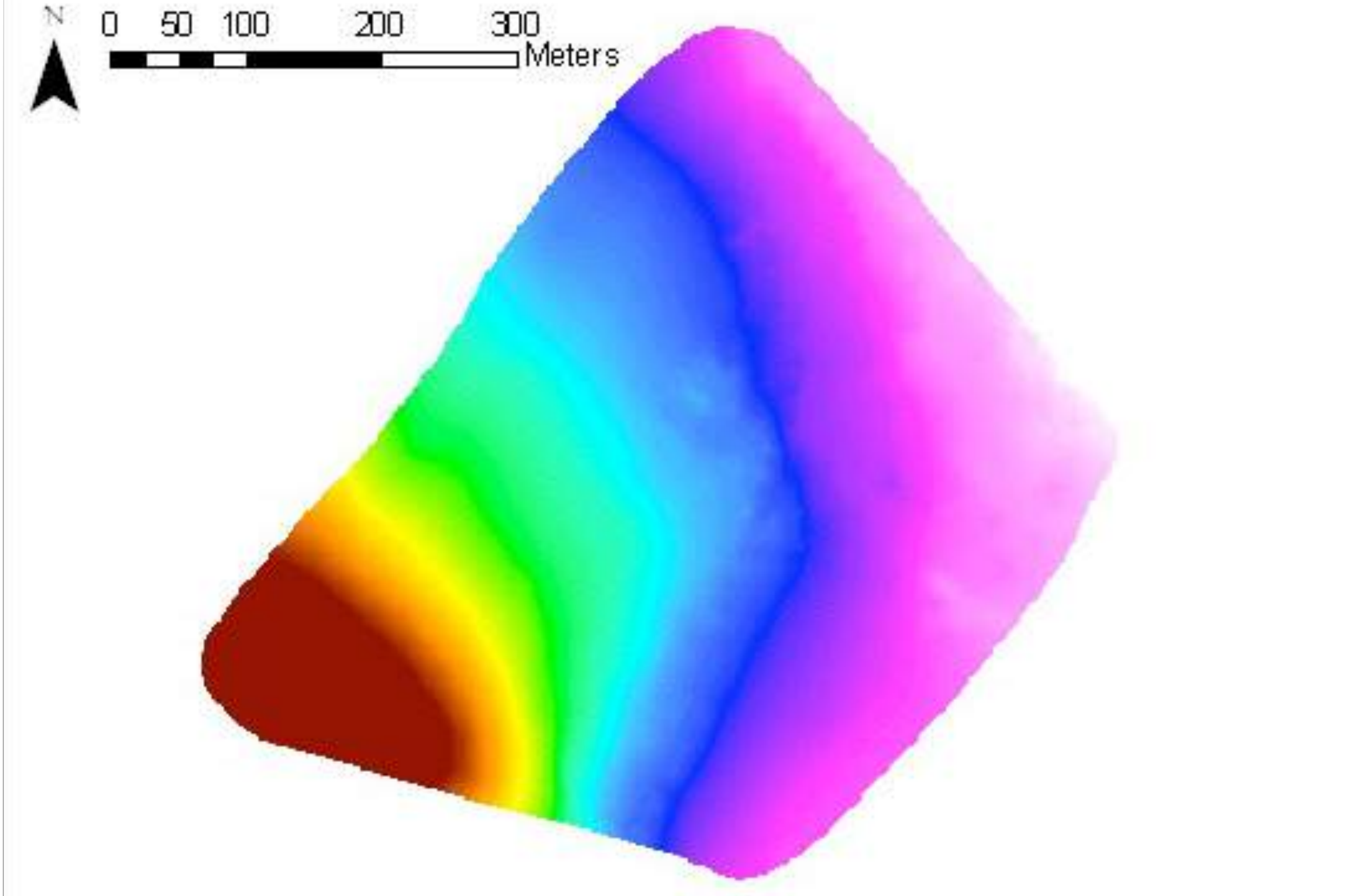
How do we think it look

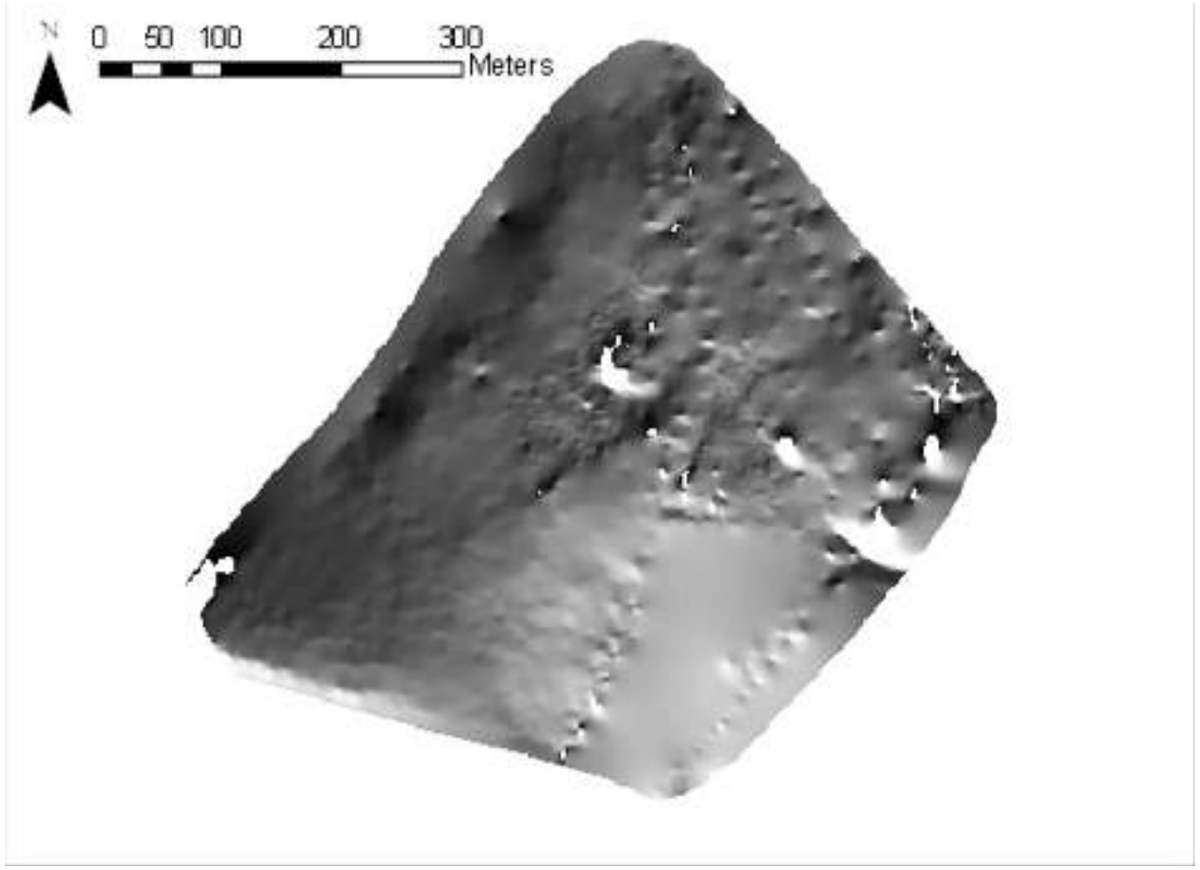


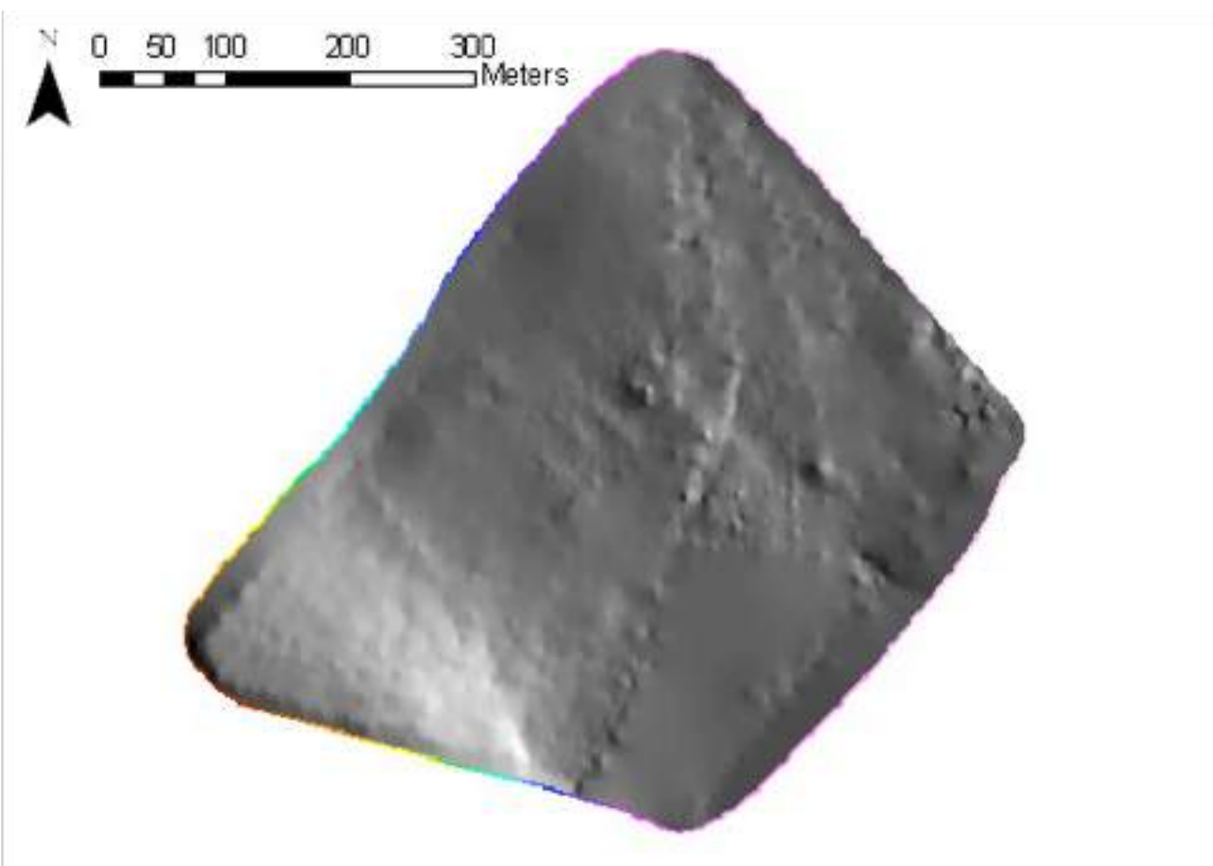


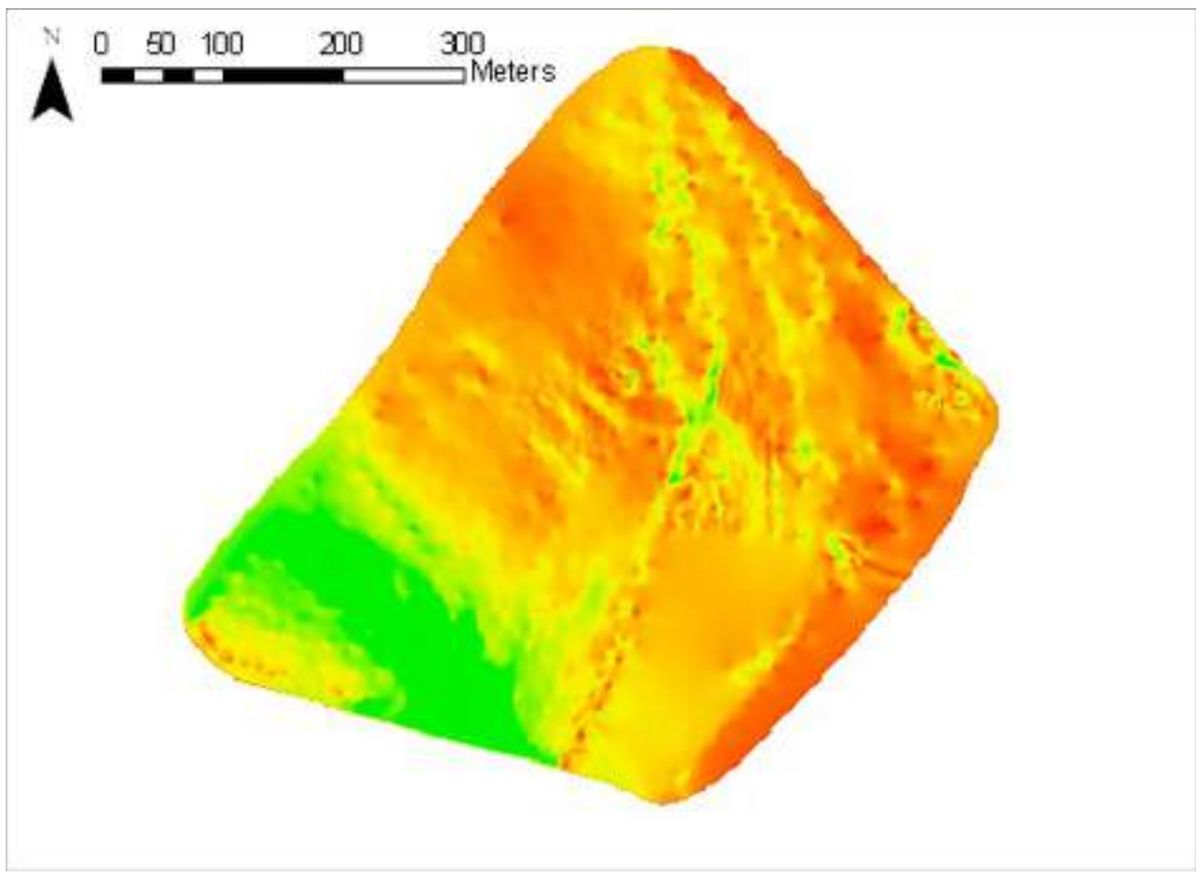


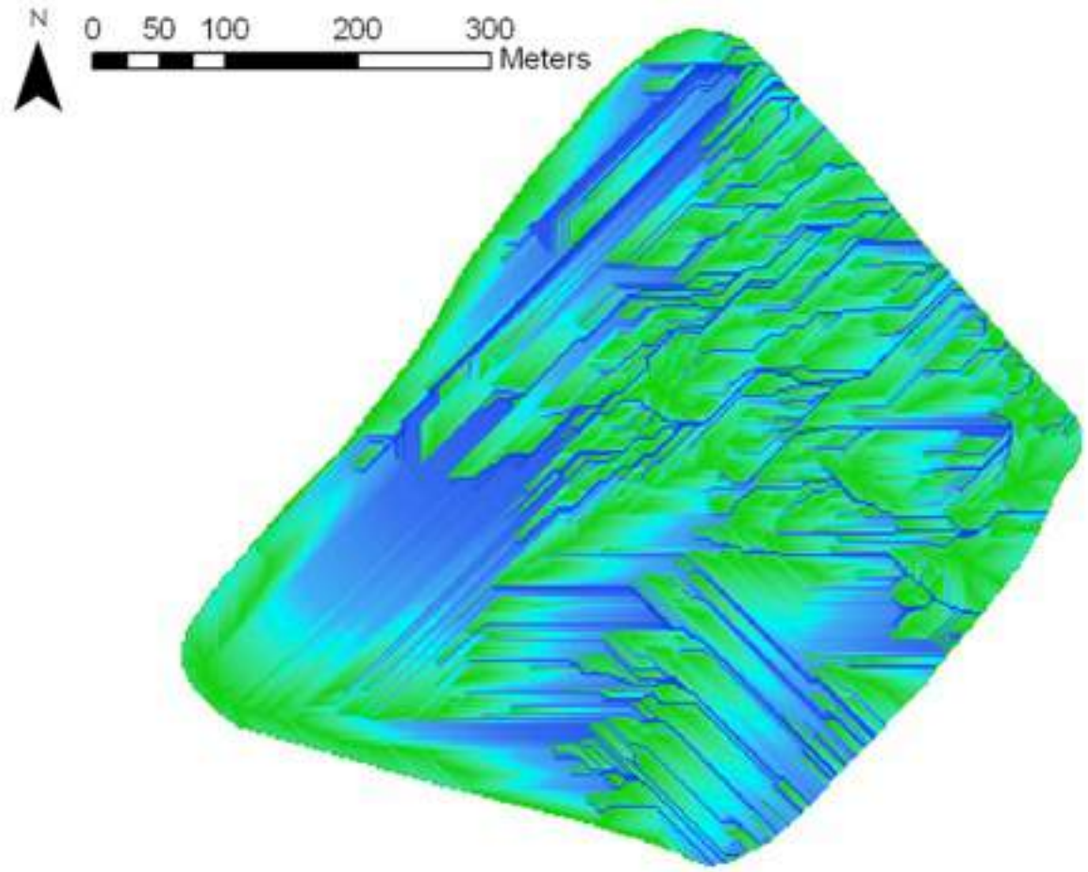
DMR

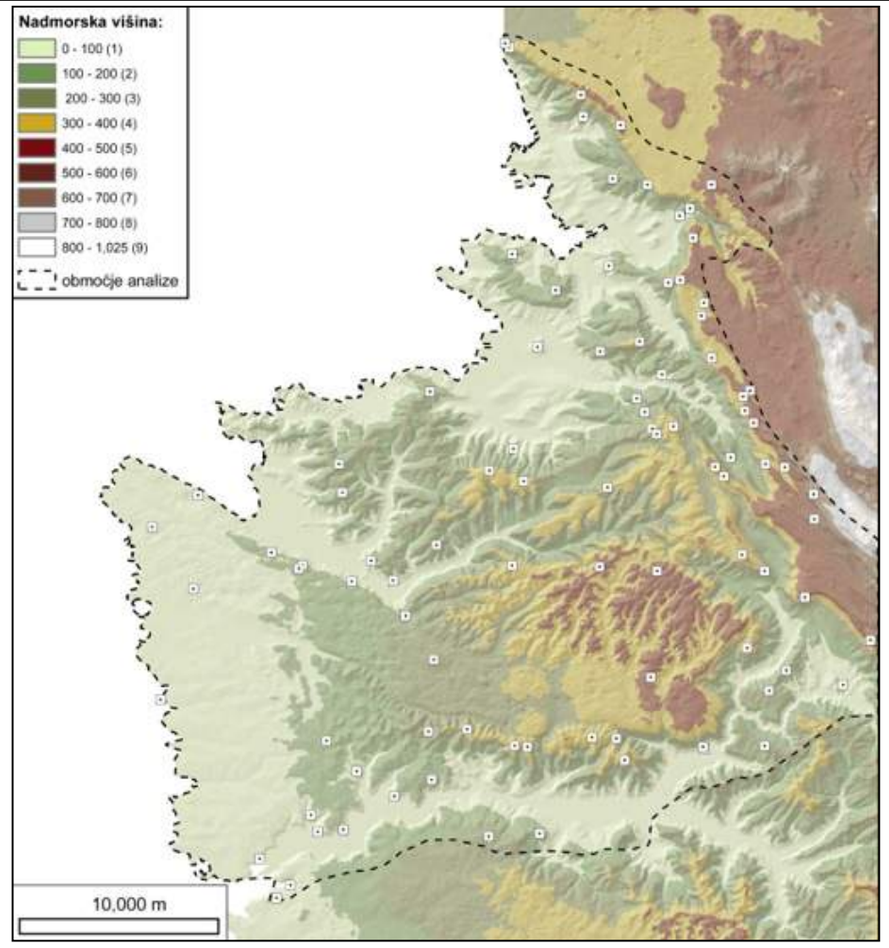

N
0
50
100
200
300
Meters

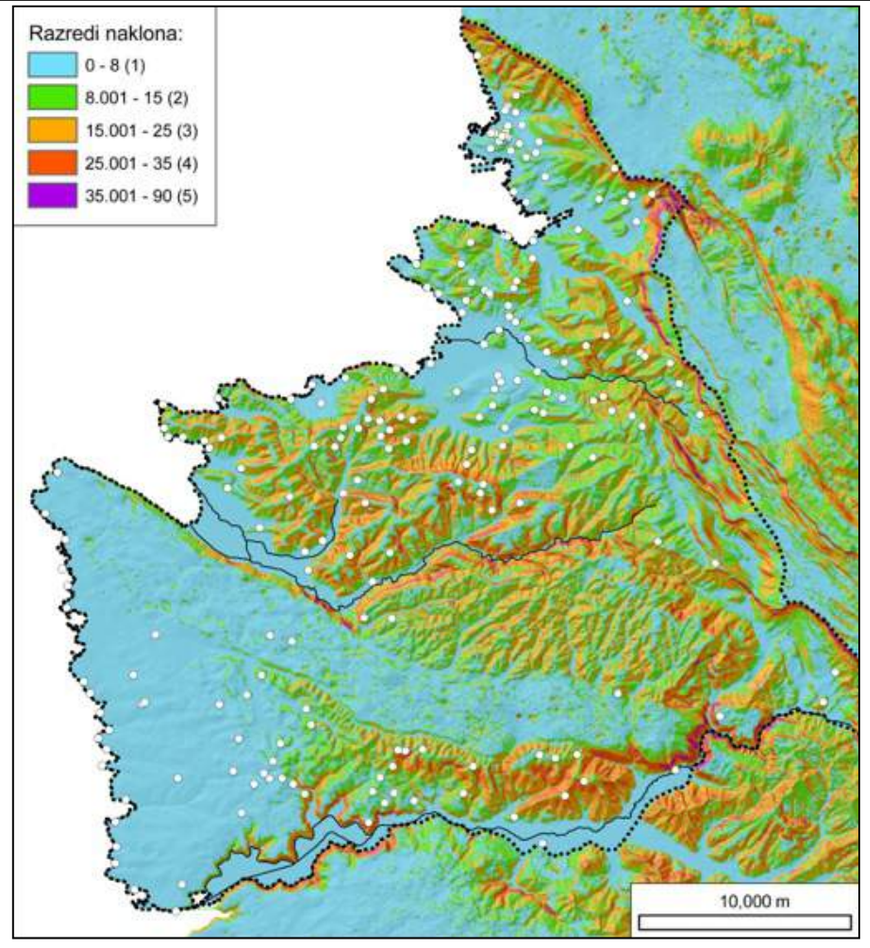

N
0 50 100 200 300
Meters

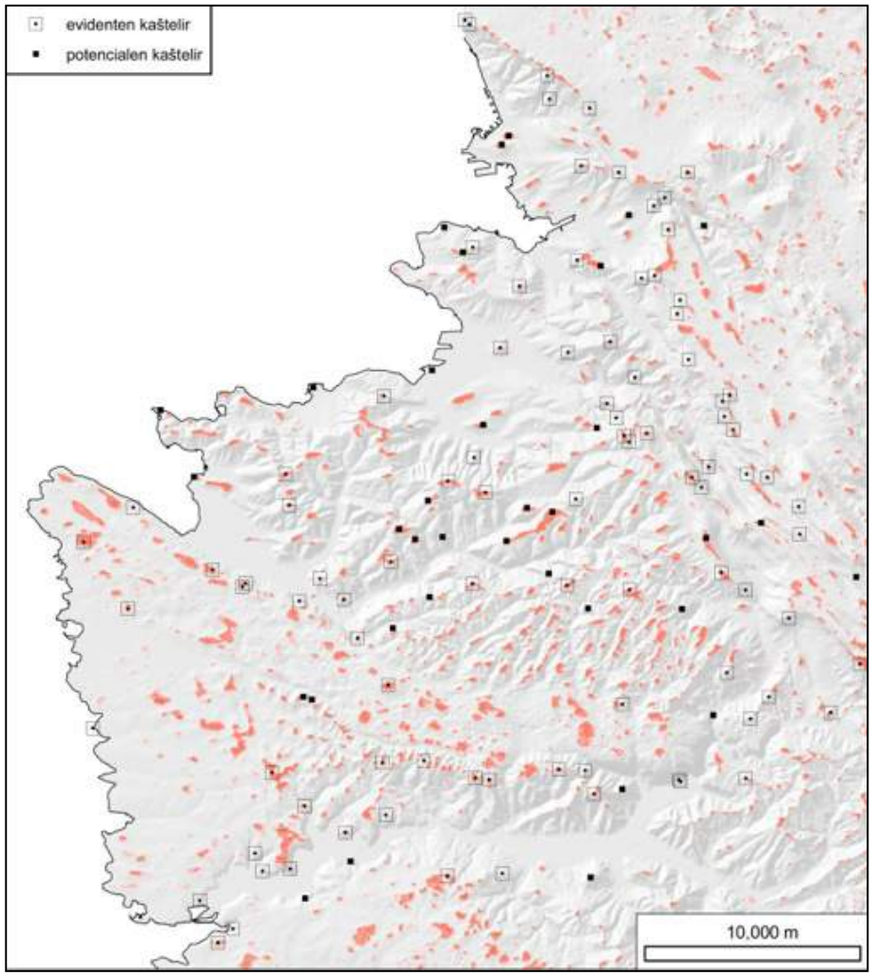

N
0 50 100 200 300
Meters

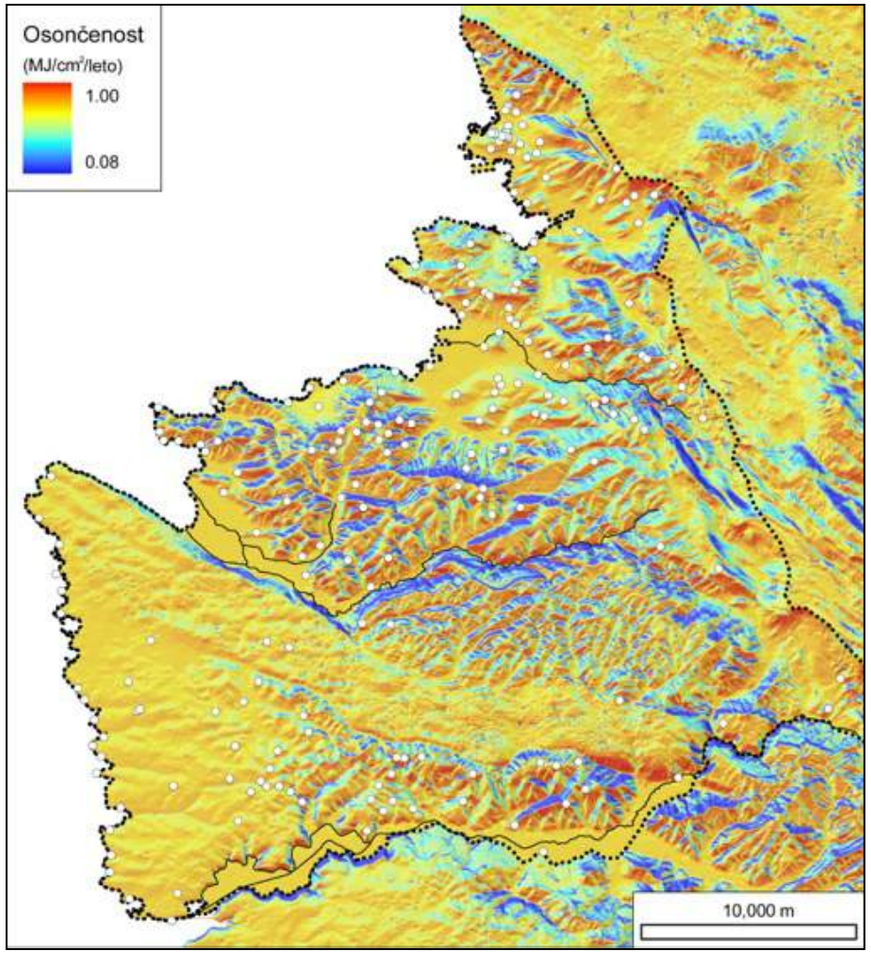

N
0 50 100 200 300
Meters

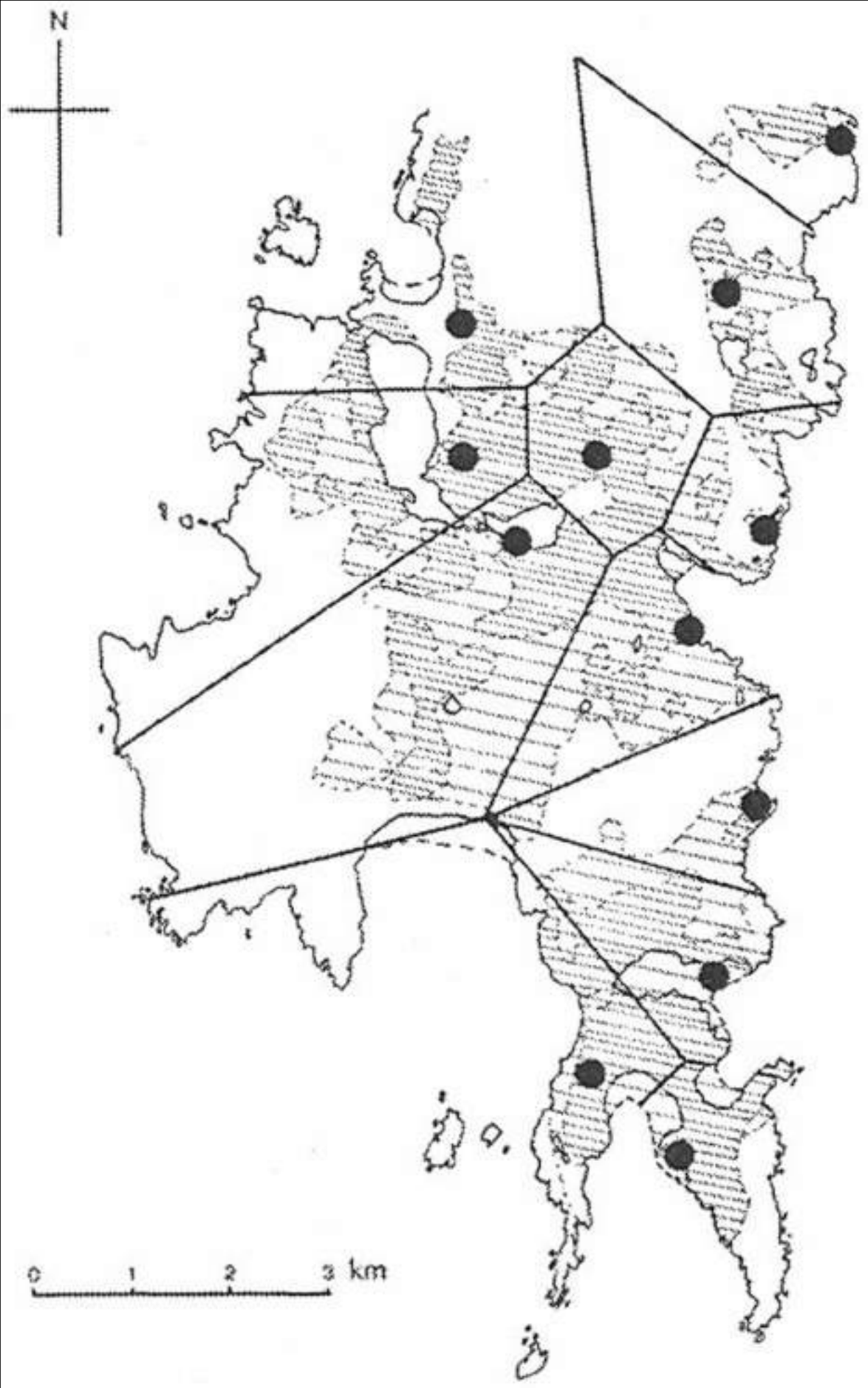

N
0 50 100 200 300
Meters

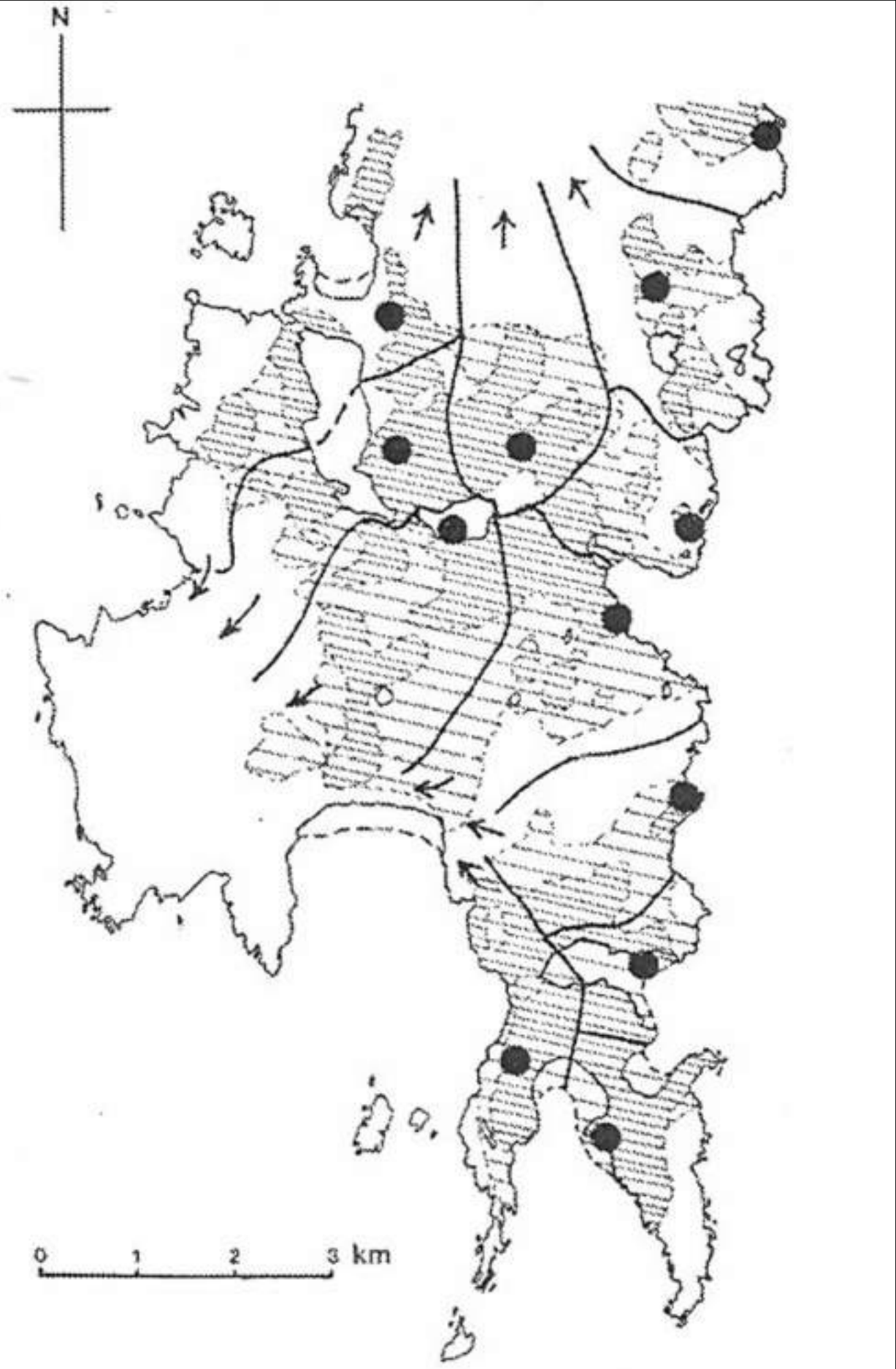

Nadmorska višina:
0 - 100 (1)
100 - 200 (2)
200 - 300 (3)
300 - 400 (4)
400 - 500 (5)
500 - 600 (6)
600 - 700 (7)
700 - 800 (8)
800 - 1,025 (9)
območje analize
10,000 m

