

Proceeding Paper

# Using QGIS as an Ideal Workspace for Archaeogeography: A Case Study on Castronovo di Sicilia <sup>†</sup>

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**Abstract:** During the Ph.D. project titled Flying off-site: new investigation methodologies for the analysis of historical landscapes, QGIS was used as a workspace for the archaeogeographical analysis of the territory of Castronovo di Sicilia (PA). The interaction between native applications and plugins developed by third parties showed that this software is the ideal environment for a complete archaeogeographical analysis, as it can integrate archaeological and geographical information of different types. The possibility of using a single software not only reduces research costs and time but also allows for new data to be obtained and a holistic approach to be applied to analyzed landscape

**Keywords:** archaeogeography; QGIS; landscape archaeology

## 1. Introduction

Archaeogeography is a little-known discipline that has yet to find its place outside of France. The first to theorize its methodological foundations was Gérard Chouquer in the late 1990s and early 2000s. In those years, Chouquer began to focus on the study of the *formes du paysage*, concentrating on the analysis of parcels and spatial systems [1–3]. The central aim of archaeogeographic research is to analyze the planimetry of the historical landscape, understood as “the product of all the actions of societies on the earth’s surface” [4], and for this reason, archaeogeographic analyses focus on roads, the development of settlement networks, agricultural parceling, artificial vegetation boundaries and water regulation. These historical landscape forms are analyzed using different types of sources: historical and current cartographies, geological and hydrogeological thematic maps, aerial and satellite images, archaeological excavation and reconnaissance data, spatial analyses, geophysical analyses, palaeoenvironmental and archaeozoological data.

The ultimate aim of archaeogeographical research is to produce a cumulative map into which all of the data collected from various sources can be incorporated. It is therefore essential that the data collected can be correctly placed in a cartographic environment. In May 2014, during a lecture held in Grosseto, as part of the *International Summer School Predictivity in Archaeology*, Magali Watteaux pointed out that the results of an archaeogeographical analysis should be processed “if possible in GIS”. Today, almost ten years later, this possibility has inescapably become the only acceptable methodological solution.

As a part of the Ph.D. project titled Flying off-site: new investigation methodologies for the analysis of historical landscapes, an archaeogeographical analysis of the area of Castronovo di Sicilia (PA) was carried out. On this occasion, the open-source software QGIS 3.28 was chosen as the exclusive workspace, to assess its potential and limitations as the main means for archaeogeographic research. The following paragraphs will highlight the methodology used, the peculiarities that emerged during the use of QGIS, and the archaeogeographical results that were processed using this software for the analyzed area.



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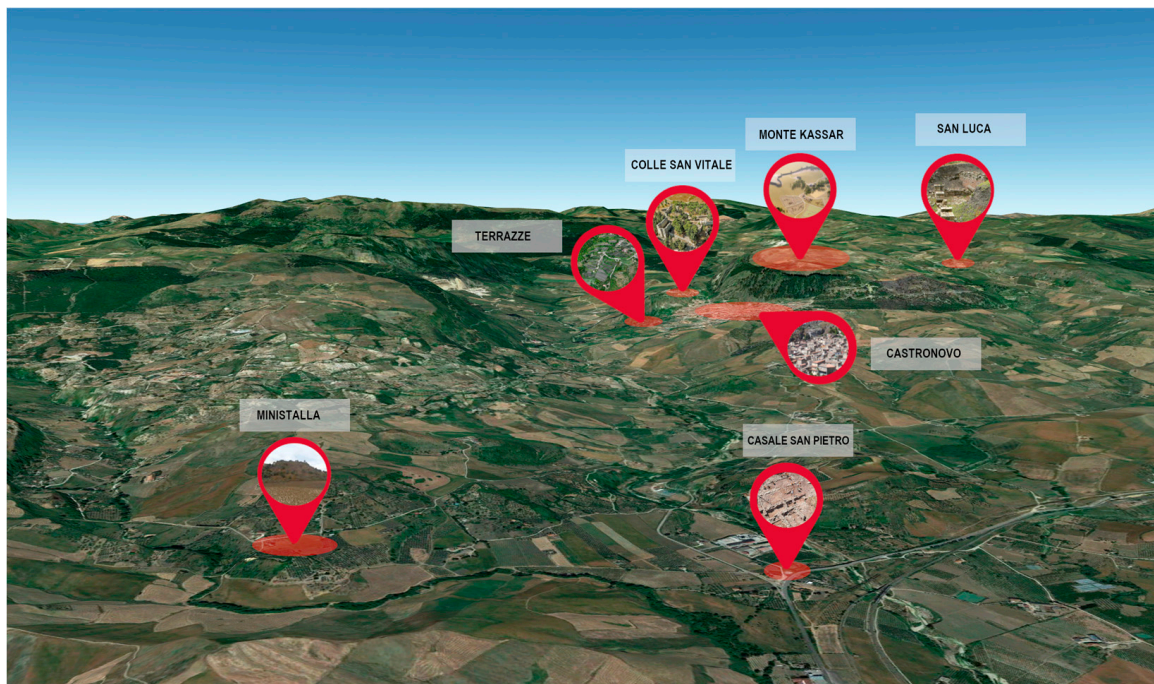


