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in Landscape Archaeology

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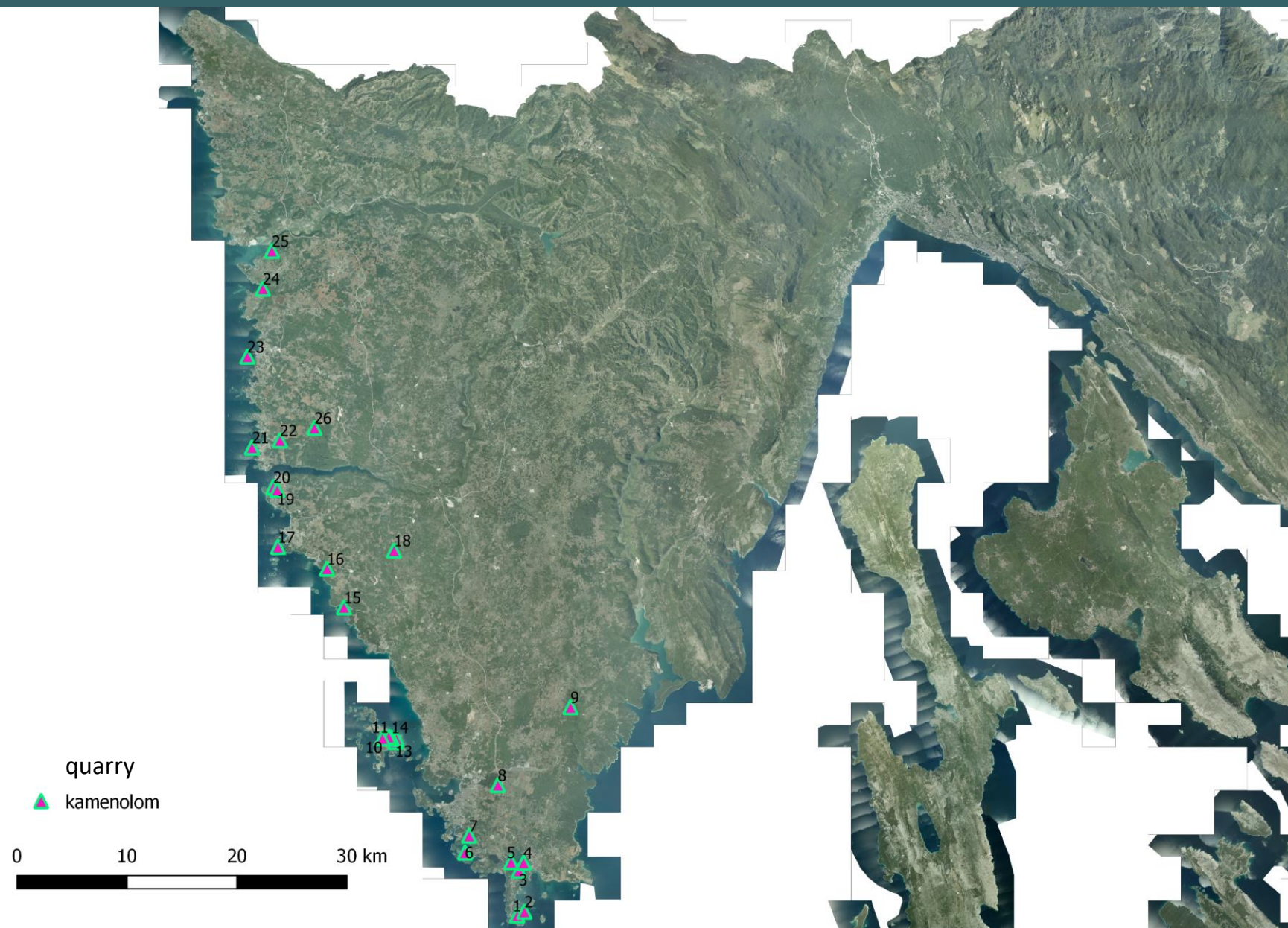


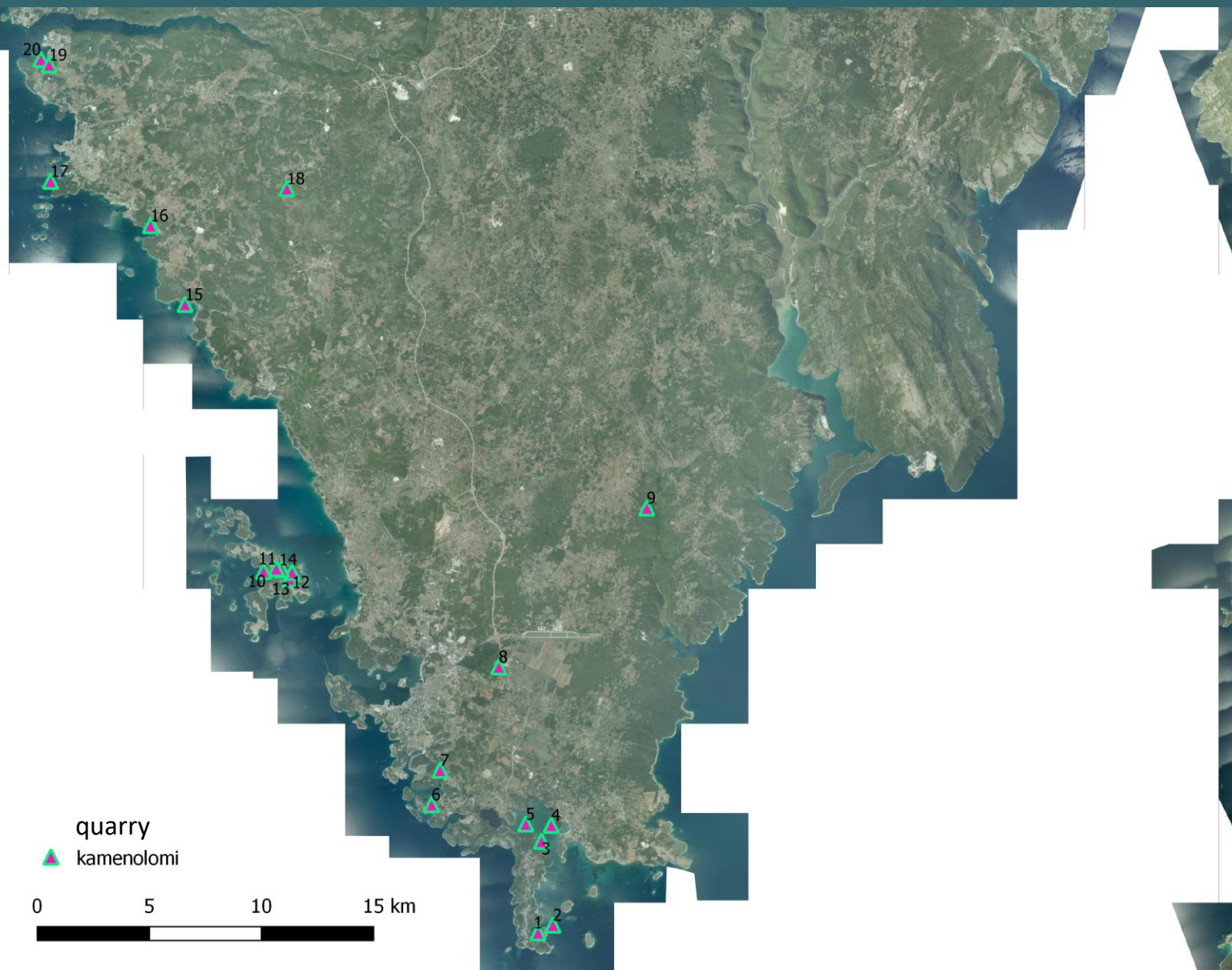
December 2nd 2019
University of Zagreb

ALL ABOARD!

Quarries and transport in Roman Istria







1. Premantura - Porto Rosso
2. Šekovac island
3. Mugli cape
4. Vižula
5. Pomer - Premanturski školjic
6. Banjole
7. Cave Romane
8. Šandalja - San Daniele
9. Marčana
10. Val Madonna quarry
11. Zoo quarry
12. Čufar quarry
13. Gradina quarry
14. Koch quarry
15. Rovinj - Sv. Damijan
16. Rovinj - Monte delle Arni
17. Rovinj - Montauro
18. Bale - Skačota
19. Rovinj - Uvala Soline
20. Rovinj - Sv. Eufemija