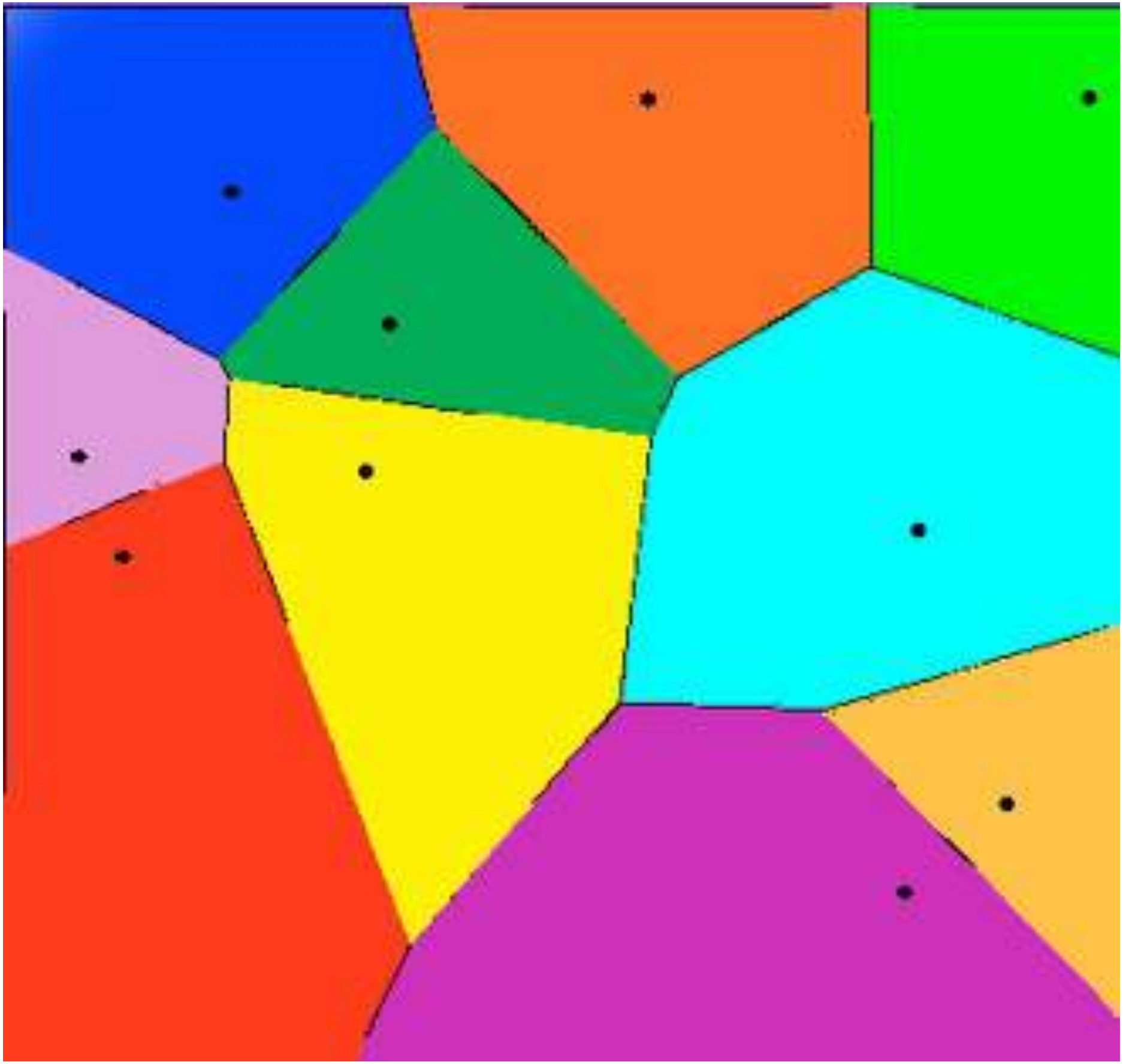

Razredi naklona:
0 - 8 (1)
8.001 - 15 (2)
15.001 - 25 (3)
25.001 - 35 (4)
35.001 - 90 (5)
10,000 m


evidenten kaštelir
potencialen kaštelir
10,000 m

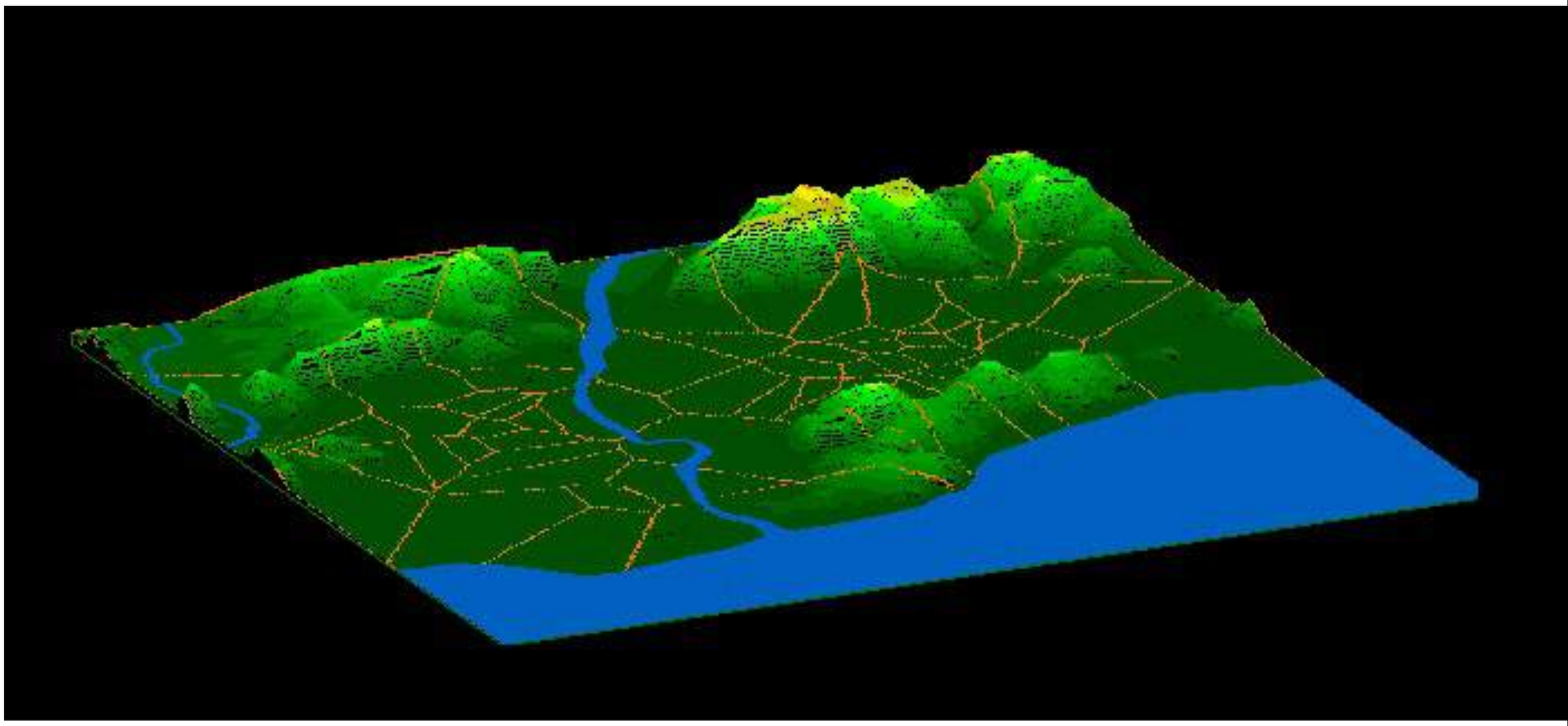

Osončenost
(MJ/cm²/leto)
1.00
0.08
10,000 m

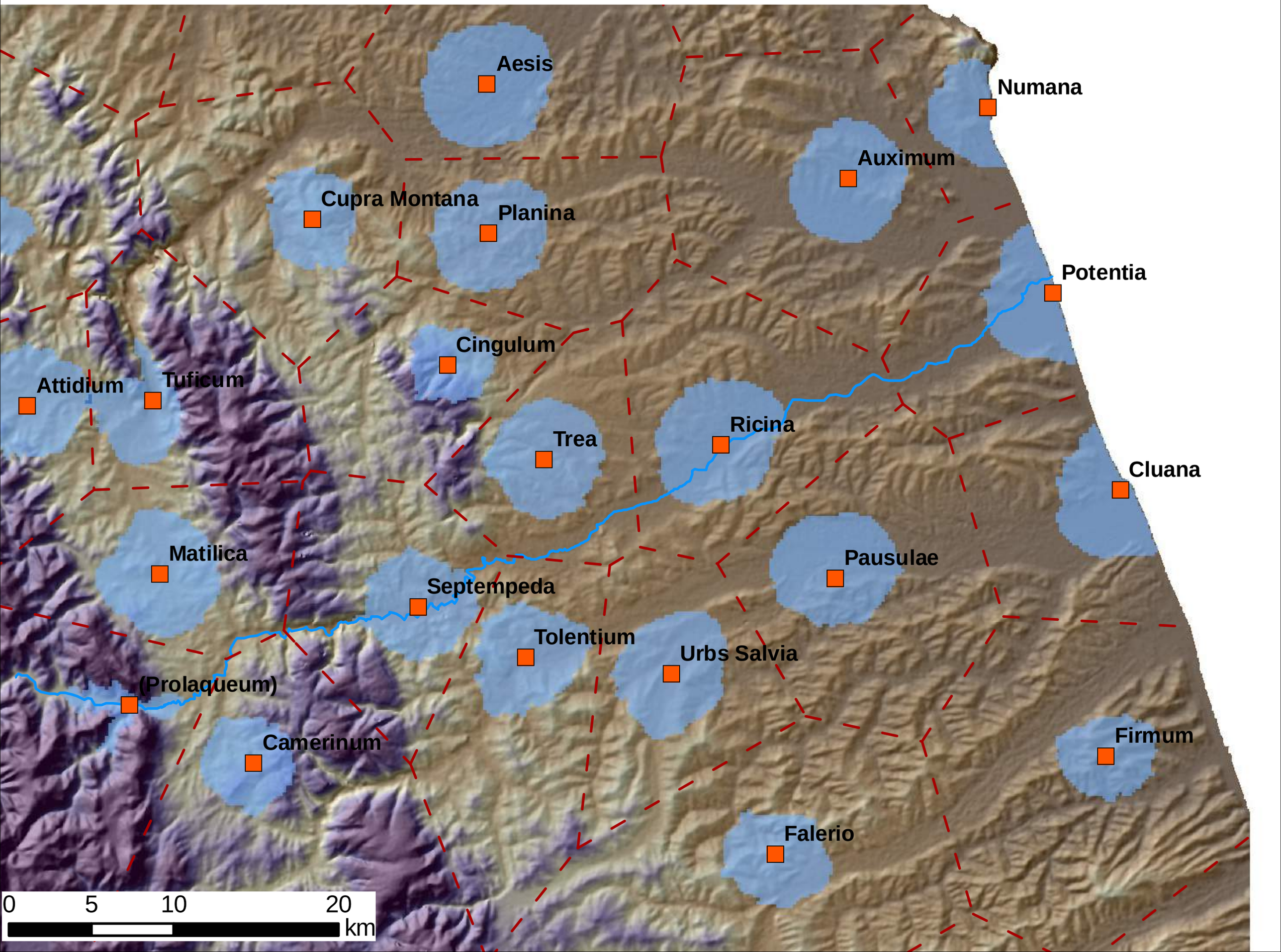

N
0
1
2
3 km


N
0
1
2
3 km

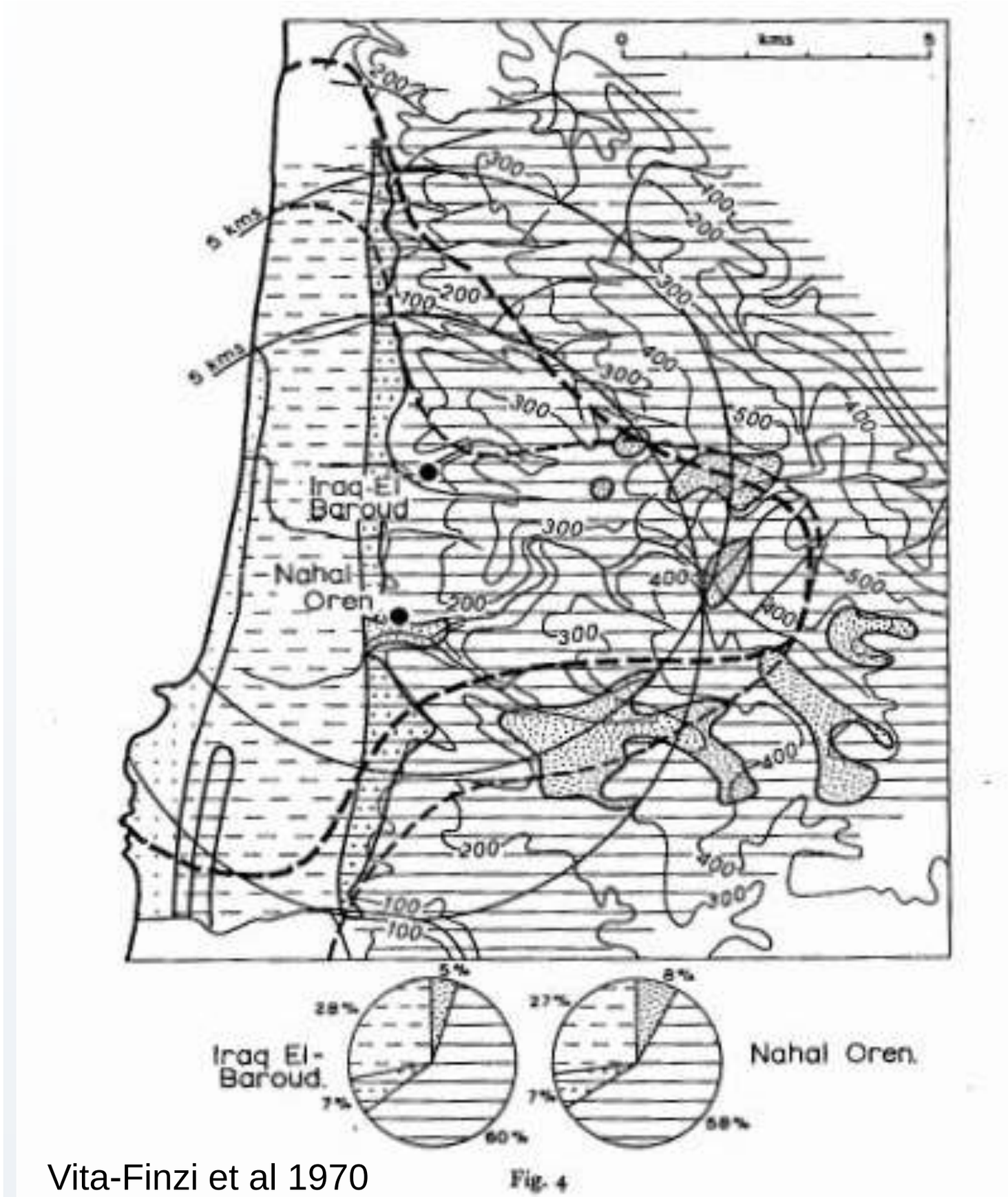


Thiessnovi poligoni




Aesis
Numana
Auximum
Cupra Montana
Planina
Potentia
Cingulum
Attidium
Tuficum
Ricina
Trea
Cluana
Matilica
Pausulae
Septempeda
Tolentium
Urbs Salvia
(Prolaqueum)
Camerinum
Firmum
Falerio
0
5
10
20
km

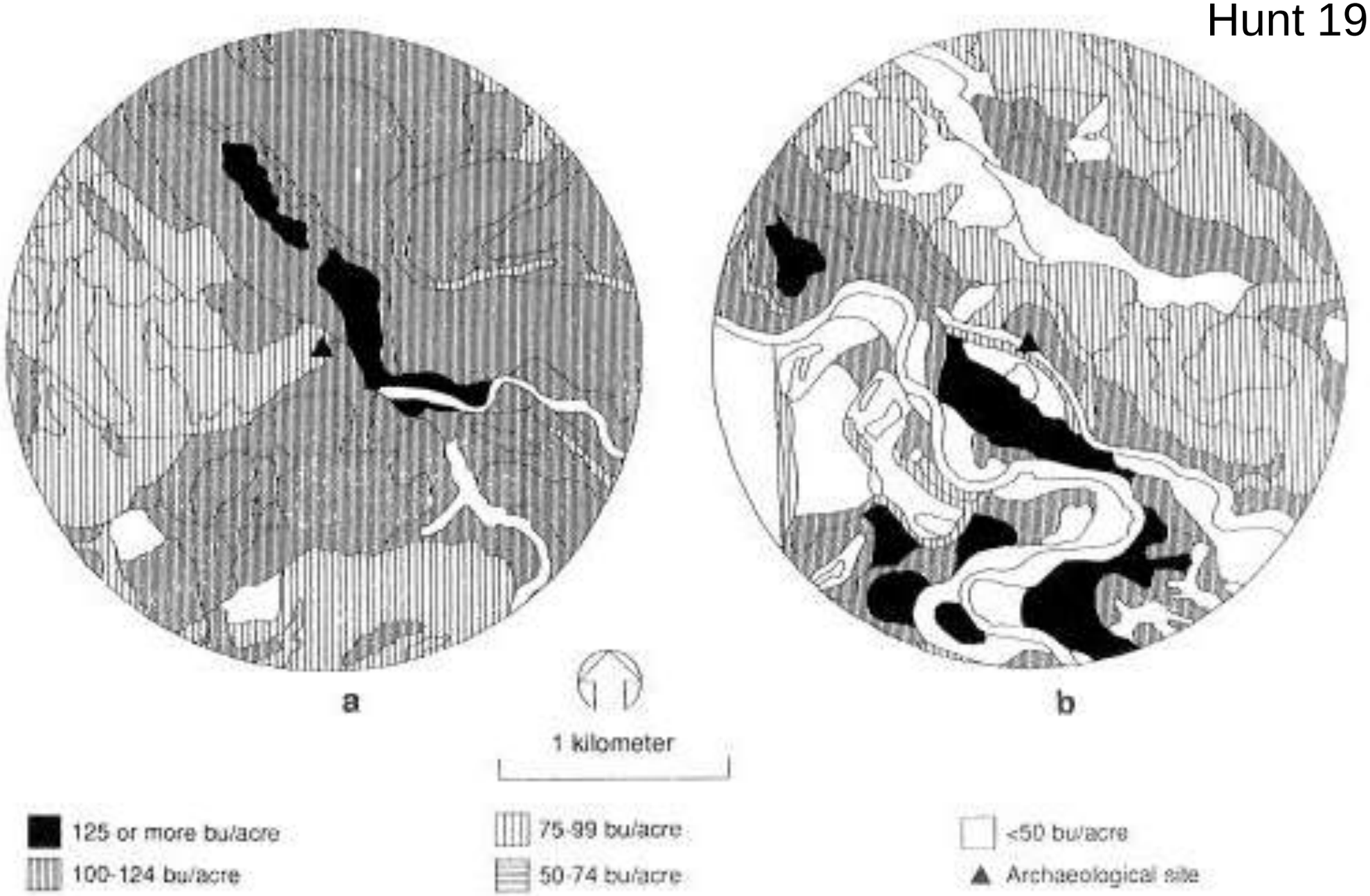
Site catchement/ najdiščno zajetje

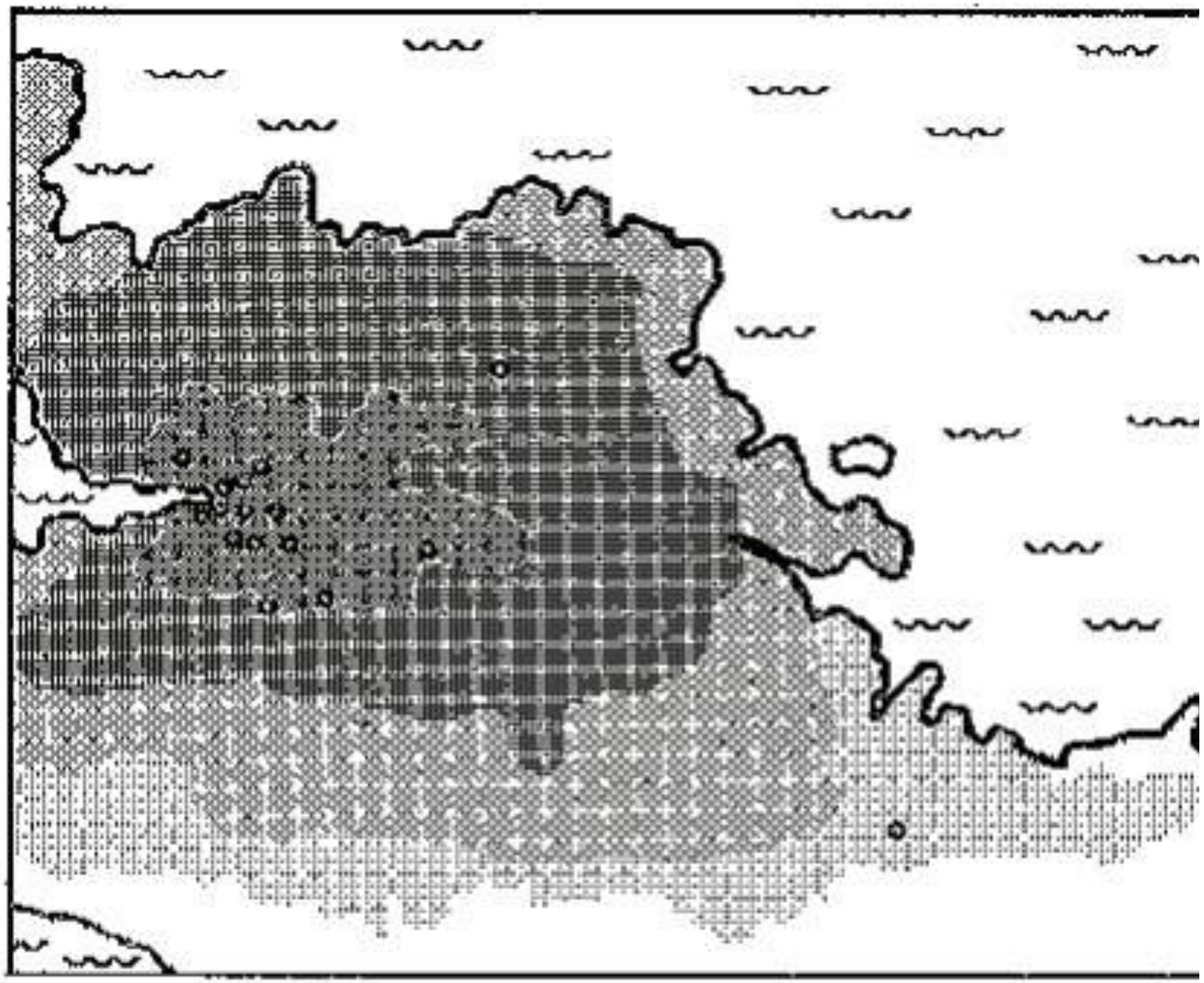


Vita-Finzi et al 1970

Fig. 4

Hunt 1992


a
b
1 kilometer
125 or more bu/acre
100-124 bu/acre
75-99 bu/acre
50-74 bu/acre
<50 bu/acre
Archaeological site



Greek sites

30 min. walk

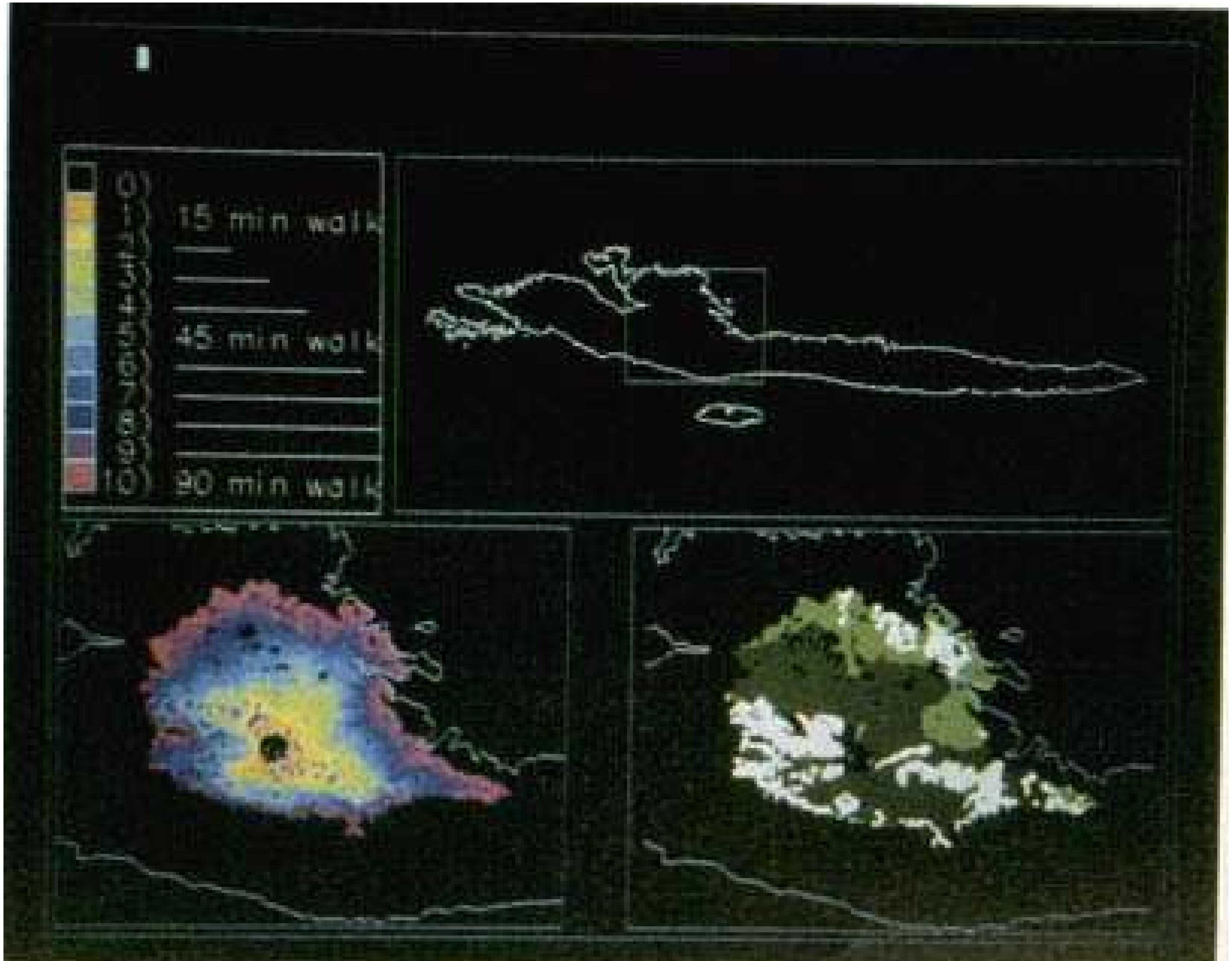
90 min. walk

150 min. walk

240 min. walk

0 5 km.

Gaffney and Stancic 1991



26. Gračišće catchment and soil types

Najdiščno zajetje

Figure 1

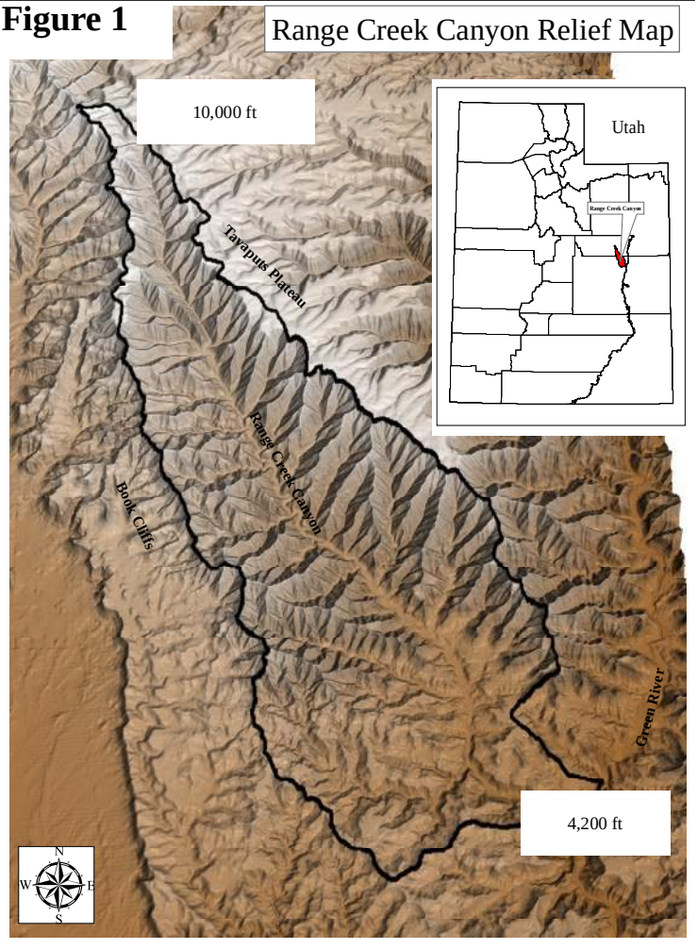


Figure 2

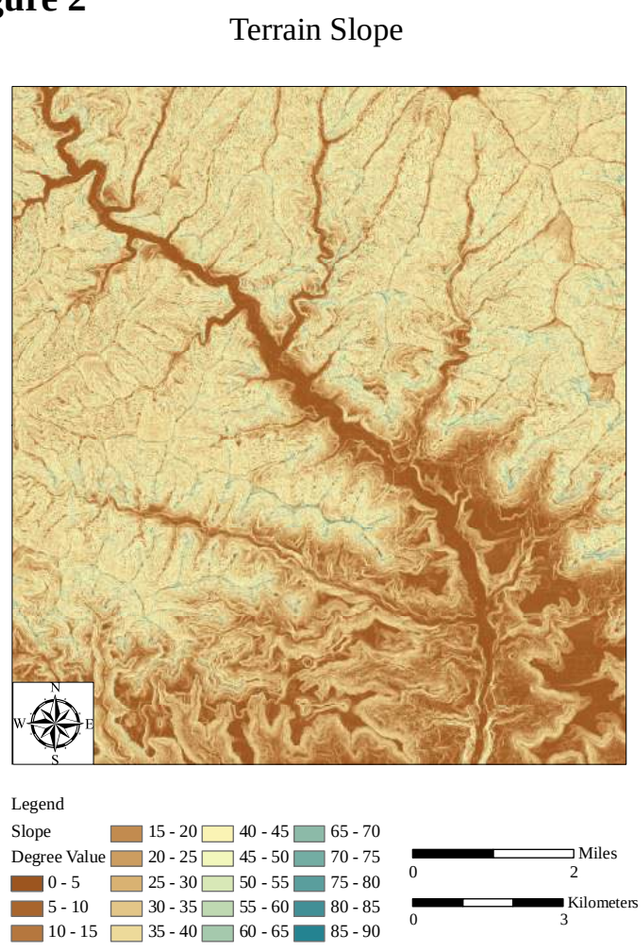


Figure 3

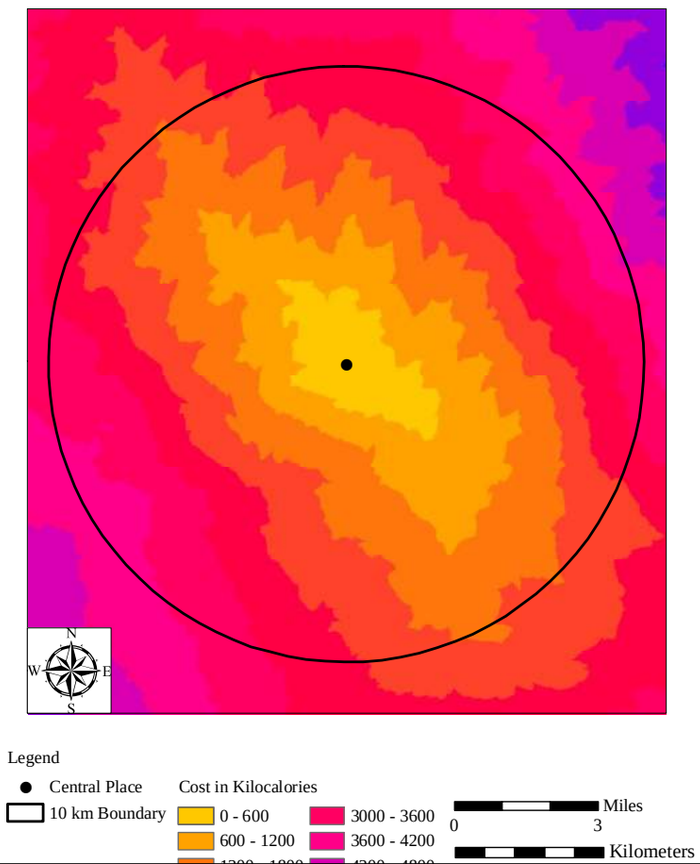
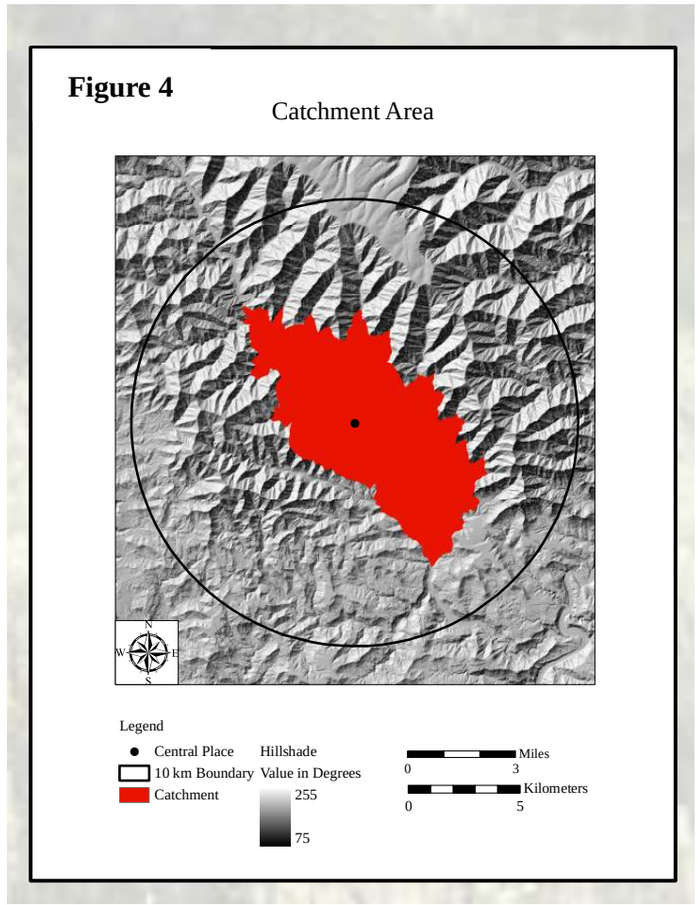
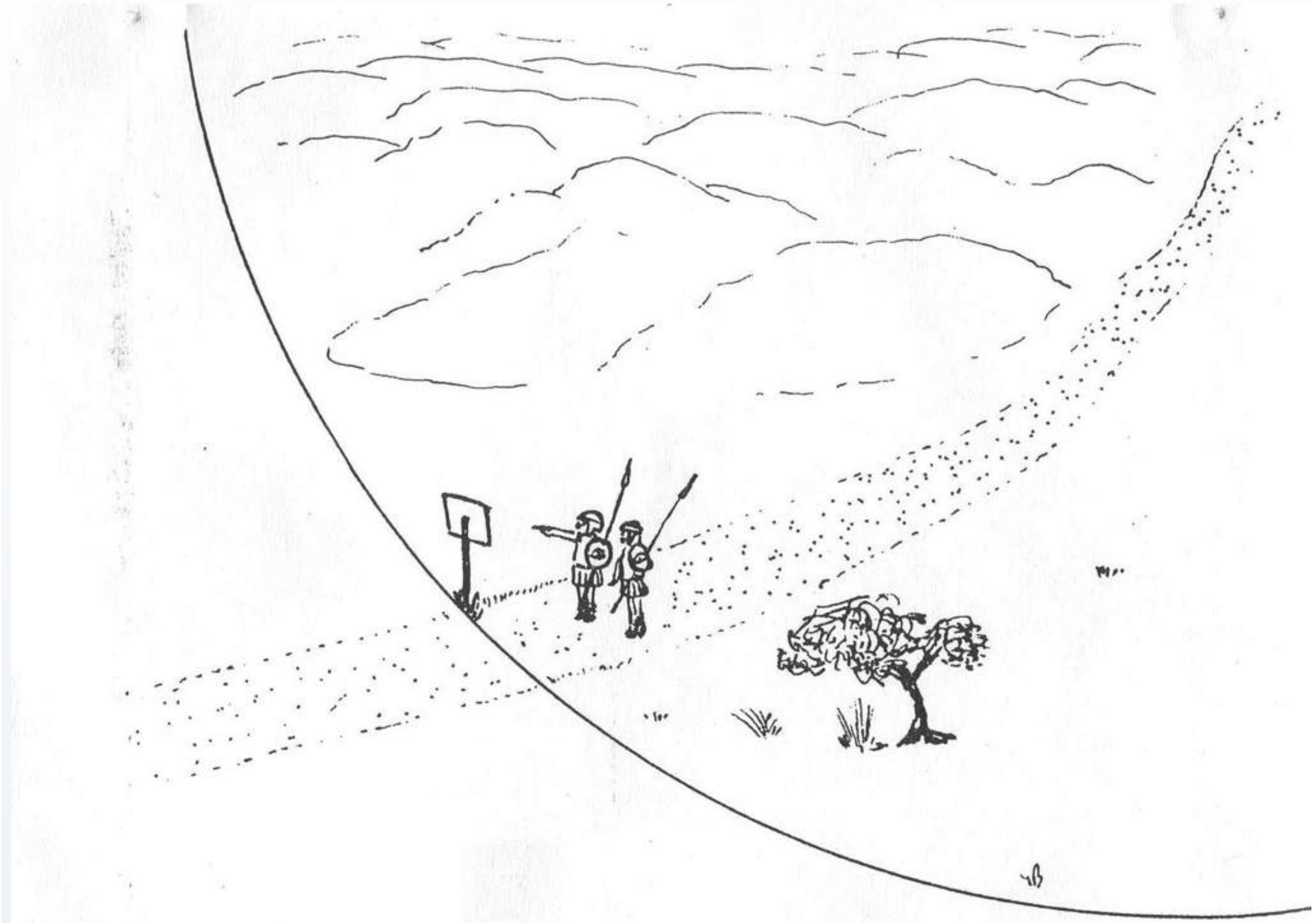


Figure 4





It appears to say " End of 5km catchment. Hunter-gatherers only beyond this point".

Site catchment

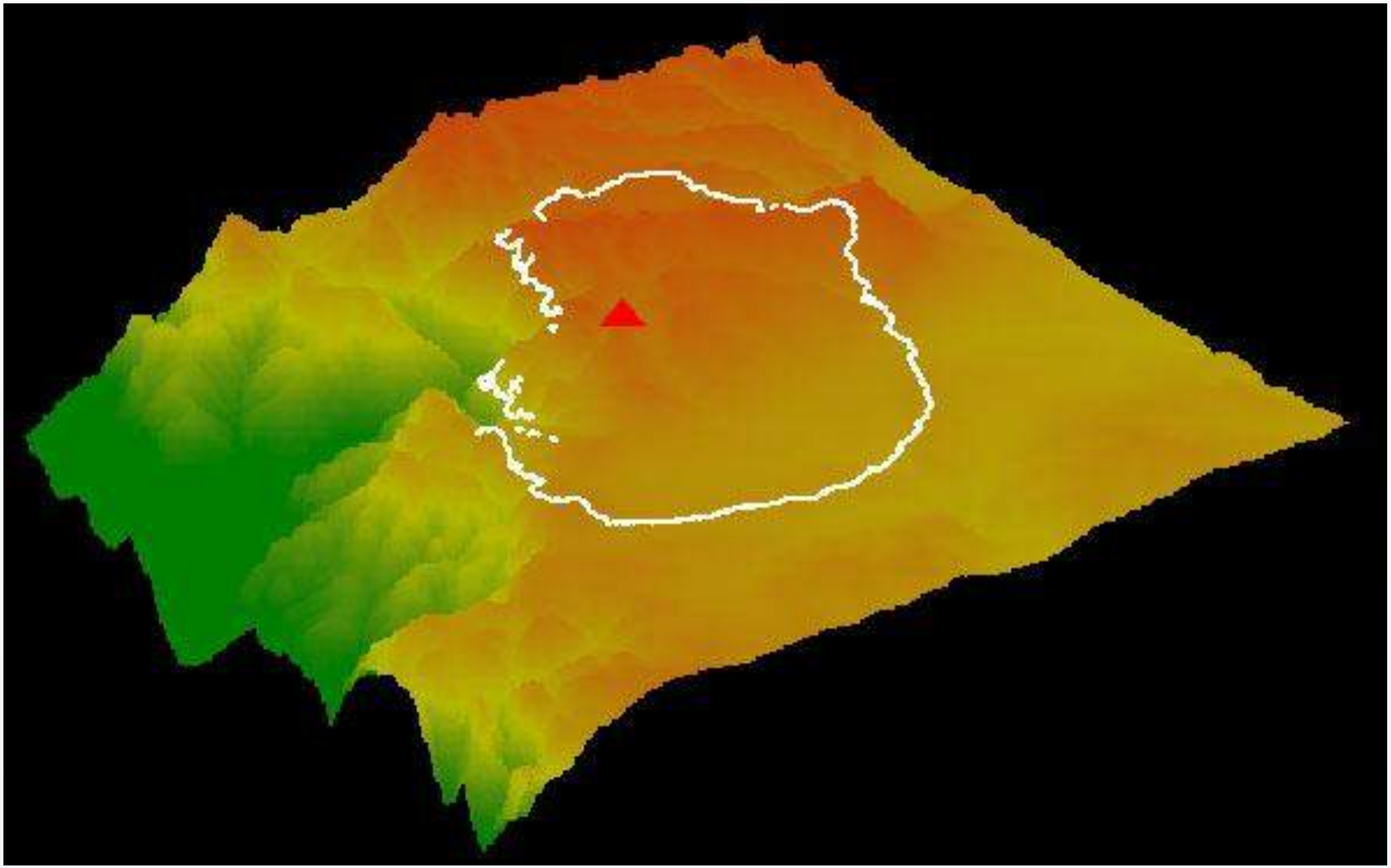


Figure 2: Left: Layers used in the modeling of agricultural potential, from the top: rooting depth, drainage, natural fertility, rainfall, gradient; Right: Spatial distribution of the agricultural potential and the archaeological sites included into the preliminary SCA. For the site affiliations, see legend in Figure 1 (map: O. Seitsonen).

