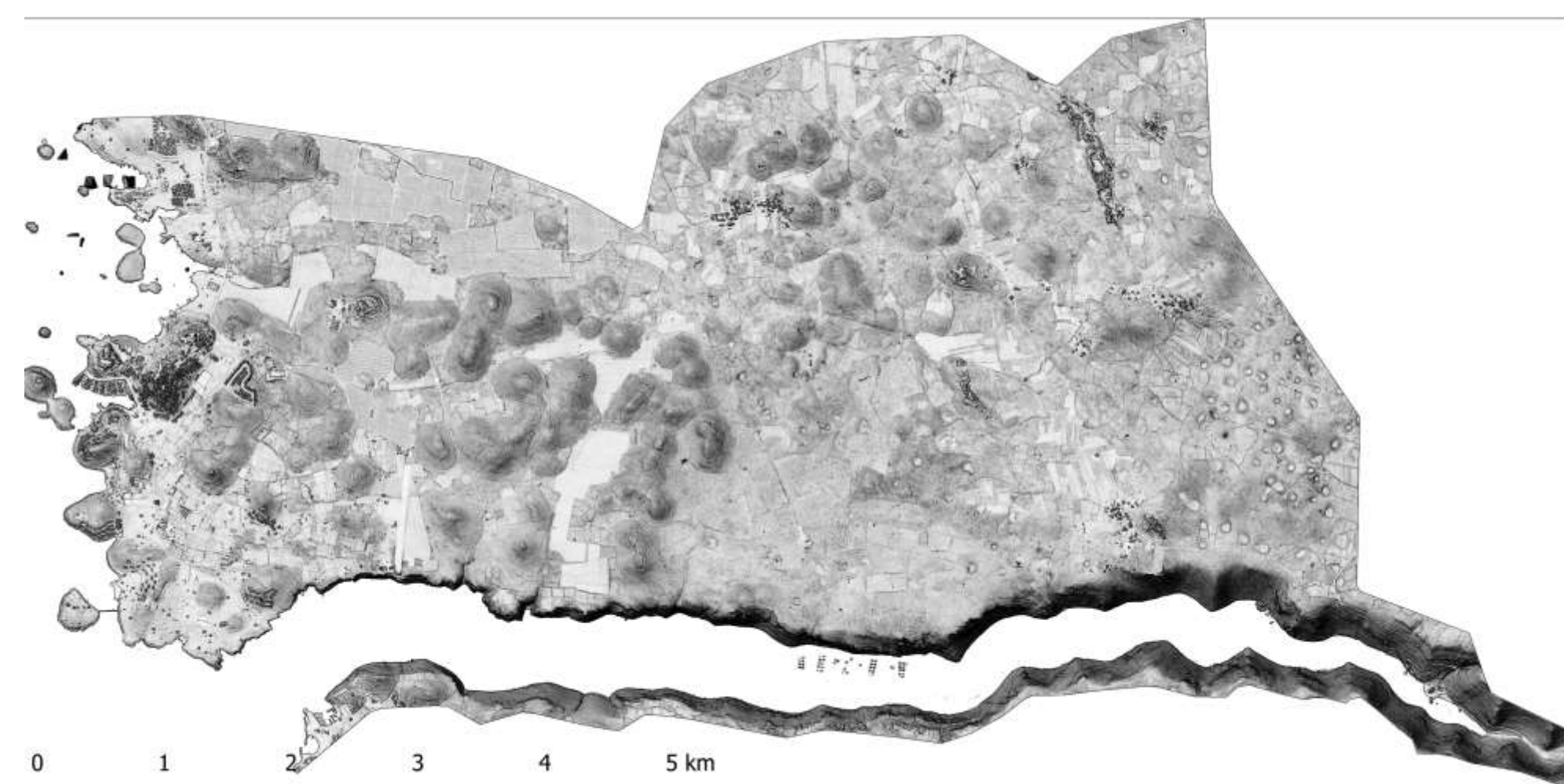


Reading terrain morphology (and land use) from ALS data in karstic environment

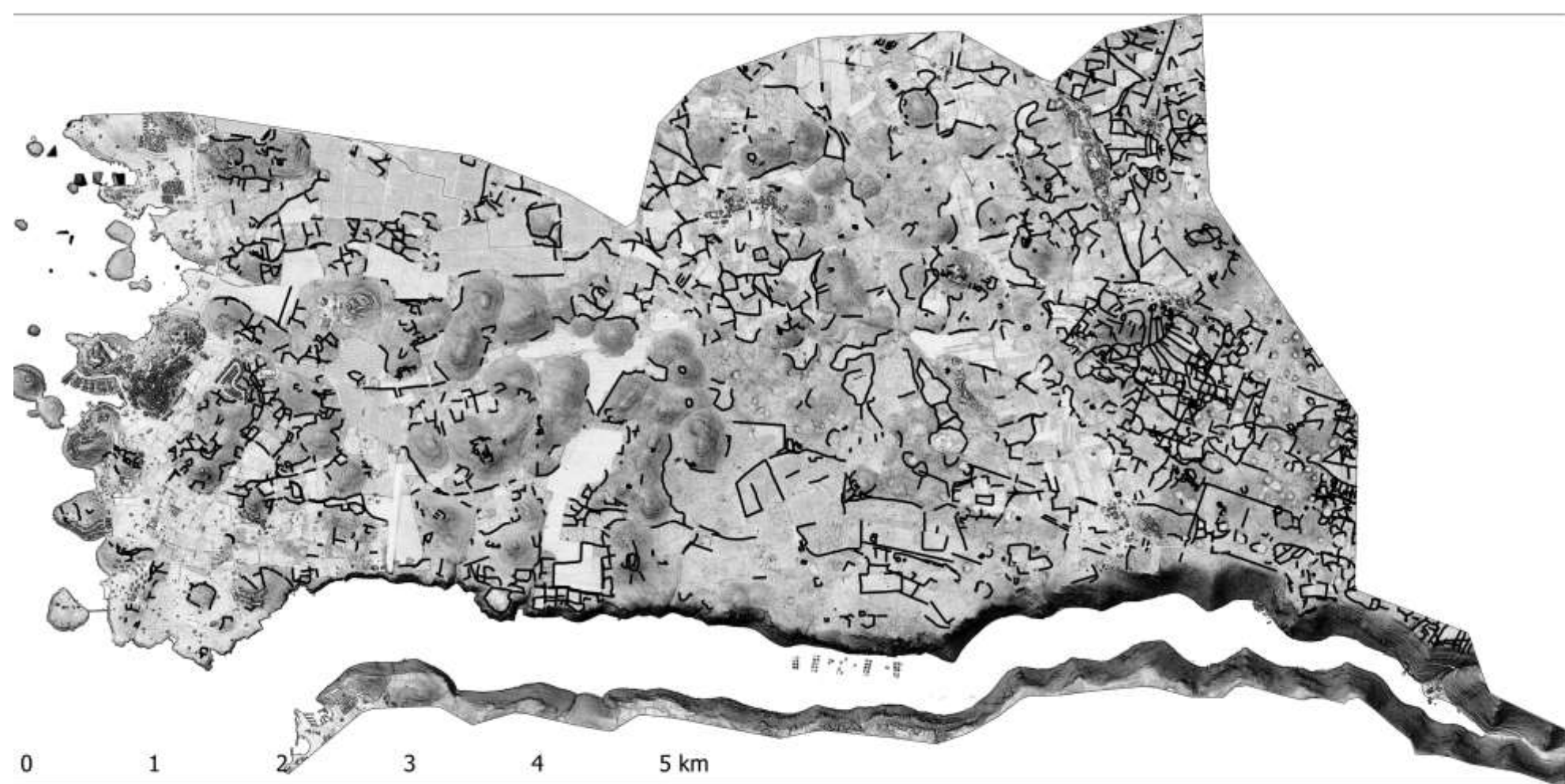
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Intensification of tourism in the last couple of decades brought abrupt change in land use along the eastern Adriatic coast. This is obvious in rapid urbanisation of coastline and abandonment of vast rural areas which are now going through natural reforestation. In research of this forested areas airborne laser scanning (ALS) has again proven to be an irreplaceable technique. It enables detection of standing, dry stone constructions which reflect diachronic spatial organisations.