21. Vrsar - Sv. Juraj

22. Vrsar - Monte Ricco

23. Poreč - Sv. Nikola

24. Poreč - Vabriga

25. Poreč - Tarska vala

26. Flengi



quarry

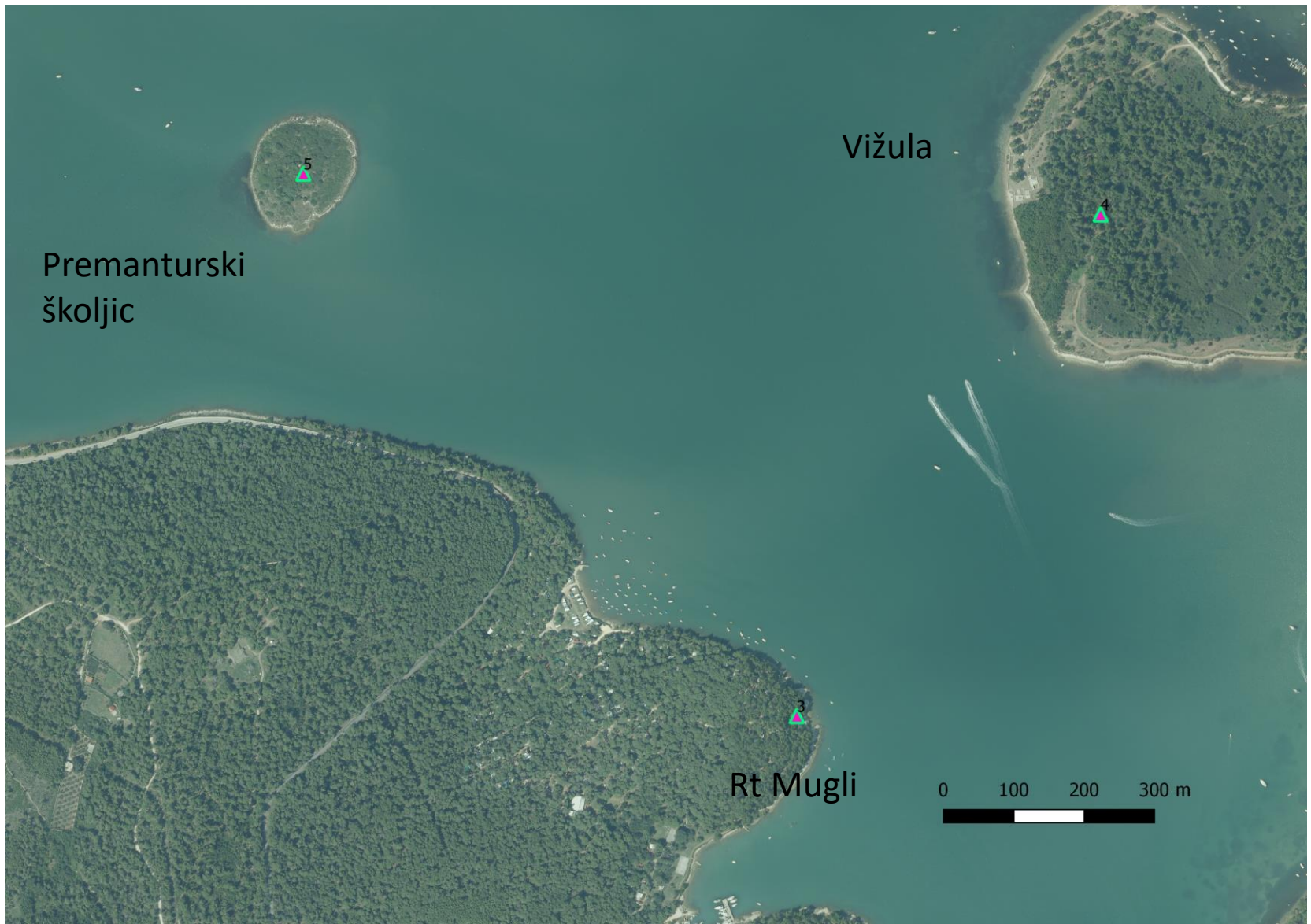
▲ kamenolomi

0 1 2 3 km



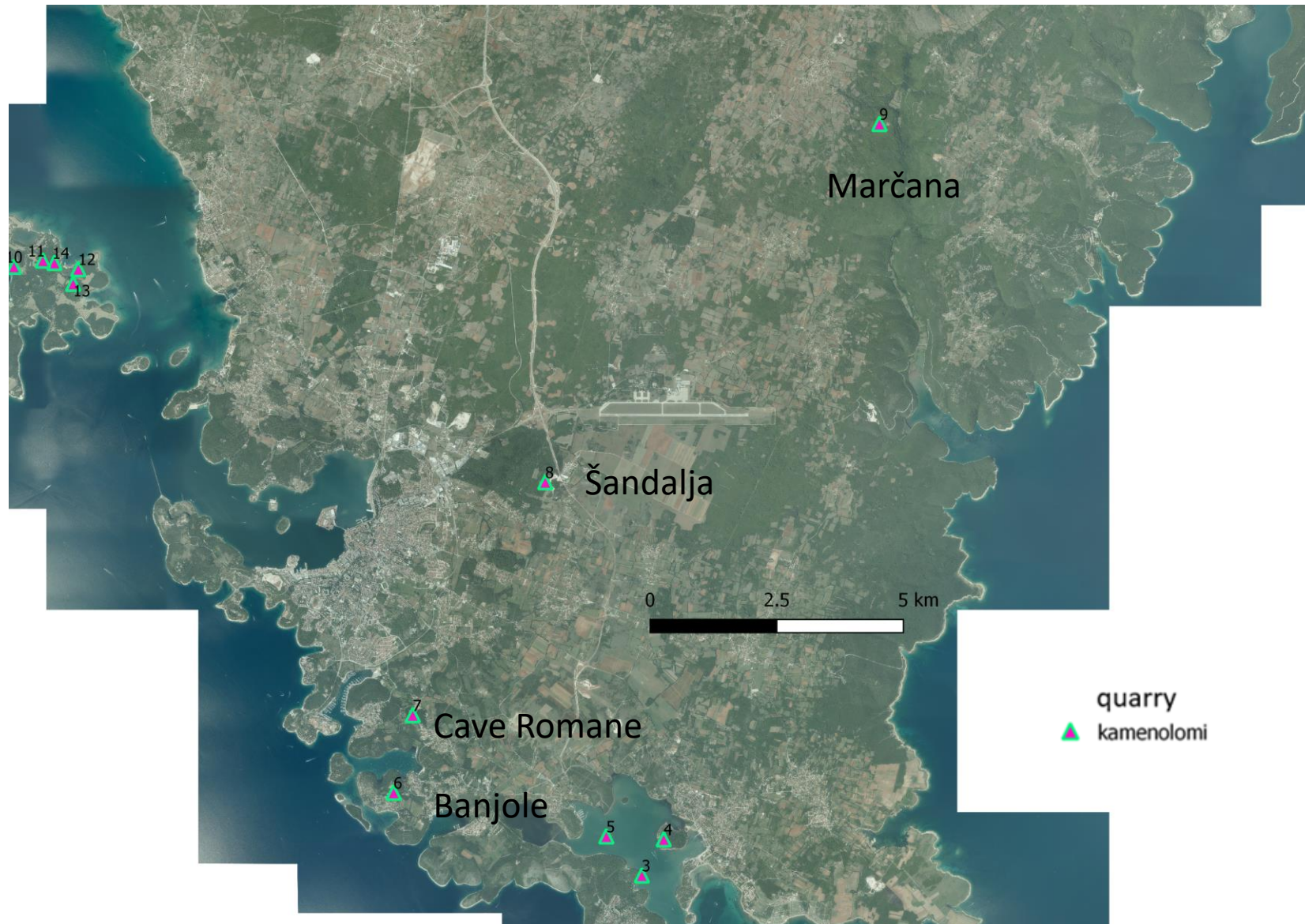


150 m



Vižula







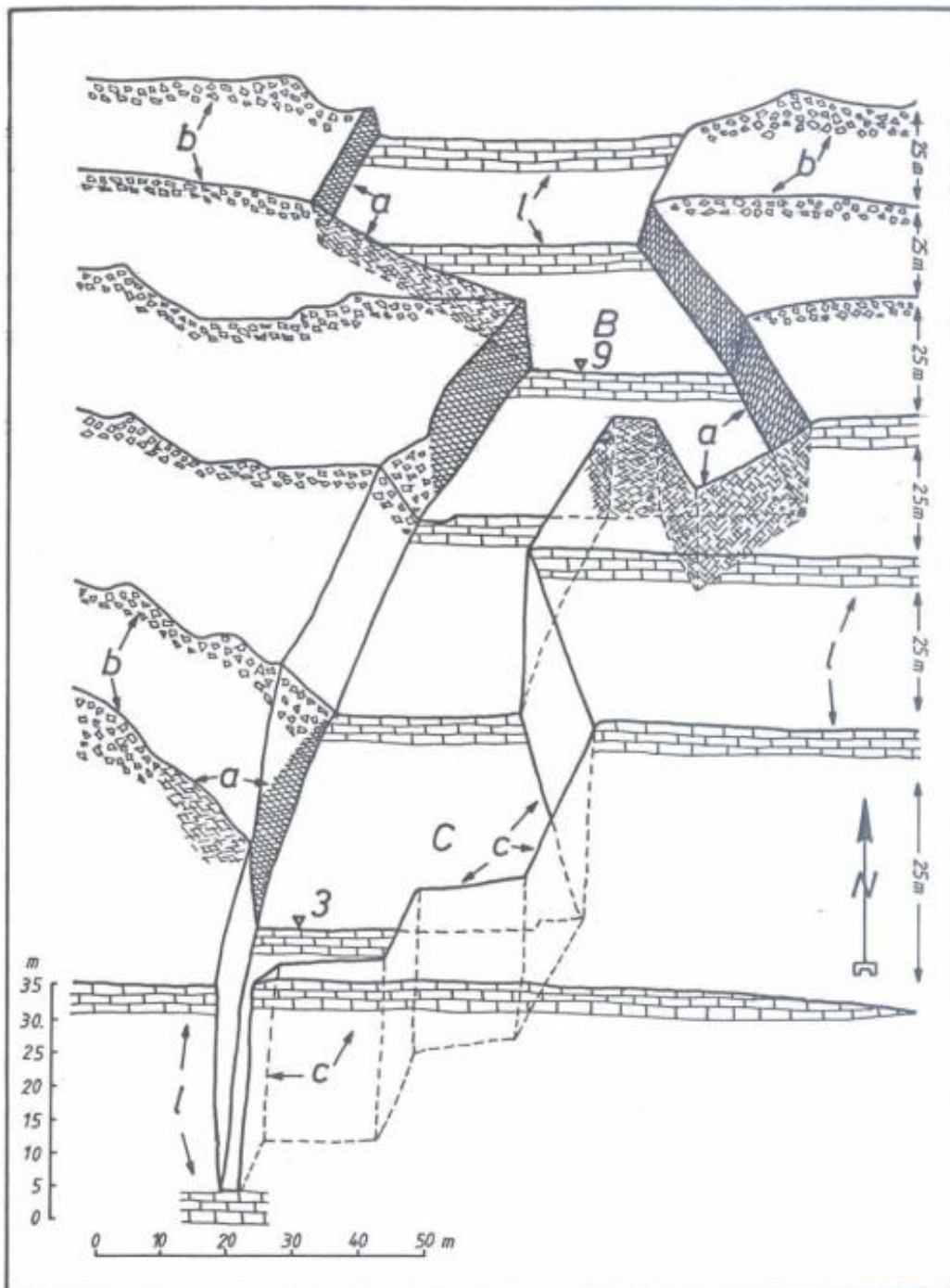
www.glasistre.hr



photo by: Katarina Šprem



Vinkuran, Cave Romane



VINKURAN

B – the area of quarrying in antiquity

C – the now operating part of the Vinkuran quarry

a – traces of the stone blocks quarrying in antiquity

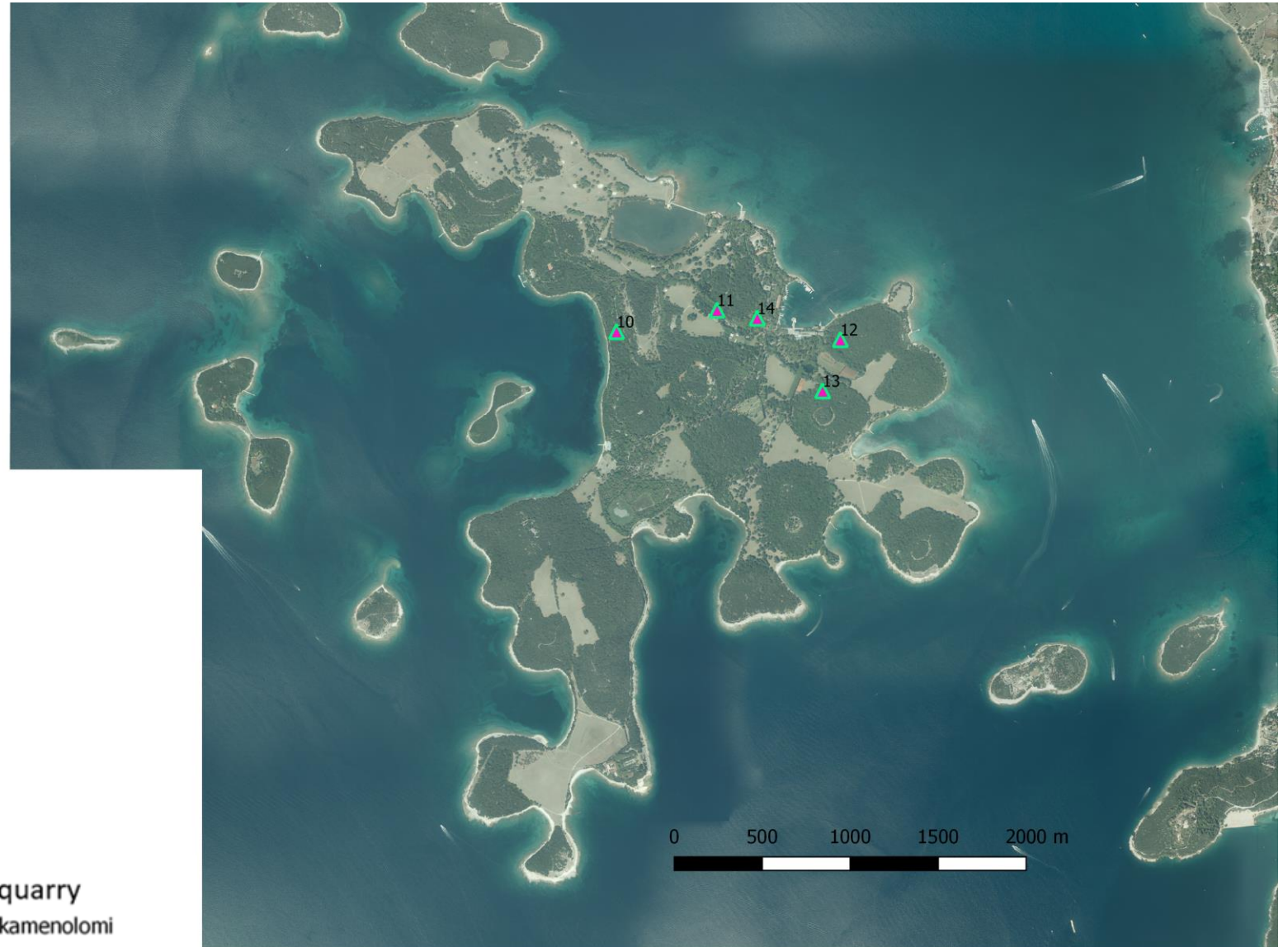
b – the waste remaining from the stone block quarried from antiquity until the present