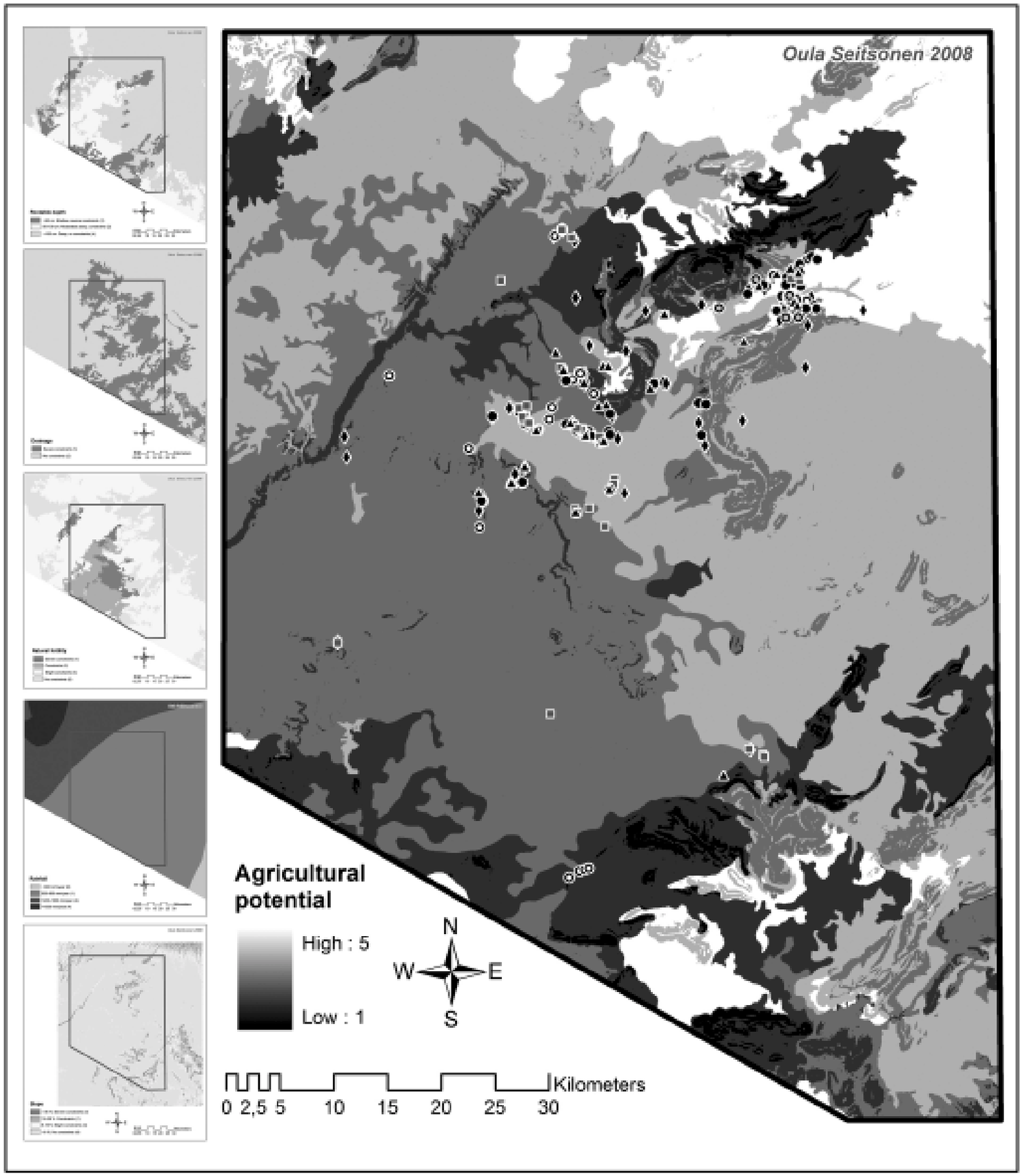
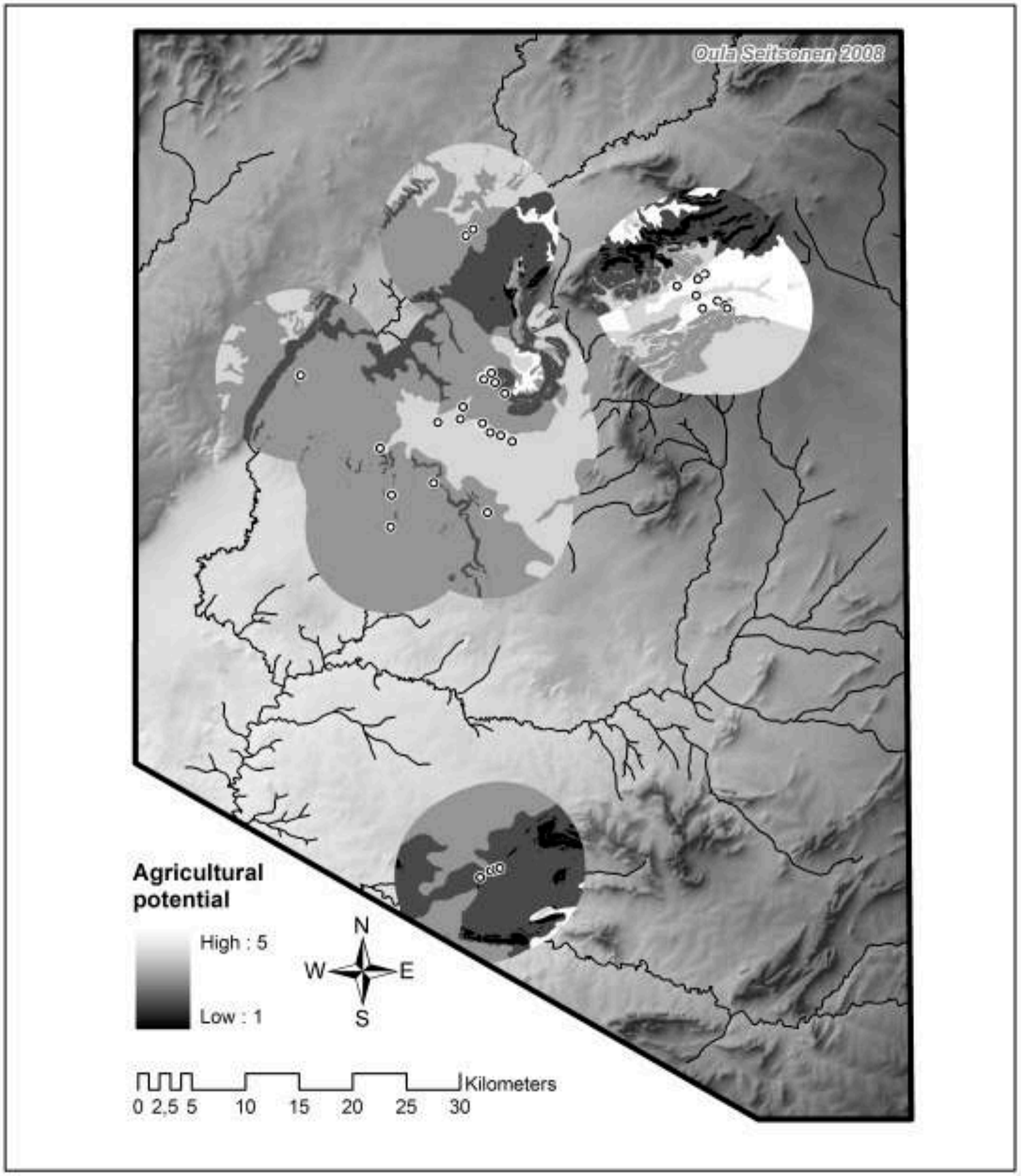
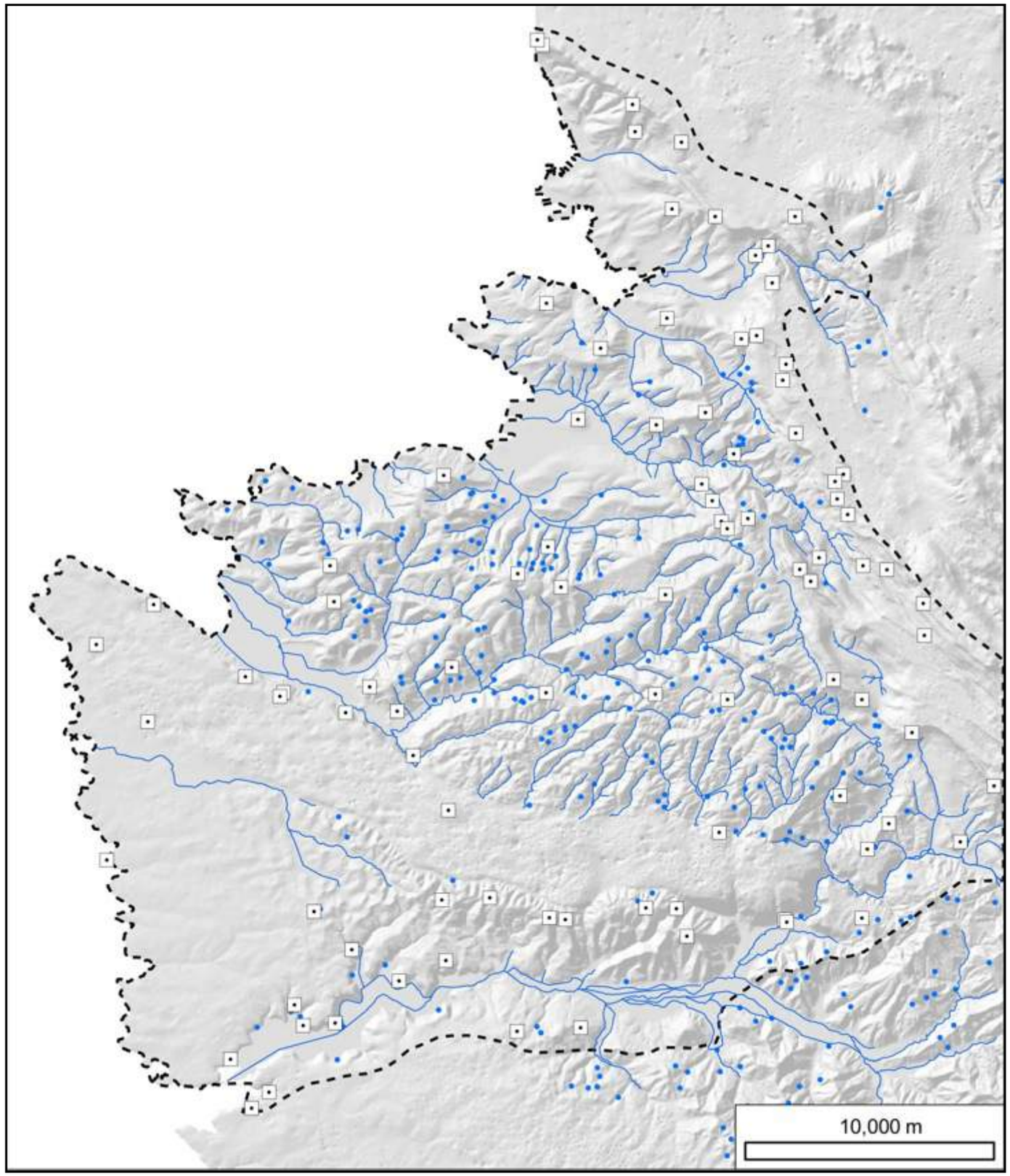
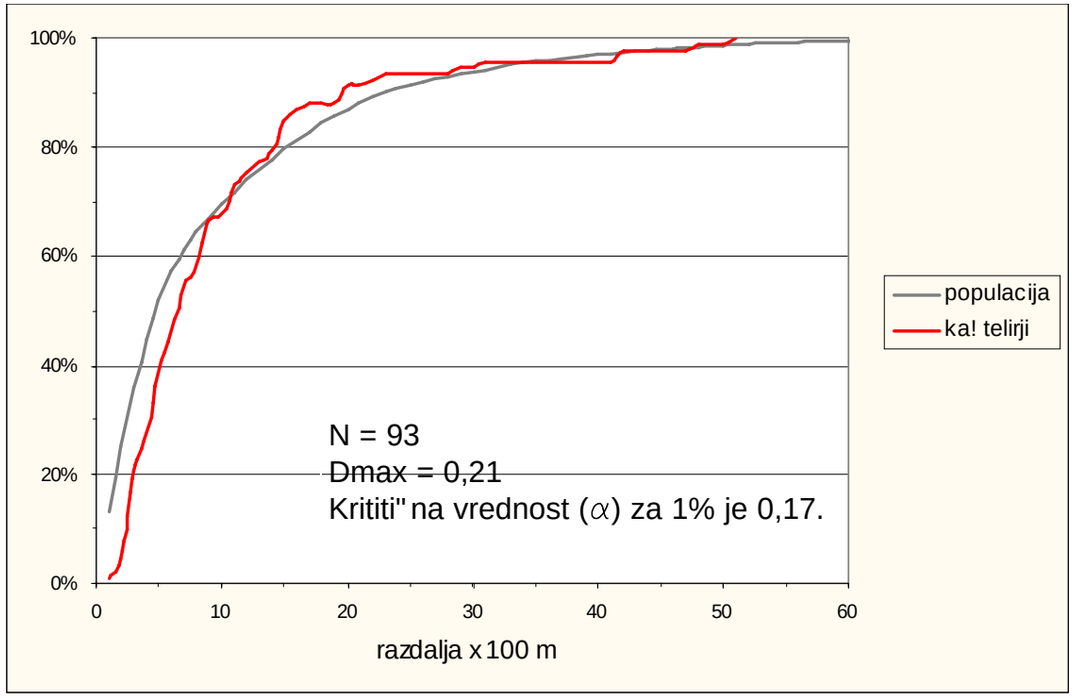


Figure 3: Circular catchments (radius = 8 km) showing the agricultural potential around the LSA sites (map: O. Seitsonen).



Lokacijske analize





Priloga 11: Kolmogorov-Smirnov test distribucije evidentnih ka! telirjev glede na evklidsko oddaljenost od kartiranih vodnih virov znotraj obmo"ja analize.

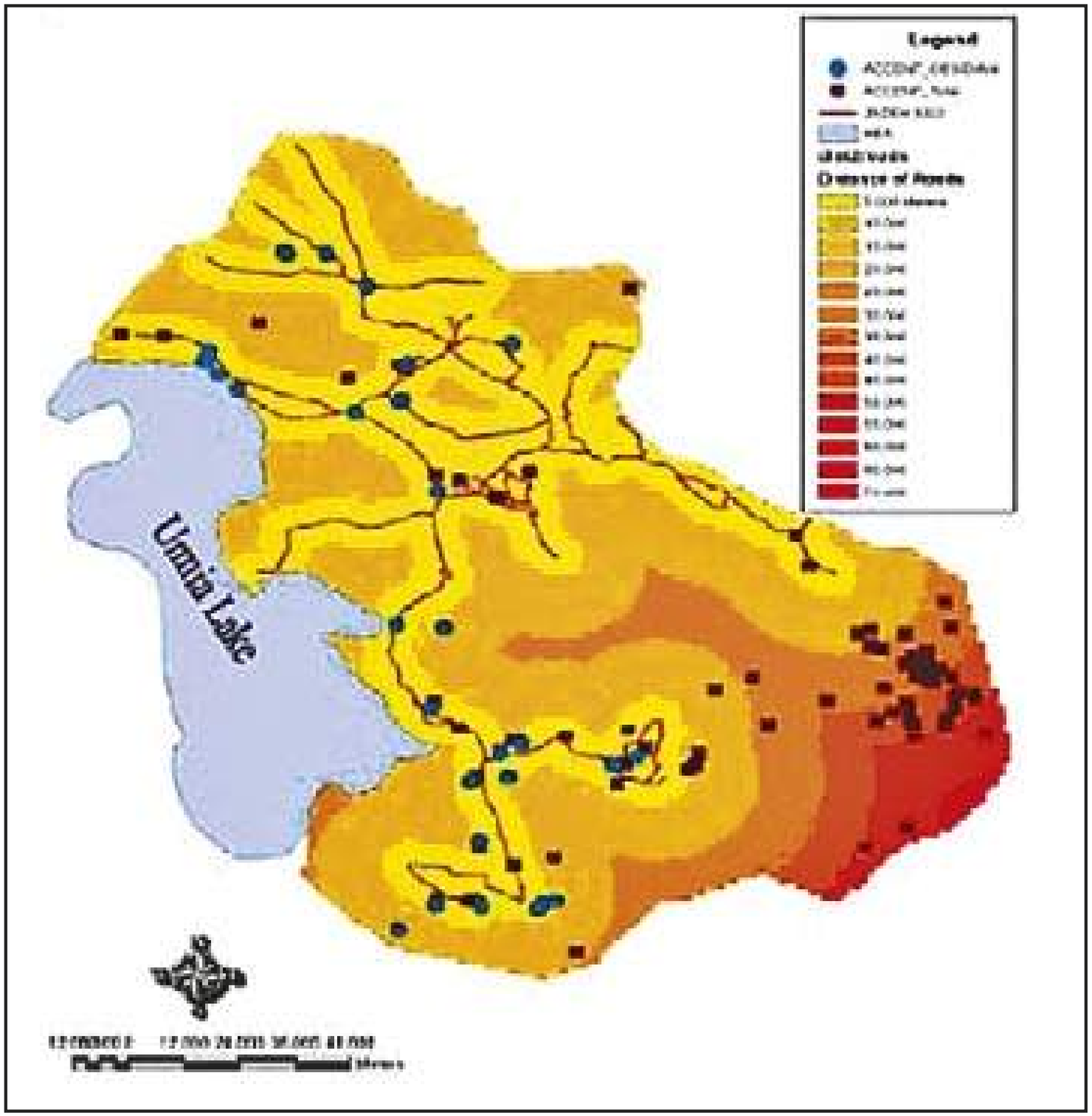


Fig. 4 – Proximity measurements of archaeological sites from possible ancient road networks.

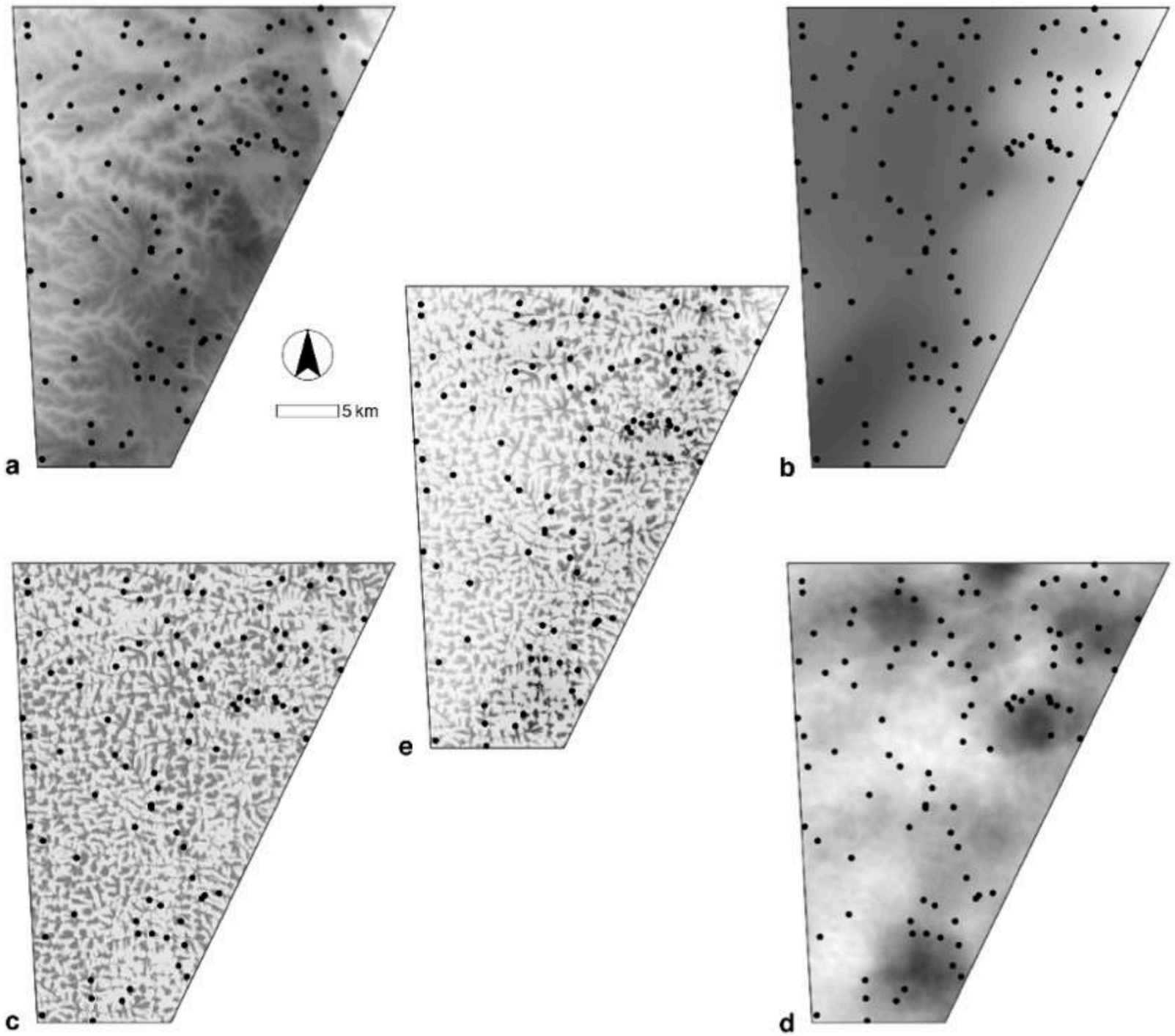
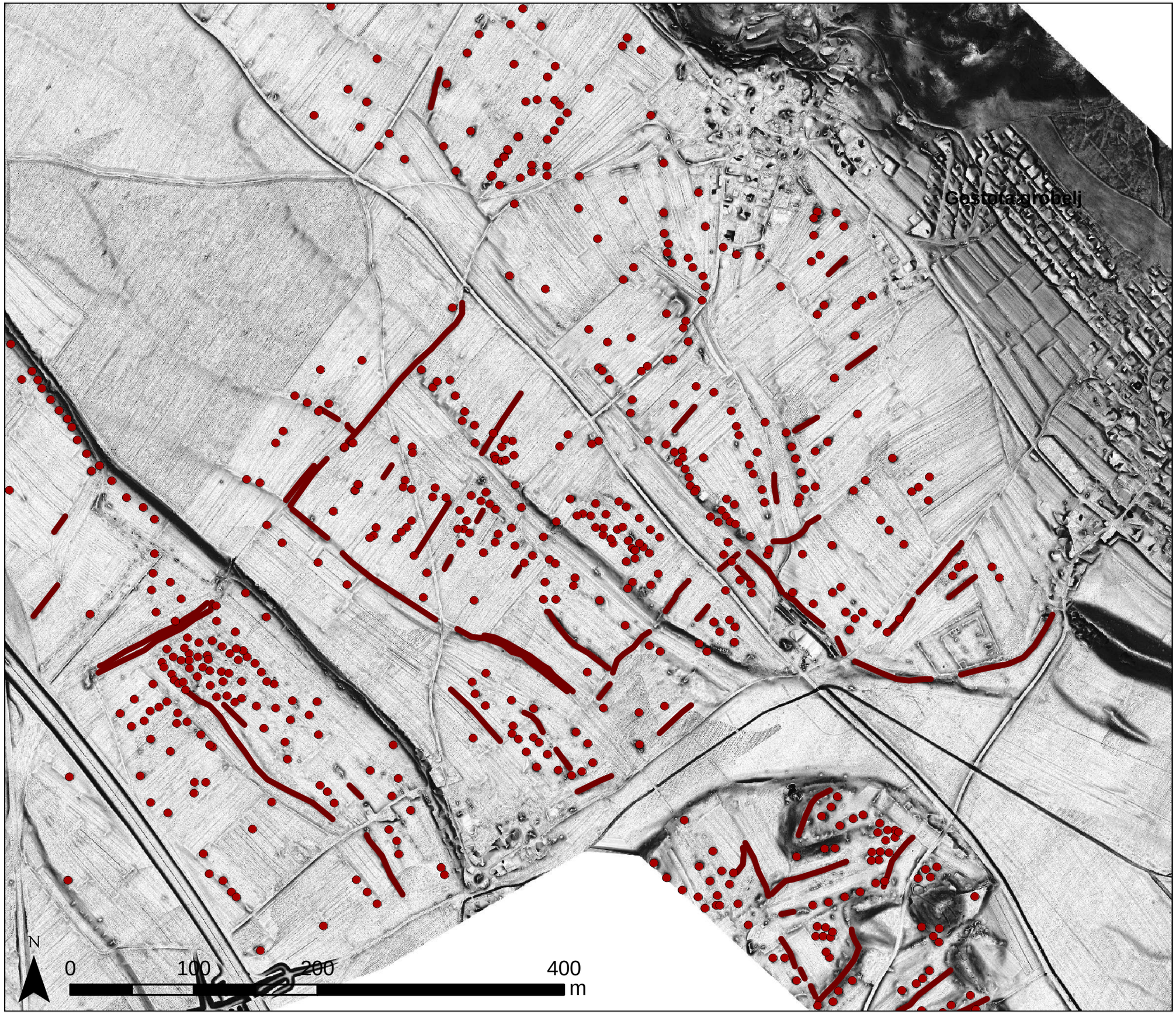
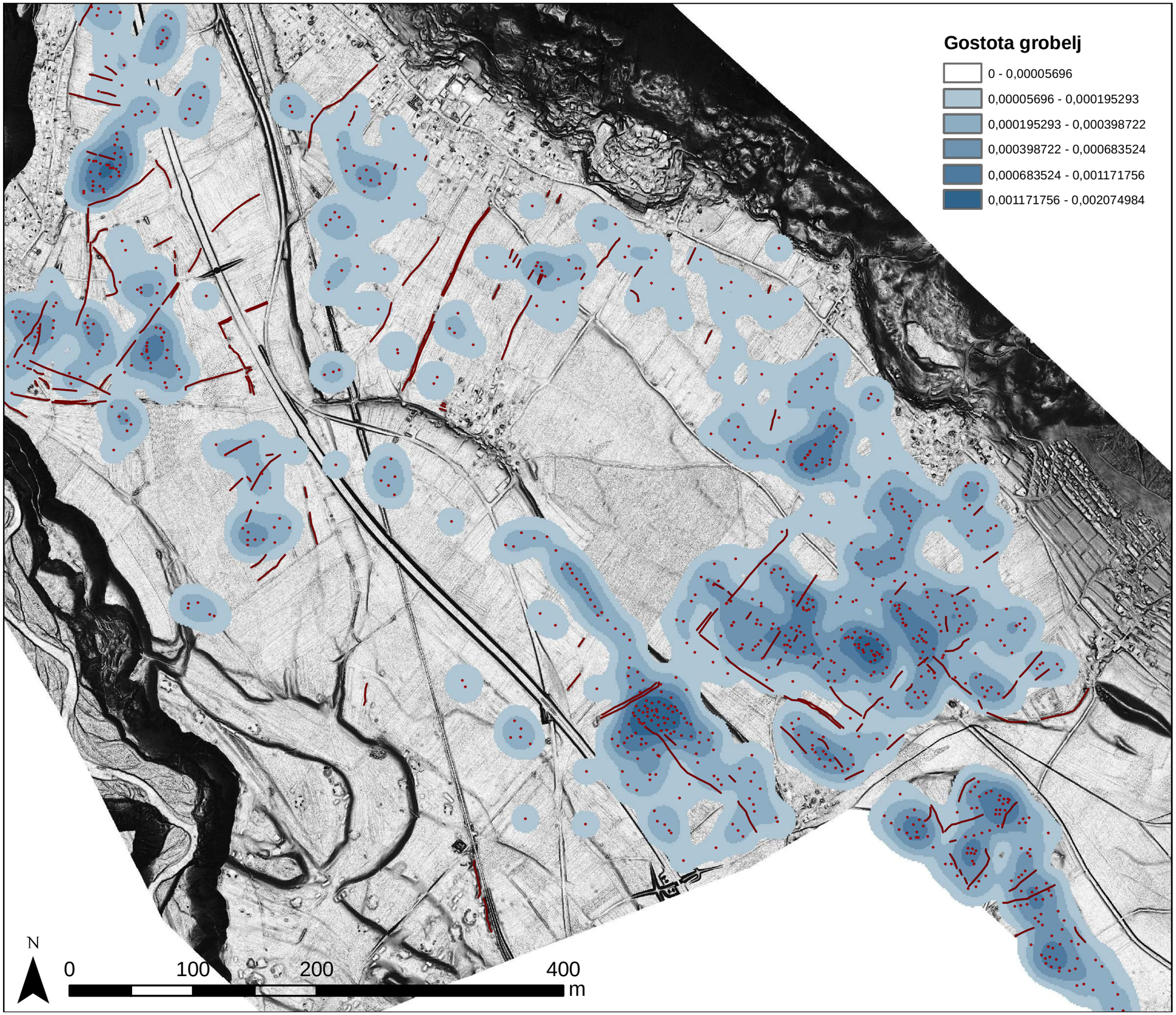


Figure 5. Iron Age I sites in the central West Bank and four possible first-order covariates: (a) elevation (light to dark ranges from 135-1010m ASL), (b) average annual rainfall (dark to light ranges from c.335-720mm), (c) ridge landforms (darker is more likely to be geomphorphometrically classified as a ridge), (d) topographic wetness index summed over a local neighbourhood (darker is wetter), and (e) a prediction surface based on the three significant covariates (darker is higher point intensity).


Gostota grobelj
N
0
100
200
400
m


Gostota grobelj
0 - 0,00005696
0,00005696 - 0,000195293
0,000195293 - 0,000398722
0,000398722 - 0,000683524
0,000683524 - 0,001171756
0,001171756 - 0,002074984
N
0
100
200
400
m

Modeliranje gibanja

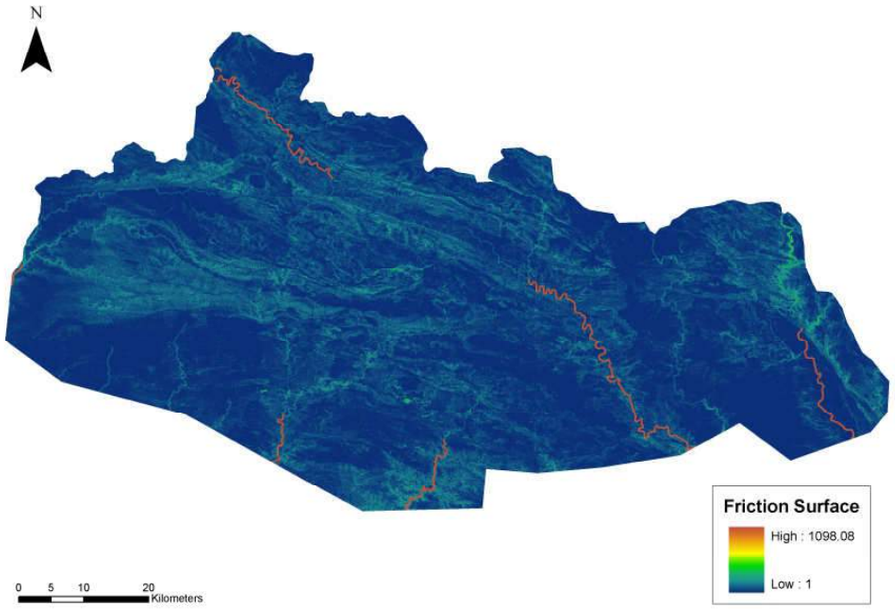


Fig. 6.4 The friction surface used in this experiment depicting relative cost units in terms of energy expended.

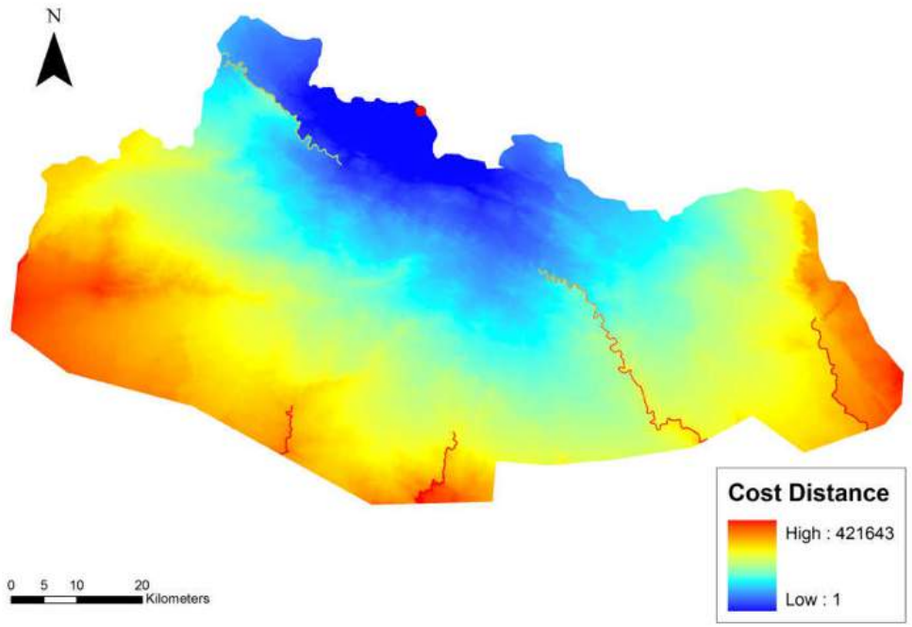


Fig. 6.5 Cost (in relative units) expended to get to node no. 9 from any point of our study area.

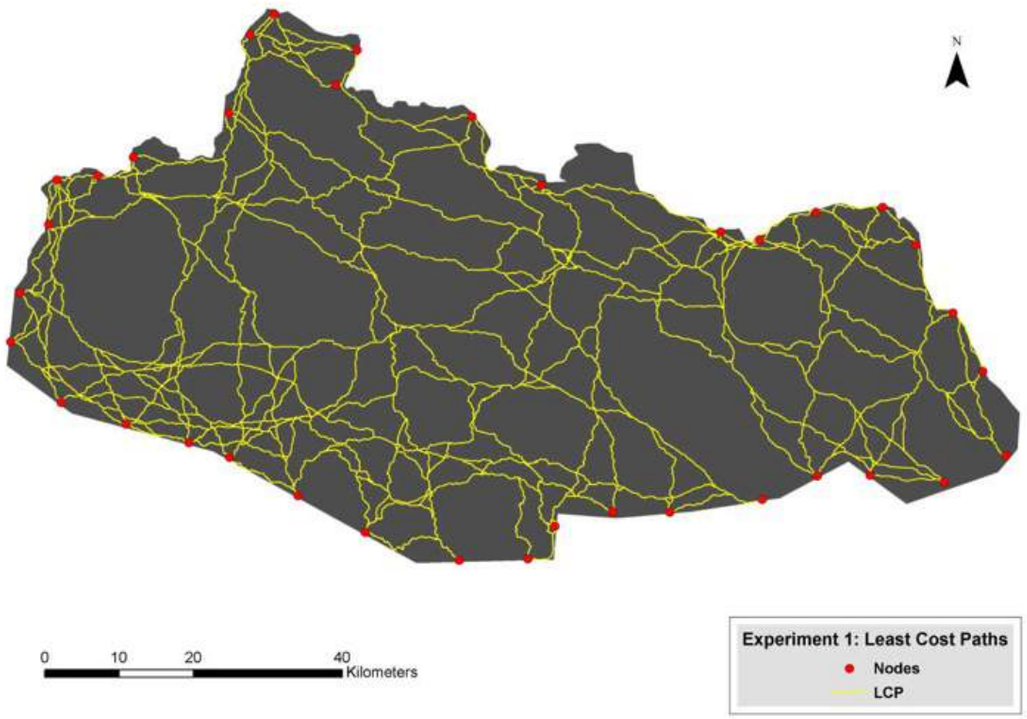
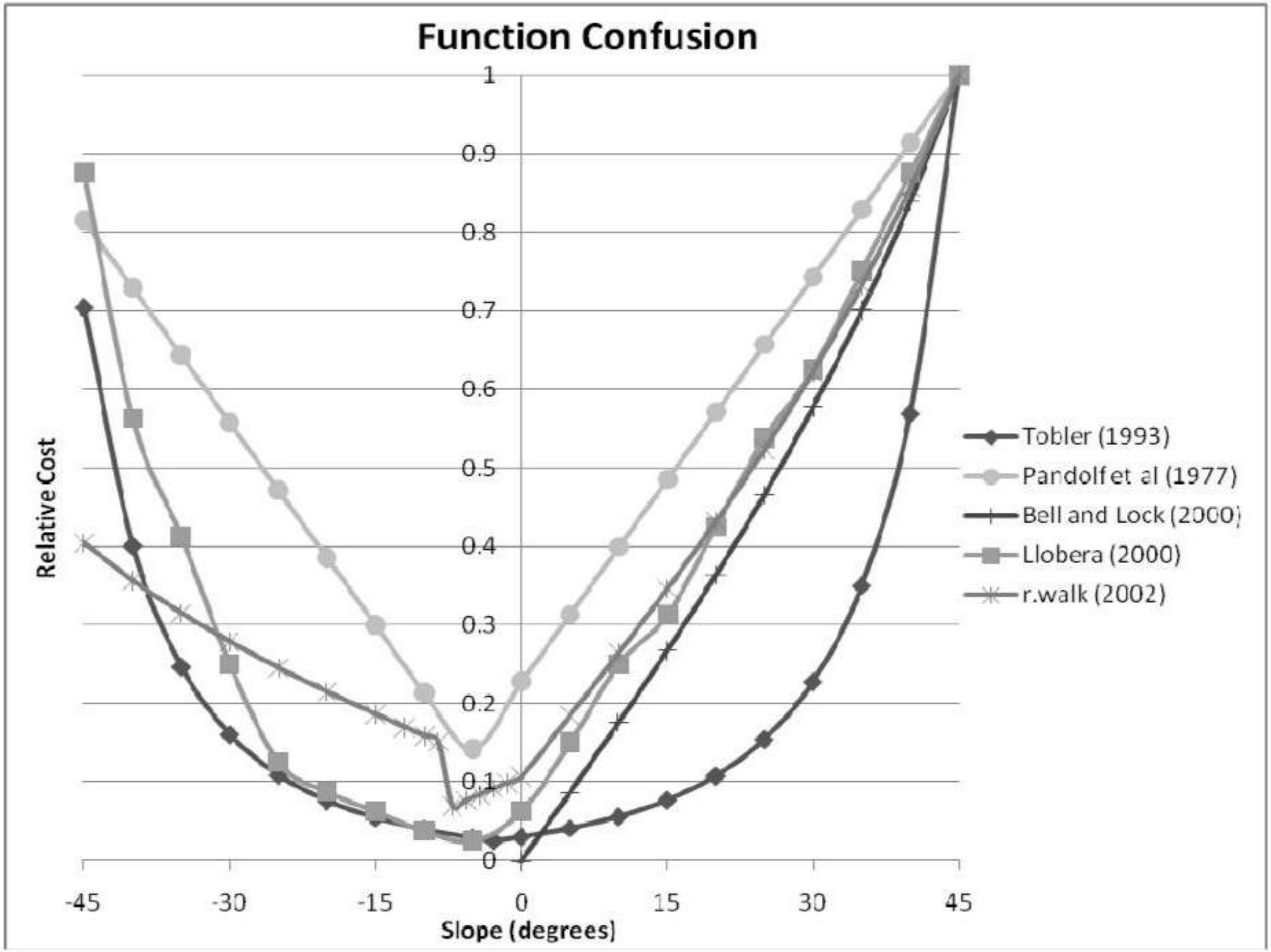


Fig. 6.8 The LCP calculated.