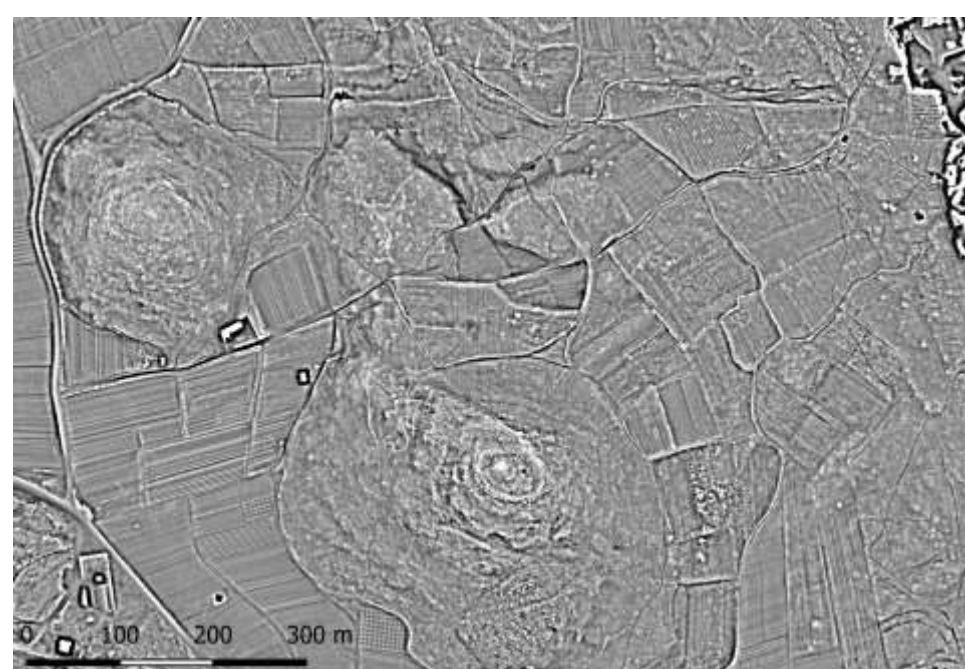
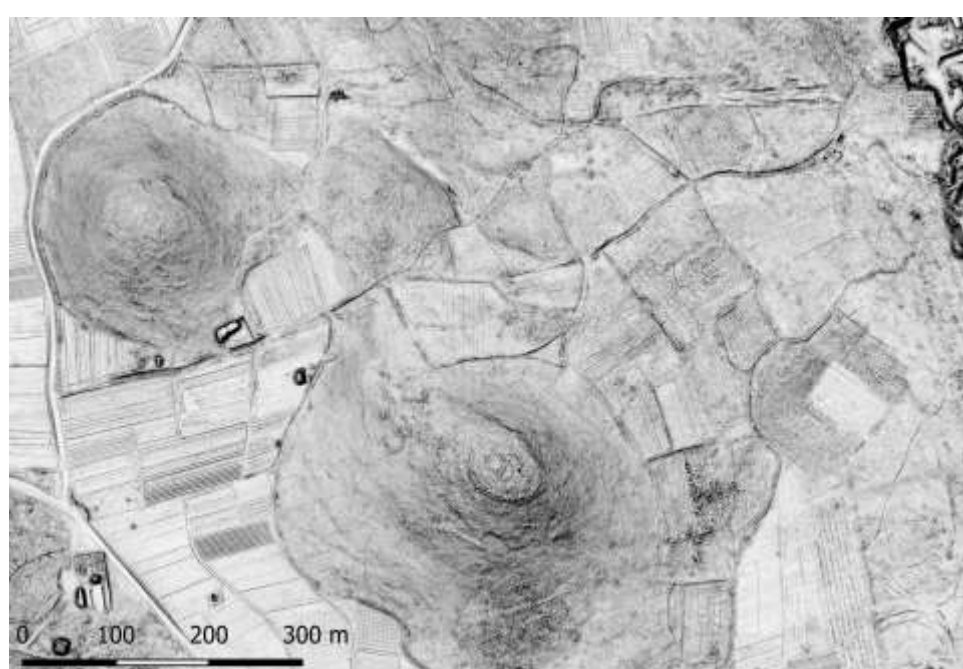


Municipality of Vrsar (roughly 38,5 km²) was scanned in 2017 with Riegl LMS-Q780 full waveform sensor. After filtering, the result was average of 24 last pulses and 0,5 m spatial resolution of the final DTM.