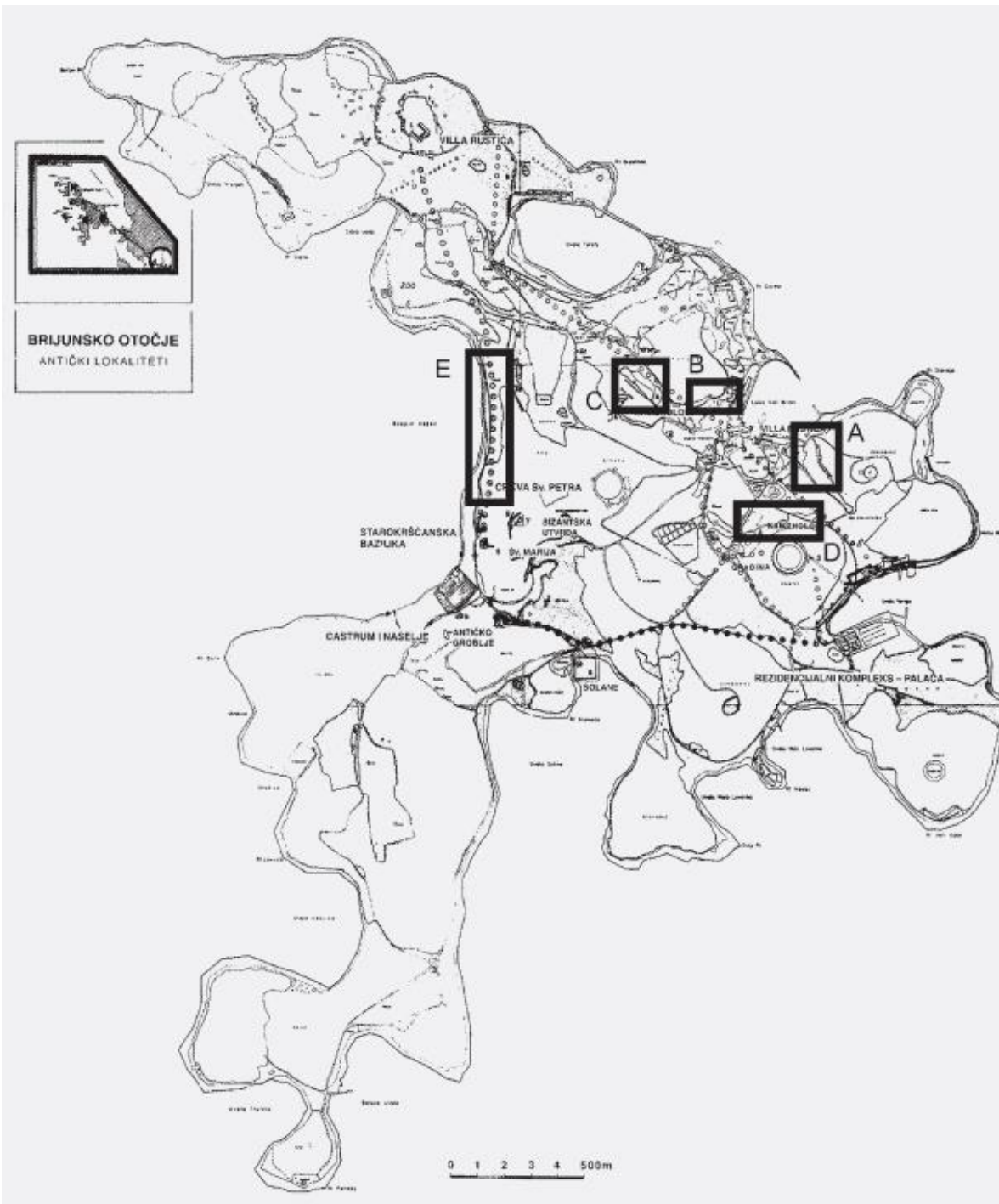
c – the present quarry front cut by wire saw

I – quarrying potentials of rudist limestone, the spacing between profiles is 25 m

Brijuni islands

quarry
▲ kamenolomi





...islands, at the entrance to Pula's harbor, famous for its quarries where stone lesser than marble, but better than usual limestone is quarried..., with which the Venetians erected many buildings...

Antoine de Ville

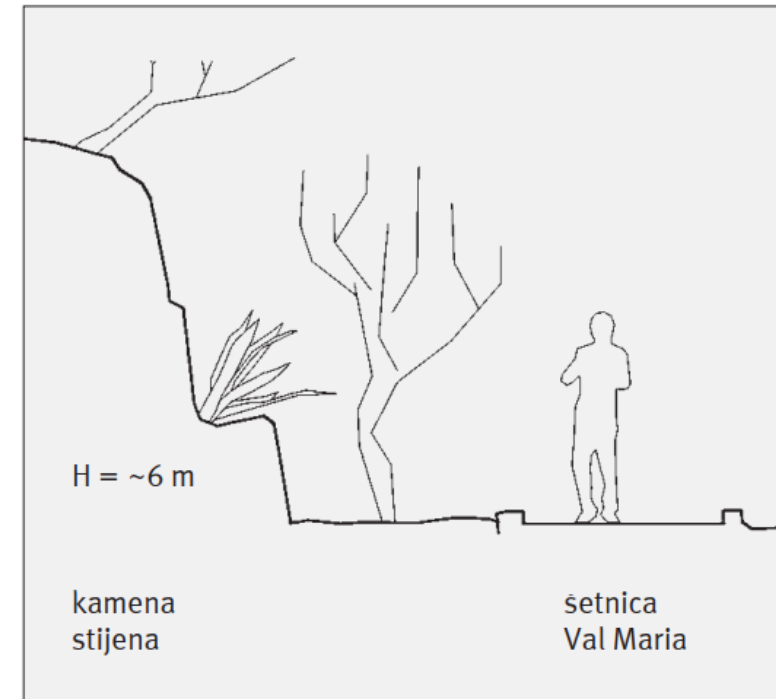
- A – Čufar quarry
- B – Koch quarry
- C – ZOO quarry
- D – Gradina quarry
- E – Val Madonna quarry

Čufar quarry;

around 1910. & 1952.



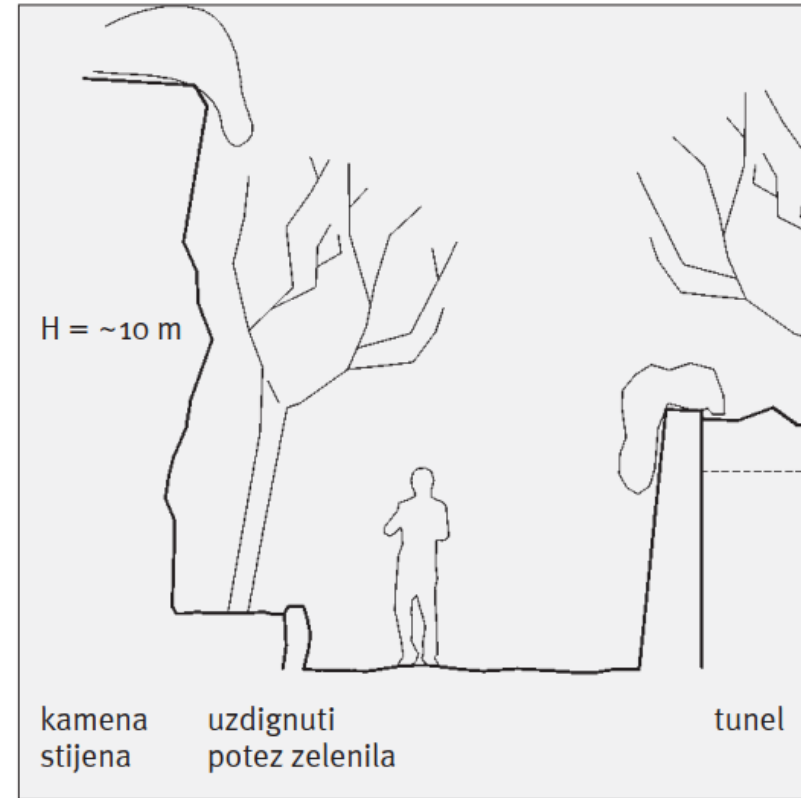
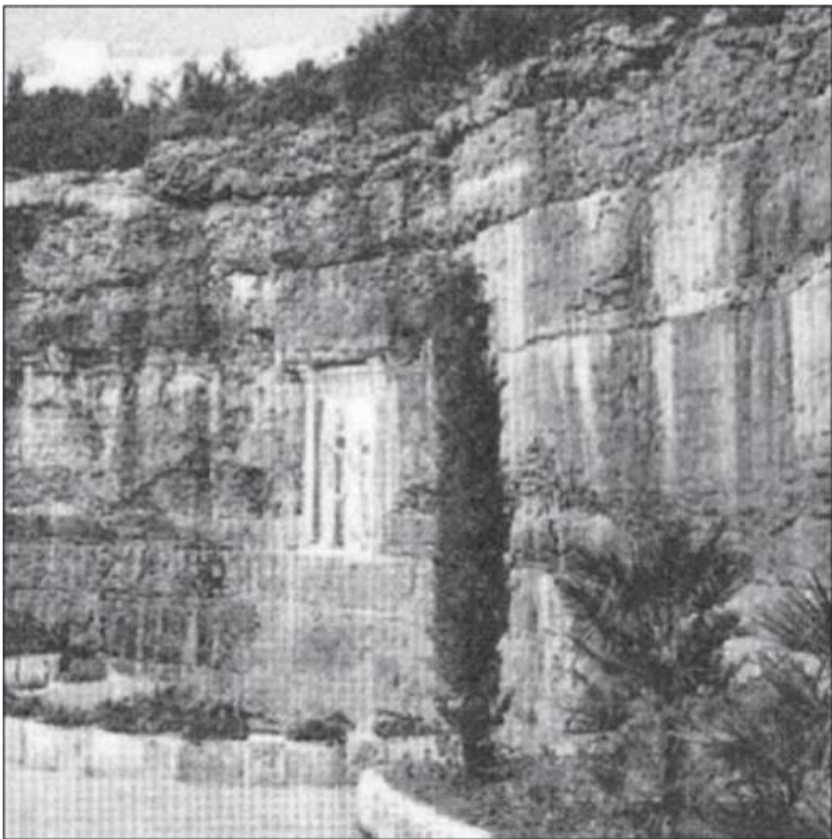
schematic representation



Premužić Ančić & Gašparović 2017.

Koch quarry;

unknown; around 1910.