Function Confusion
Relative Cost
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-45
-30
-15
0
15
30
45
Slope (degrees)
Tobler (1993)
Pandolfet al (1977)
Bell and Lock (2000)
Llobera (2000)
r.walk (2002)

“...current GIS can only make local decisions as to which neighbouring cell has the highest or lowest value – they incorporate no global knowledge of the landscape at all.” (van Leusen 1999, p.218).

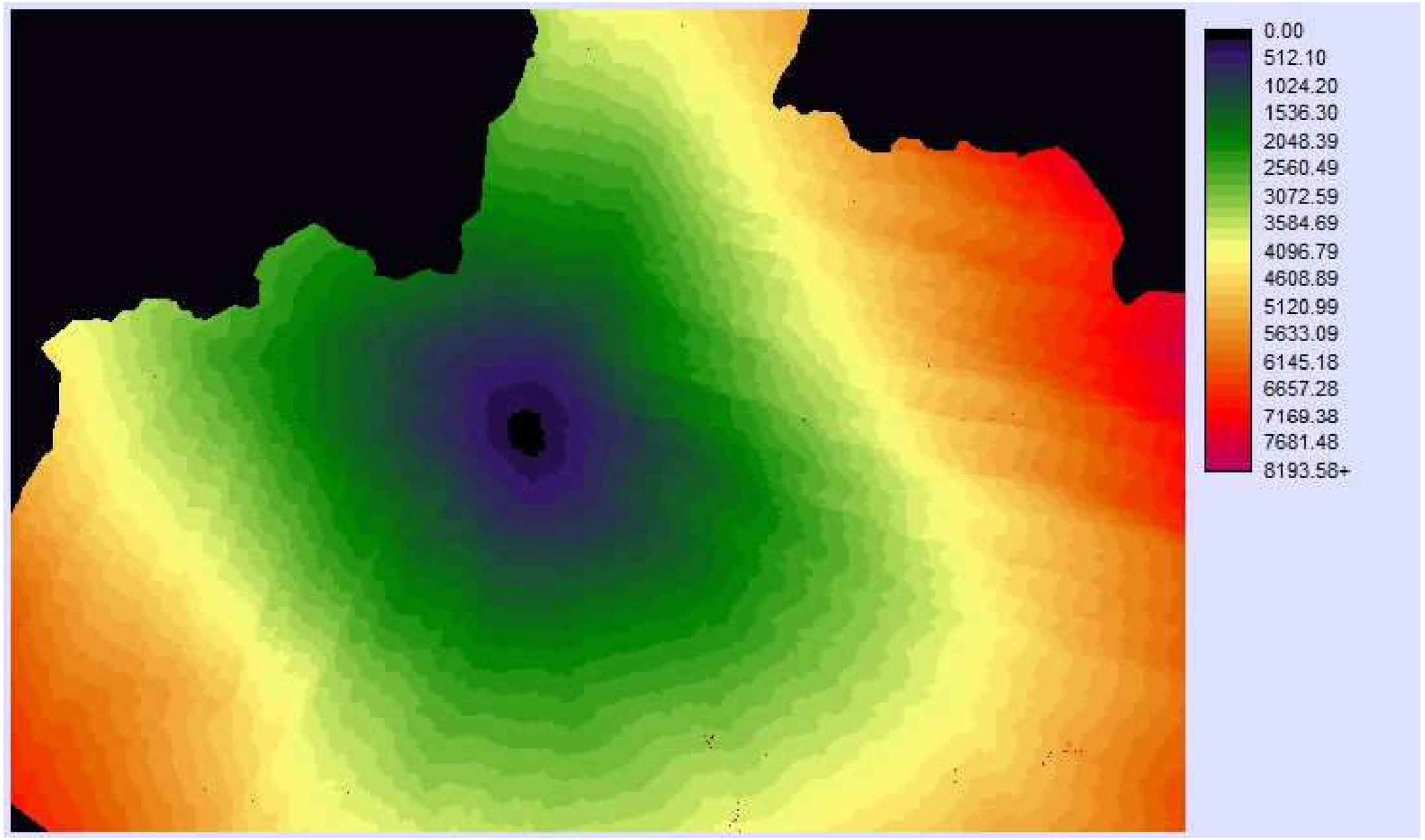
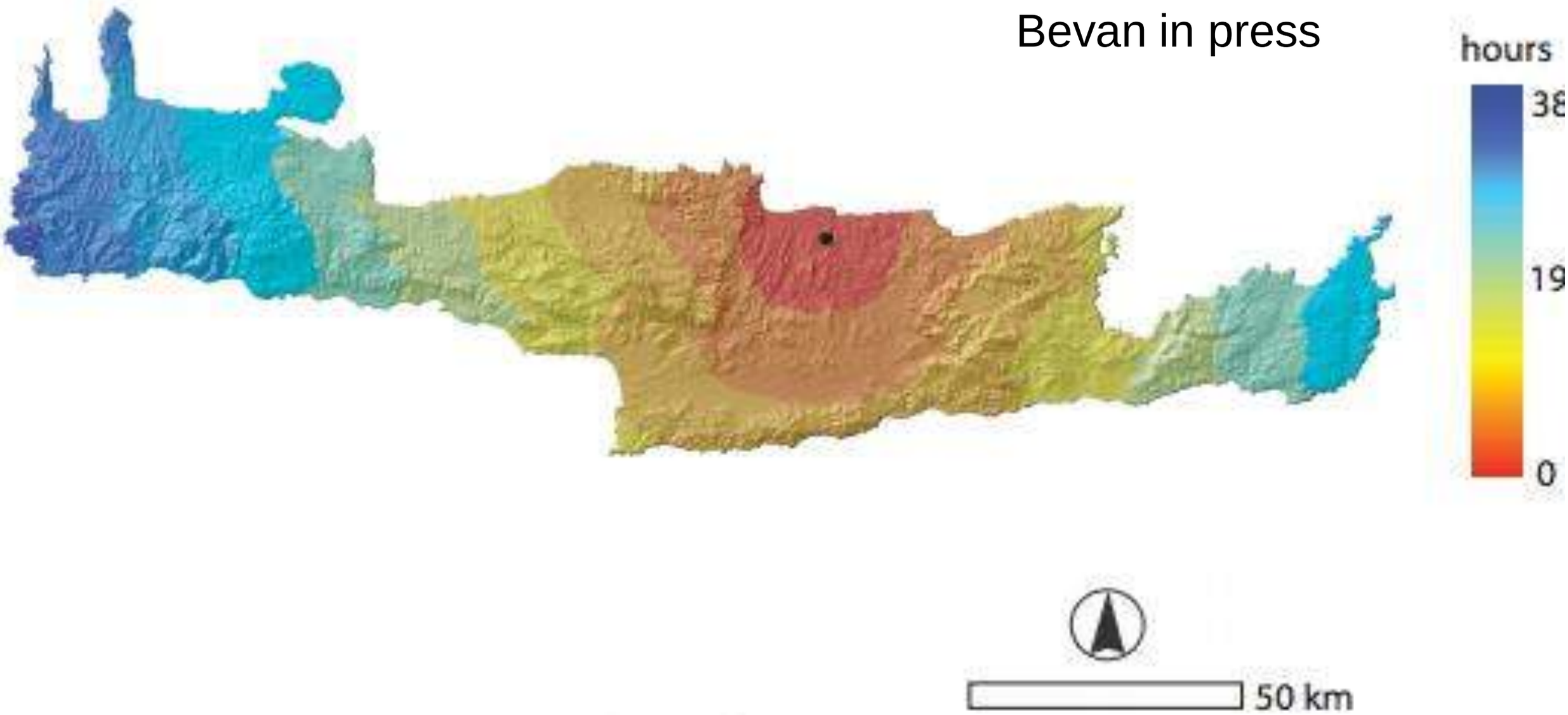
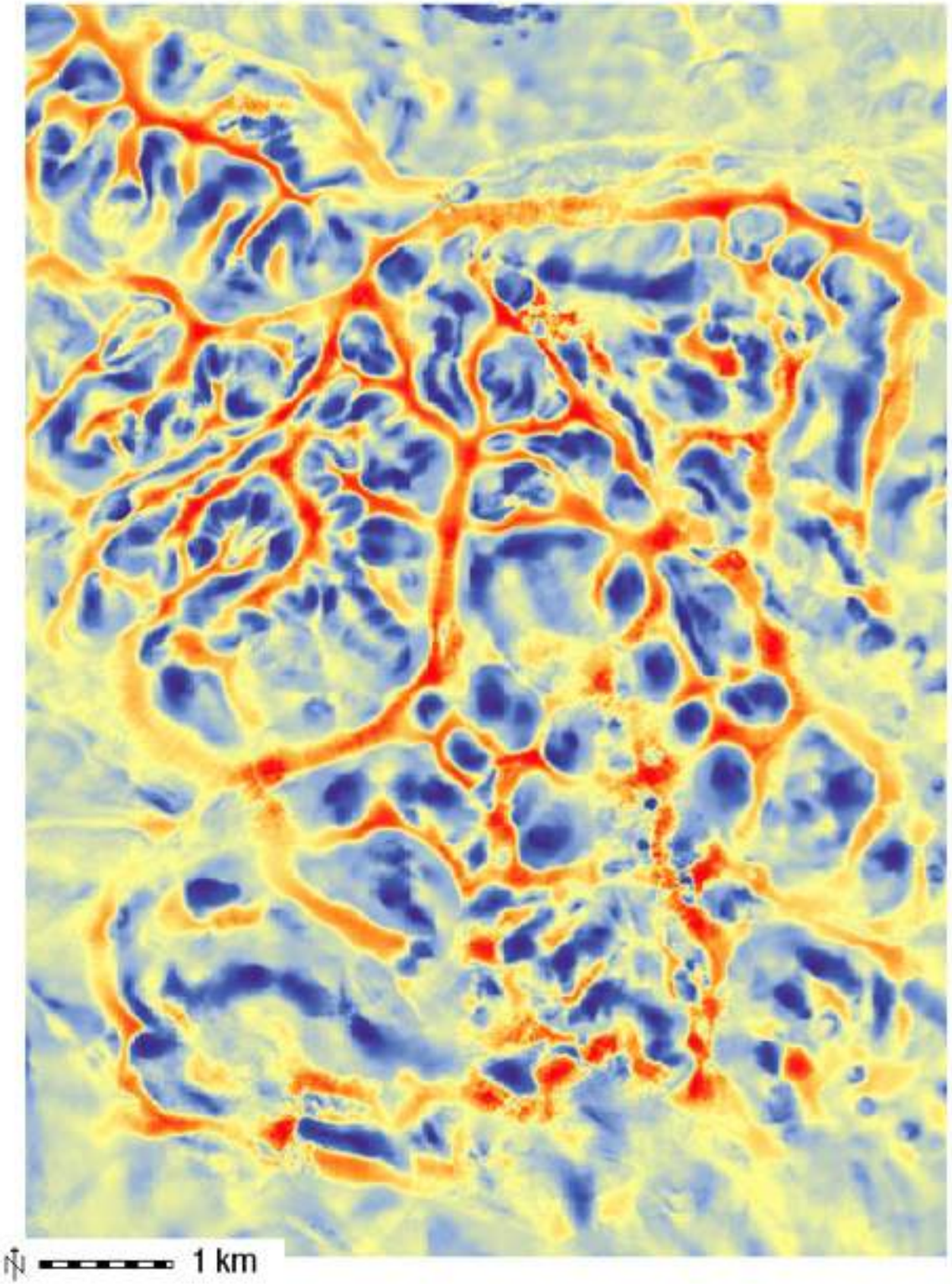
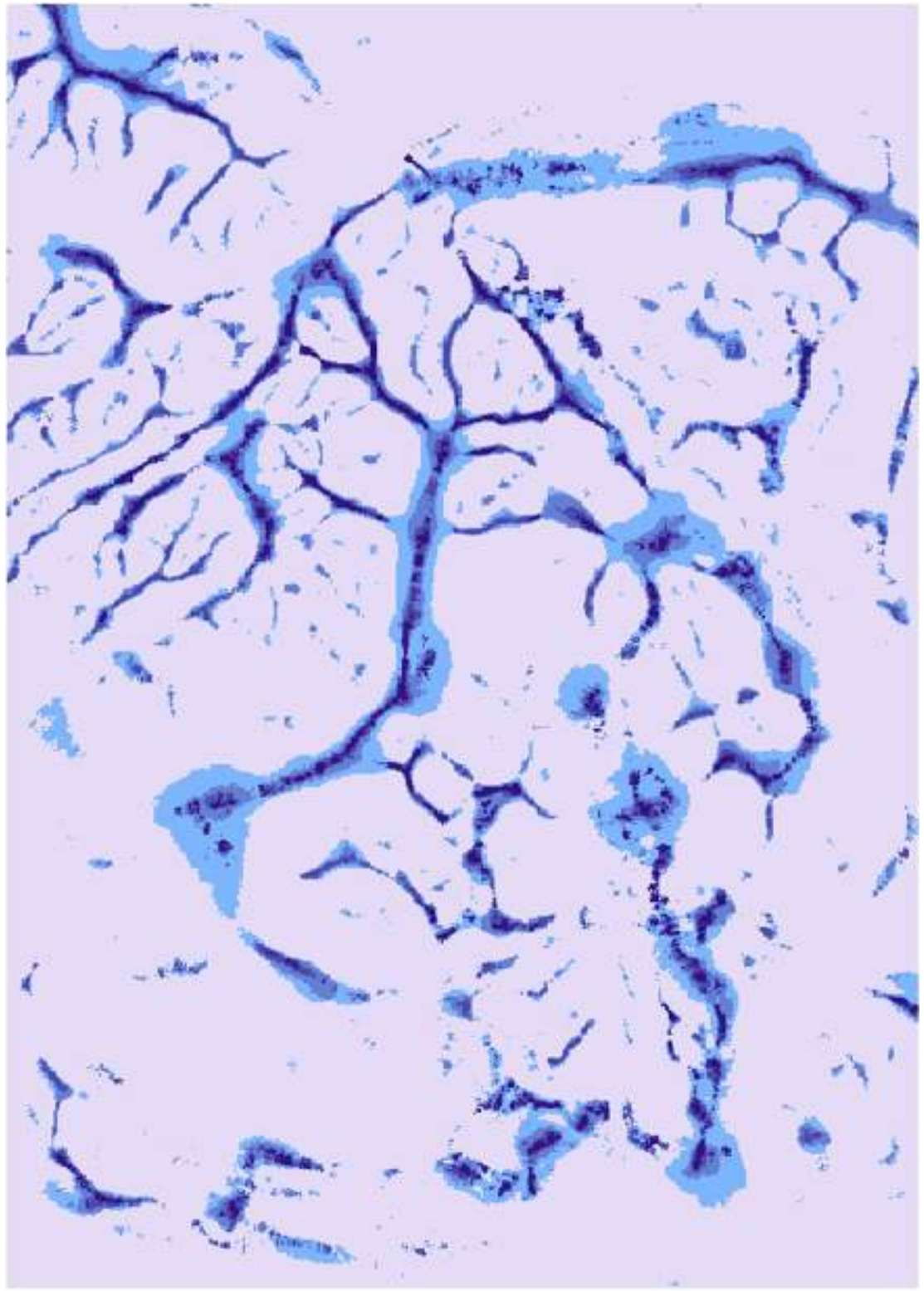


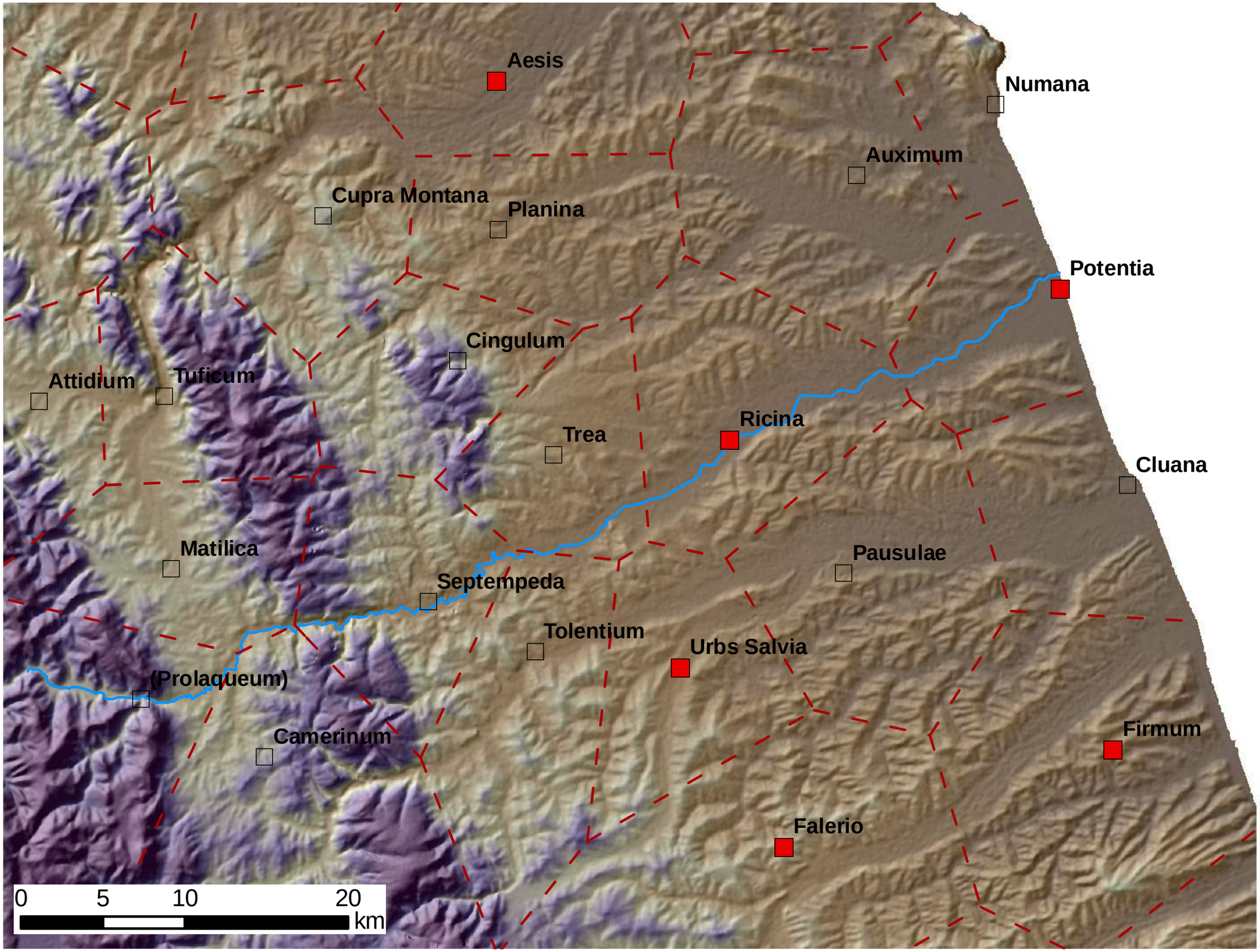
Fig. 6.25 Cost surface of node 199. Cost of walking in Joules / (Kg m).

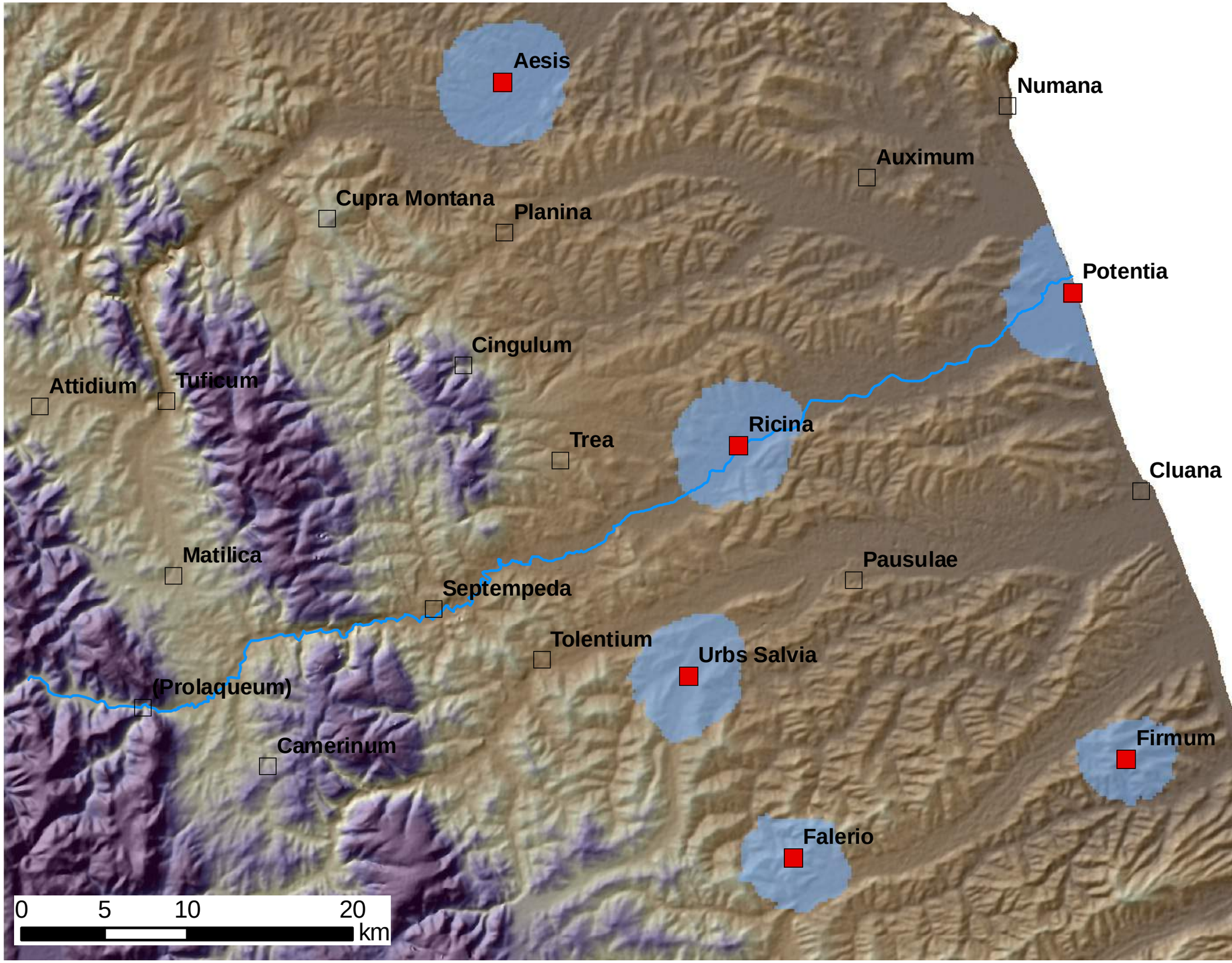
Isokrone

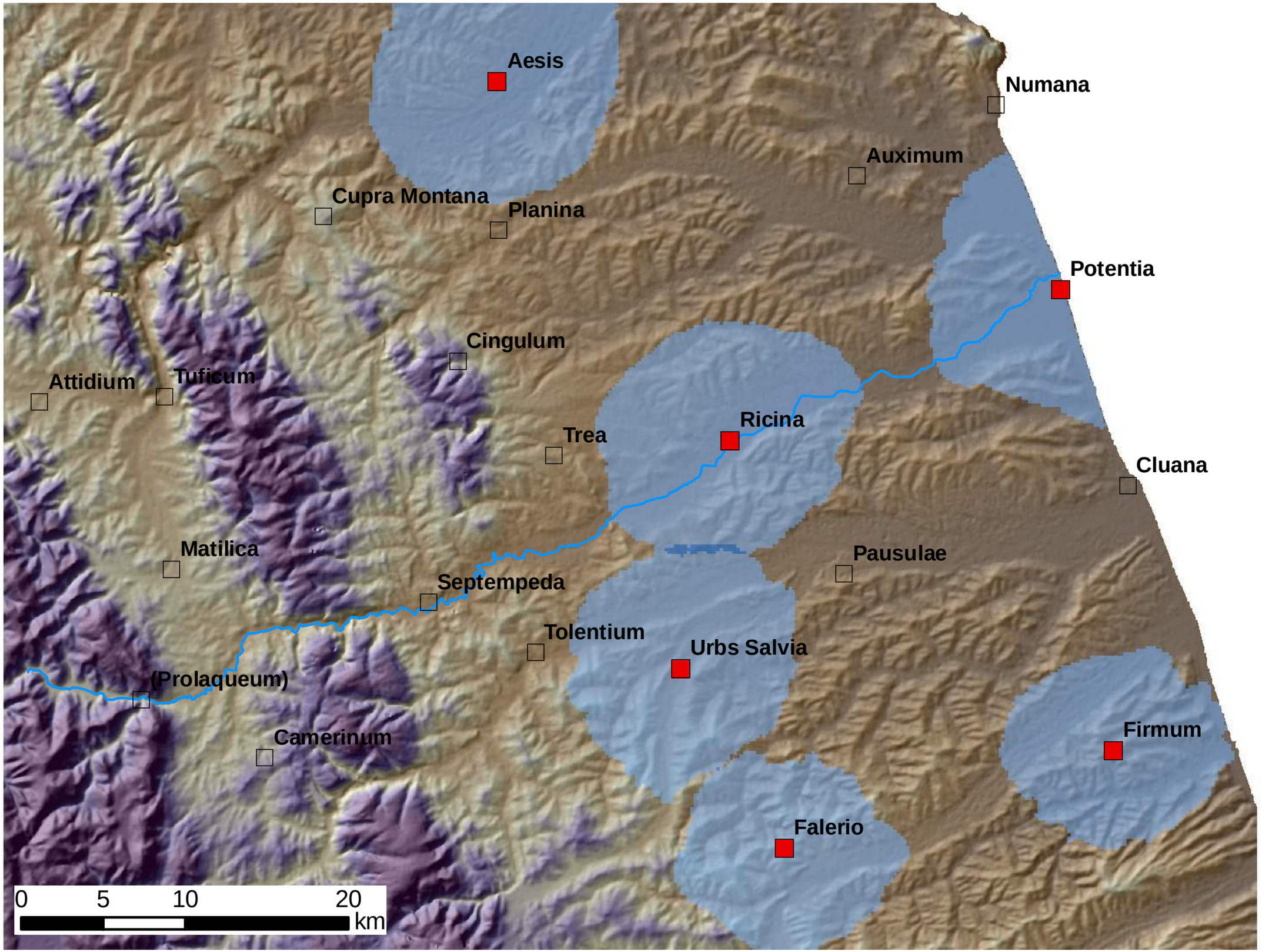


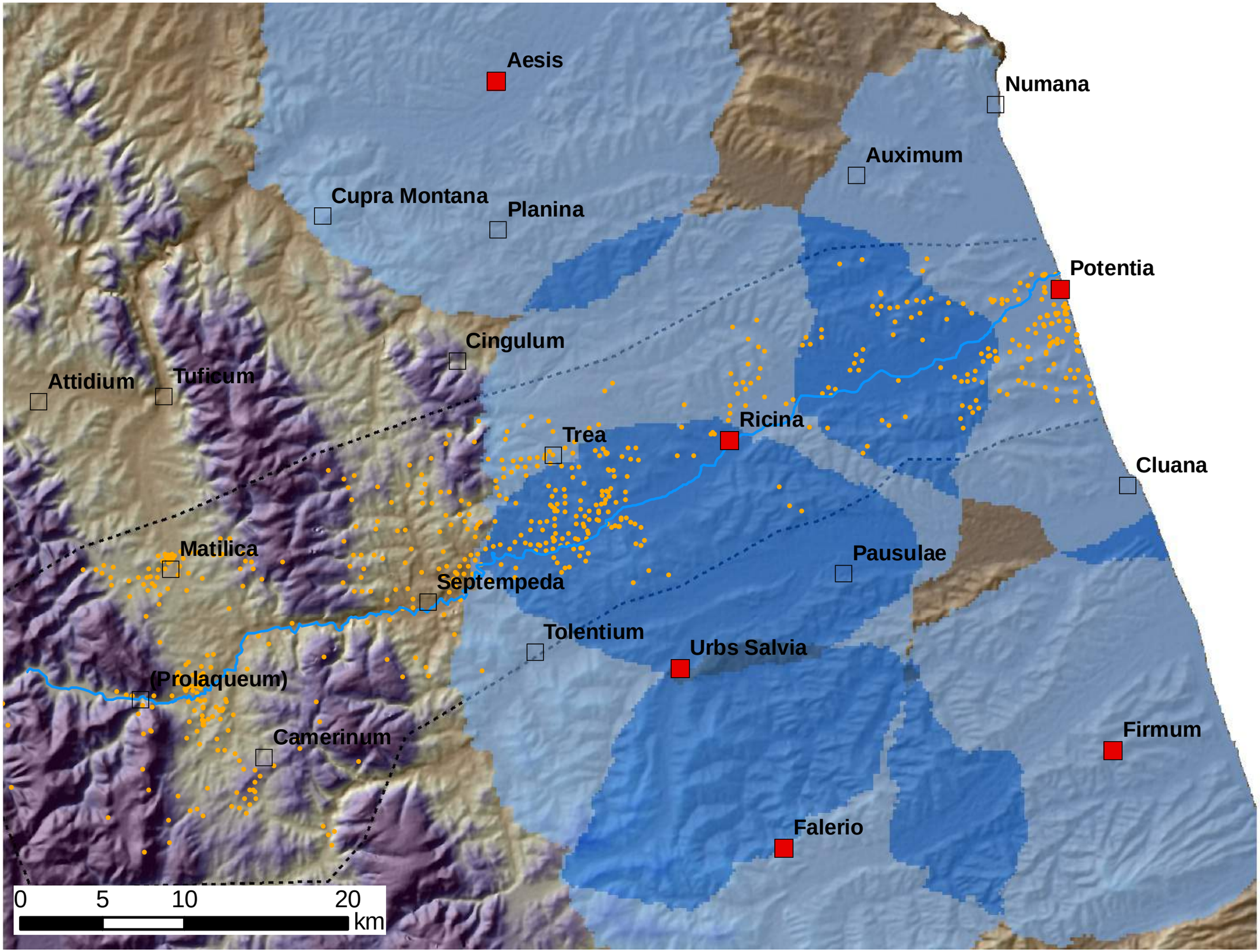

N
1 km

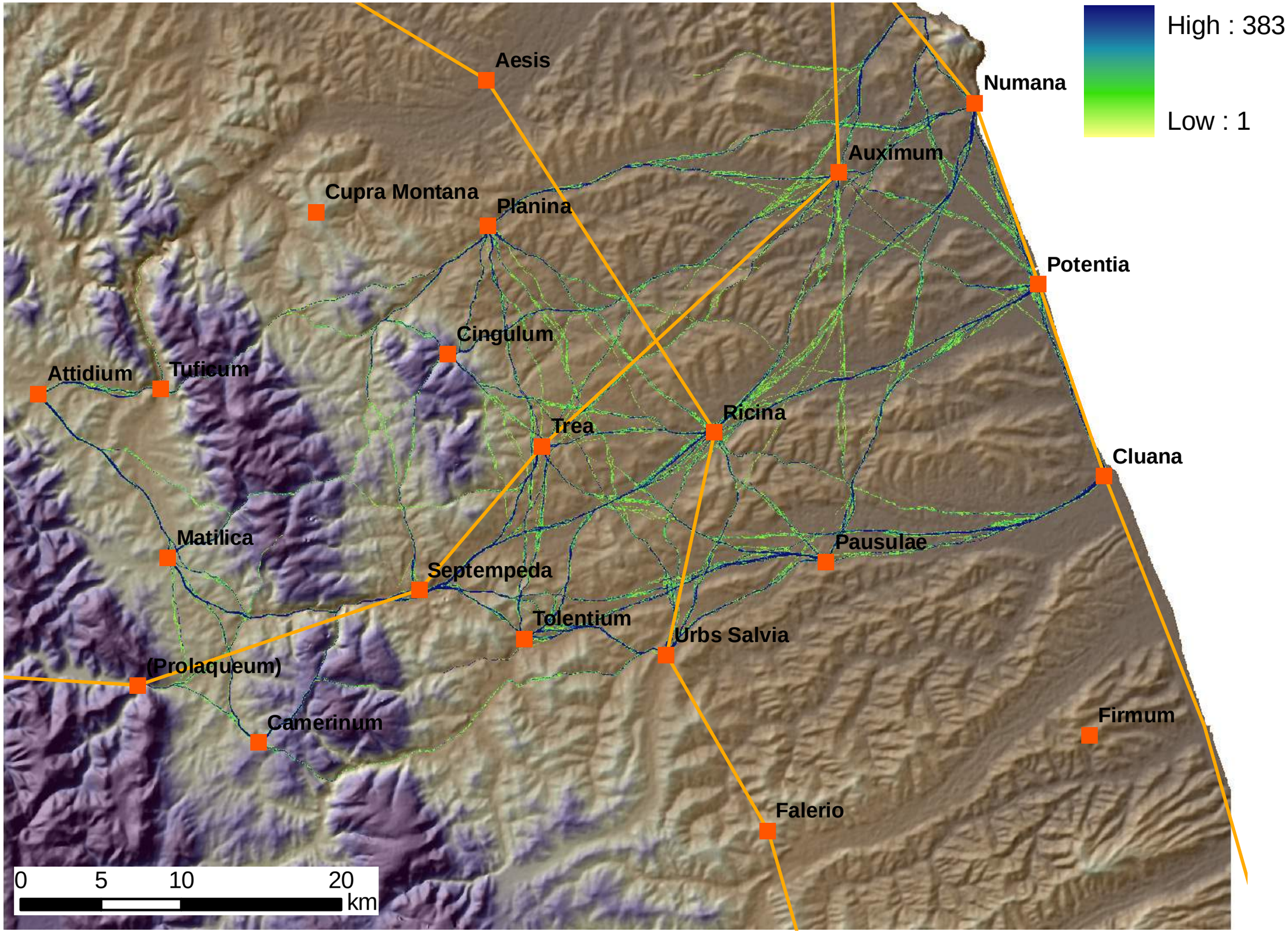


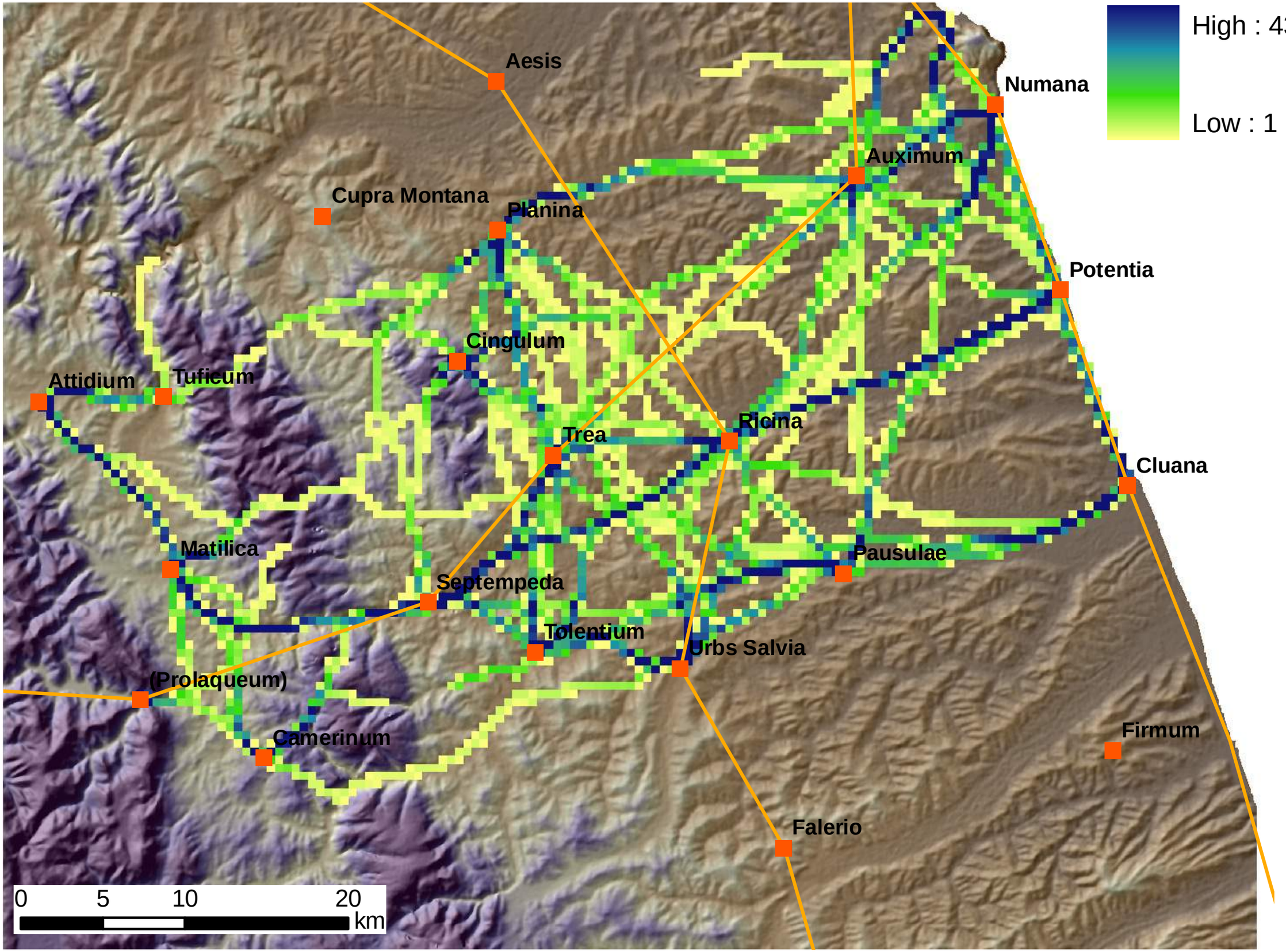

Aesis
Numana
Auximum
Cupra Montana
Planina
Potentia
Cingulum
Attidium
Tuficum
Ricina
Trea
Cluana
Pausulae
Matilica
Septempeda
Tolentium
Urbs Salvia
(Prolaqueum)
Camerinum
Firmum
Falerio
0
5
10
20
km