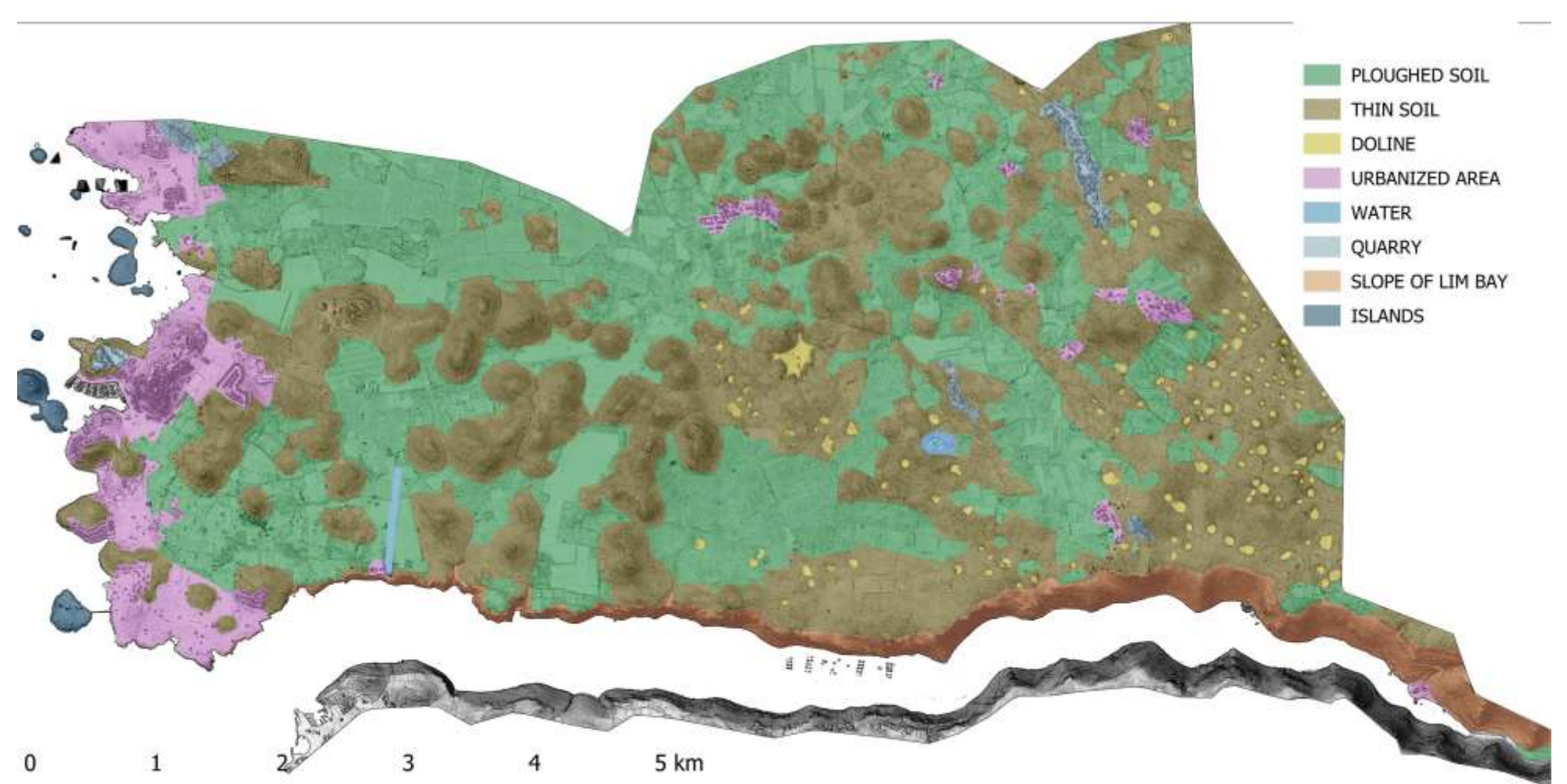


All dry stone structures are interpreted from ALS. Sky-view factor visualisation was used for detecting and mapping still standing structures, while local relief model for dilapidated walls, visible only as subtle bumps compared to surrounding terrain.