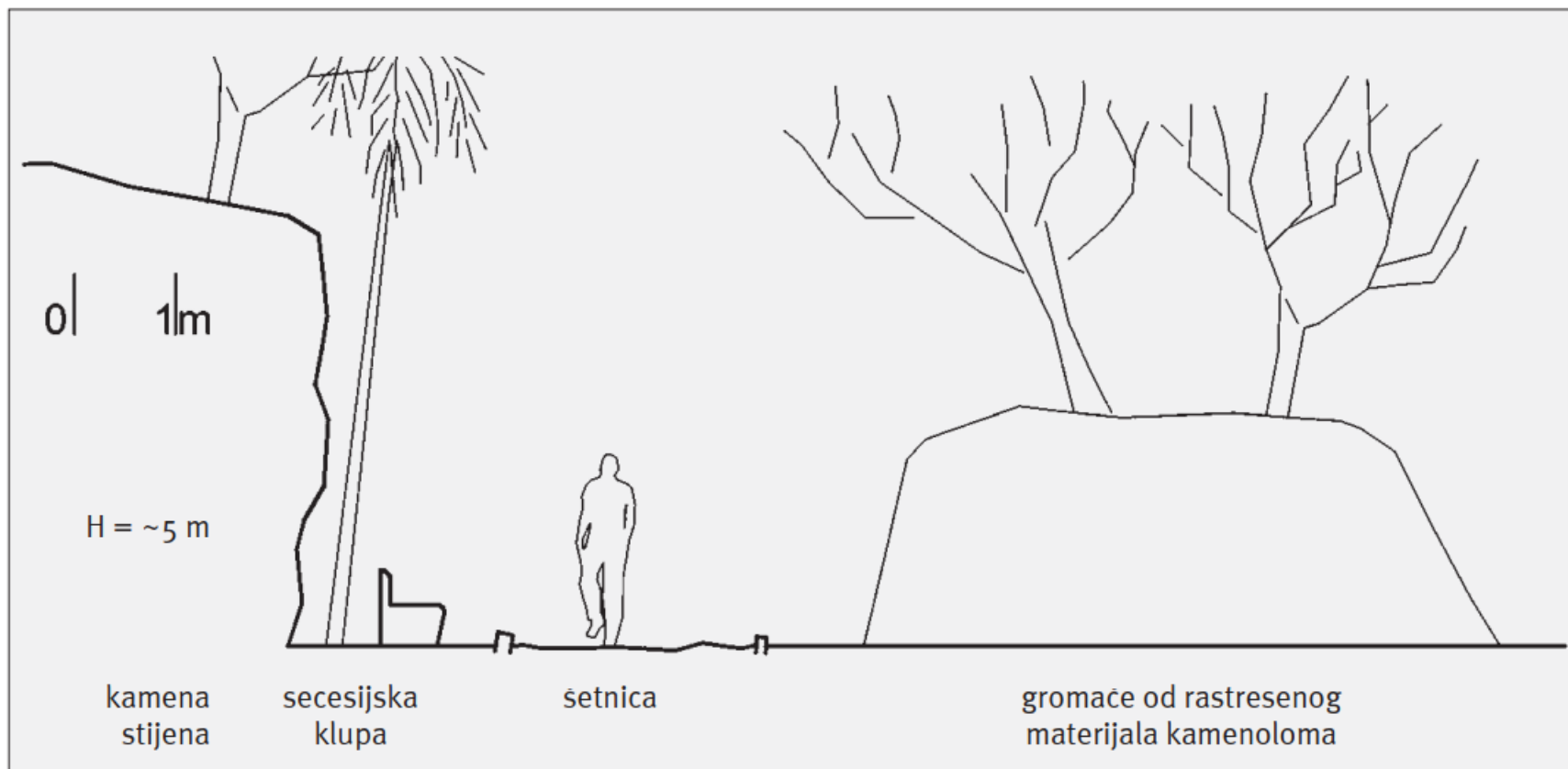


schematic representation

Gradina quarry;

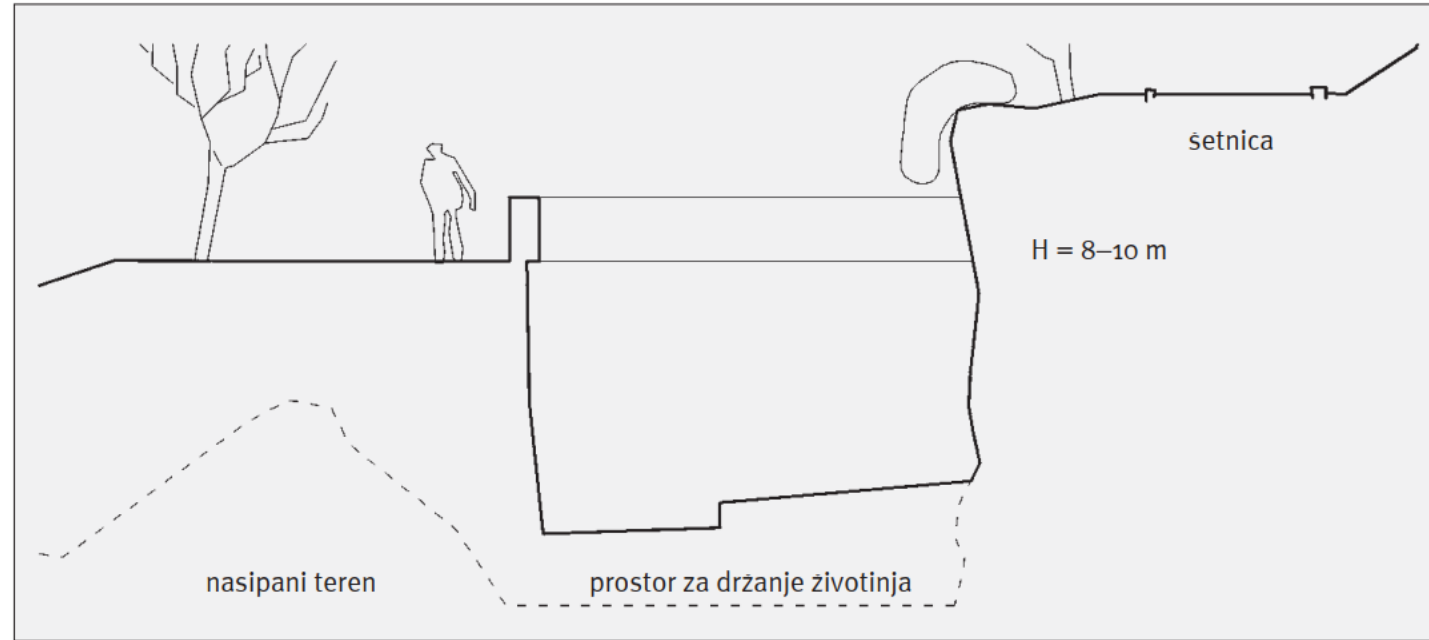
unknown

schematic representation



ZOO quarry;

1911; 1984

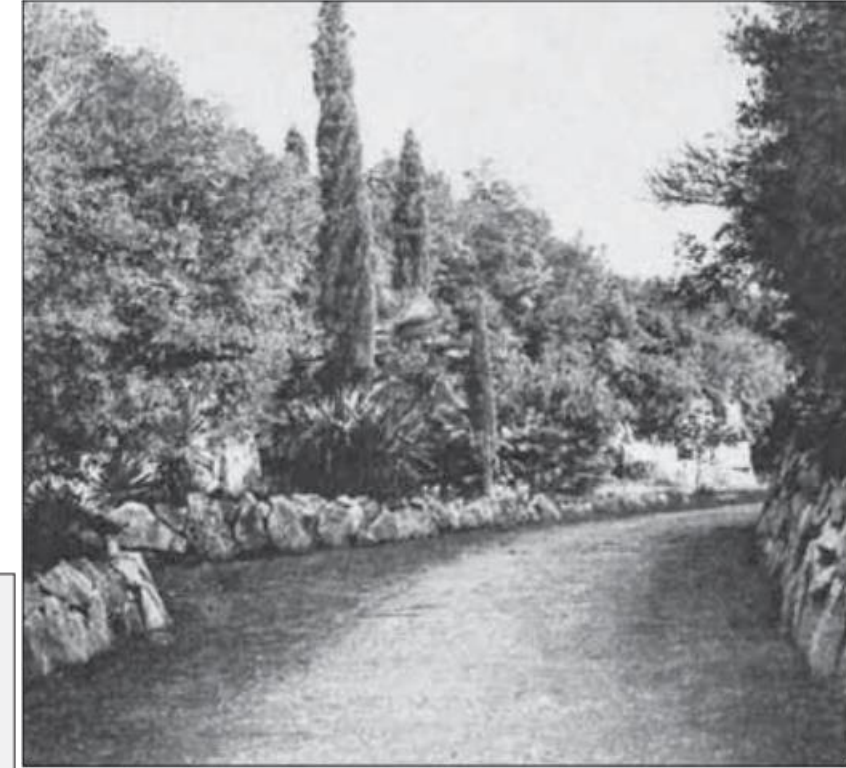
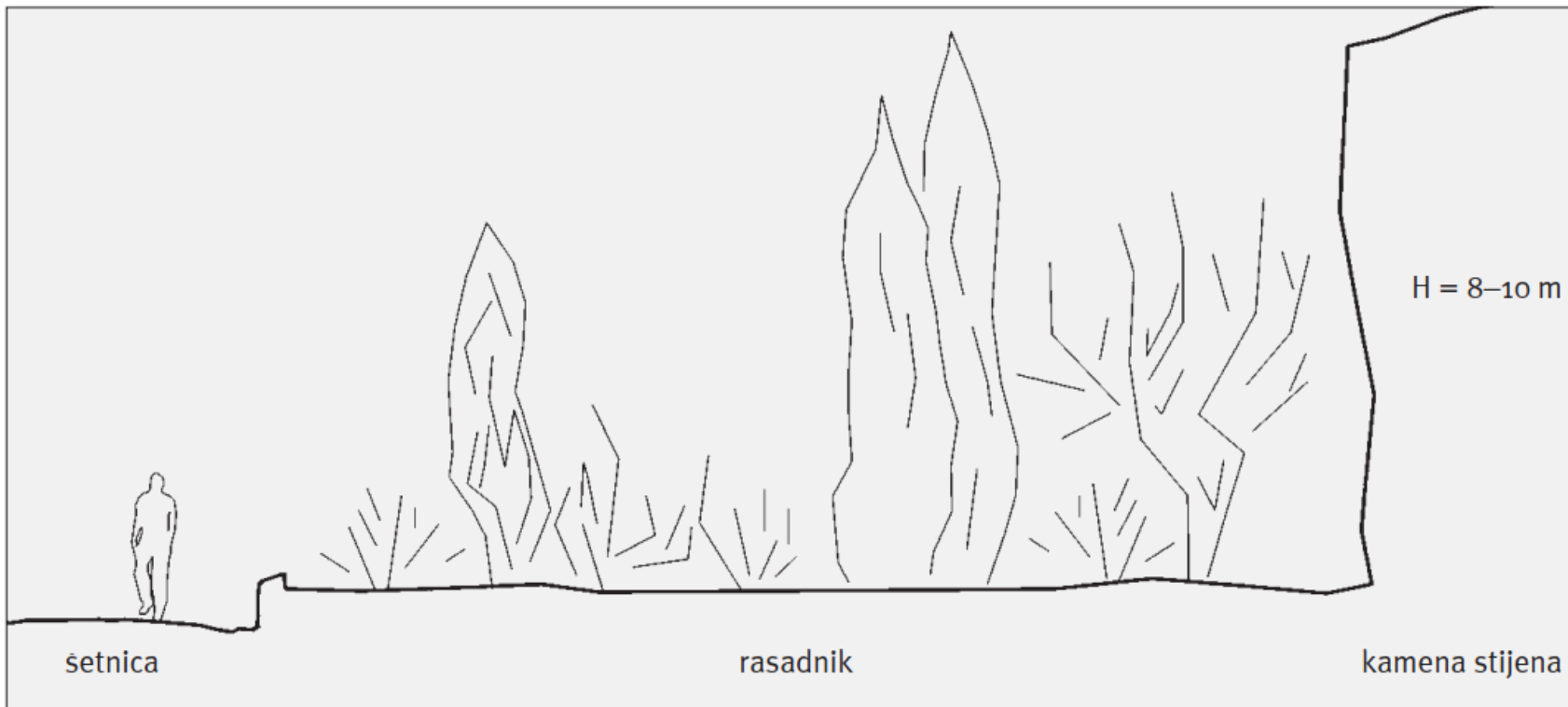