Aesis
Numana
Auximum
Cupra Montana
Planina
Potentia
Cingulum
Attidium
Tuficum
Ricina
Trea
Cluana
Matilica
Pausulae
Septempeda
Tolentium
Urbs Salvia
(Prolaqueum)
Camerinum
Firmum
Falerio
0
5
10
20
km

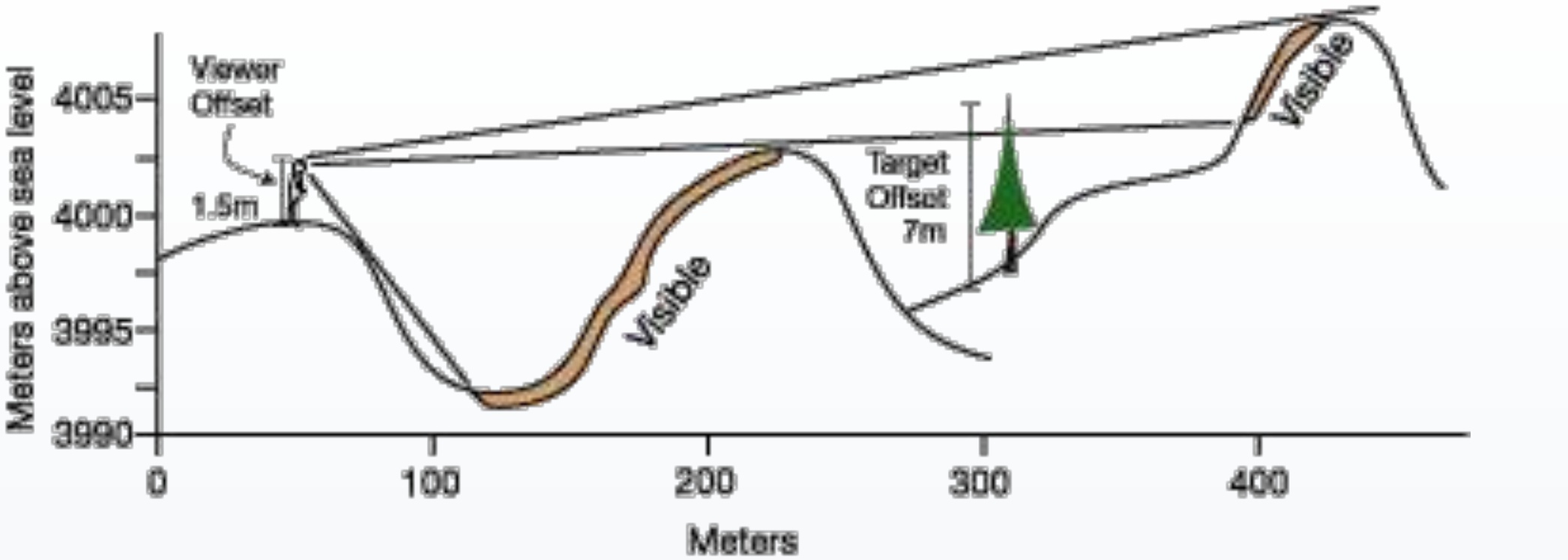

Aesis
Numana
Auximum
Cupra Montana
Planina
Potentia
Cingulum
Attidium
Tuficum
Ricina
Trea
Cluana
Matilica
Pausulae
Septempeda
Tolentium
Urbs Salvia
(Prolaqueum)
Firmum
Camerinum
Falerio
0
5
10
20
km


Aesis
Numana
Auximum
Cupra Montana
Planina
Potentia
Cingulum
Attidium
Tuficum
Ricina
Trea
Cluana
Matilica
Pausulae
Septempeda
Tolentium
Urbs Salvia
(Prolaqueum)
Firmum
Camerinum
Falerio
0
5
10
20
km


High : 383
Low : 1
Aesis
Numana
Auximum
Cupra Montana
Planina
Potentia
Cingulum
Attidium
Tuficum
Ricina
Trea
Cluana
Matilica
Pausulae
Septempeda
Tolentium
Urbs Salvia
(Prolaqueum)
Camerinum
Firmum
Falerio
0
5
10
20
km

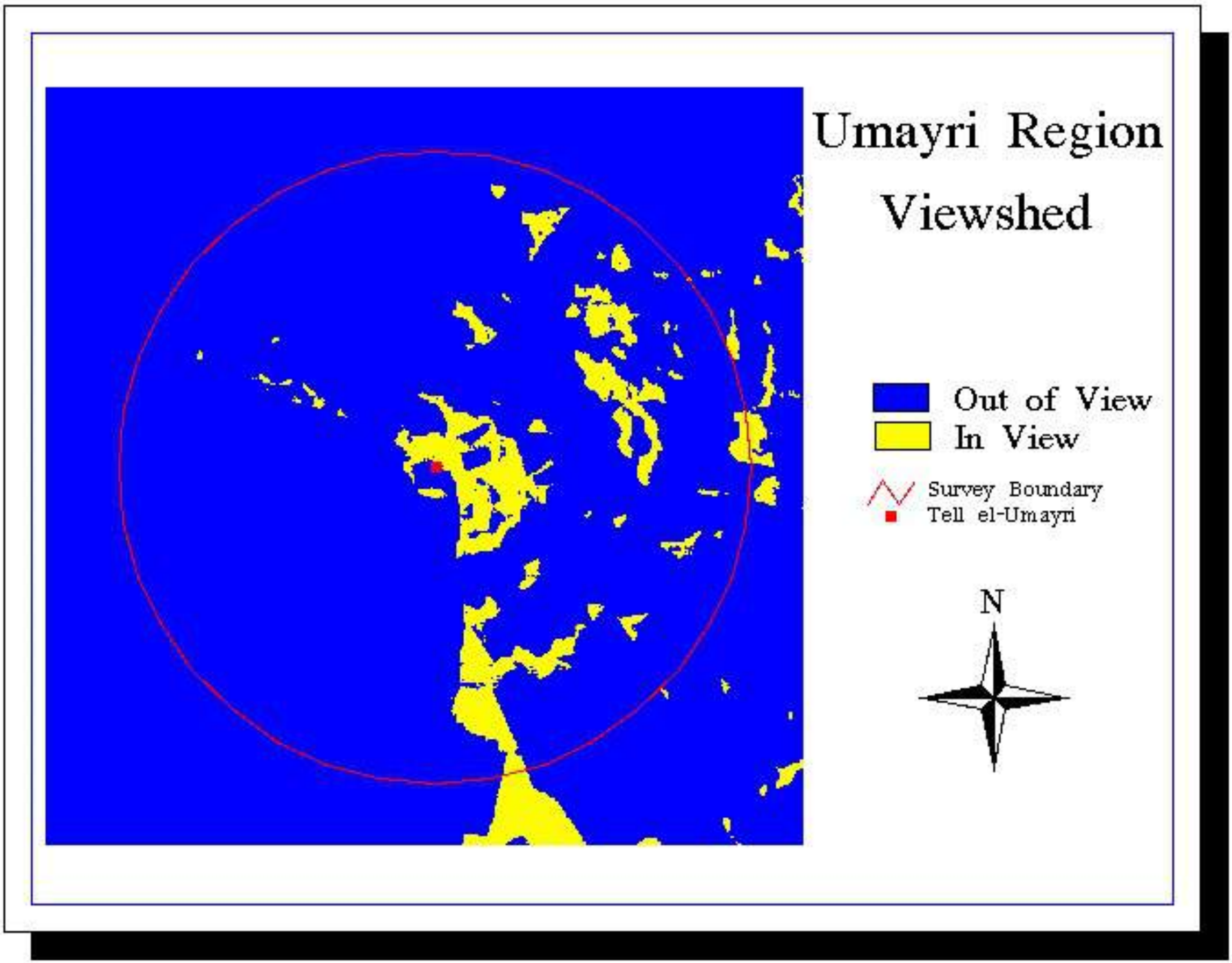

High : 4322
Low : 1
Aesis
Numana
Auximum
Cupra Montana
Planina
Potentia
Cingulum
Attidium
Tuficum
Ricina
Trea
Cluana
Matilica
Pausulae
Septempeda
Tolentium
Urbs Salvia
(Prolaqueum)
Camerinum
Firmum
Falerio
0
5
10
20
km

Karta vidnosti (viewshed)



http://mapaspects.org/colca/research/viewshed/what_is.html

Binarna karta vidnosti



Kumulativne karte vidnosti

Figure 3 - Example viewshed map generated from one long barrow of the Salisbury Plain group (shown as a black dot).

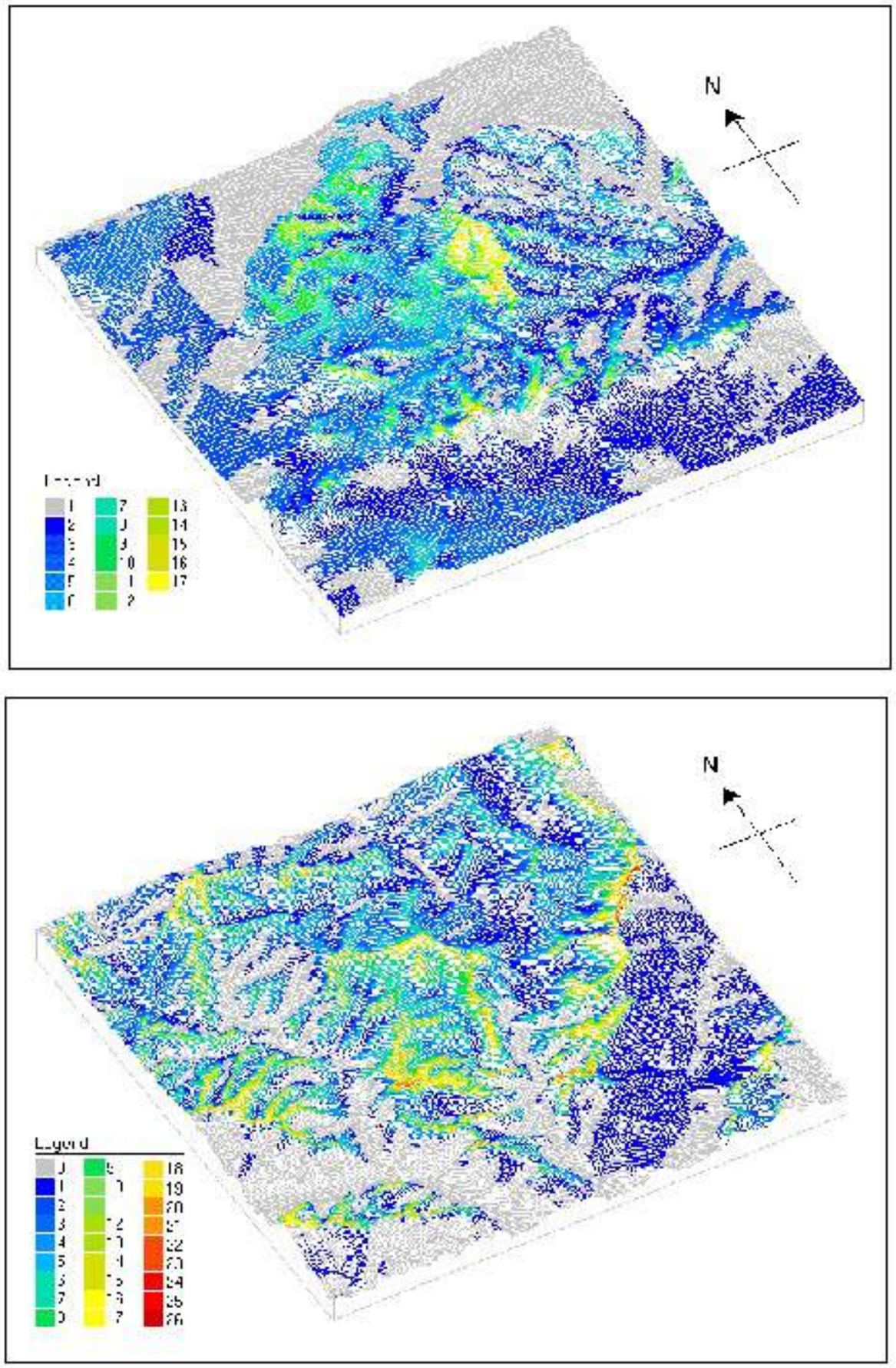
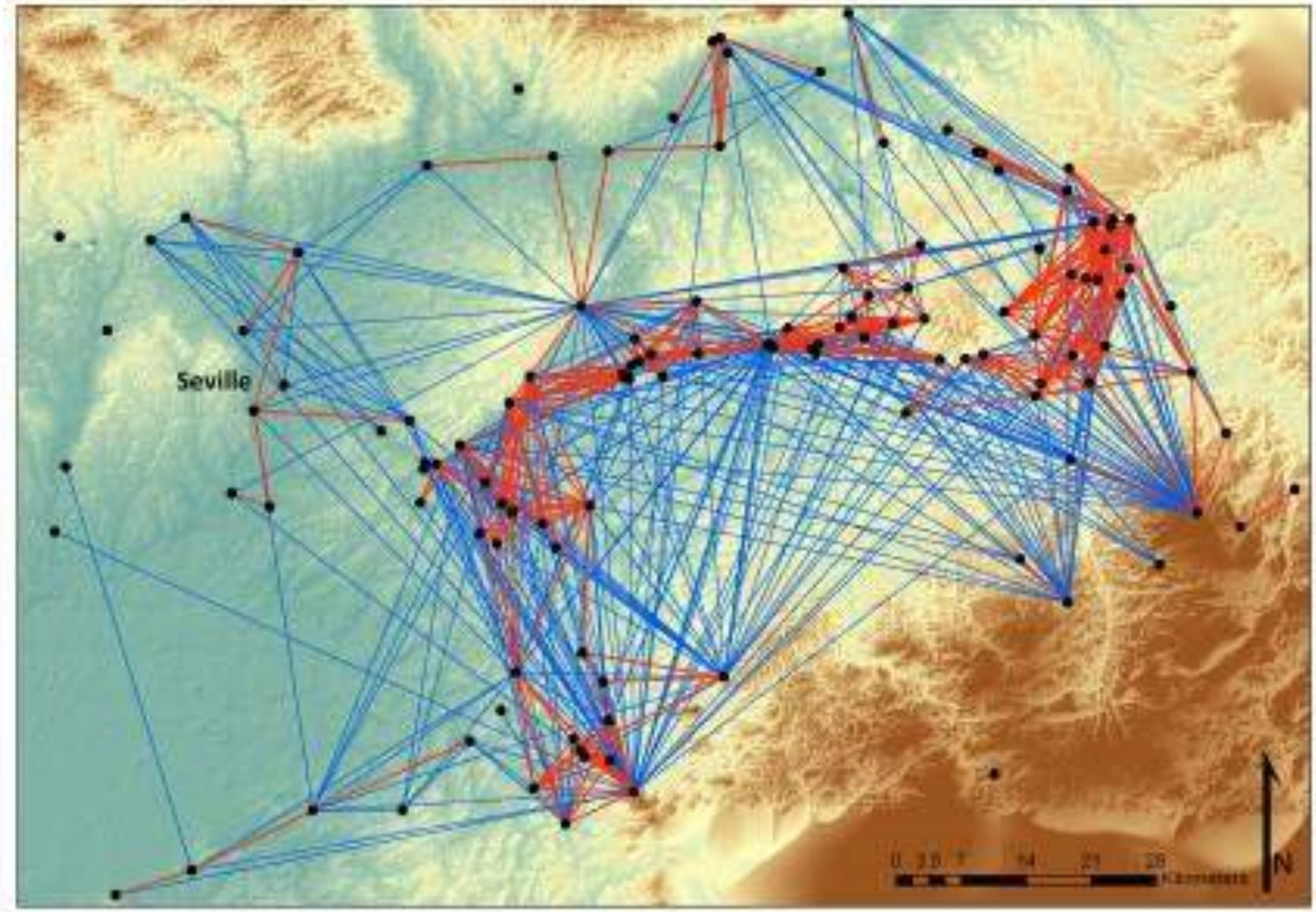


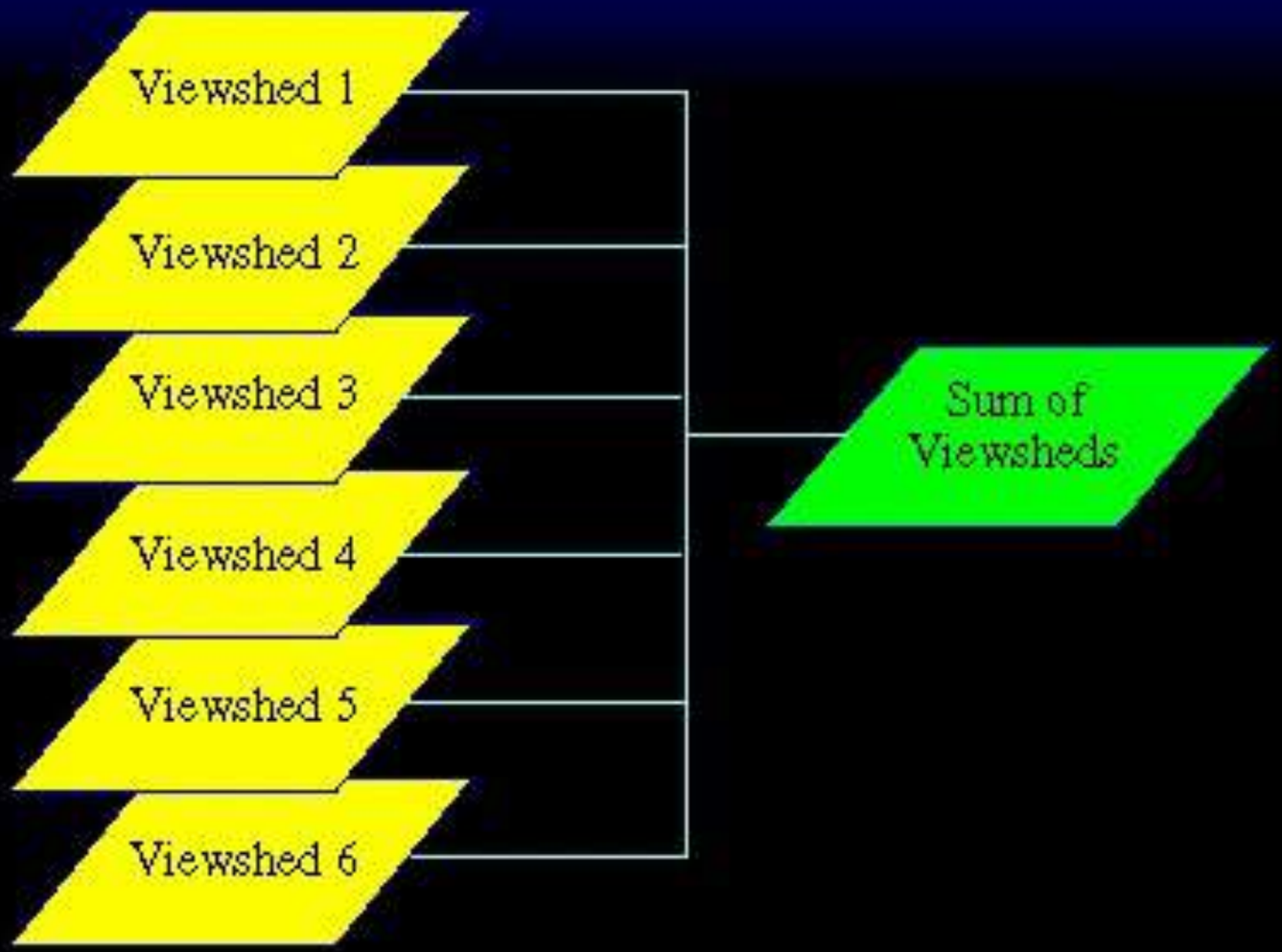
Figure 4 - Cumulative viewshed maps overlain on elevation to show the relationship. Top: Avebury area, Bottom: Salisbury Plain. Both diagrams show the entire 20km square area which was studied (see figure 3).

Medsebojna vidnost



http://digitalhumanities.soton.ac.uk/blog/1276

Calculating a Cumulative Viewshed



Higuchijevi indeksi

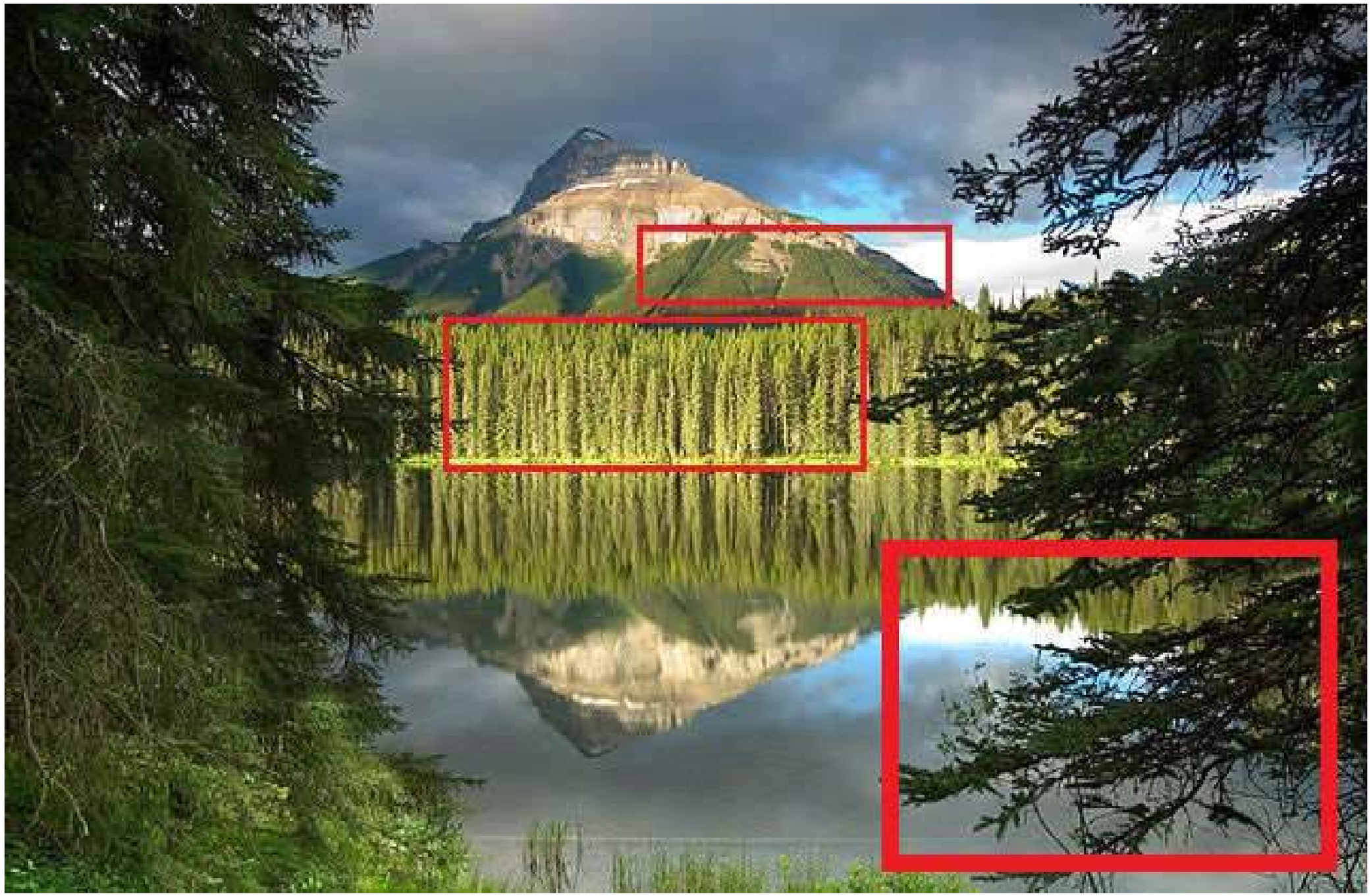
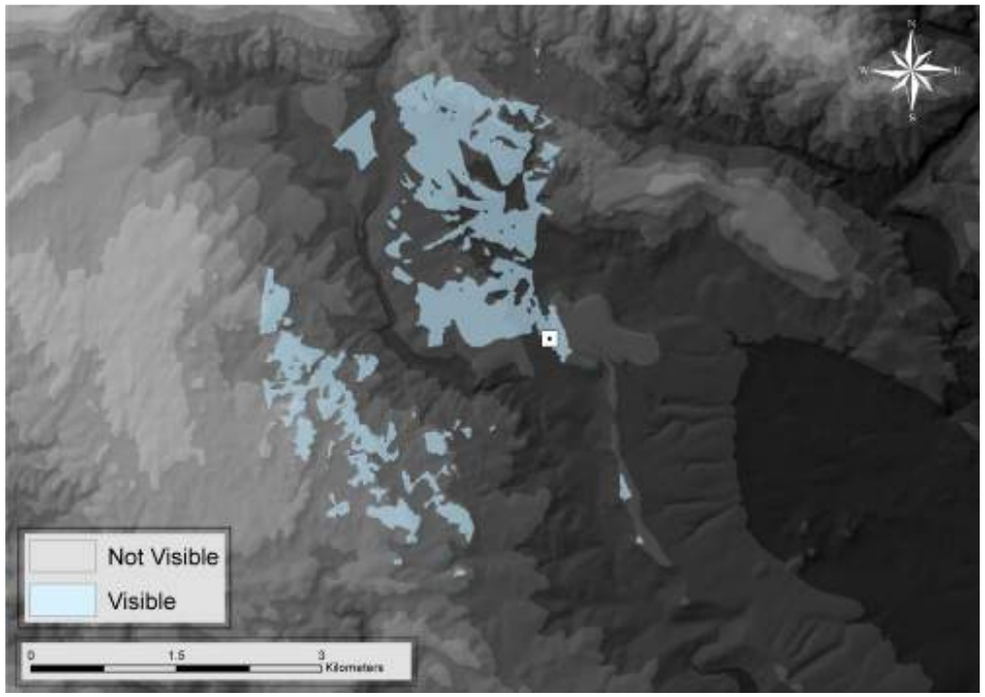
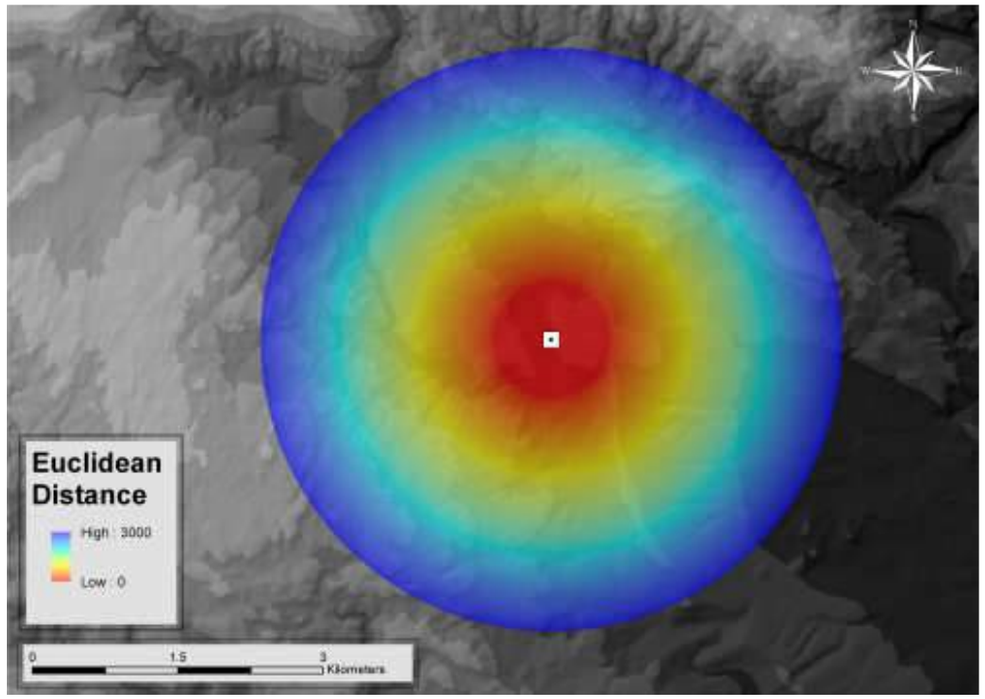
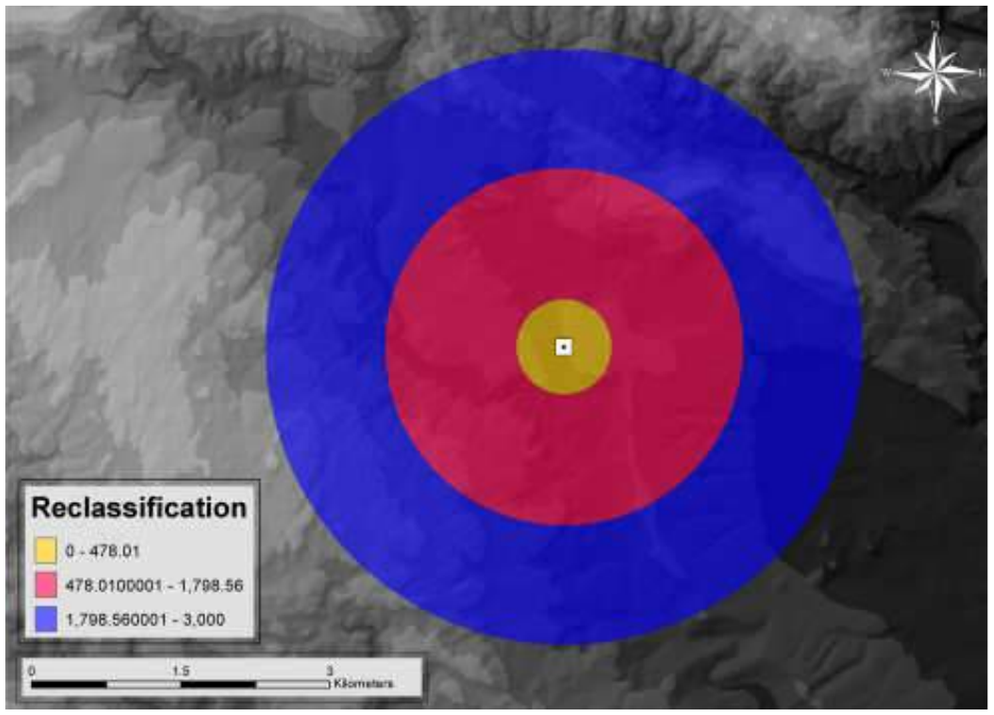


Fig. 5.20 Ranges established in the Higuchi viewshed. At short range, individual trees and details are recognizable, at middle range the forest is distinguished as a mass, and at long-distance range the forest becomes part of the background losing any distinctive identity. Photo by Chuck Szmurlo.







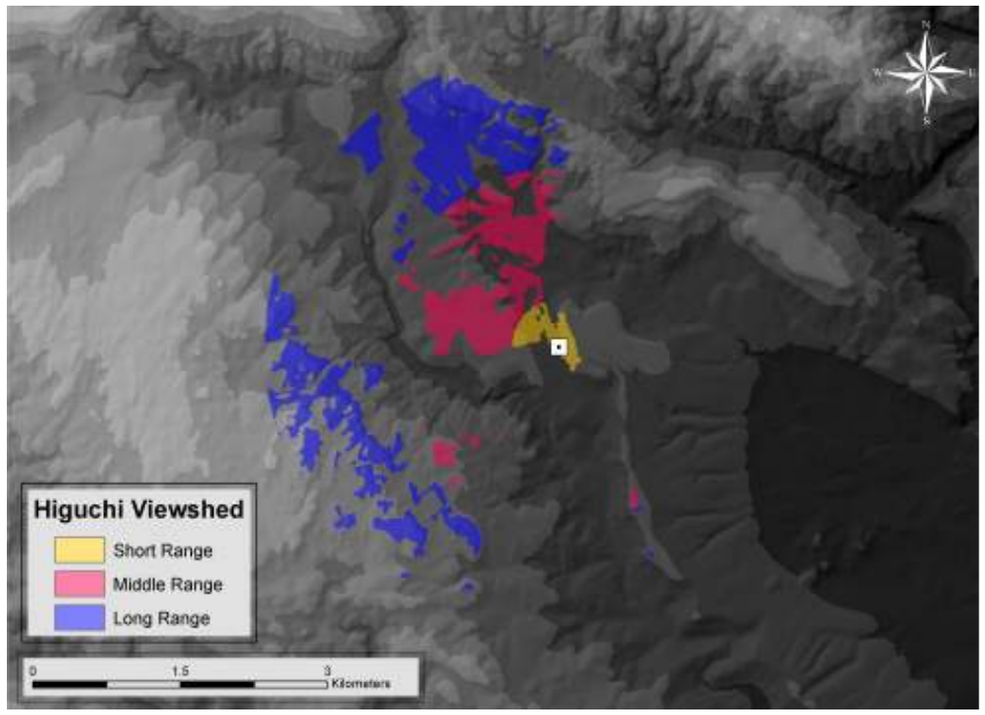
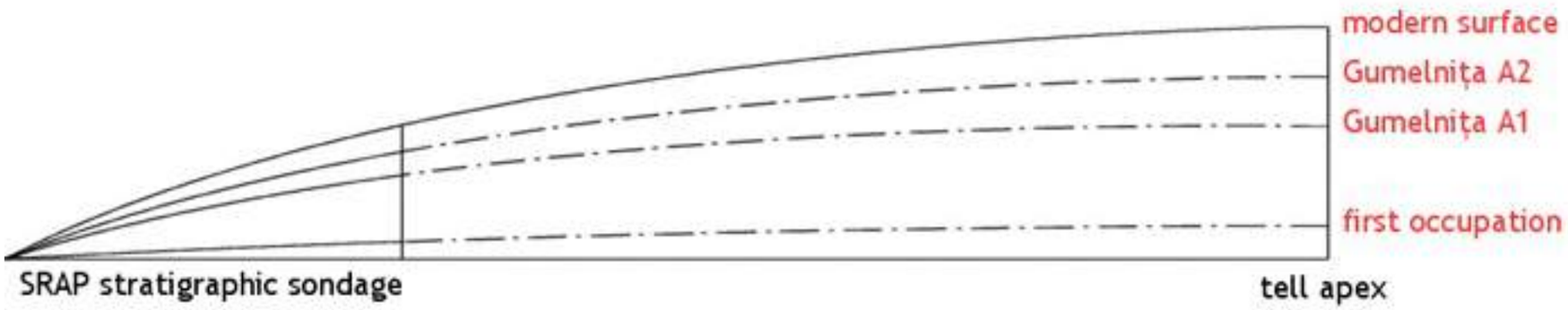
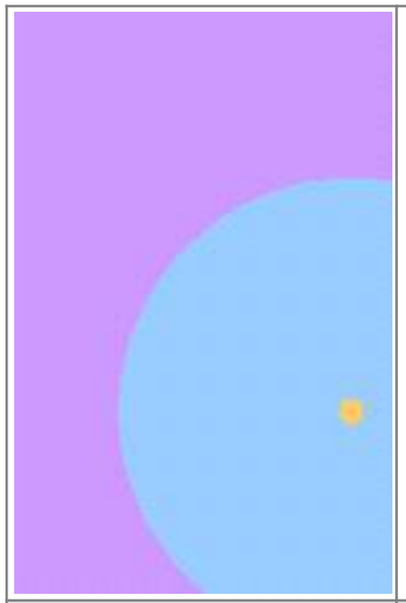


Fig. 6.42 Procedure to generate Higuchi viewshed. a) Binary viewshed; b) Calculation of Euclidean Distance; c) Reclassification to index established and d) Combination of both.