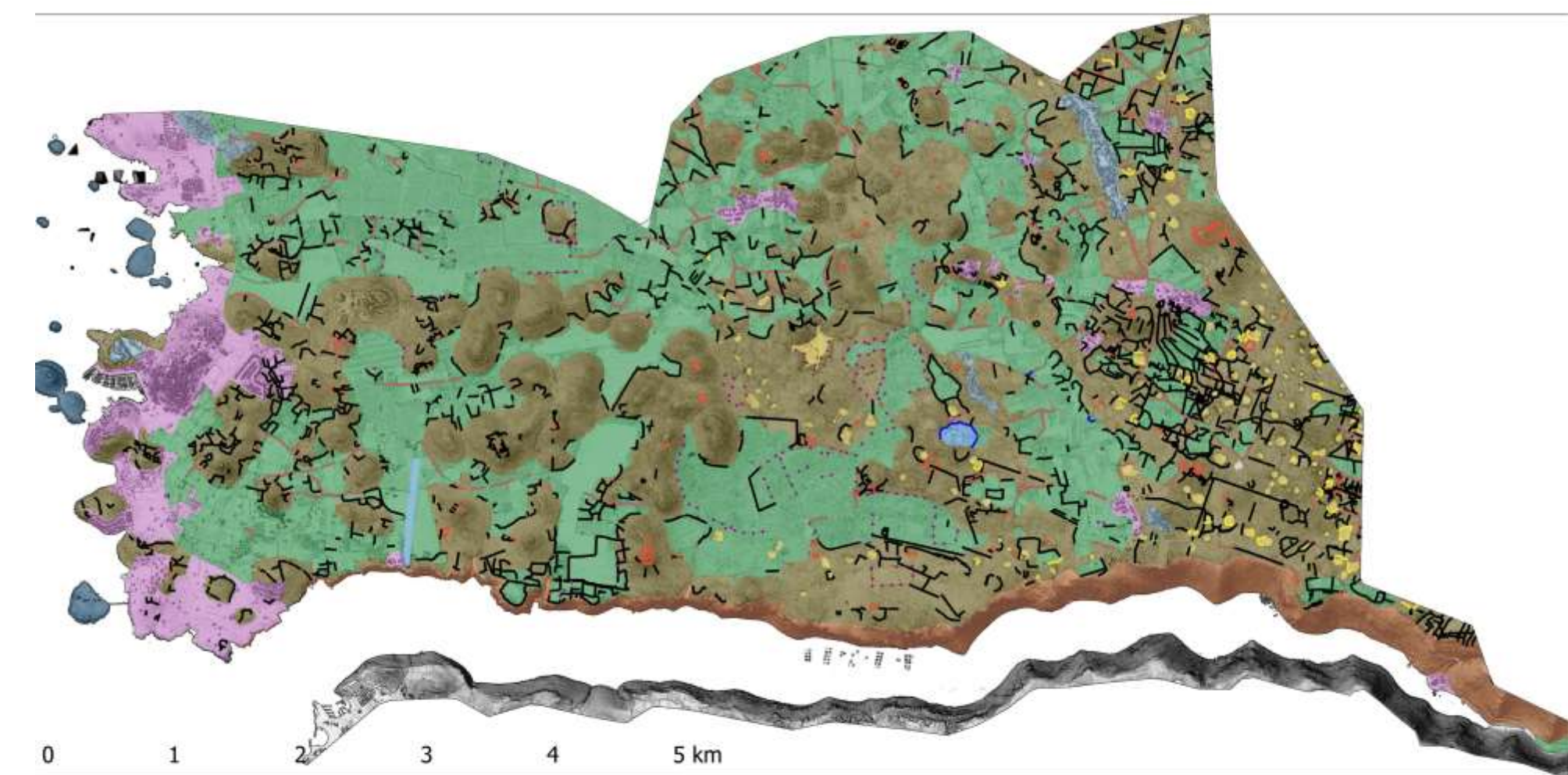
In areas with thin soils most of the preserved structures are in connection with pastoral land use. Beside enclosures and funnels for directing animals, pastoral land use can be also understood from numerous stone walls which don't reflect private property but are borders between fertile and non-fertile areas. From this we can conclude that the latter was used for grazing.



Along with identification of numerous dry stone walls, ALS data also provides information about terrain morphology. In karstic environment we can differentiate between areas with enough fertile soil which can be ploughed and stony areas with visible outcrop and thin soils. This natural landscape patterns and their correlation with built structures can provide insights into different functions of these constructions. This consequently enables reconstruction of land use (cultivation of crops vs. animal husbandry) in the rural landscape.



Classification of surface morphology of non-urban area has 2 main categories: ploughed soils (dolines are also ploughed) and thin soils (slopes of Lim bay and islands are also in this category with outcrop visible on surface)



While being mapped, all the structures were attributed with function, state of preservation and date if possible. In stony areas remains of built structures are more numerous than in fertile ones.

Understanding stratigraphy of standing structures (which is cutting which, or which is superimposed to other) will give us the time sequence in terms of 'older - younger'. Still, absolute dating of constructions reflecting pastoral use remains a challenge for number of reasons: some of the forms didn't change for millennia, some could have been in use for longer periods, and for many of them (for exp. walls or funnels) we can't expect any material remains.