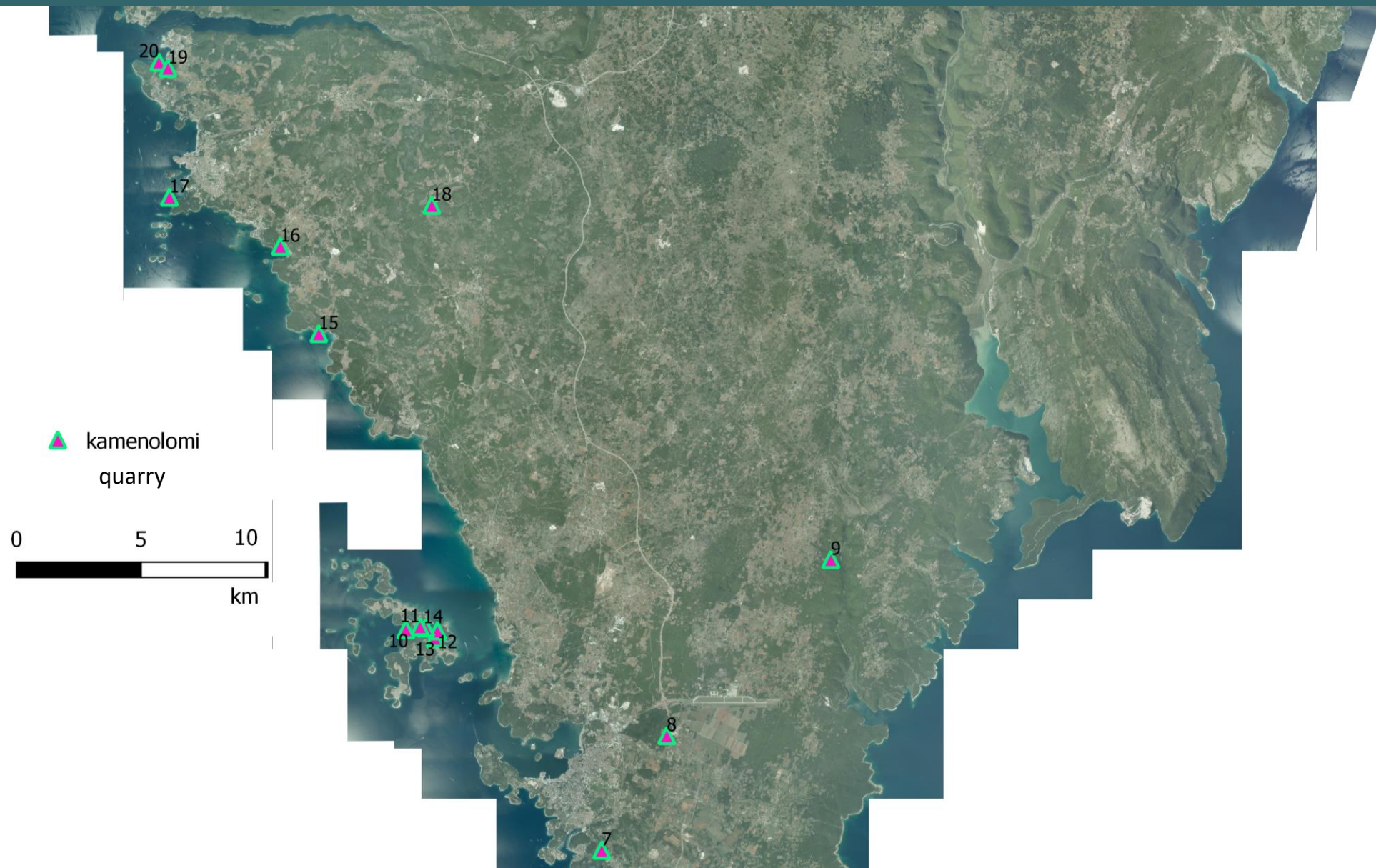
schematic representation



Val Madonna quarry; 1910.

schematic representation







Rovinj – Sv. Damijan

photo by: Jan Sonnemans



Rovinj – Montauro



photo by: Jan Sonnemans

Rovinj

Križ Bay
(St. Eufemija)





photo by: Katarina Šprem



photo by: Jan Sonnemans

Vrsar – Monte Ricco





photo by: Robert Matijašić

Vrsar – Flengi





www.tripadvisor.co.za

Poreč – Sv. Nikola

www.plazubytovaniechorvatsko.com



Poreč – Tarska vala



photo by: Katarina Šprem



Baths of Caracalla

Transport costs

- the cost depends on several elements:
 - distance from source
 - geography of the place
 - weight and volume of cargo
 - availability of transportation means



photo by: Katarina Šprem

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photo by: Katarina Šprem

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photo by: Katarina Šprem



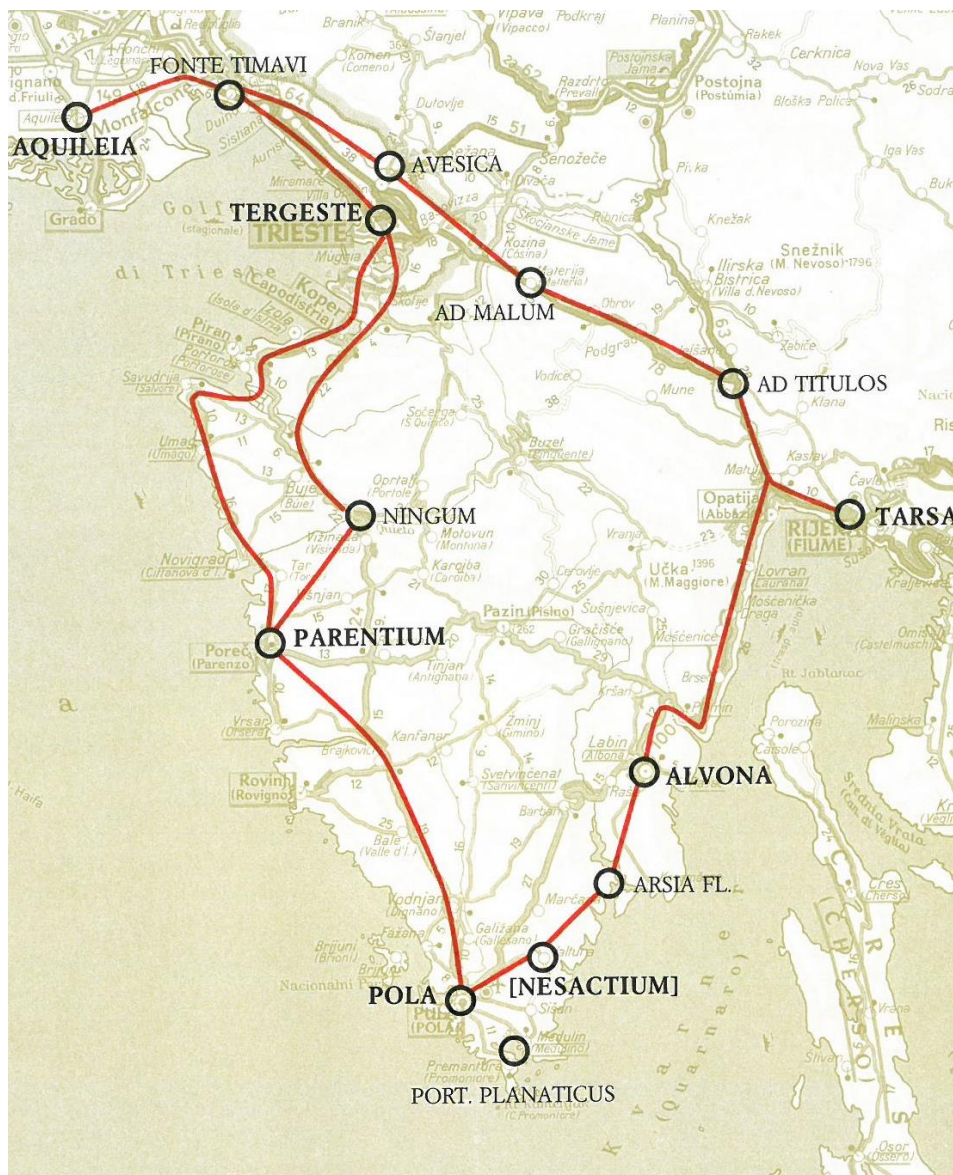
Edict of Diocletian

- *Edictum De Pretiis Rerum Venalium*, 301 AD
- Aphrodisian fragment:

1 : 3,9 : 7,7 : 42

sea river river overland
downstream upstream (ox-cart)

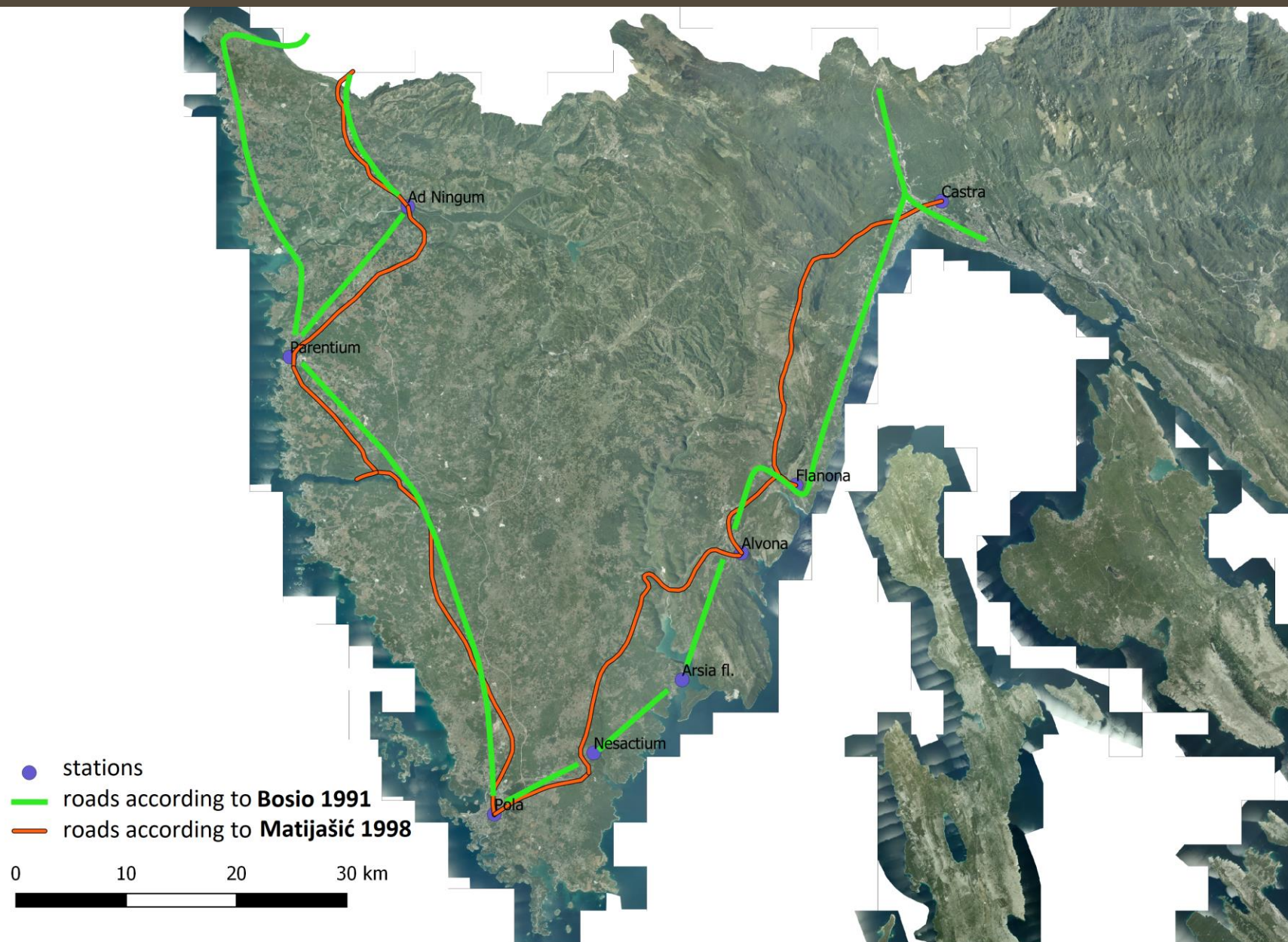
Roman quarry in Carrara, Italy (photo by: Katarina Šprem).