a. Higuchi bands

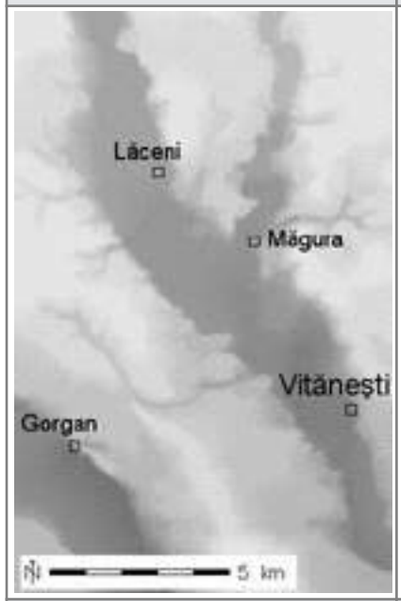
b. Base viewshed

c. Gumelniţa A1 viewshed

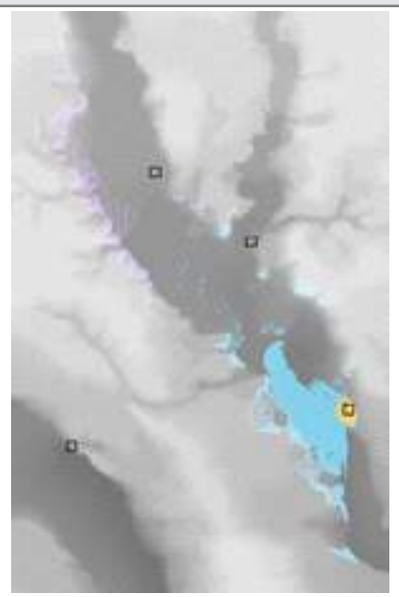
d. Gumelniţa A2 viewshed

e. Gumelniţa B1 viewshed

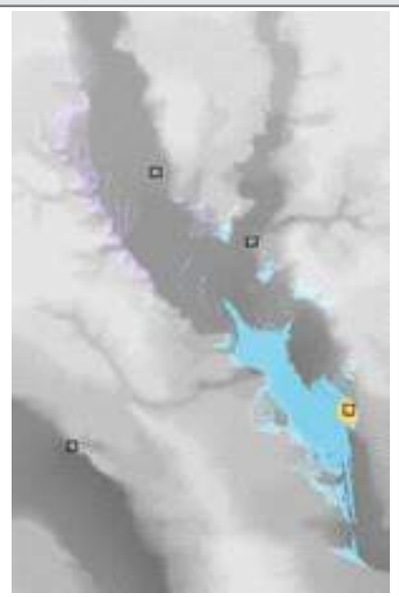
f. Modern viewshed



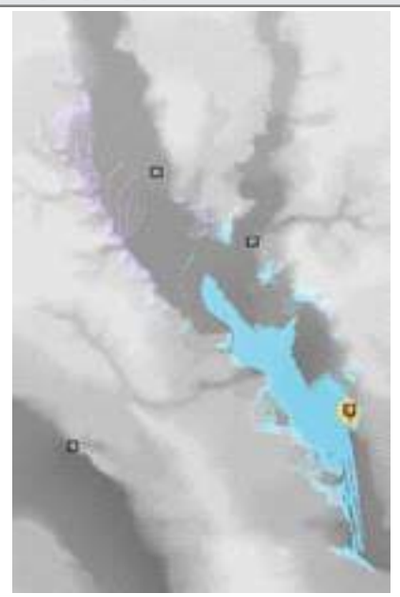
a. DEM of locale



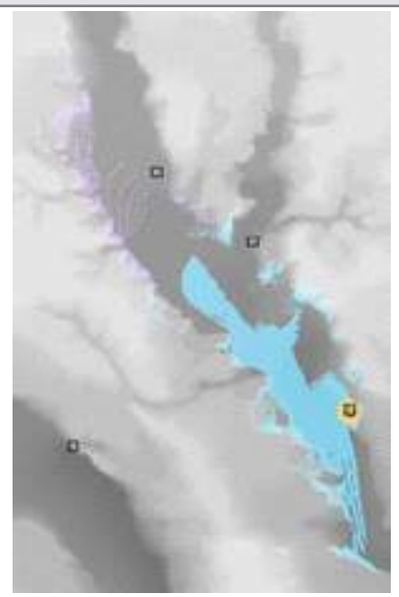
b. Basal viewshed overlaid



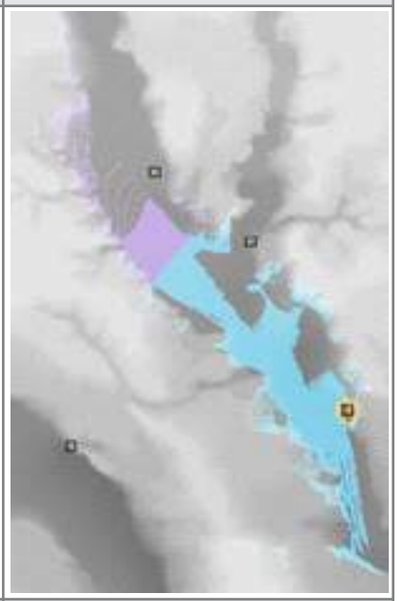
c. Gumelniţa A1 overlaid



d. Gumelniţa A2 overlaid

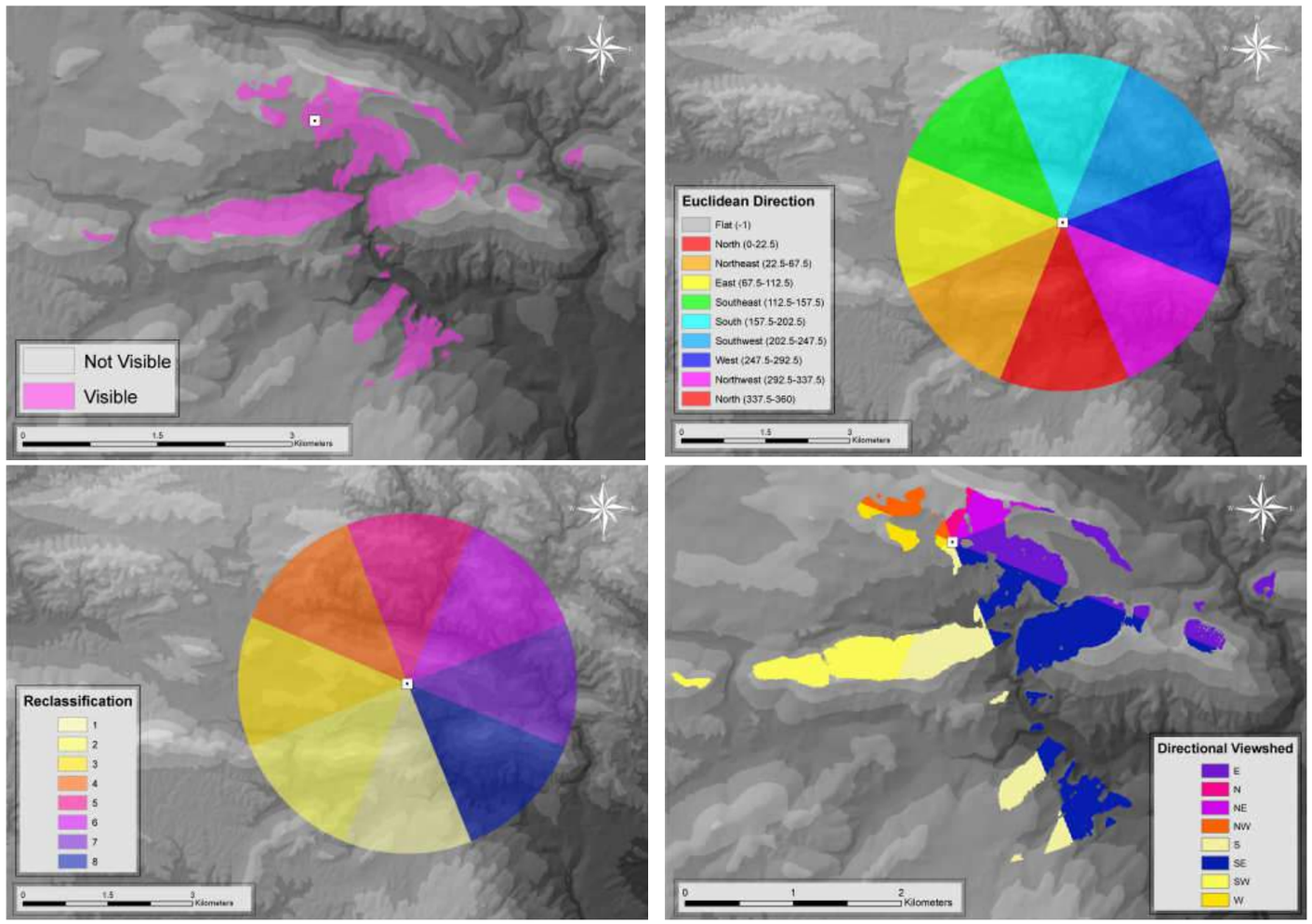


e. Gumelniţa B1 overlaid



f. Modern viewshed

Usmerjena karta vidnosti



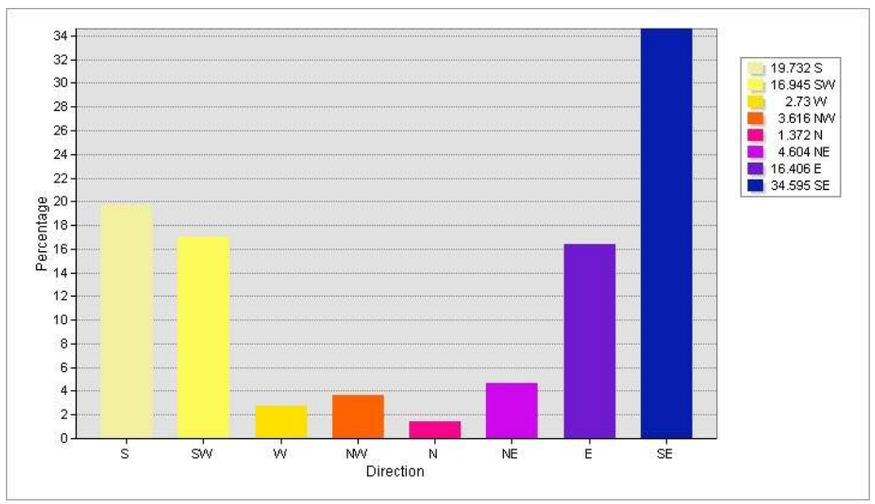
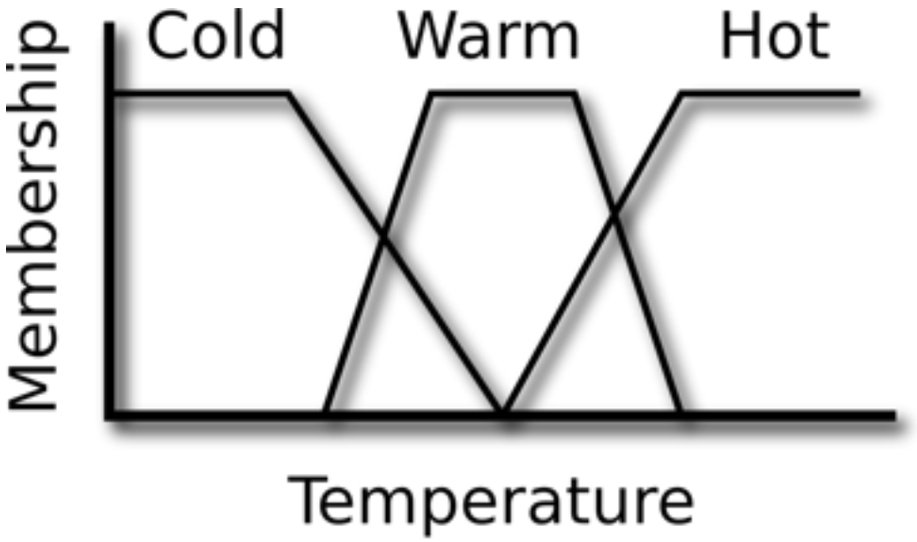


Fig. 6.41 a) Simple binary viewshed; b) Calculation of Euclidean Direction; c) Reclassification of Euclidean Direction; d) Overlap of viewshed and Direction; e) Graphic showing the predominant direction of the viewshed.

Mehka vidnost/fuzzy viewshed



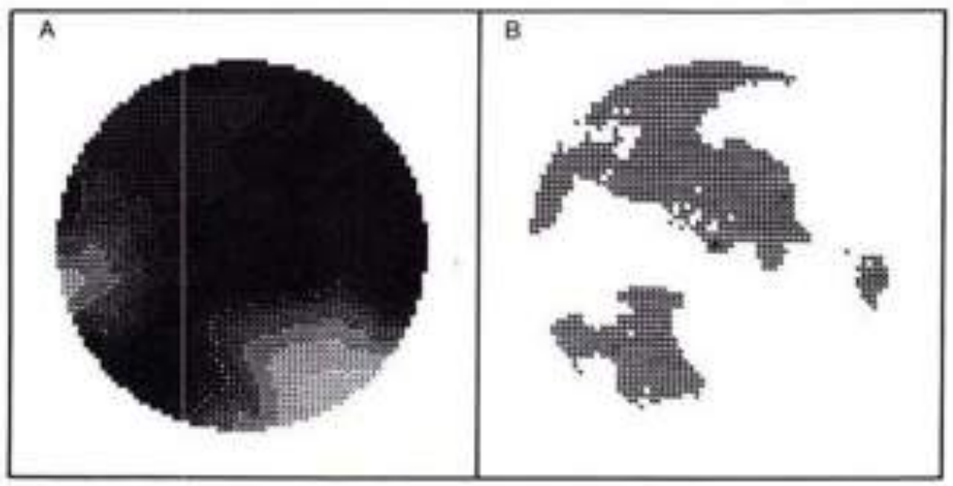


FIG. 2. (A) The DEM within 1 km from Point 1 (elevation increases with darkness), and (B) the Boolean viewshed from Point 1.

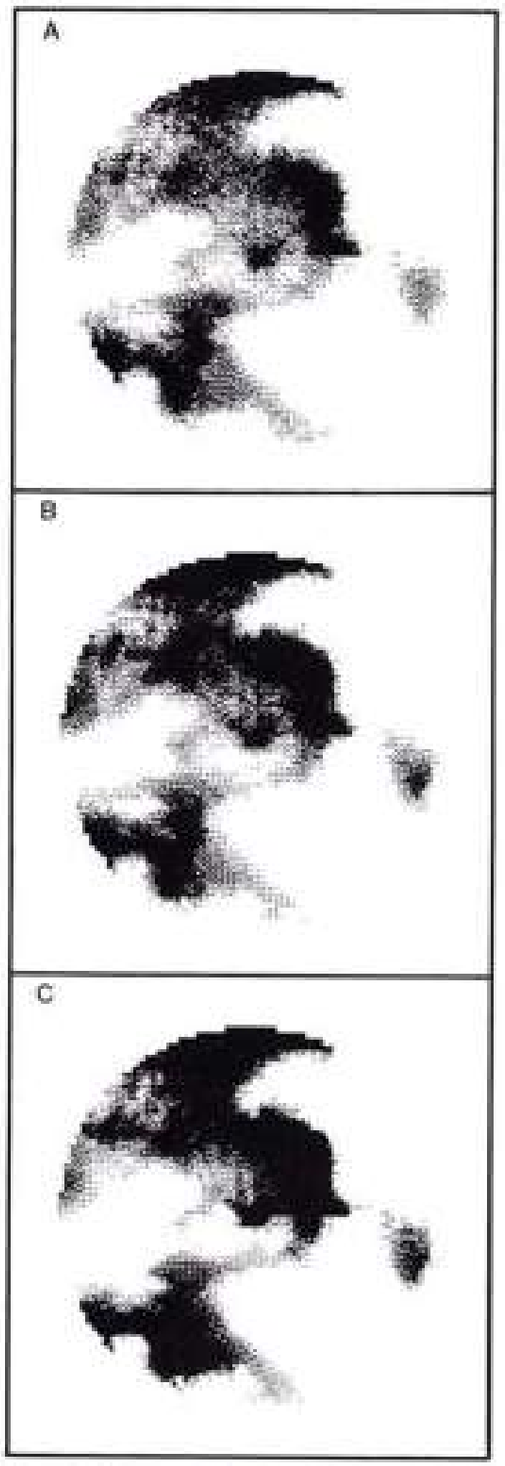


FIG. 8. Fuzzy viewsheds from Point 1 with variable SA, (A) I = 0, (B) I = 0.7, and (C) I = 0.9. Note that Figure 8a is the same as Figure 4b. Darker areas have higher fuzzy memberships.

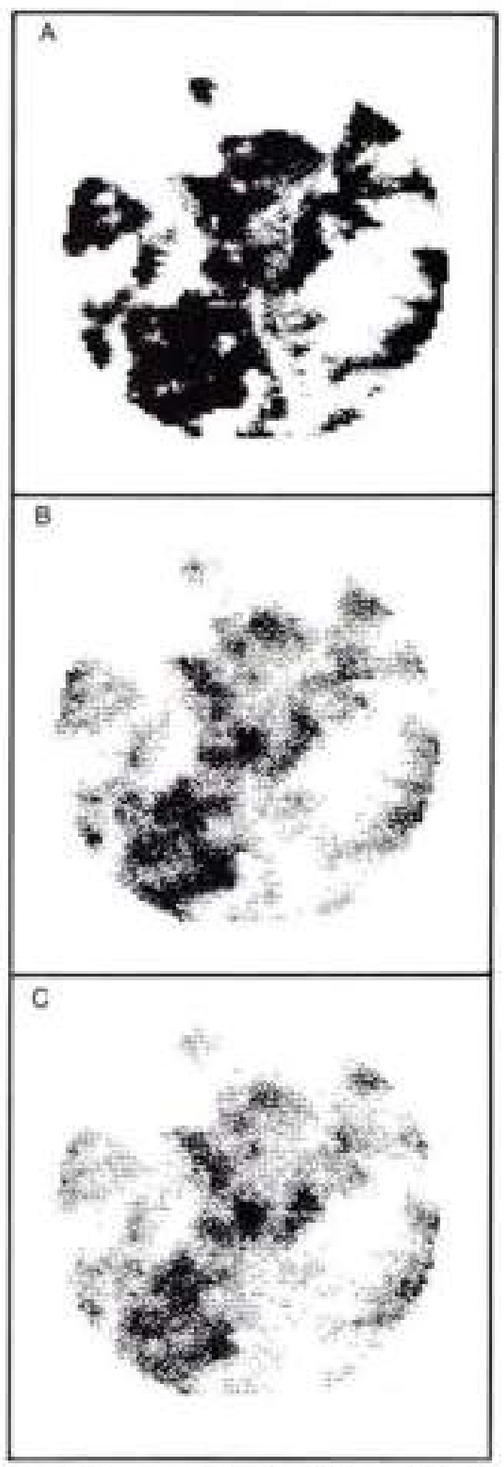


FIG. 6. Fuzzy viewsheds from Point 2 with (A) RMSE = 2, (B) RMSE = 7, and (C) RMSE = 10. Note that Figure 6b is the same as Figure 10a. Darker areas have higher fuzzy memberships.

Karta totalne vidnosti (total viewshed)

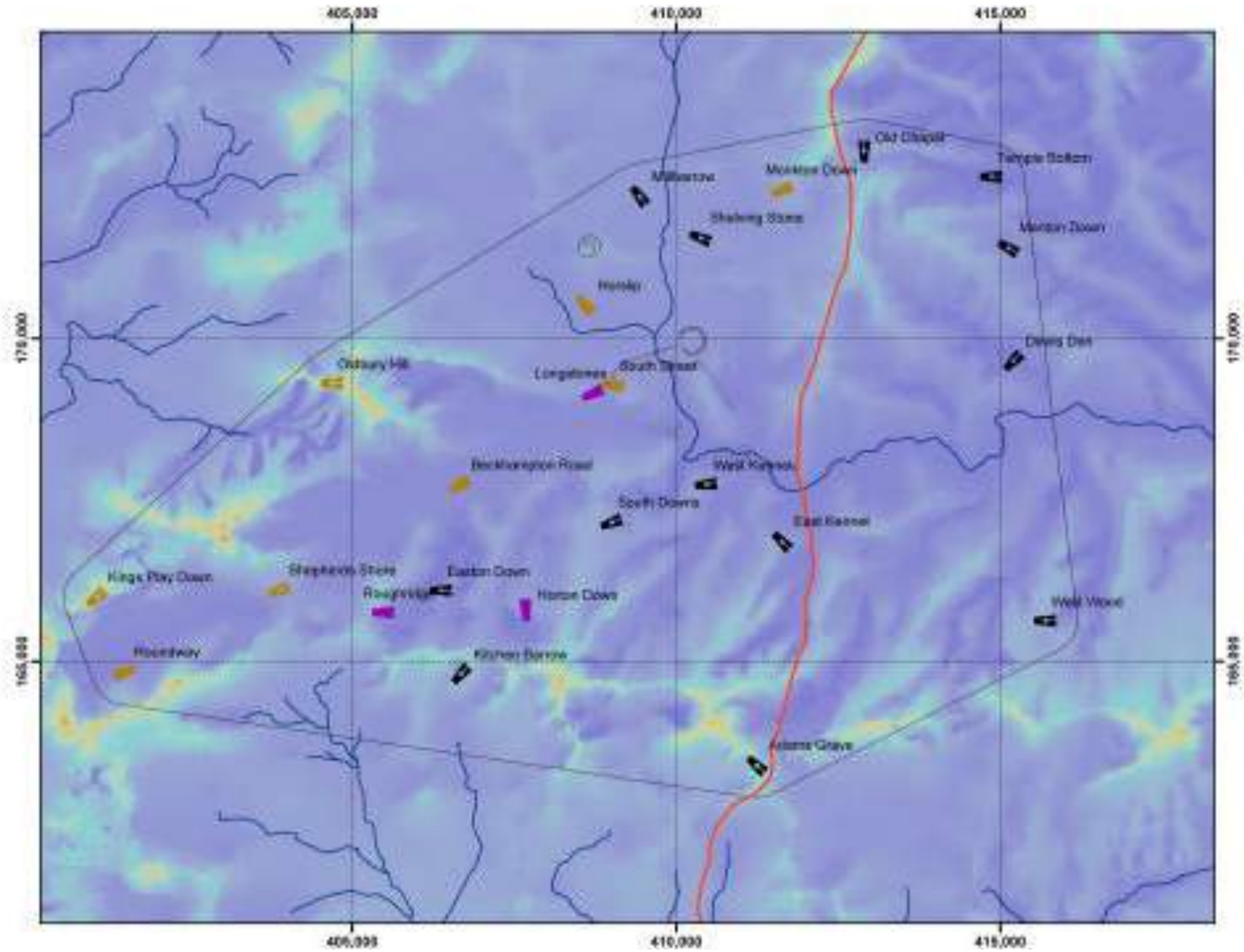


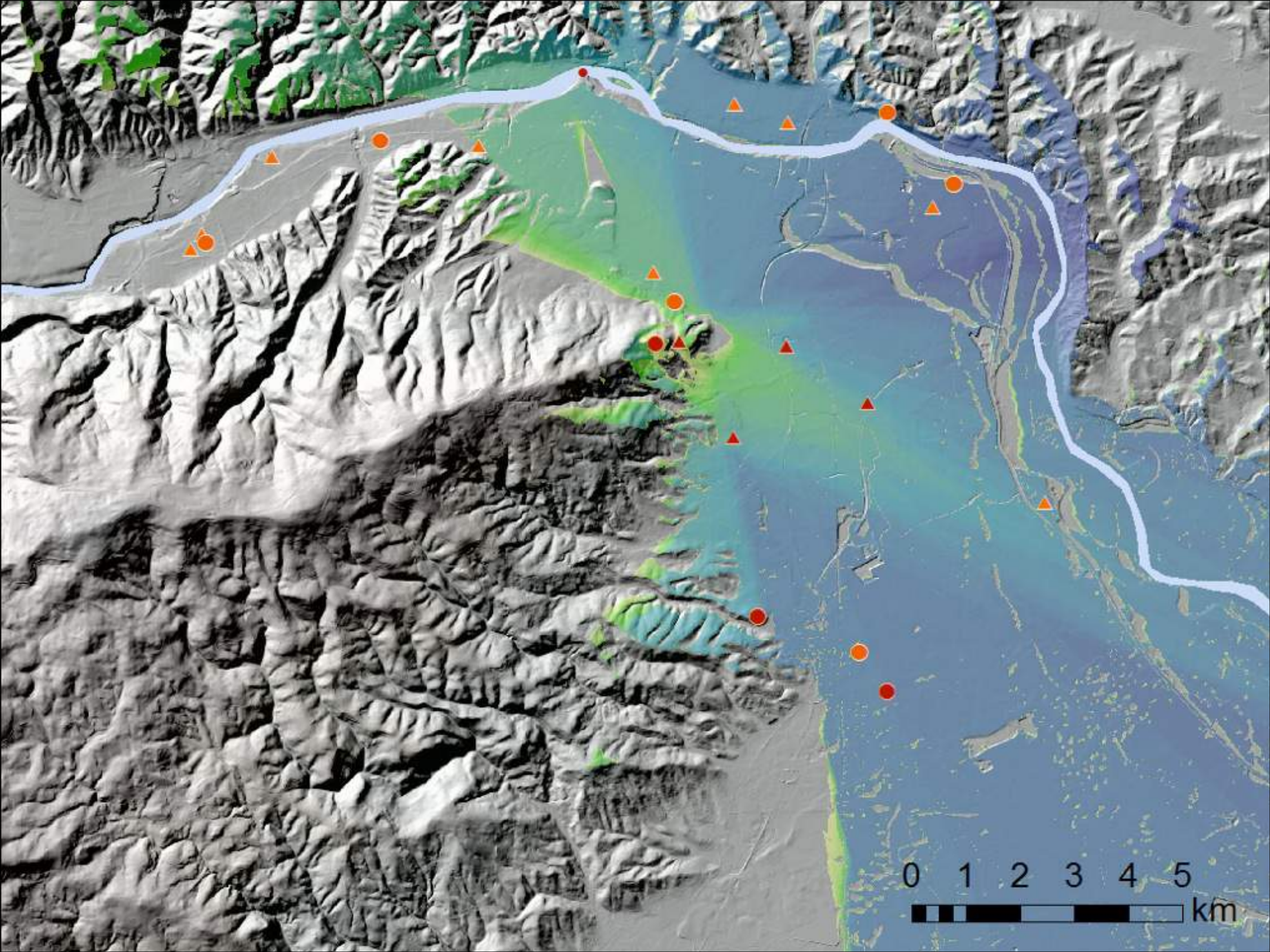
Figure 3. Total viewshed for the same region as in figure 2. Here, values represent the area from which a monument would be visible if built at each location. Lower values are in darker blue, with the highest values in red.