Bosio 1991



Matijašić 1998



up to 450 kg



TRANSPORTATION MEANS

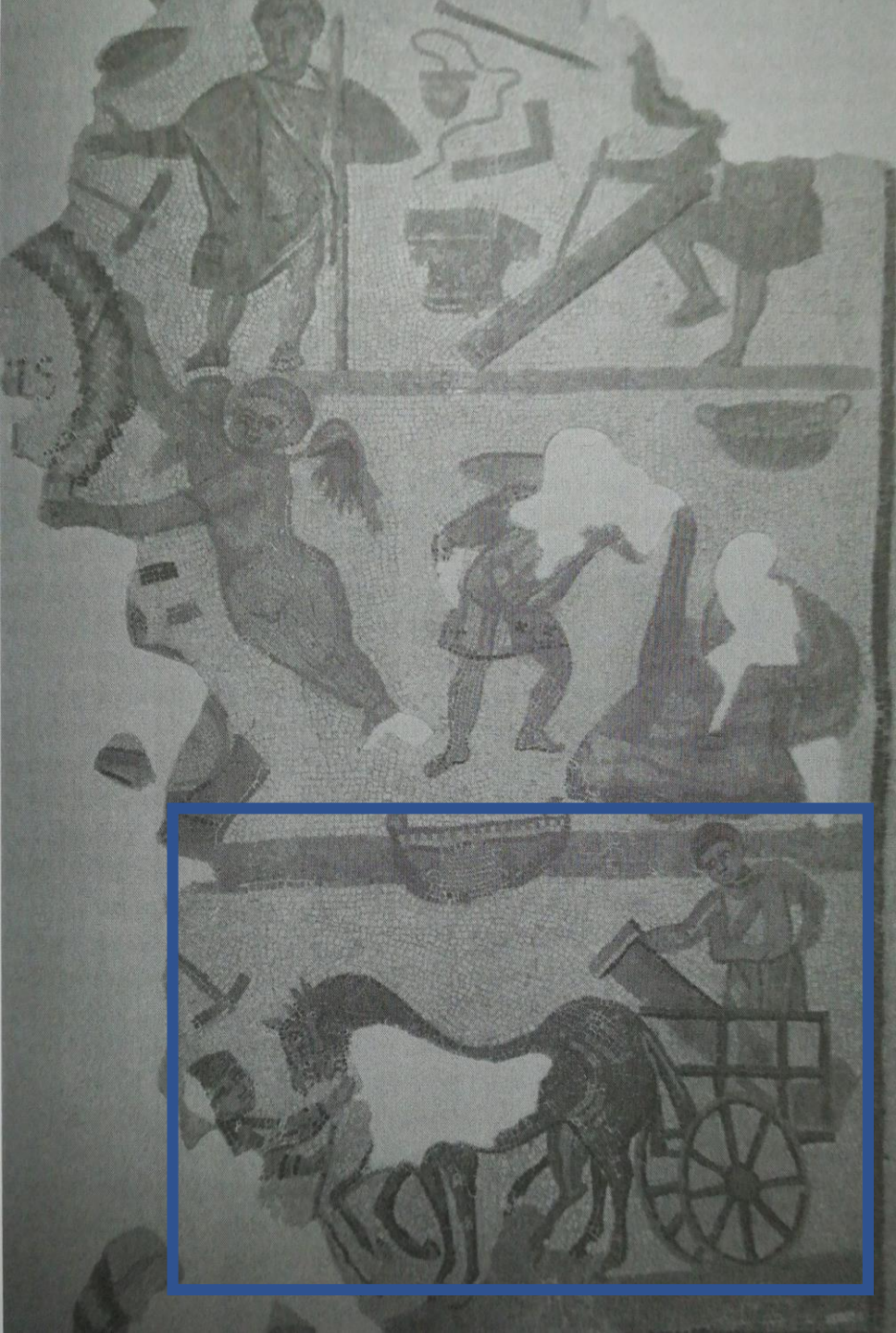
50-70 kg



- human porters
- pack animals
- draught animals

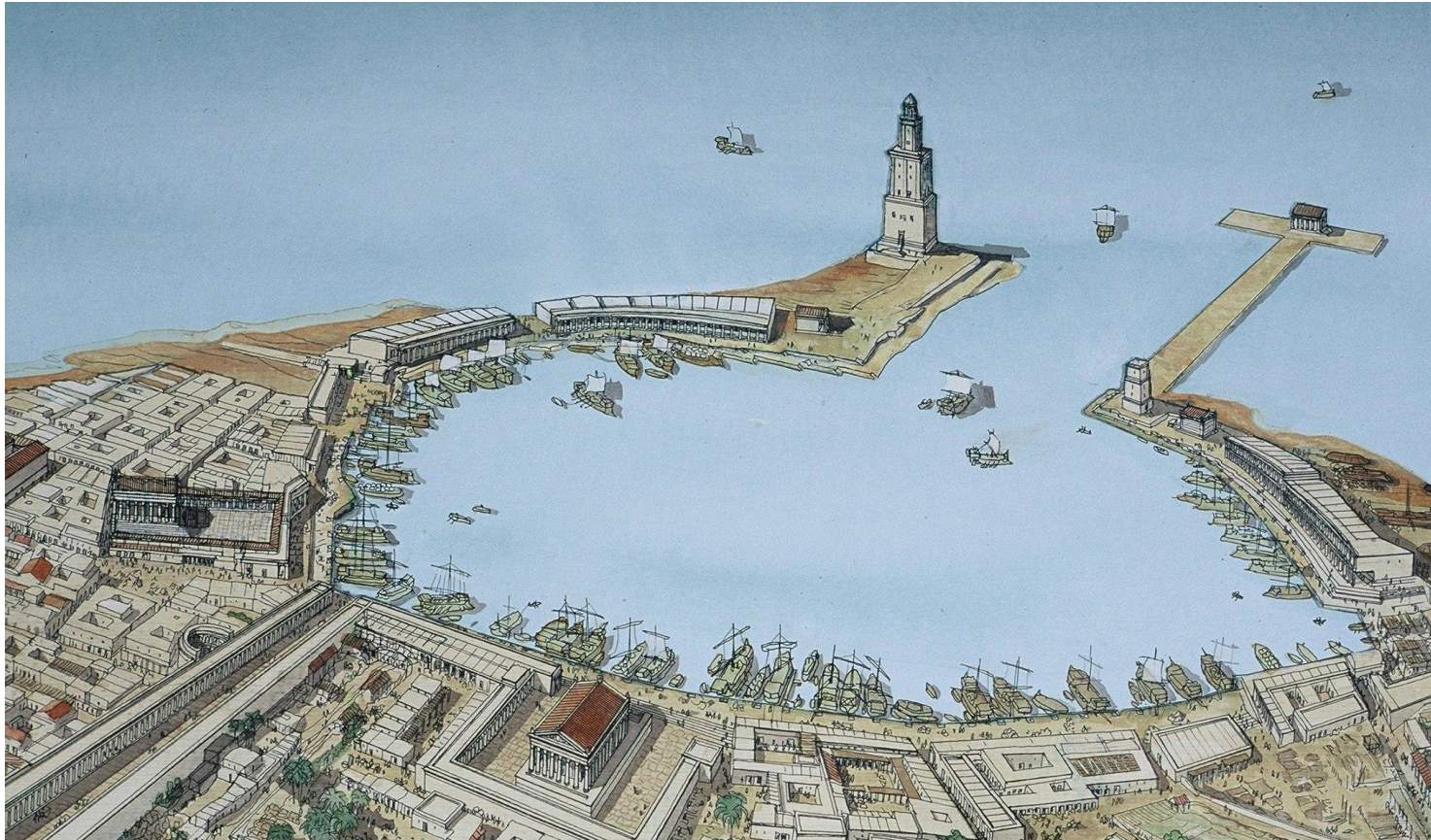


up to 180/800 kg



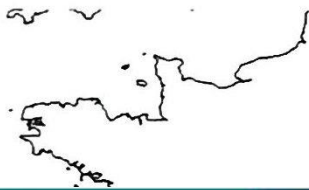
Late Antique mosaic from
Oued R'mel, Tunisia

(Russell 2013)



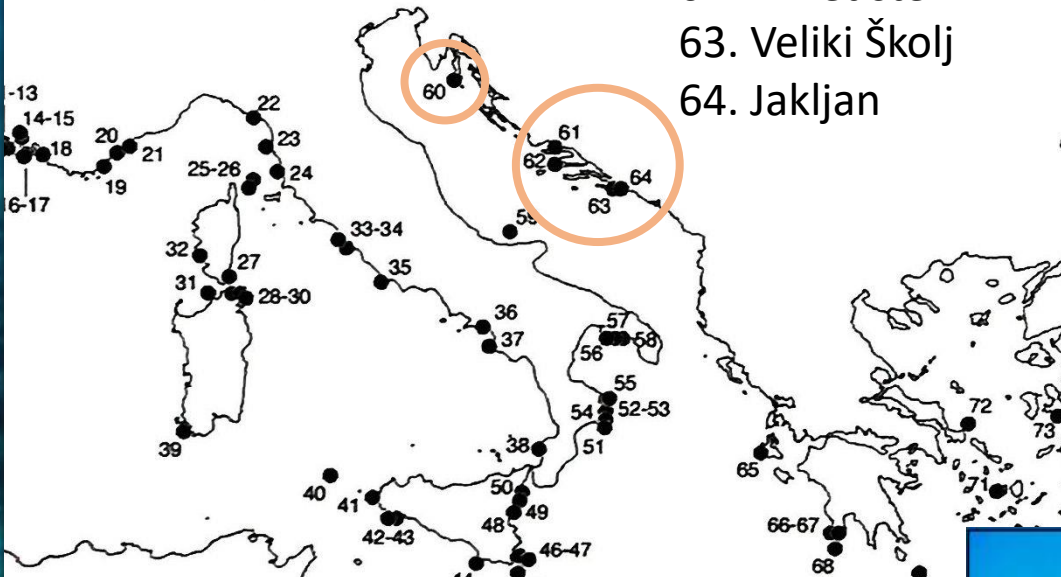
A port (lat. *portus*)

- natural or artificial sea, lake or river basins
- bays could have been used without the need for port facilities
- ships can find refuge from waves, currents, ice etc
- can load, unload or reload cargo or make repairs
- *positio, statio, emporium...*



Miholjek i Mihajlović 2008

60. Margarina



61. Sutivan

62. Izmetište

63. Veliki Školj

64. Jakljan



Veliki Školj (Mihajlović 2009)