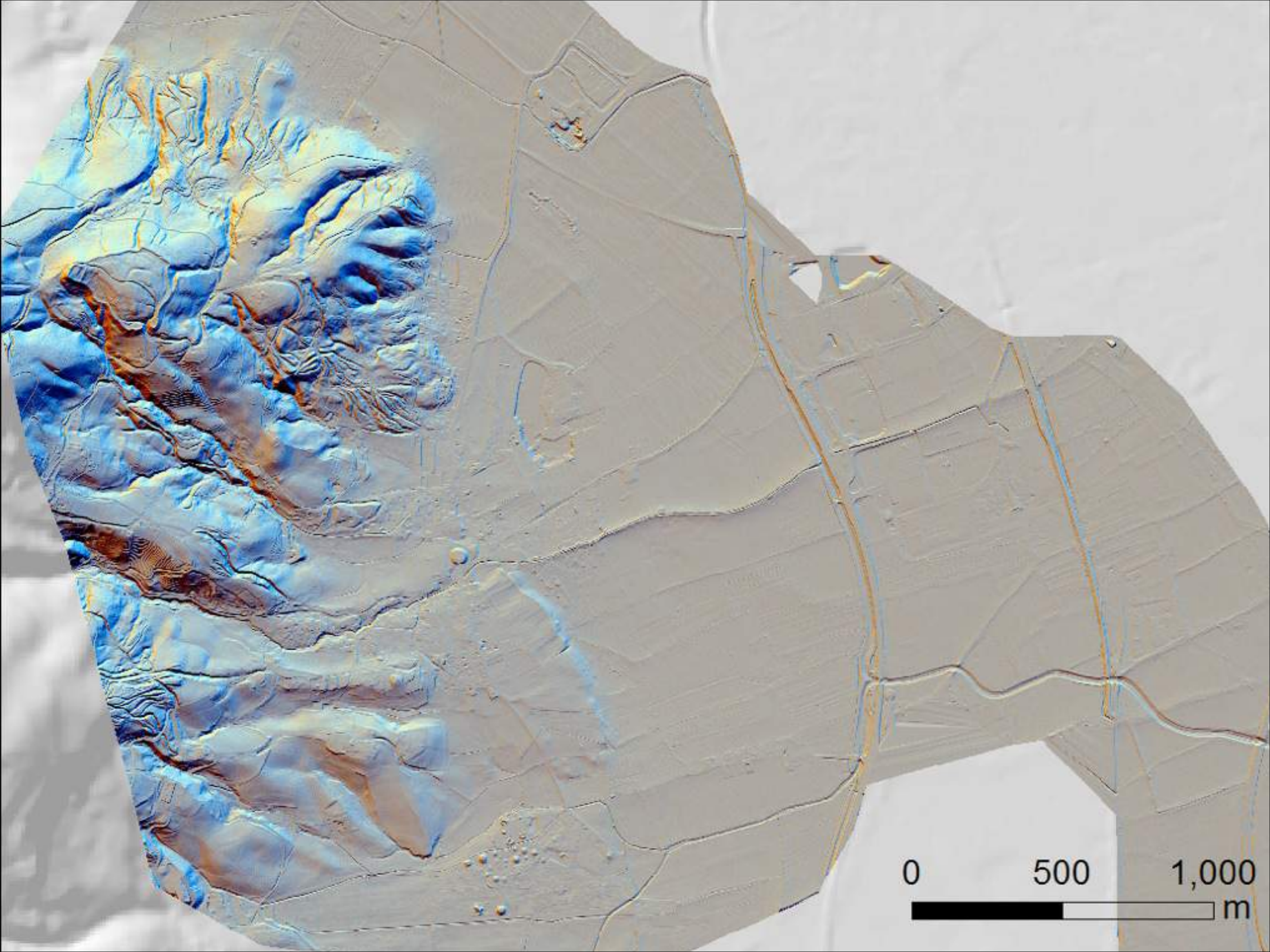
Poštela

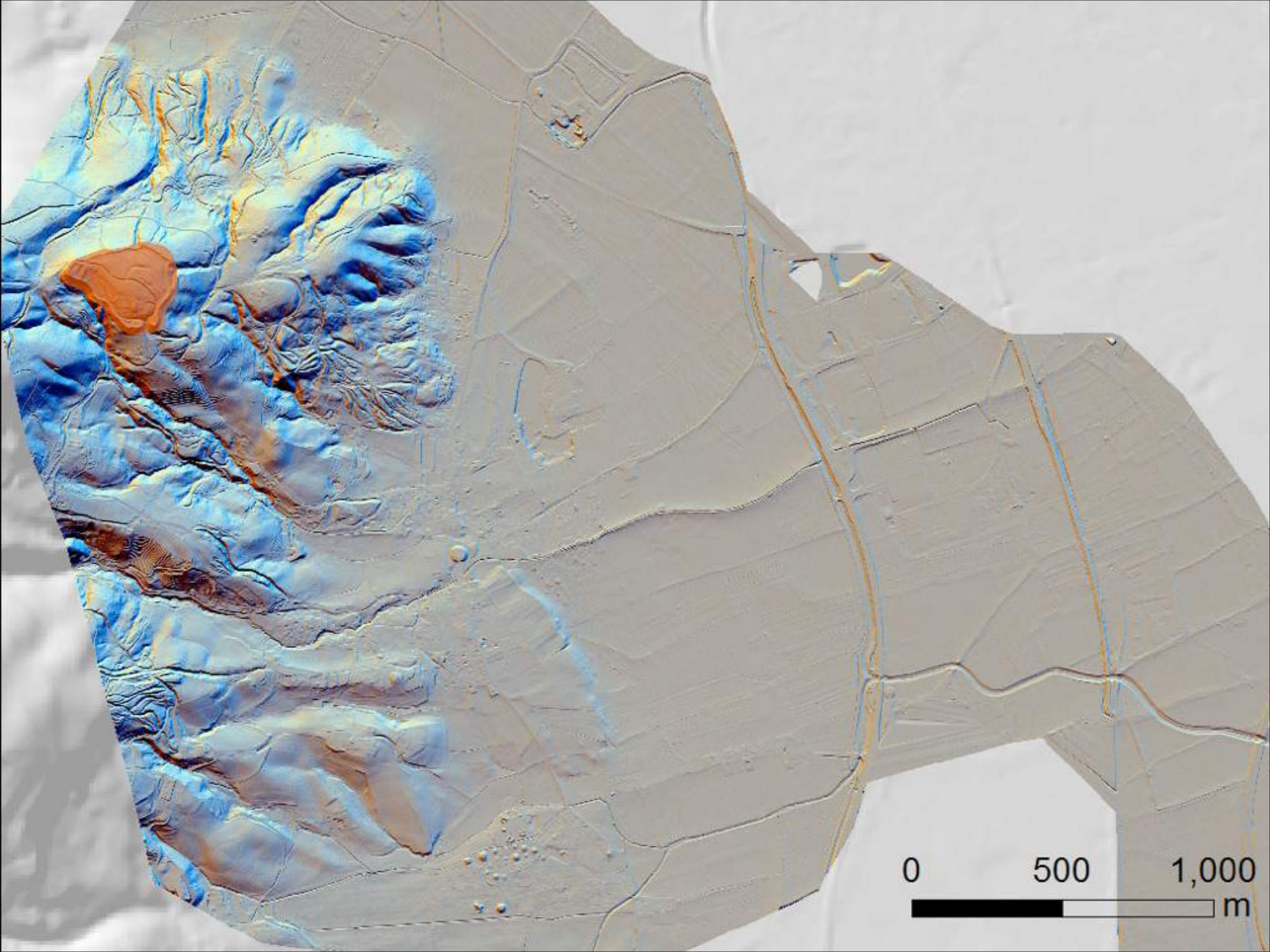
Drava

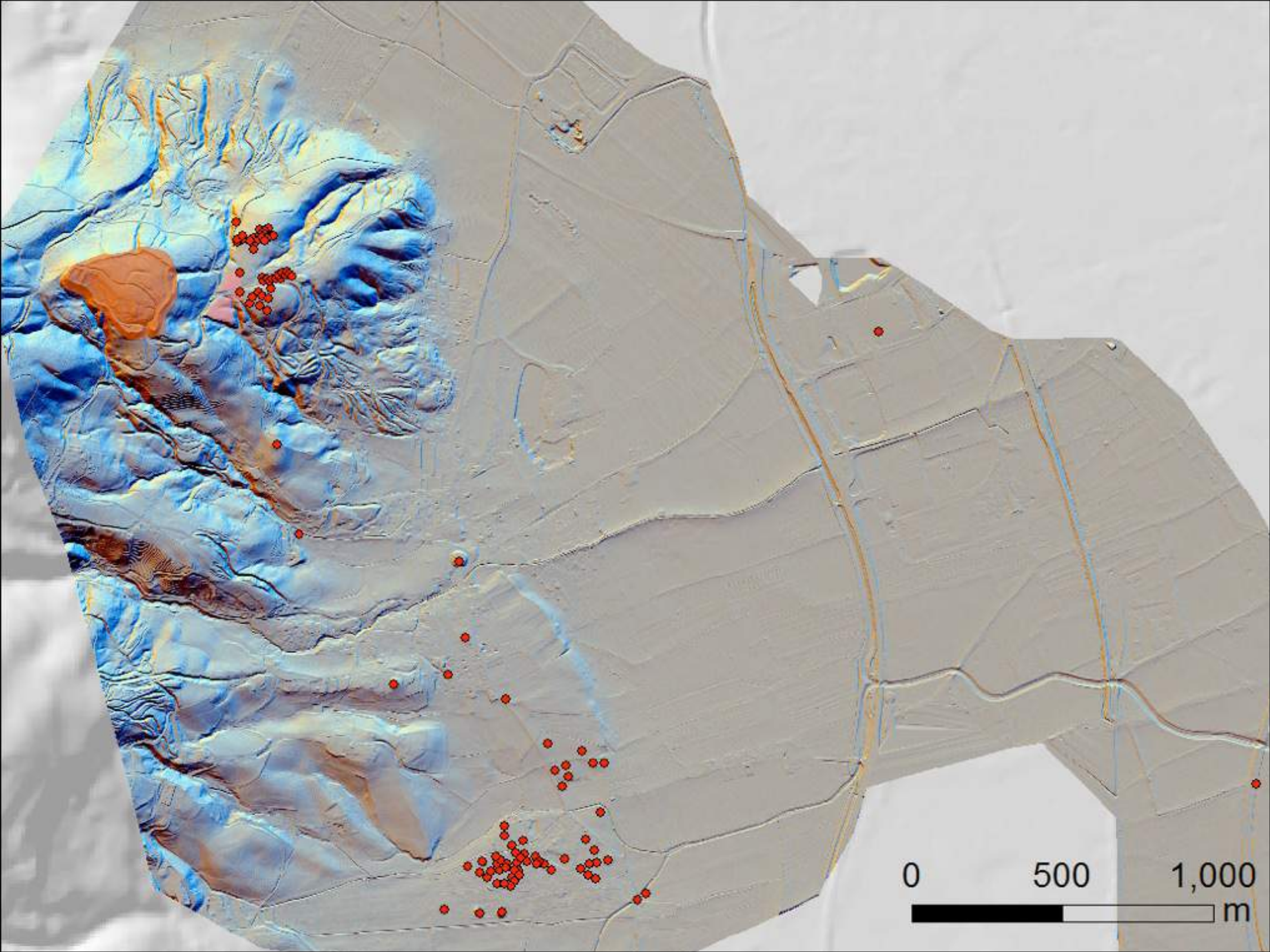
Urnfield
Iron Age

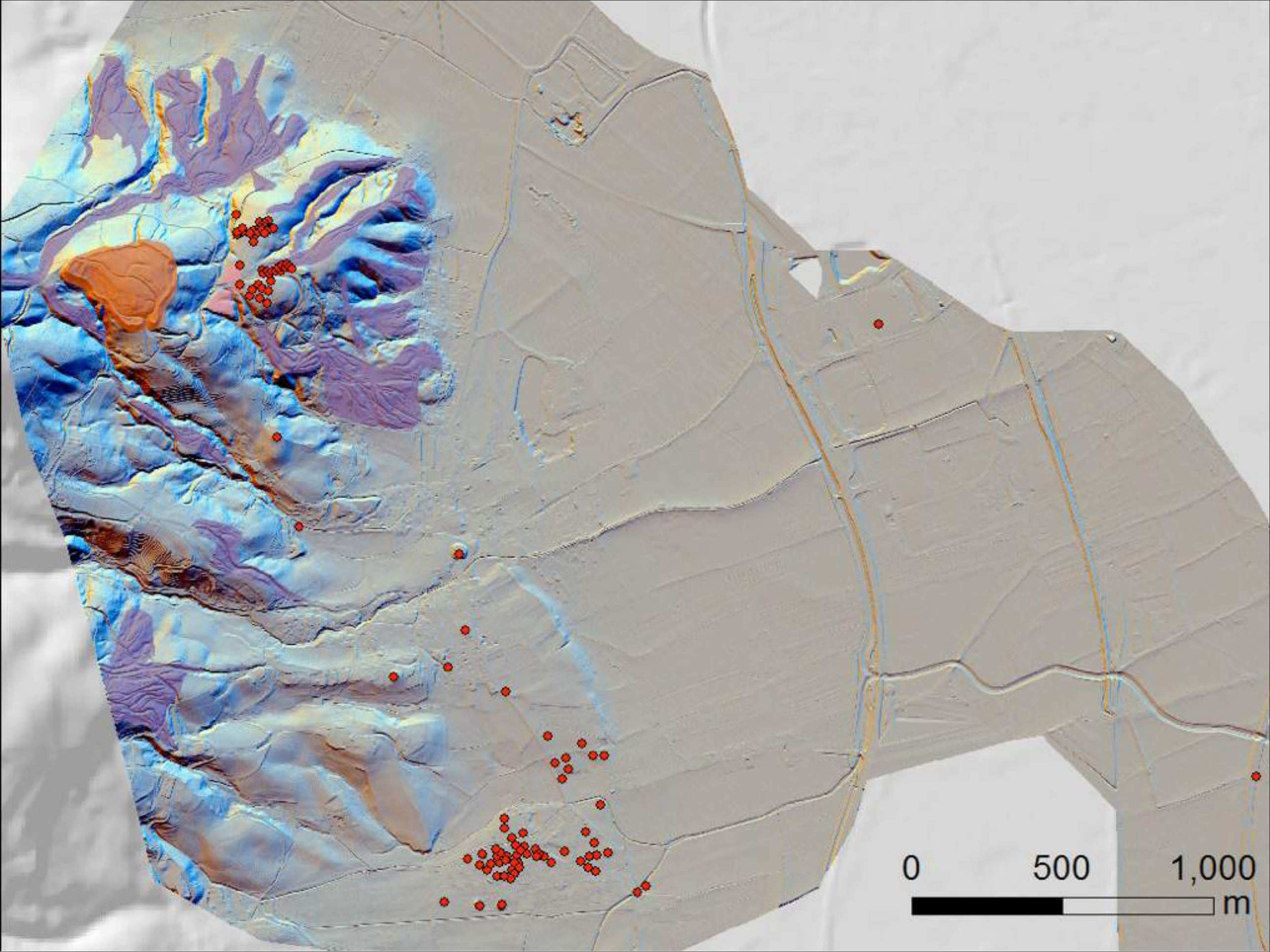
0 1 2 3 4 5
km

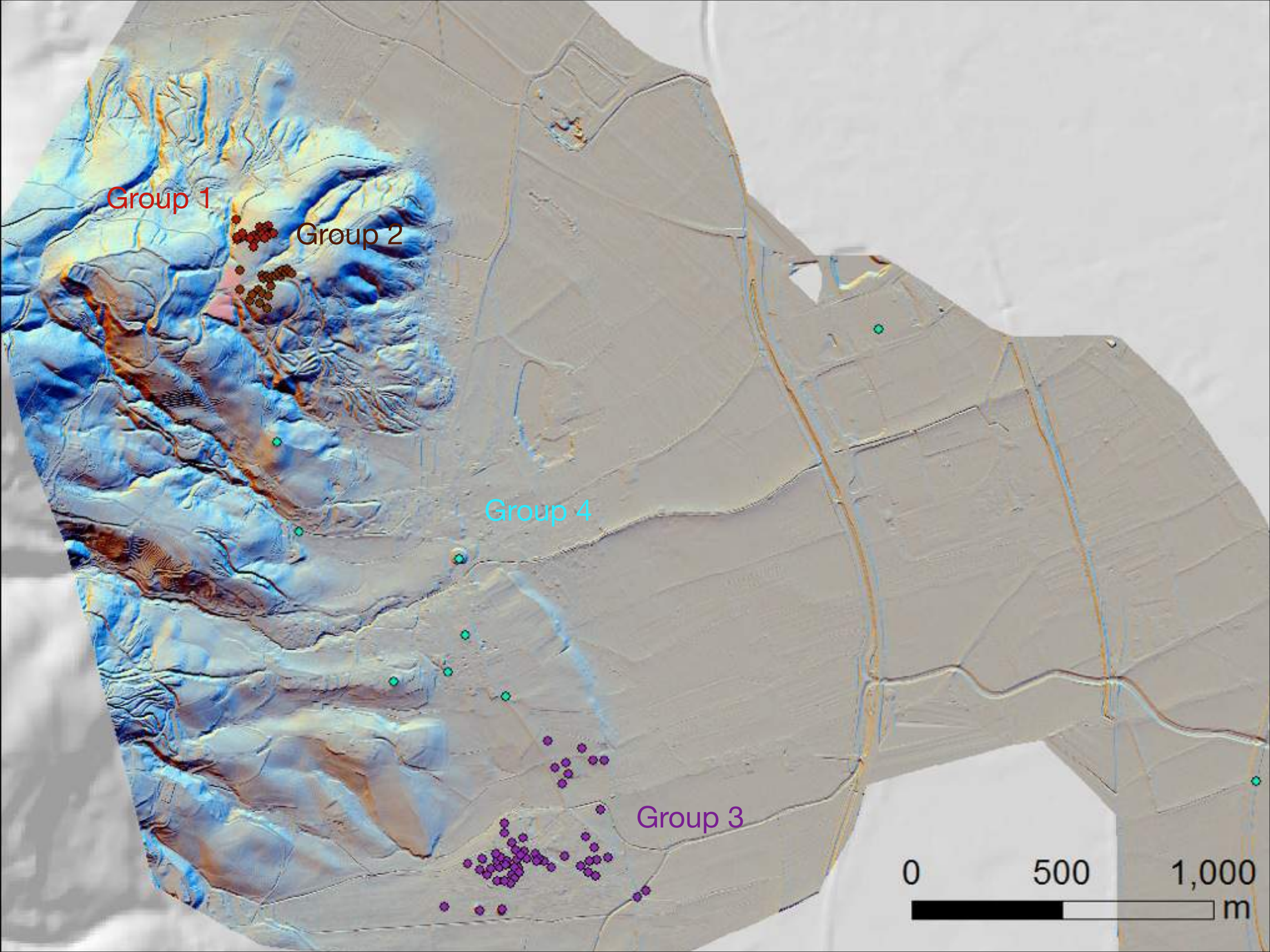

0 1 2 3 4 5
km

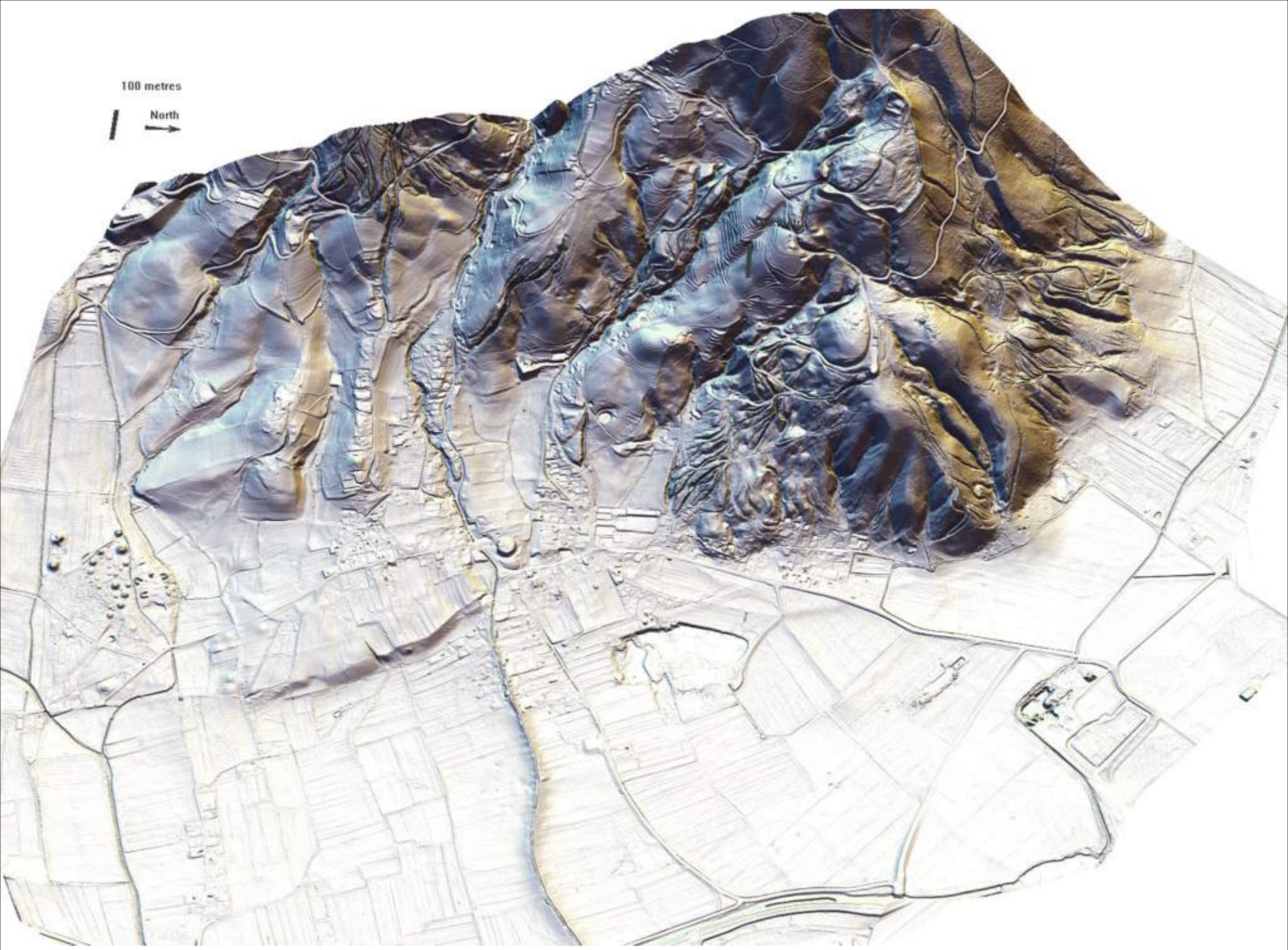

0
500
1,000
m

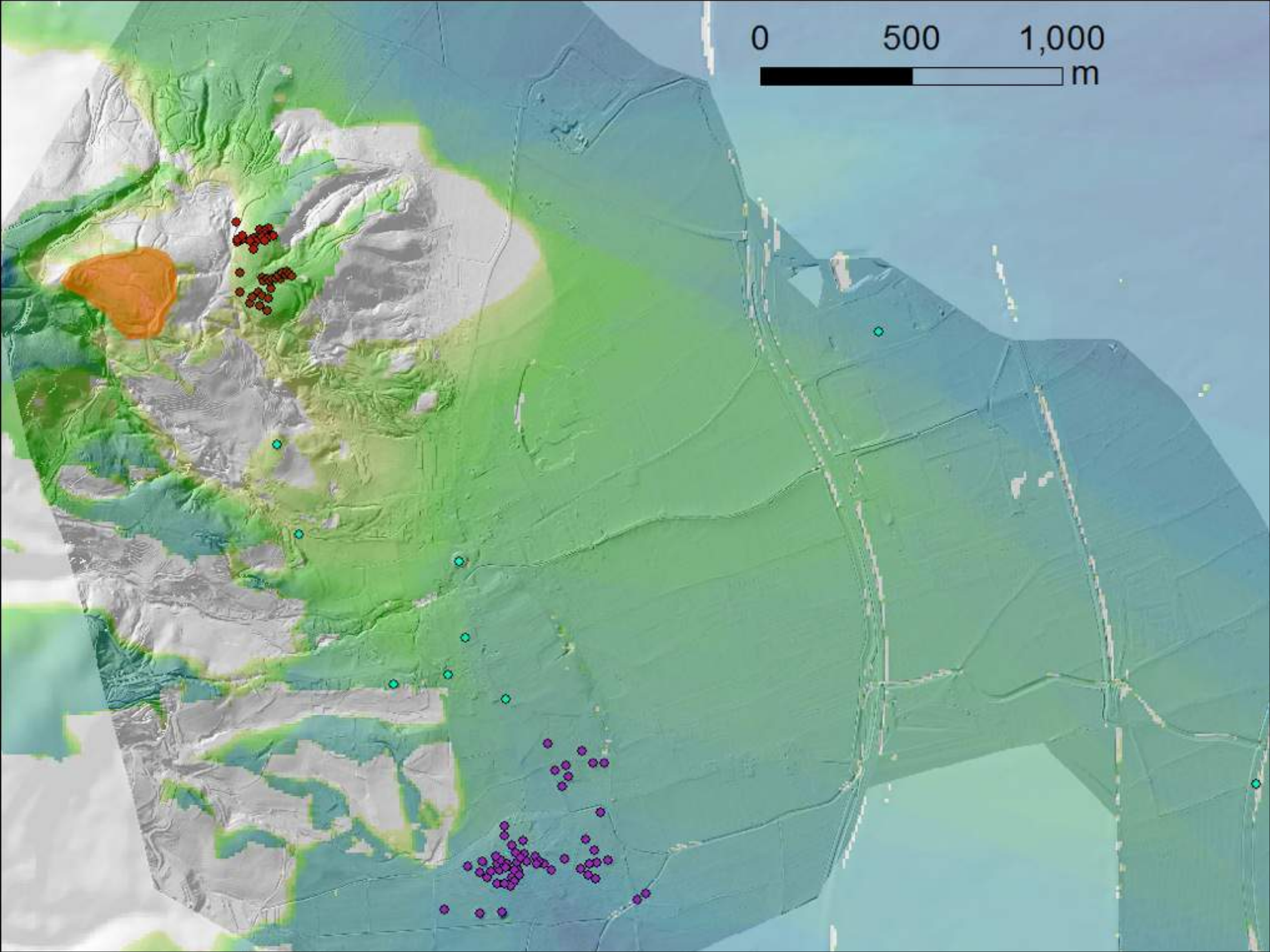

0
500
1,000
m

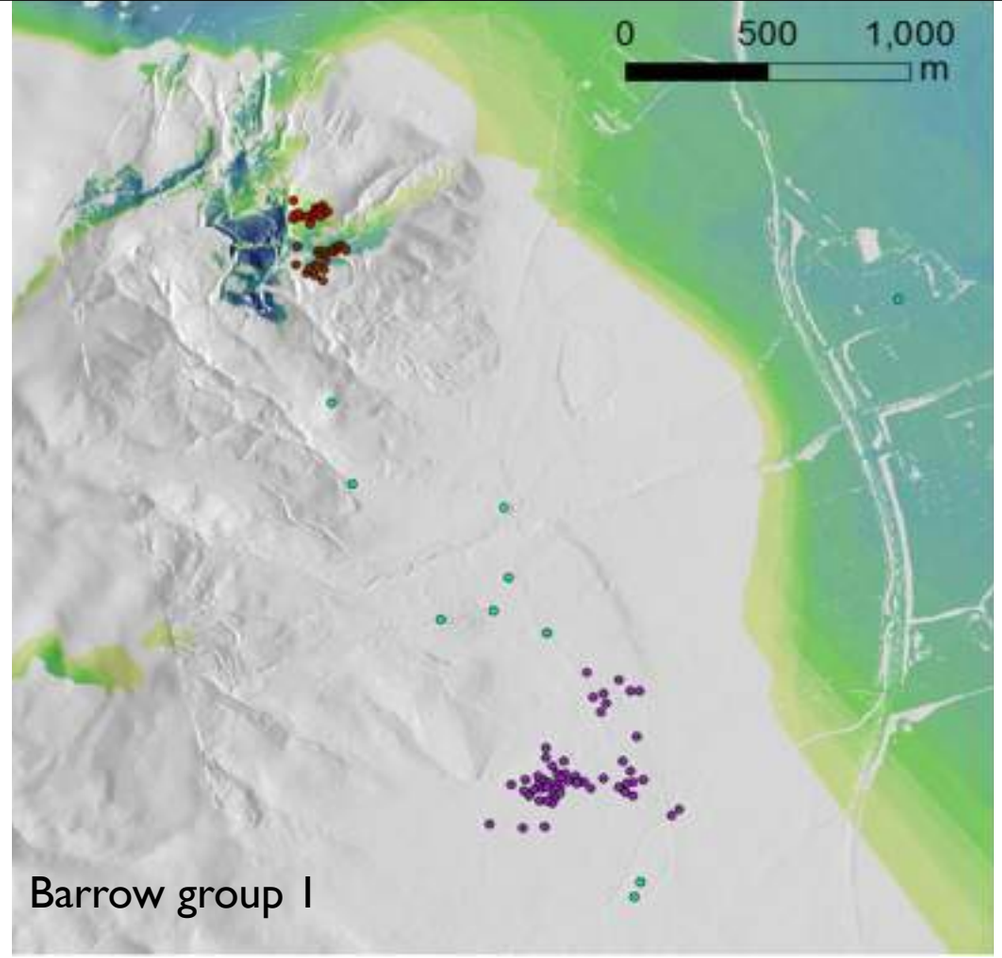

0
500
1,000
m


0
500
1,000
m

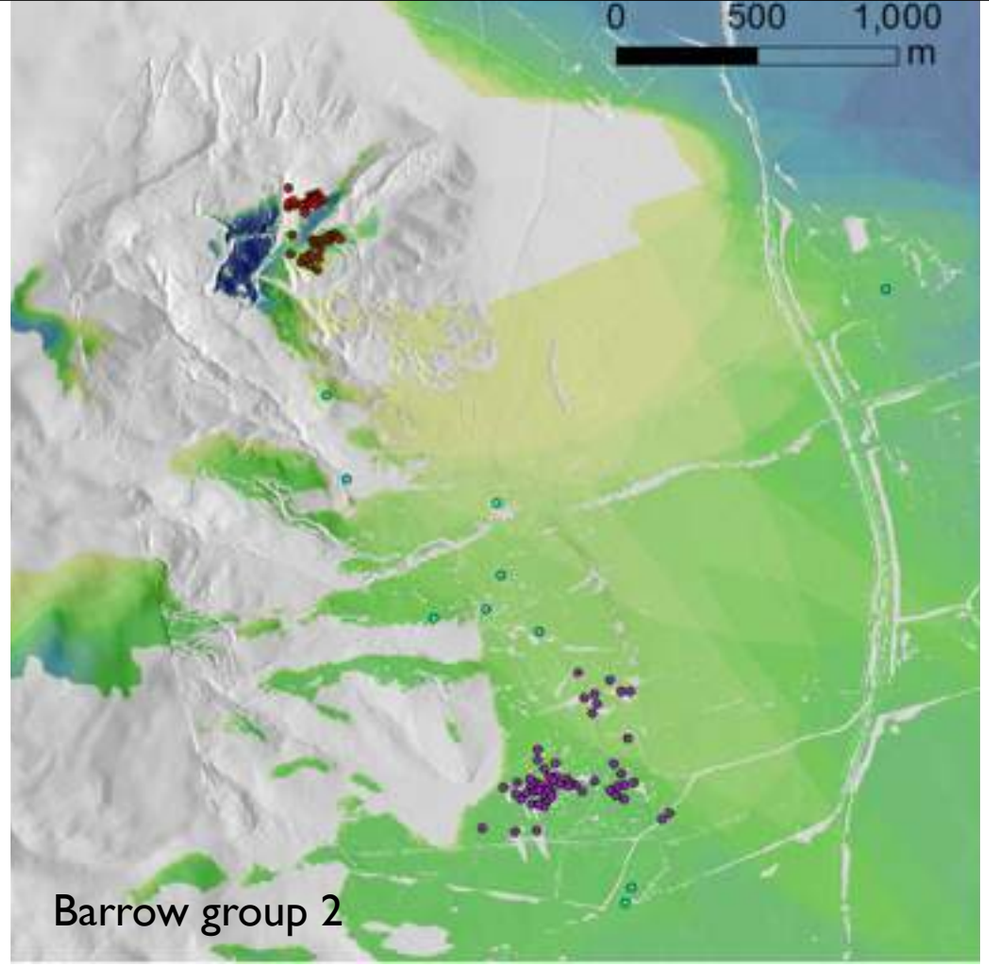

Group 1
Group 2
Group 4
Group 3
0
500
1,000
m


100 metres
North

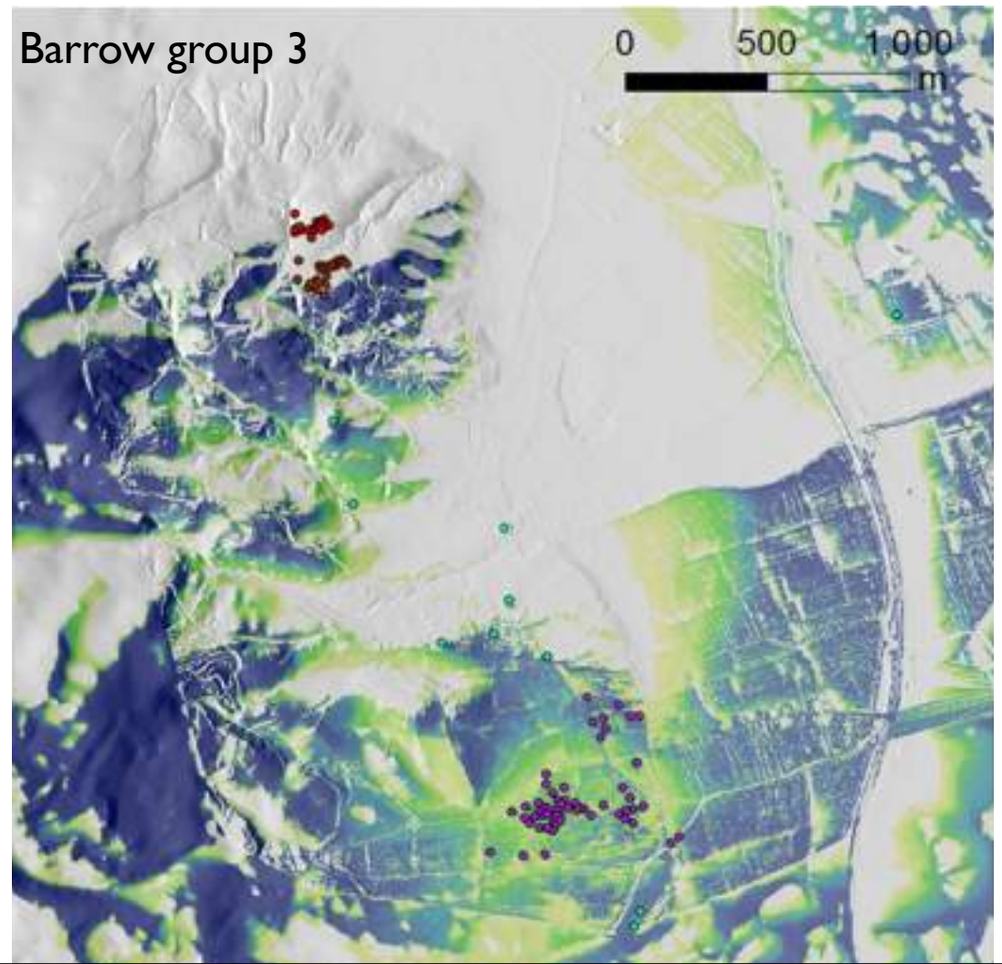

0
500
1,000
m



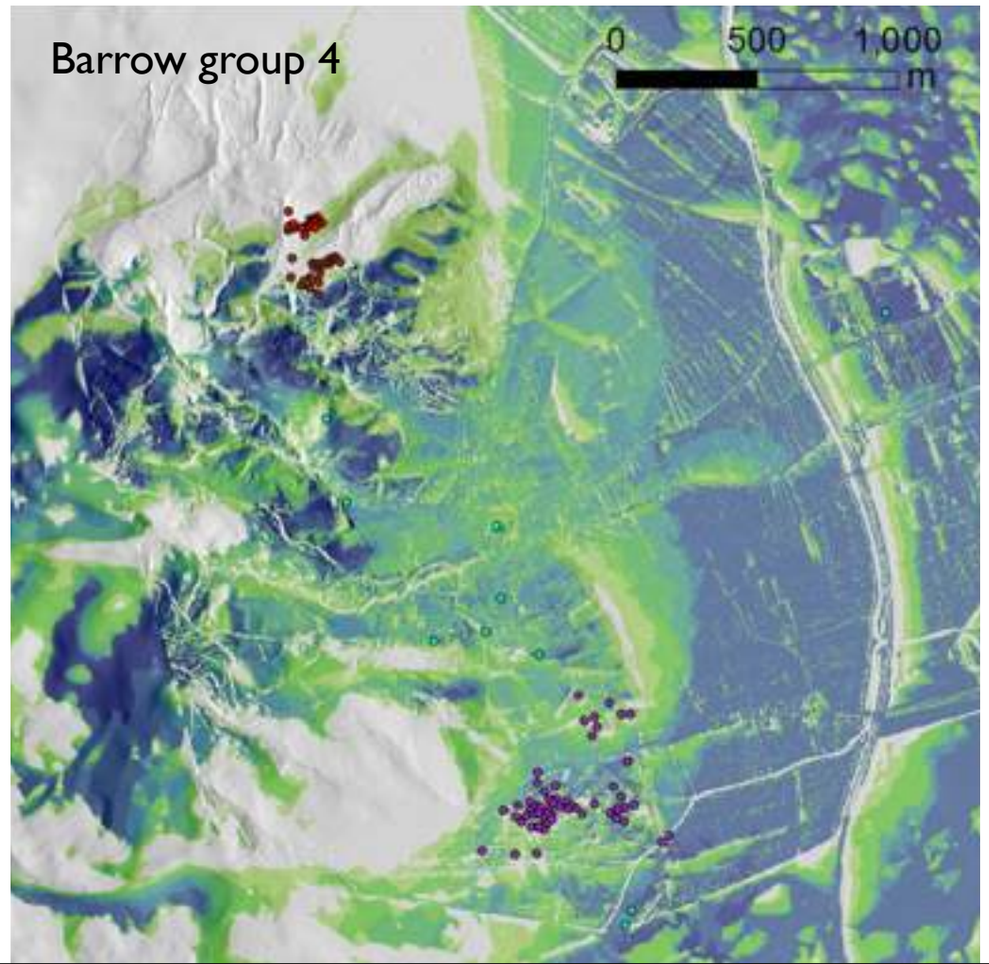
Barrow group 1



Barrow group 2



Barrow group 3



Barrow group 4

Group 3

0 100 200
m

Total viewshed, foreground

Group 3

More visible

Less visible

0 100 200

m

Total viewshed, midground

Group 3

More visible

Less visible

0 100 200

m

Groups 1 & 2

0 100
m

Total viewshed, foreground

Groups 1 & 2

More visible

Less visible

0 100

m

Total viewshed, midground

Groups 1 & 2

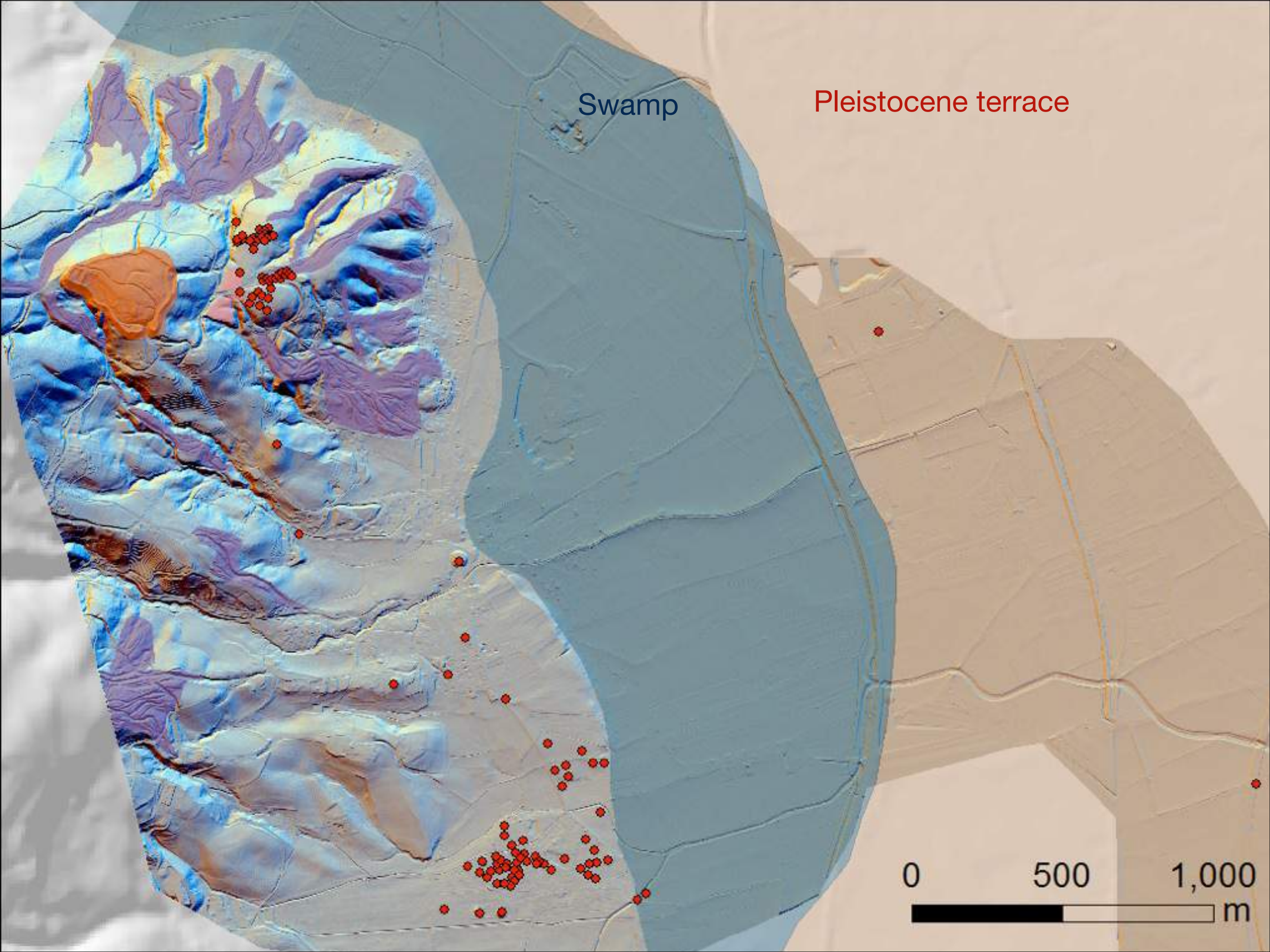
More visible

Less visible

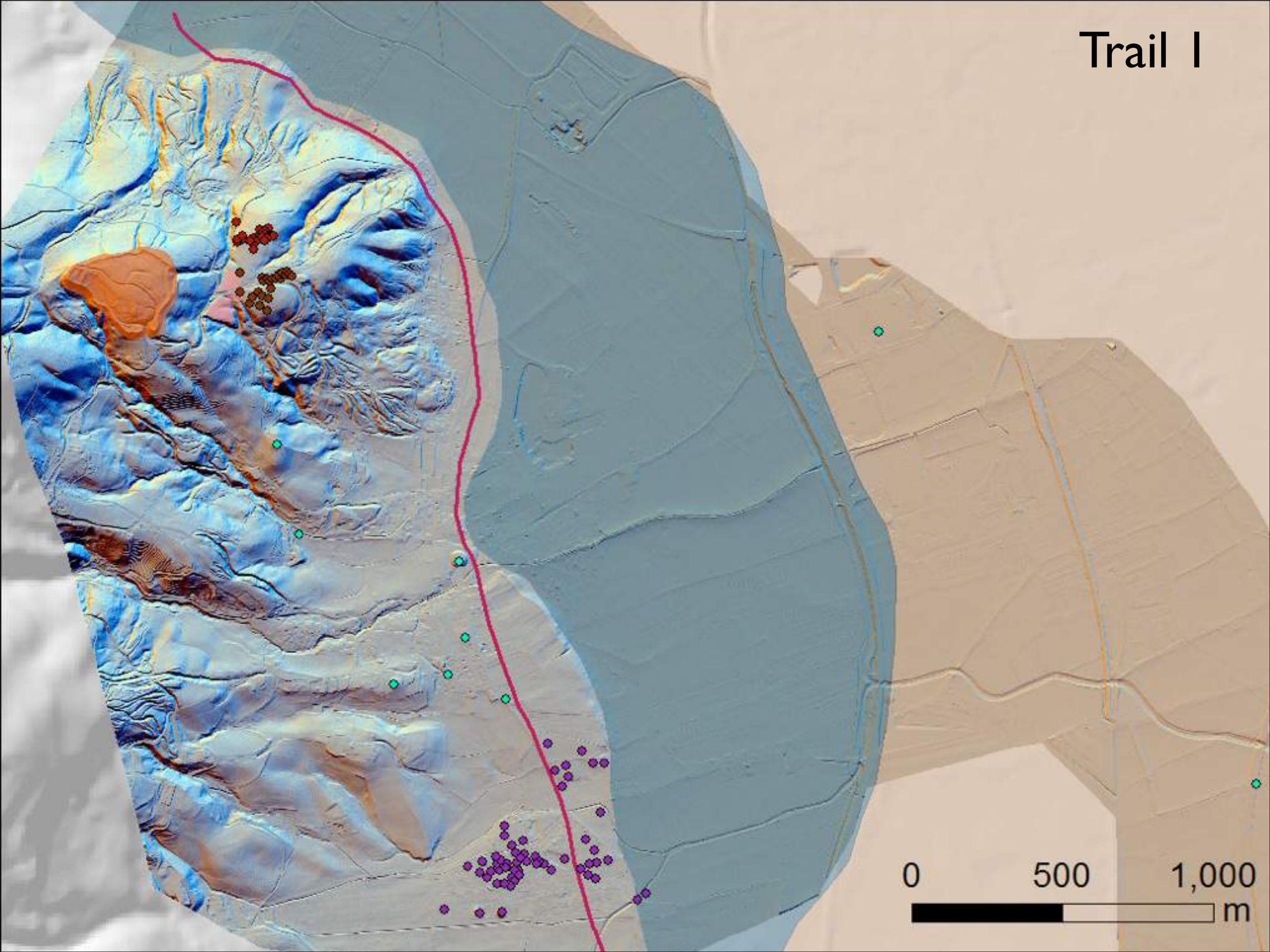
0

100

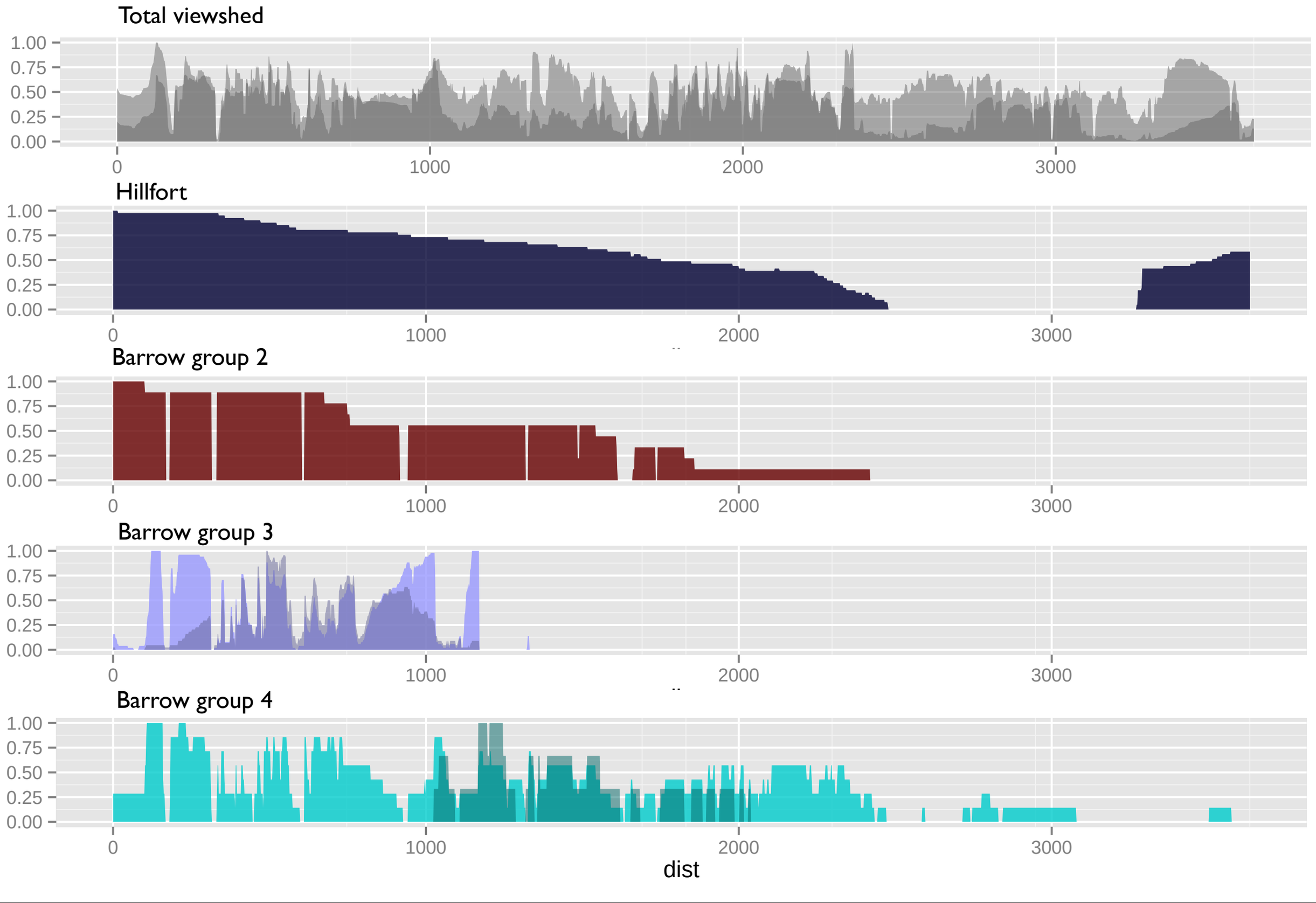
m


Swamp
Pleistocene terrace
0
500
1,000
m

Trail I



Trail 1

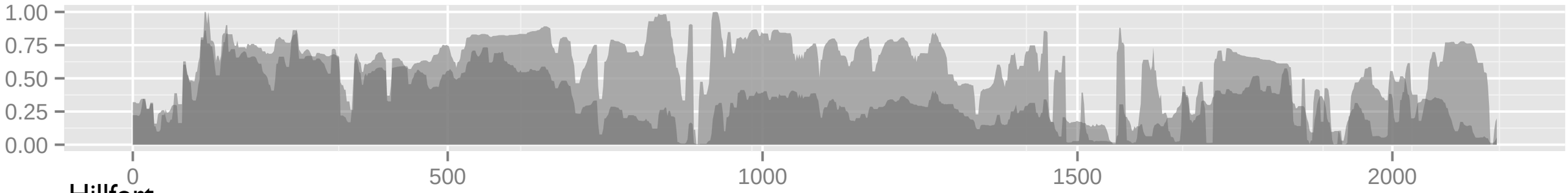

Total viewshed
Hillfort
Barrow group 2
Barrow group 3
Barrow group 4
1.00
0.75
0.50
0.25
0.00
0
1000
2000
3000
dist

Trail 2

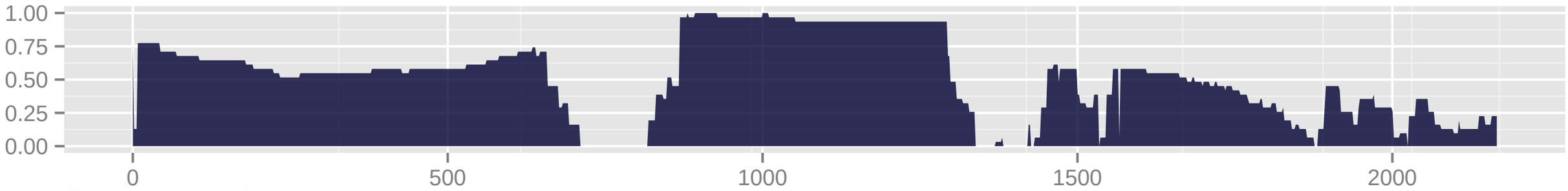
0 500 1,000
m

Trail 2

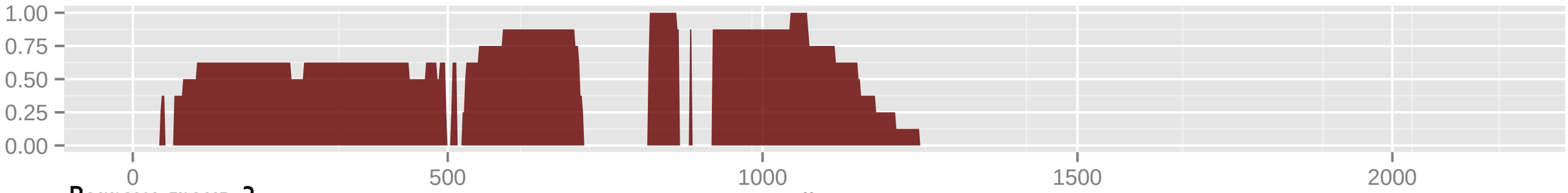
Total viewshed



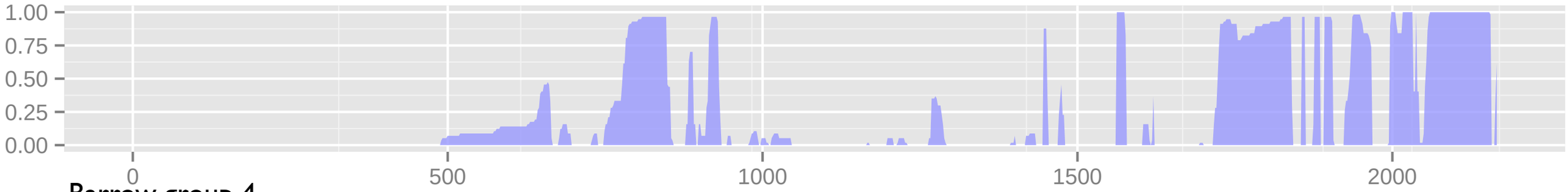
Hillfort



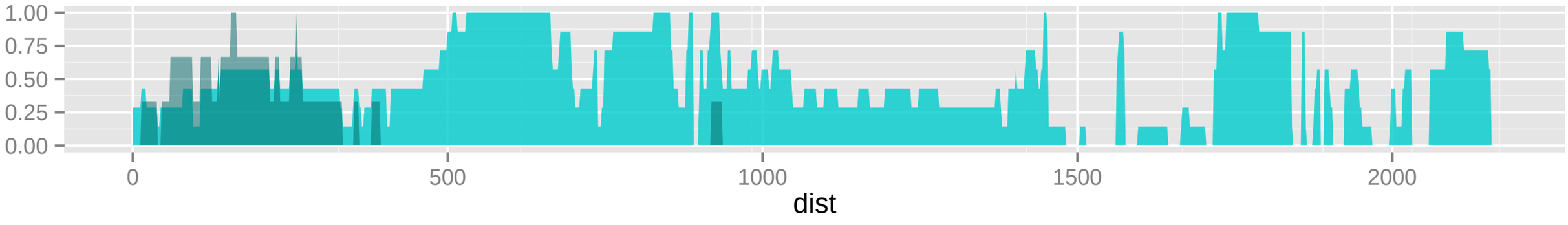
Barrow group 2

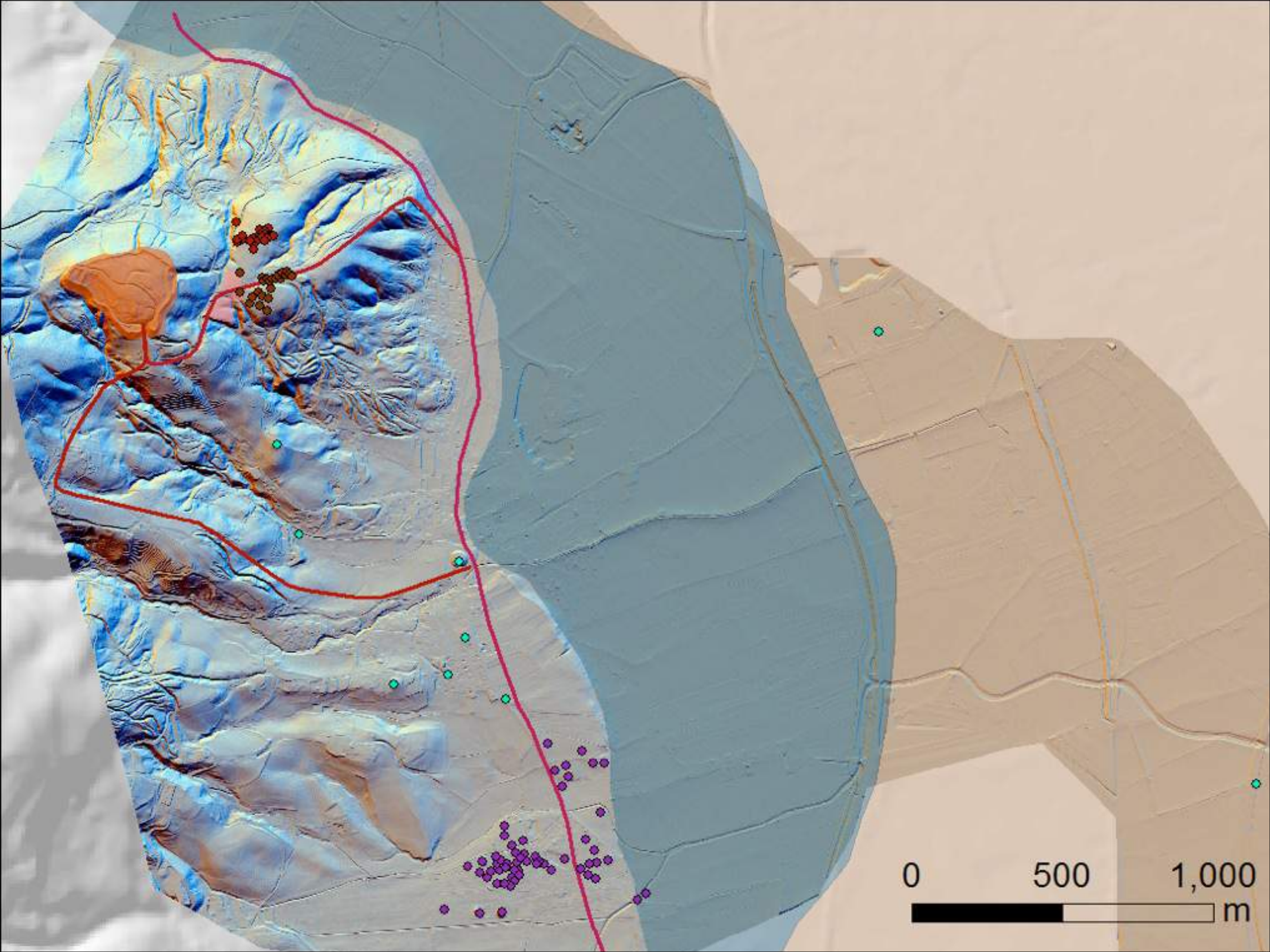


Barrow group 3

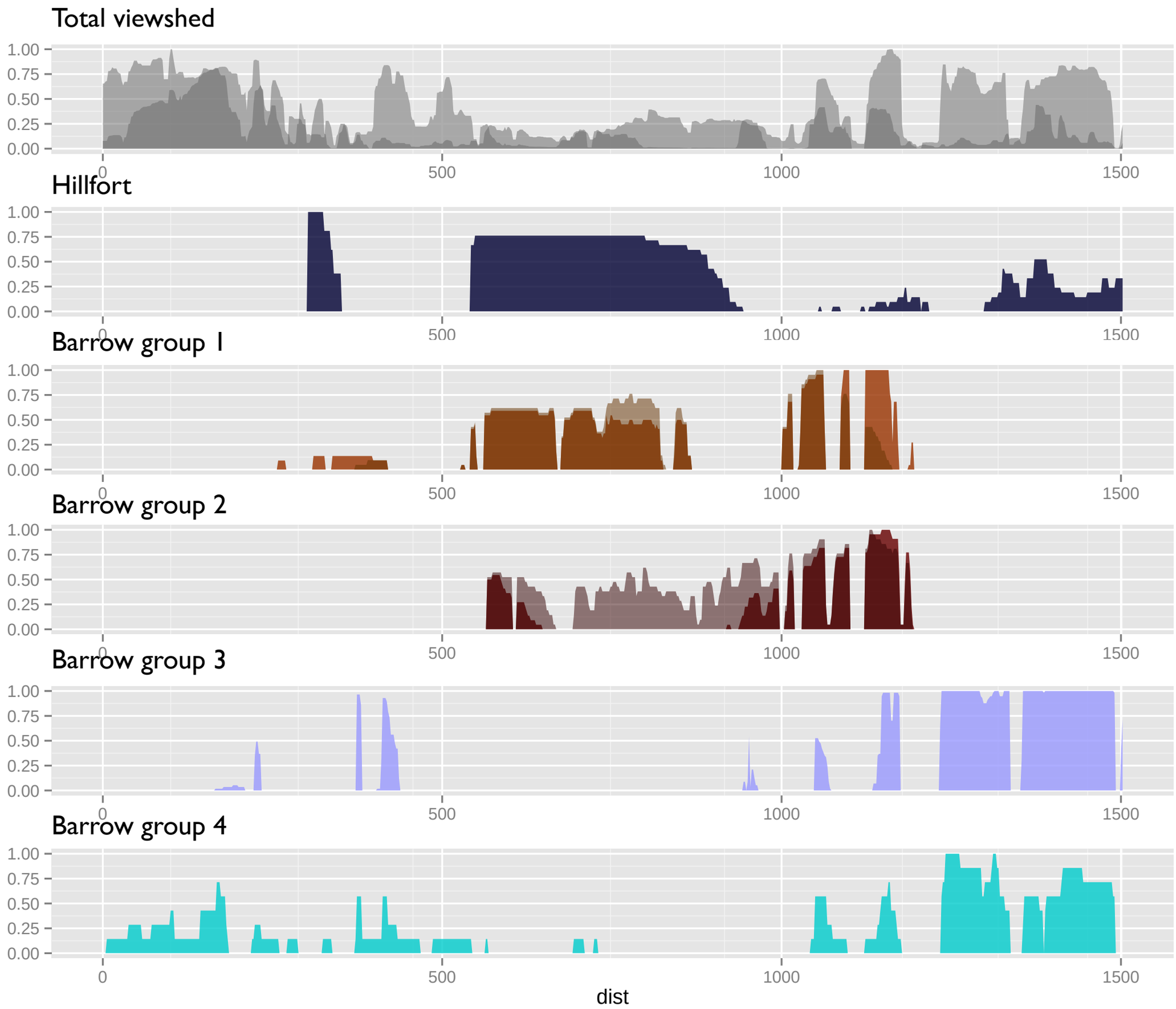


Barrow group 4

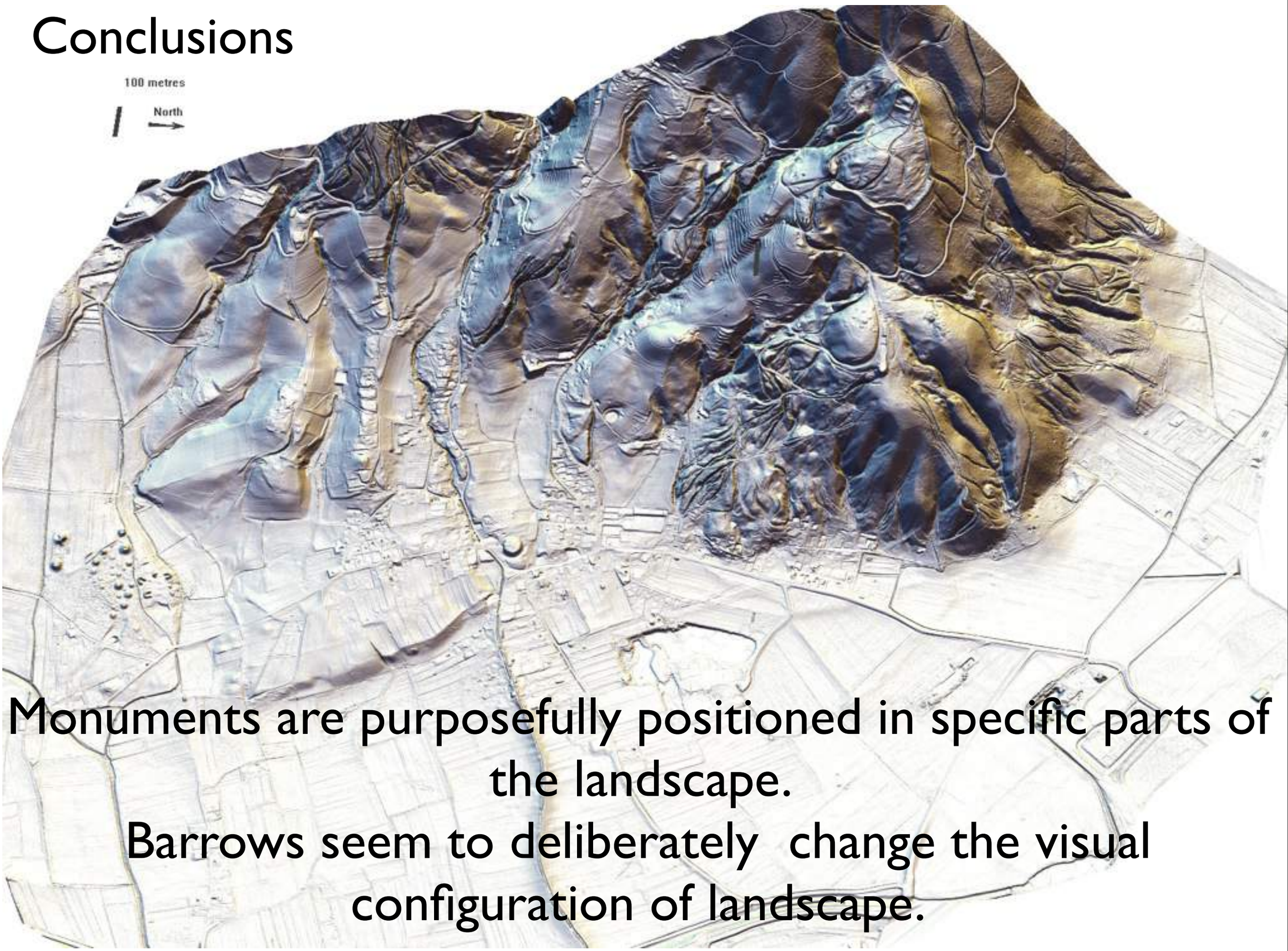



0
500
1,000
m

Trail 3


Total viewshed
Hillfort
Barrow group 1
Barrow group 2
Barrow group 3
Barrow group 4
1.00
0.75
0.50
0.25
0.00
0
500
1000
1500
dist

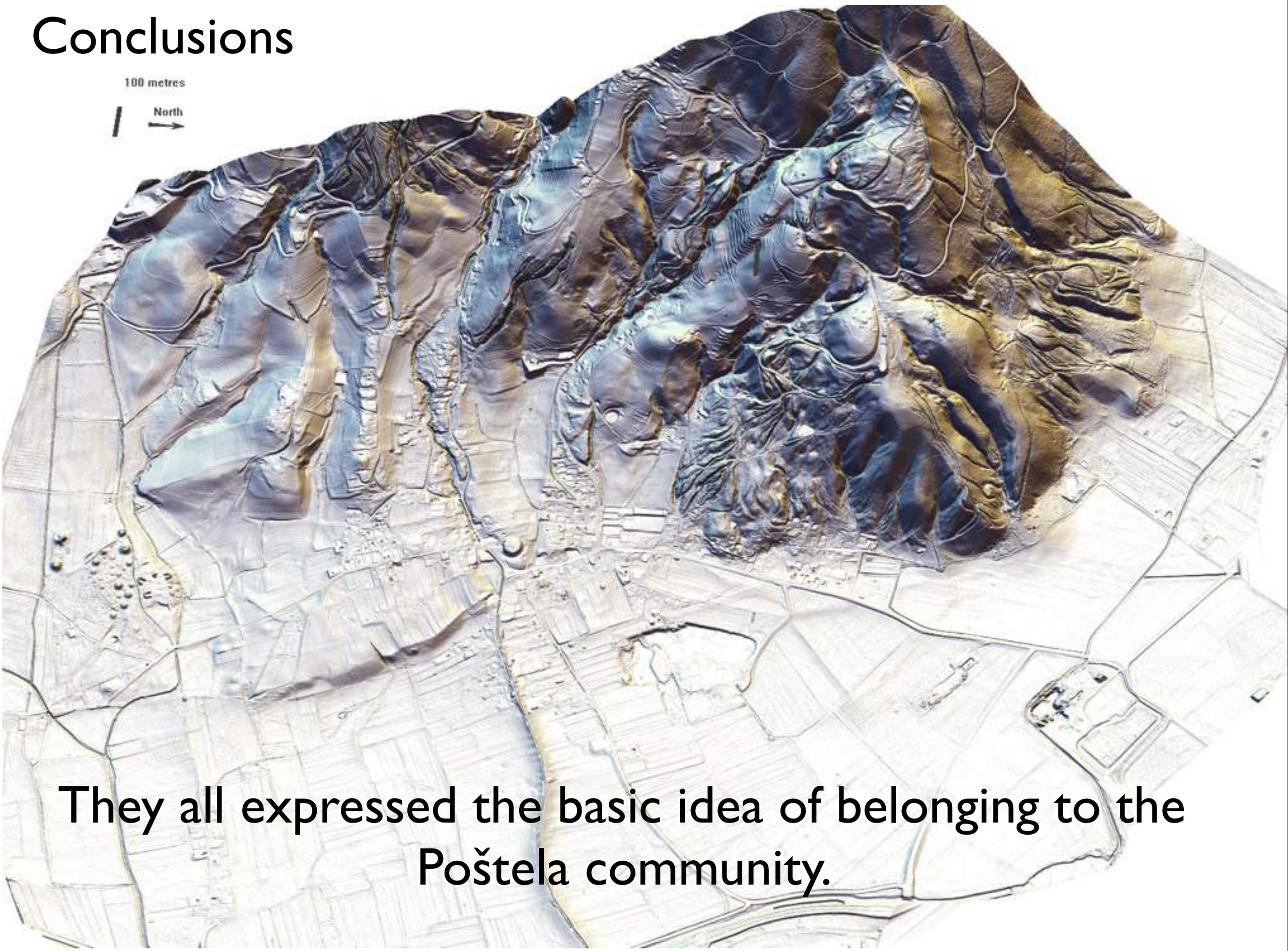
Conclusions



Monuments are purposefully positioned in specific parts of the landscape.

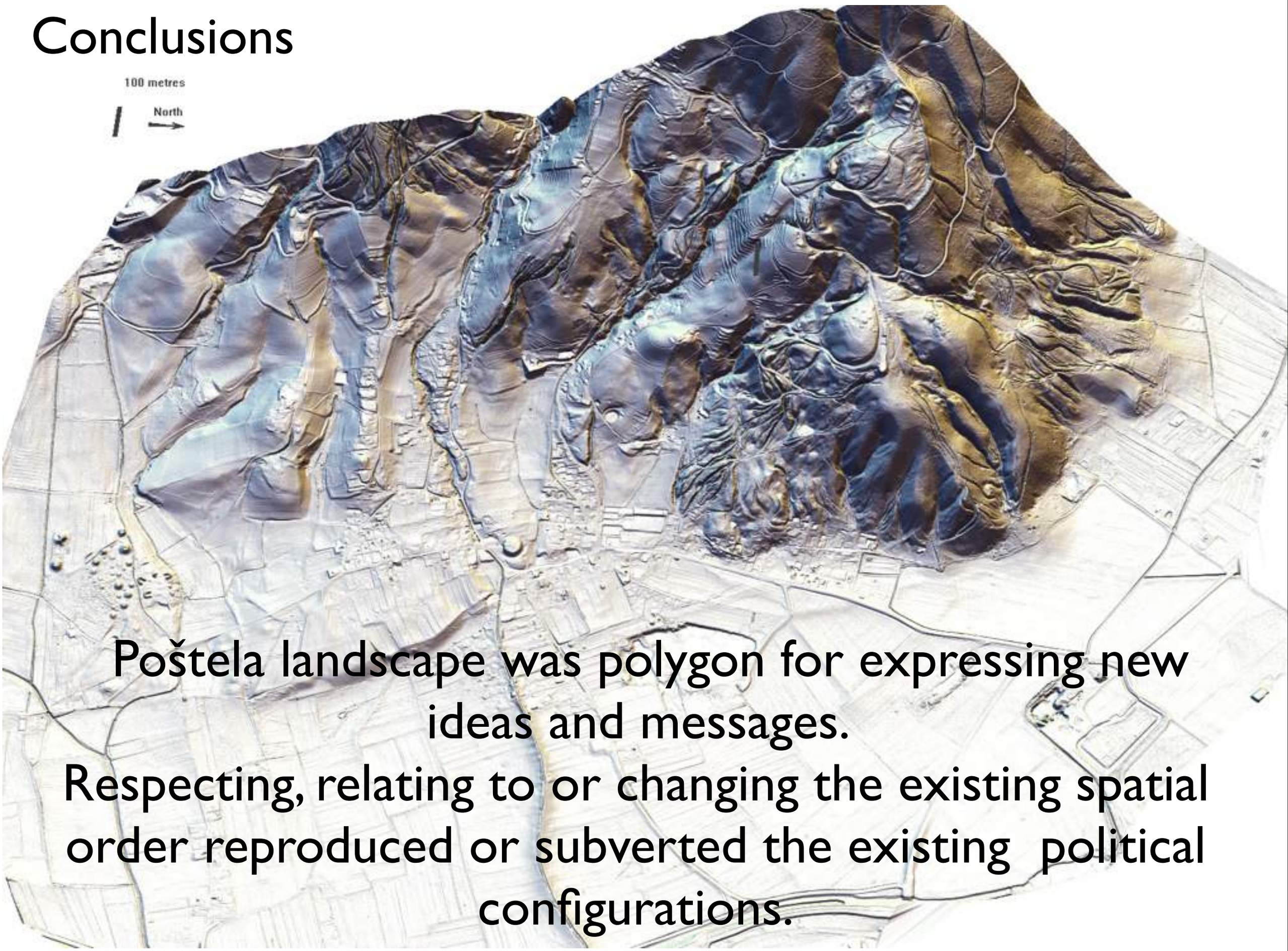
Barrows seem to deliberately change the visual configuration of landscape.

Conclusions



They all expressed the basic idea of belonging to the Poštela community.

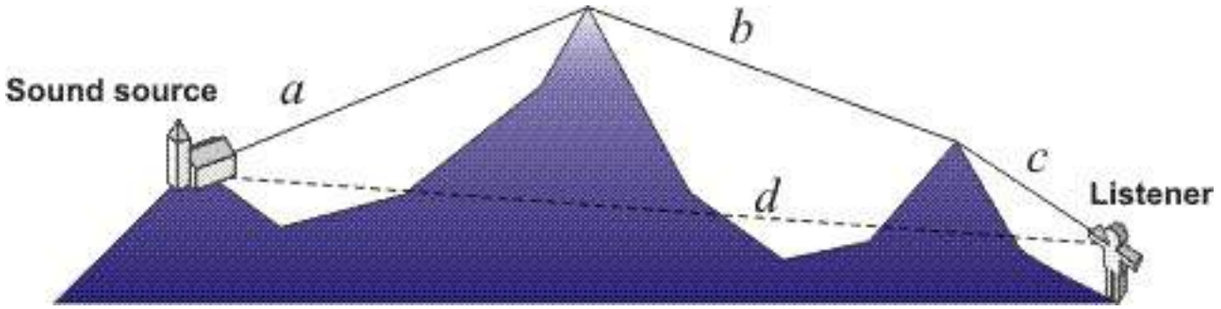
Conclusions

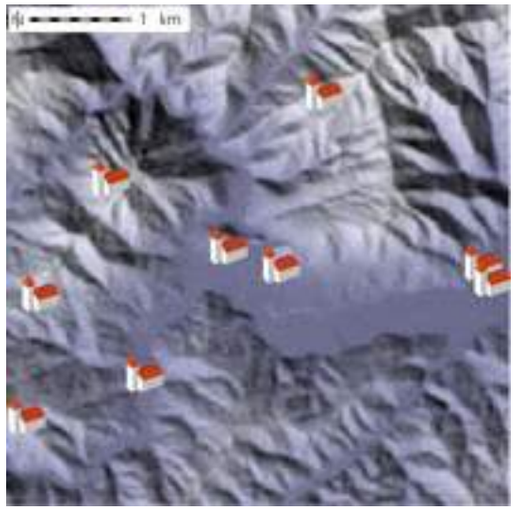


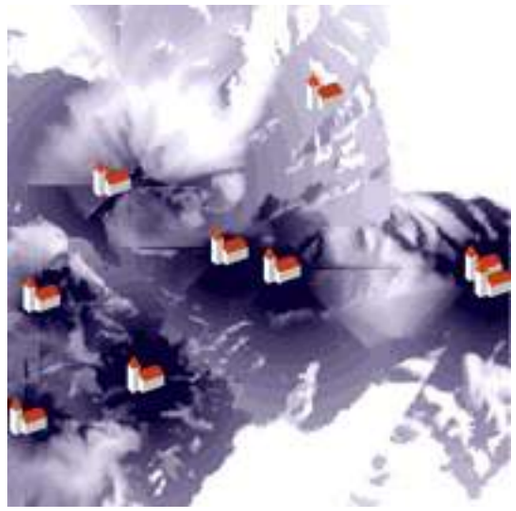
Poštela landscape was polygon for expressing new ideas and messages.

Respecting, relating to or changing the existing spatial order reproduced or subverted the existing political configurations.

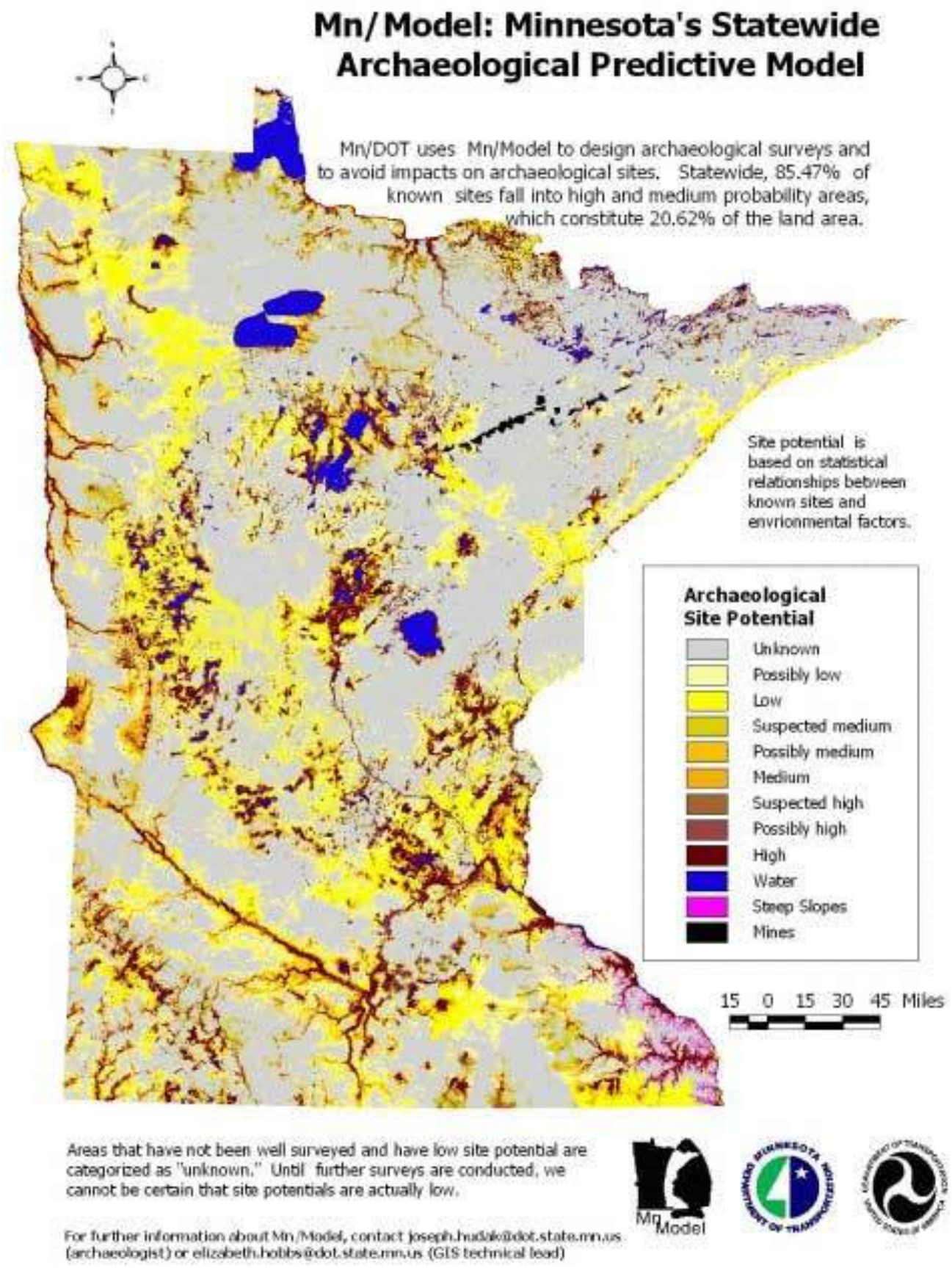
Zvočne krajine



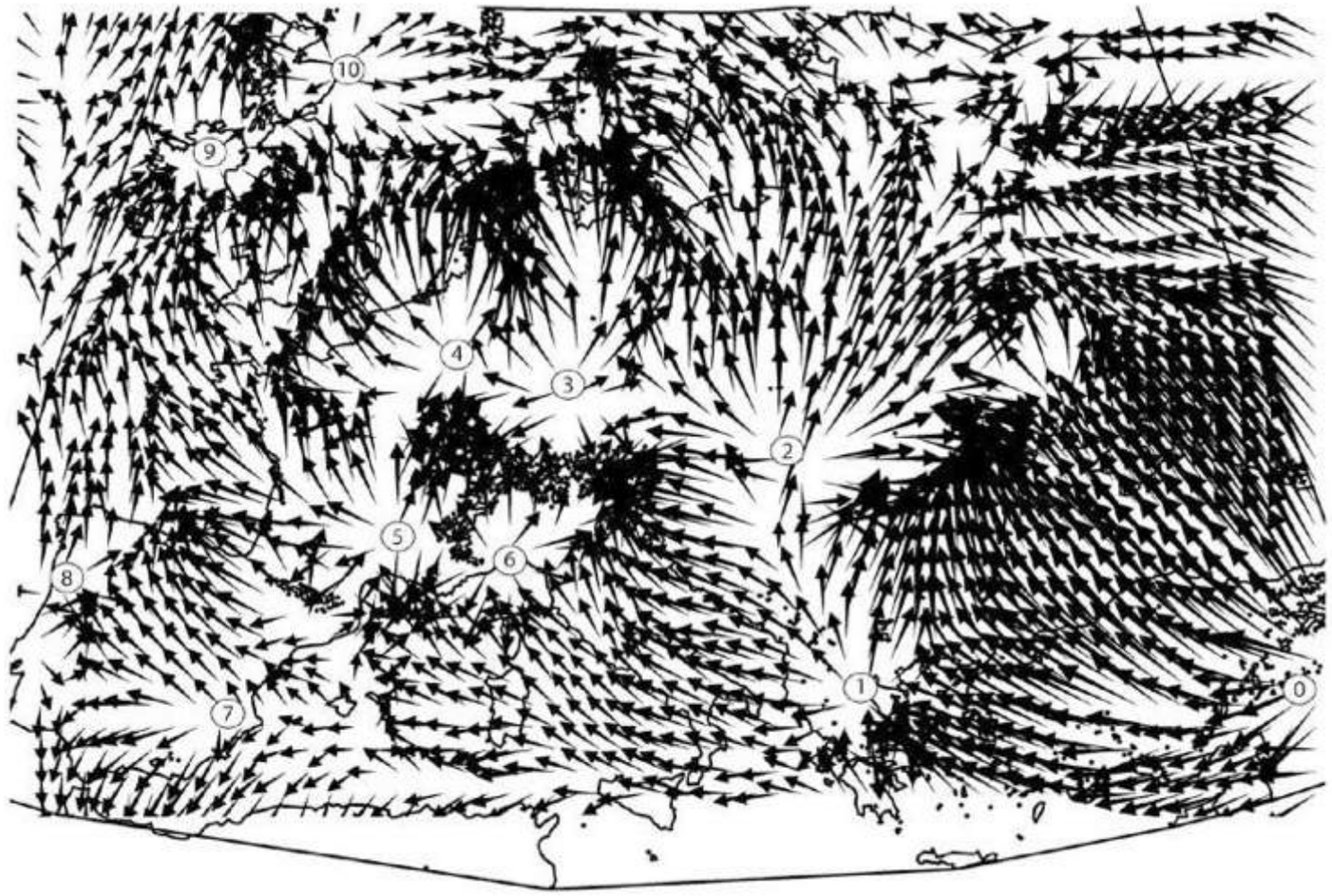




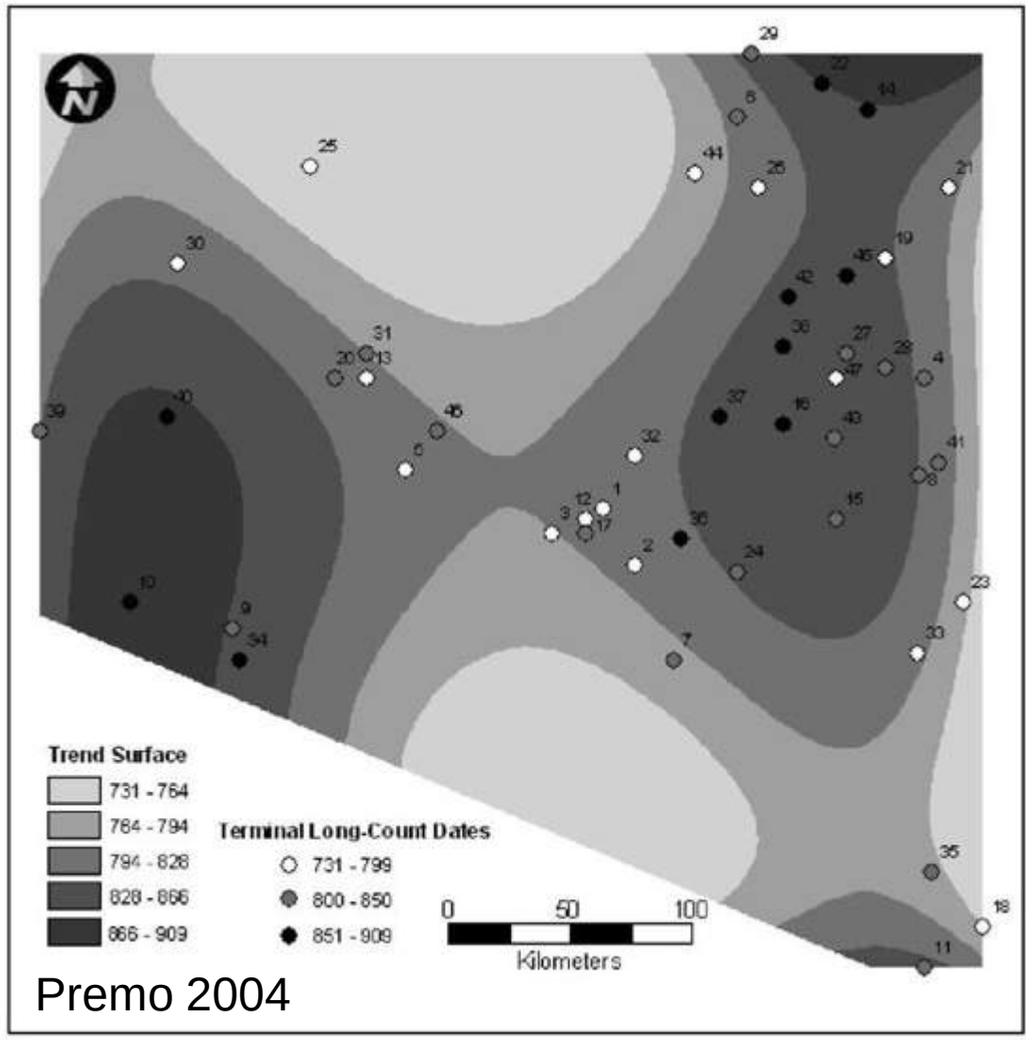
Prediktivni modeli



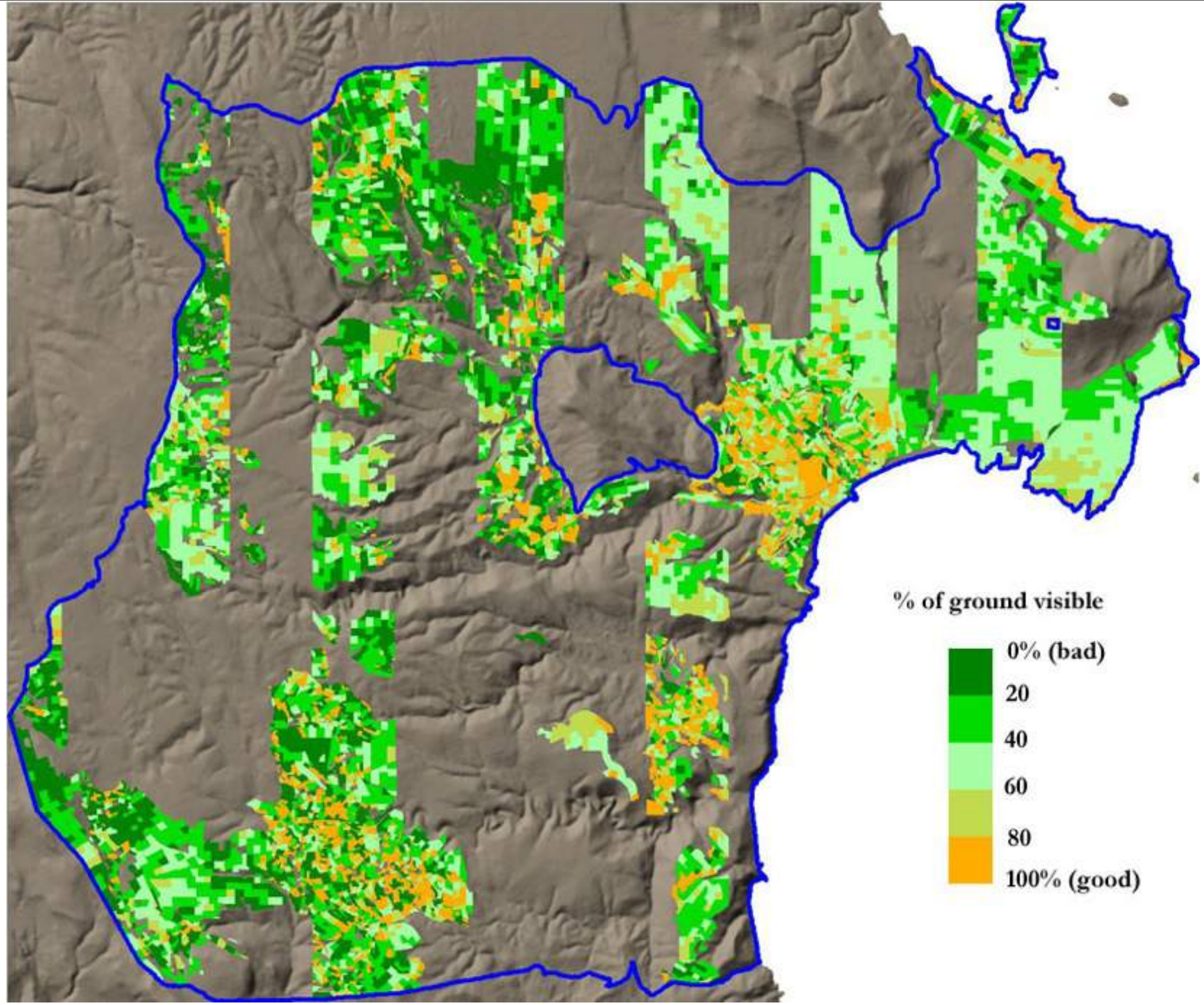
Geostatistično modeliranje



Bocquet-Appel et al 2009



Premo 2004


% of ground visible
0% (bad)
20
40
60
80
100% (good)