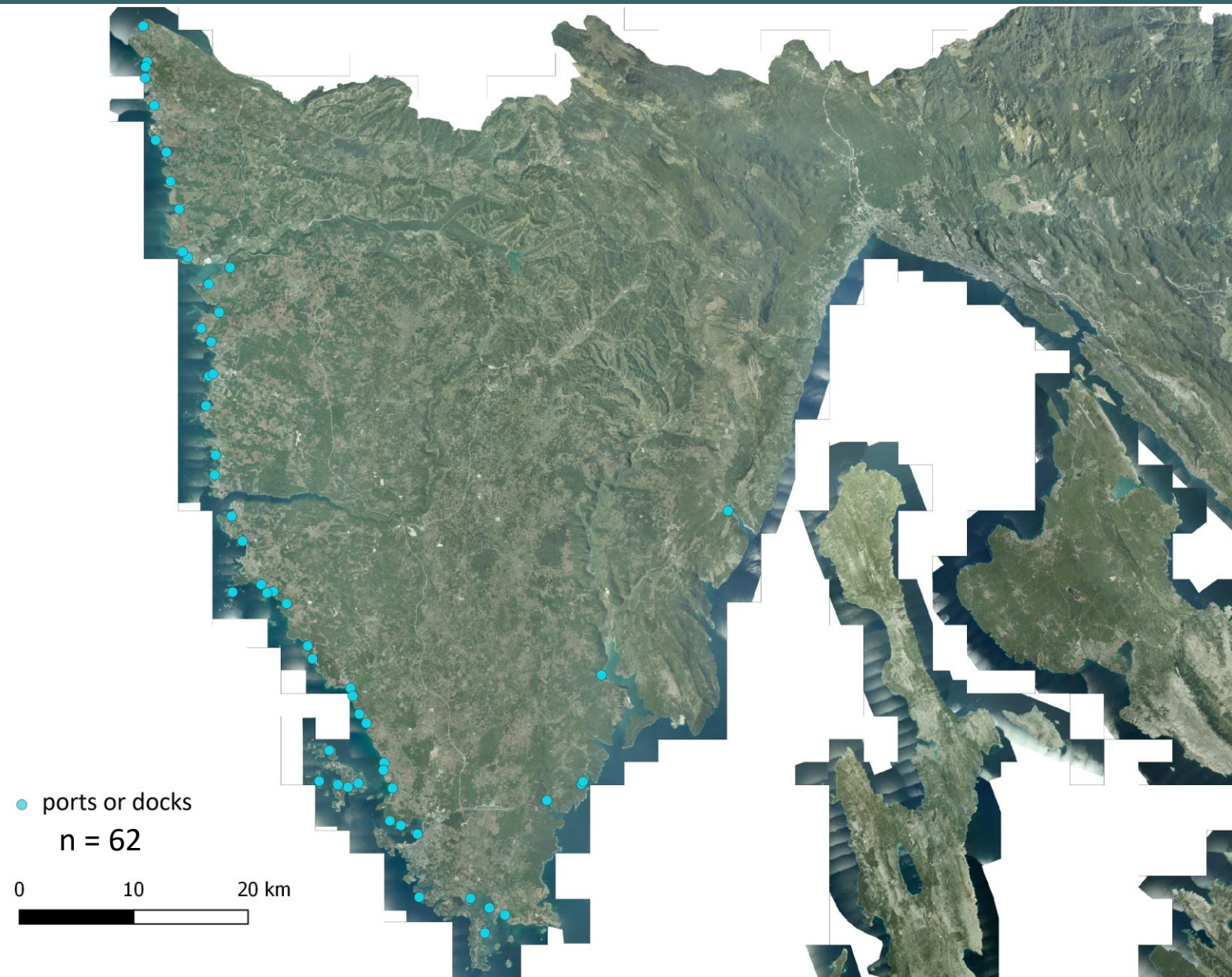
Sutivan (photo by: Jerko Macura)

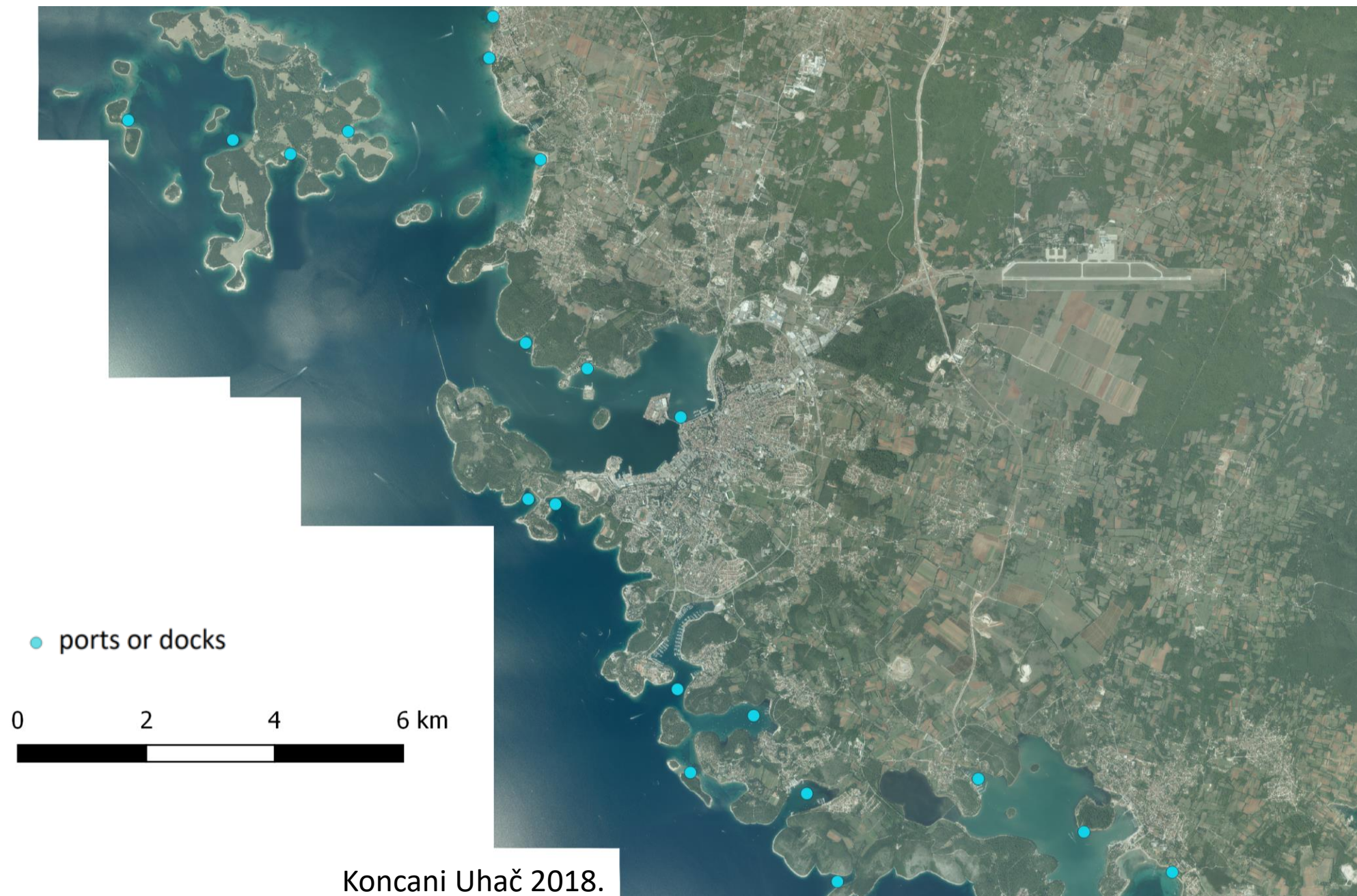


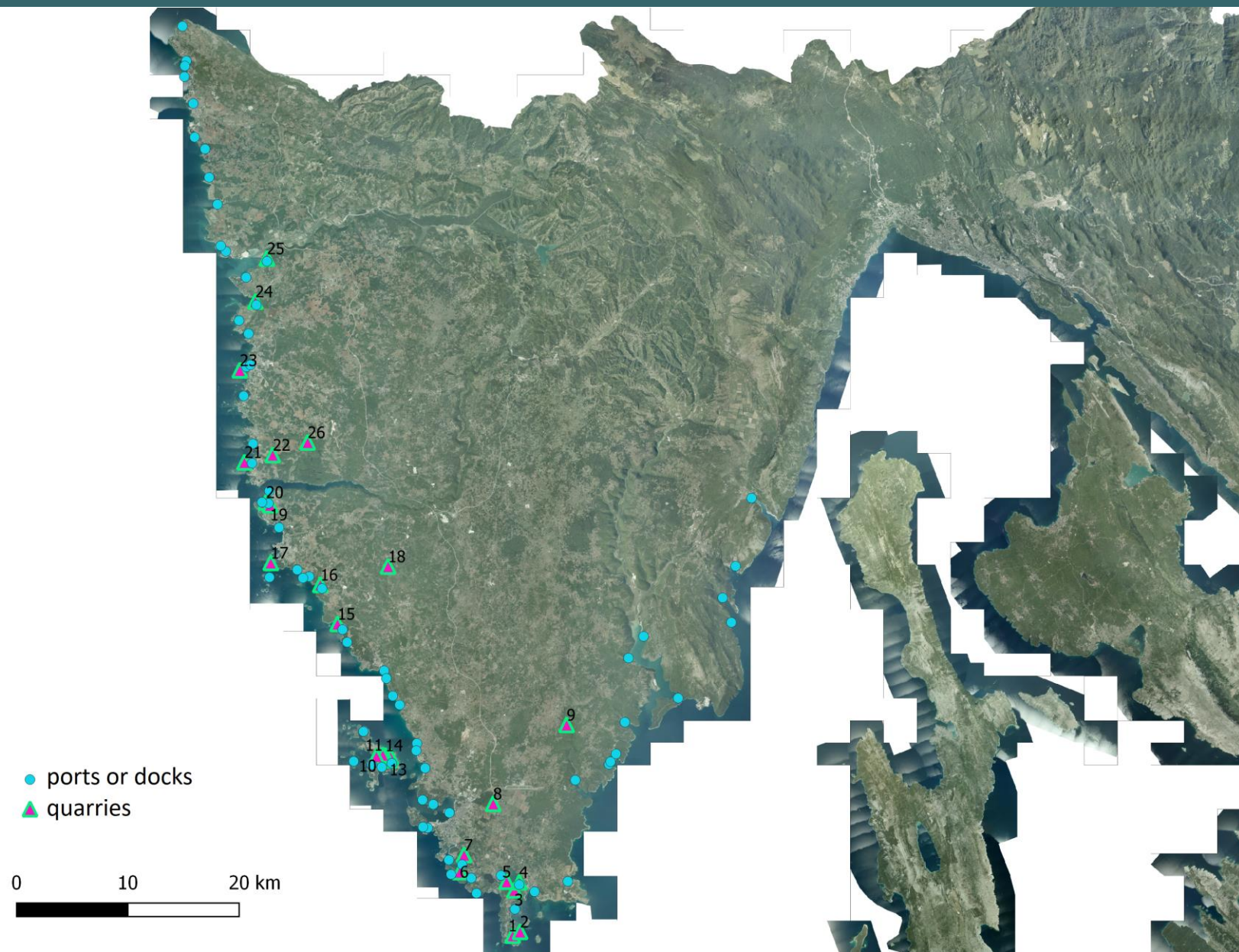
Jakljan (Mihajlović 2009)

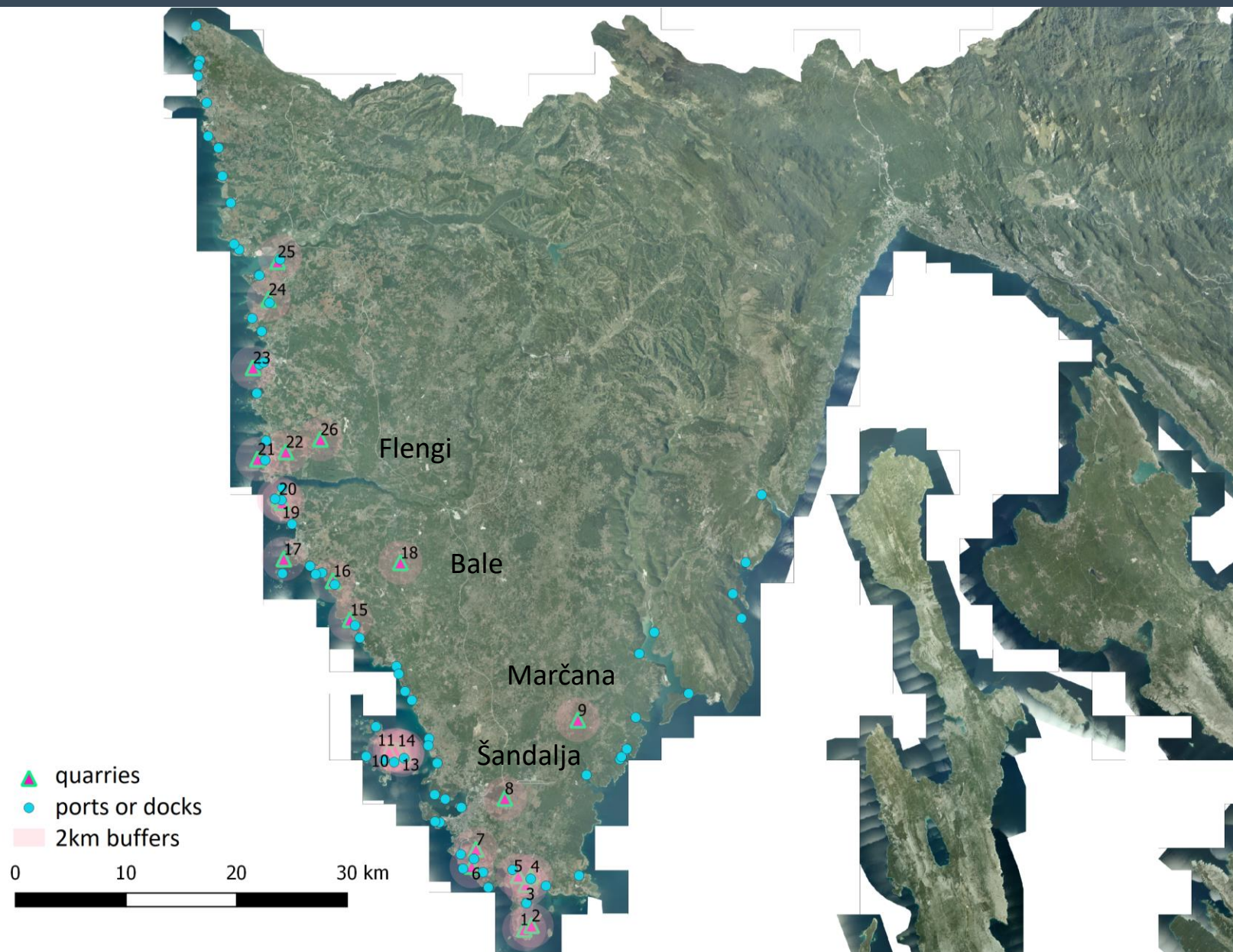


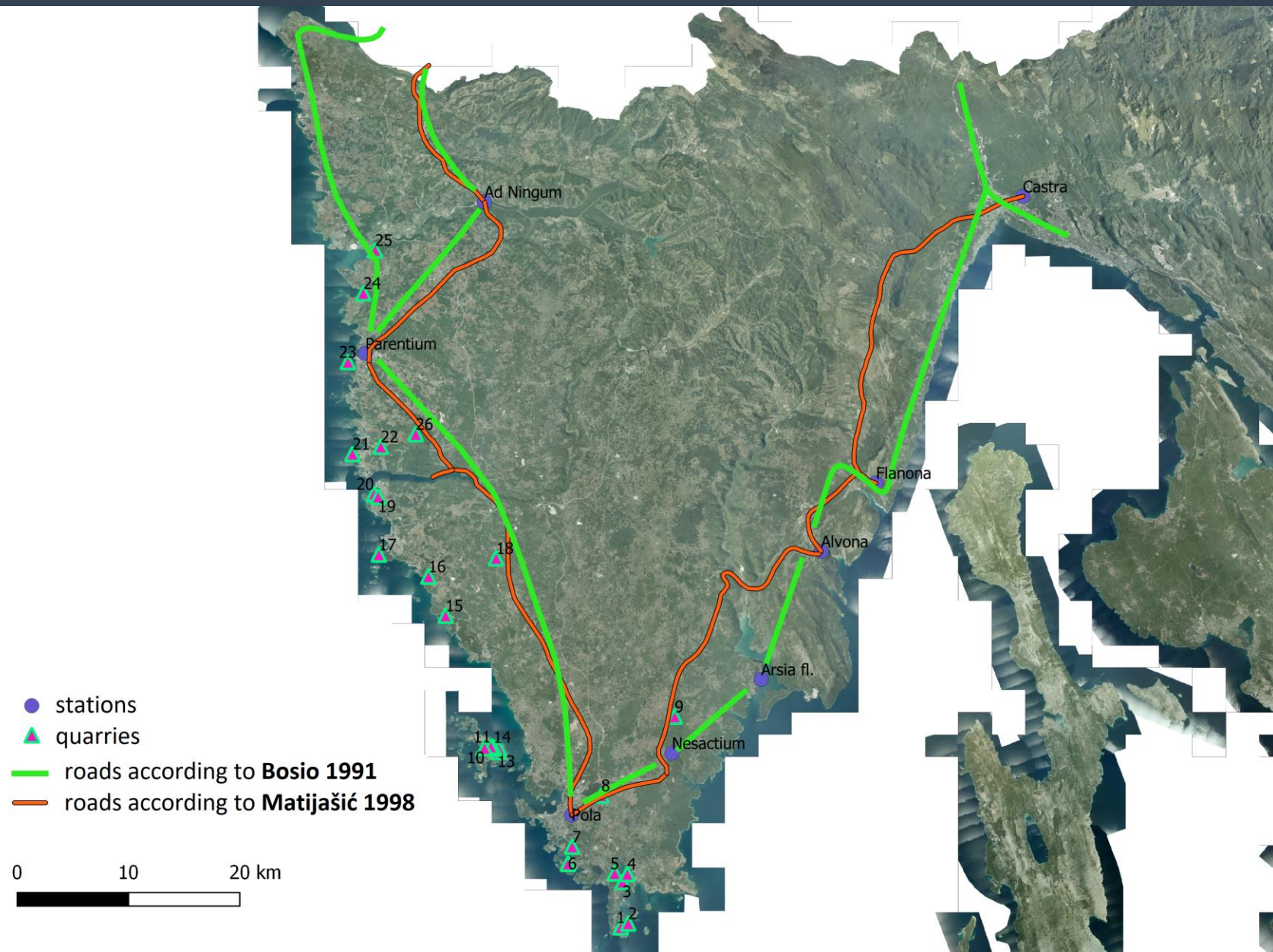
Map of shipwrecks containing stone cargoes (Russell 2013)

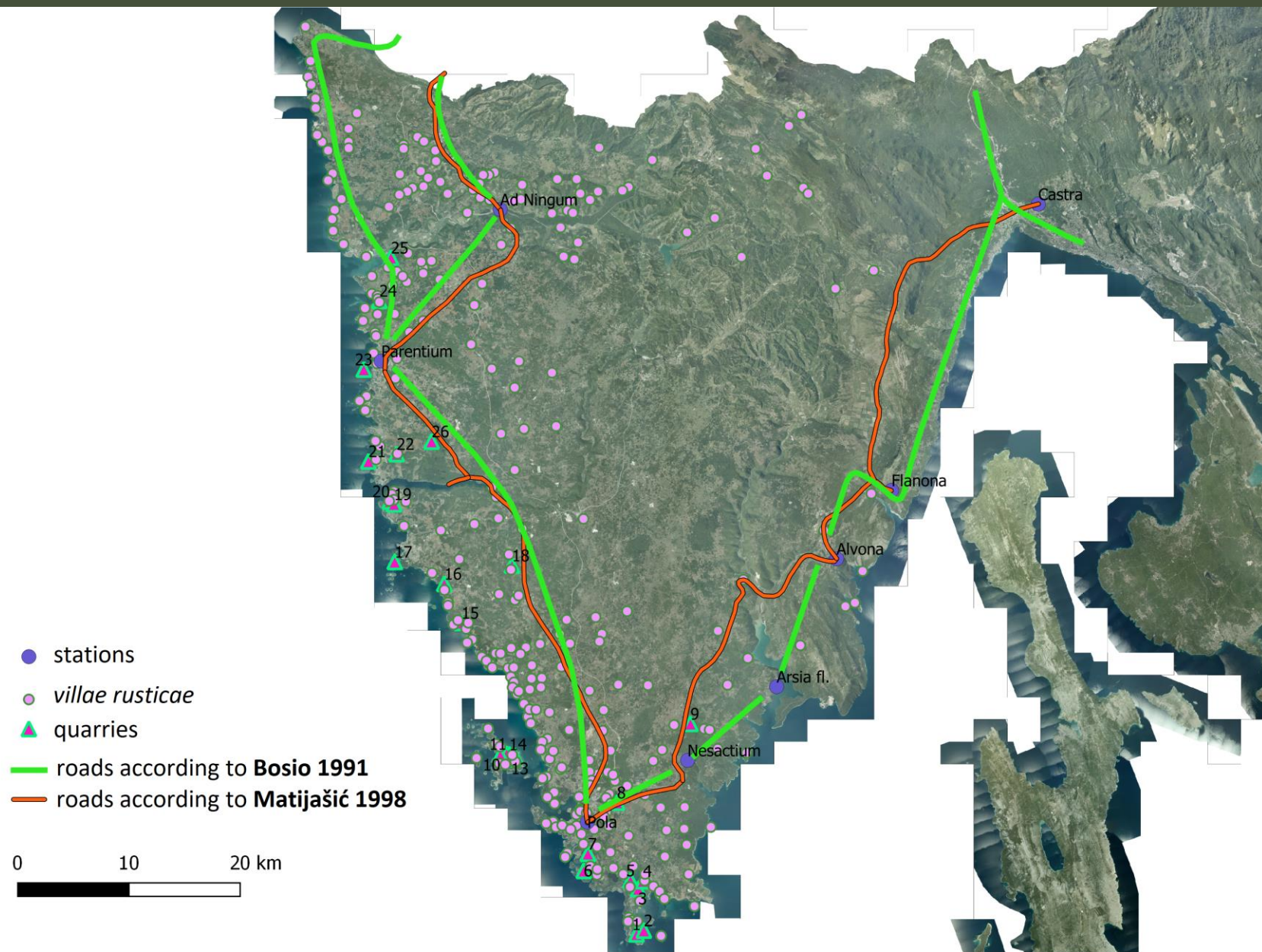






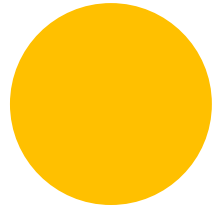
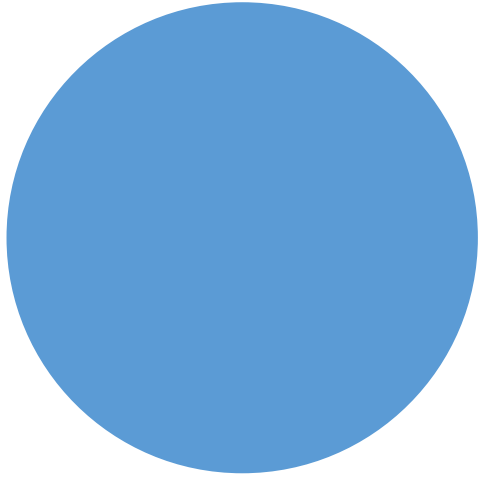






CONCLUSION

- 26 quarries
- 62 bays, ports or docks
- 2 suggested road directions
- What next?
 - petrographic analysis of monuments and quarries
 - geochemical analysis



Thanks for the
attention!

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