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## 2. Data and Methods

### 2.1. Study Area

The area subject to the archaeogeographical research comprises the central part of the territory of the municipality of Castronovo di Sicilia (PM) (Figure 1). It is an area of approximately 200 km<sup>2</sup>, in the central-western part of the island, halfway between Palermo and Agrigento. The municipal territory, one of the main ones in the province of Palermo, in terms of landscape variety, historical archaeological evidence, and extension, can be divided into three distinct areas: the western sector, characterized by the eastern offshoots of the Monti Sicani mountain chain, which presents limestone massifs of Mesozoic origin, often highlighted by sheer cliffs alternating with vast plateaus, woods, and natural springs; the central area, on which lies the fertile valley of the Platani River, which springs from the slopes of the Monti Sicani in the municipal territory; and finally, the eastern area consisting of a vast system of hills occupied mainly by arable land and pastures. The entire area, which is rich in natural and water resources, is optimally located in the Sicilian hinterland, at the center of the main natural routes that connect the island along the east–west and north–south axes. All of these concourses have determined intense settlement activity for the area from prehistoric times [5,6] to the present day without interruption.



**Figure 1.** Research area of Castronovo di Sicilia.

In the 19th century, intense research activity of an antiquarian nature, concerning the territory of the municipality was conducted by the historian of Castronovo, Luigi Tirrito, who, between 1873 and 1877, published the volume entitled *Sulla città e comarca di Castronuovo di Sicilia. Ricerche storiche, topografiche, statistiche ed economiche* [7]. This work also published the first topographical plan of the fortification of Kassar, drawn in 1867 by Francesco Saverio Cavallari on behalf of the Commission of Antiquities and Fine Arts of Sicily at the urging of Tirrito himself, who gave the fortification a classical-age date [7]. After a period of stagnation, the 1980s saw a renewed historical and archaeological interest, in particular, in the area of Mount Kassar. Giovanni Uggeri was the first, in 1981, to propose a Byzantine foundation for the fortification. Confirmation was given a few years later, first by the archaeological samplings carried out in 1984 by Agata Villa in some of the inner areas of the fortification [8] and, later, by the field reconnaissance and analysis of the layout of the walls carried out by Ferdinando Maurici in 1992 [9]. In these years, the fortification

of Colle San Vitale, located on the rocky spur delimiting the western part of the built-up area of Castronovo, was also investigated, first through some excavation samplings, also carried out by Agata Villa, in 1985, and then with further investigations between 1998 and 2001, during the construction of the suburban park. In 1999, attention returned to the entire territory of Castronovo with the work of Vittorio Giustolisi, who, among other things, identified Casale San Pietro, located in the Platani valley, near the current SS198 Palermo-Agrigento, as the location of the Statio Petrina, present in the VIII-Item ab Agrigento Lilybeo of the Itinerarium Antonini [5].

The first decade of the new century saw a new series of archaeological investigations, directed by the Soprintendenza of Palermo, in various areas of the territory. In fact, in 2002 and 2004, two excavation campaigns were carried out in the Roman villa in Contrada San Luca, while in 2005, a new research campaign was conducted in the Kassar area, during which both the walls were cleaned and surveyed in detail, and several excavation samplings were carried out in the area of the eastern gate, two towers on the western part of the walls, and the small church located within the walls near the eastern boundary. In the same period, two excavation samplings were carried out in the small single-nave church, which is part of the complex of today's Casale San Pietro [10].

The fervent activities of the early 2000s were followed by a new period of an absence of research, interrupted only in 2013 by the field survey activities carried out by Castrorao Barba [11] under the direction of the Soprintendenza di Palermo and, in the following year, by the beginning of an intense activity of extensive and multidisciplinary research, which lasted six years and was carried out within the framework of the ERC advanced grant Sicily in transition (Sictransit) project, co-directed by Martin Carver (University of York) and Alessandra Molinari (University of Rome Tor Vergata), to investigate the transformations of the area as the dominations changed between the 5th and 13th centuries [12].

## 2.2. Methodology

The archaeogeographical analysis of the Castronovo di Sicilia area was characterized by the use of various sources. The sources used and the method by which they were employed within the QGIS 3.28 software are listed below.

Historical and modern cartography: If, in the first case, the insertion within the GIS environment was carried out using the georeferencing method, in the case of modern cartography, WMS services (Web Map Service) were used to load thematic cartographic, geographic, and hydrogeological maps in real time from the Geoportale Nazionale (GN, <http://www.pcn.minambiente.it>, accessed on 26 July 2023) and the SITR of the Regione Sicilia (<https://www.sitr.regione.sicilia.it>, accessed on 26 July 2023).

Aerial and satellite photographs: Aerial photographs were included in the GIS project by exploiting both methods highlighted for the previous category of sources. The various aerial photographs present on the GN were uploaded through WMS services, while some photographs from the Istituto Geografico Militare (I.G.M.) were georeferenced. In contrast, the first of a series of plugins developed by third parties was used for the satellite images: the Semi-Automatic Classification Plugin [13]. This plugin makes it possible to download images from different types of satellites (those mainly used in the presented research are the Sentinels) and to carry out processing both on the different bands of the images and using semi-automatic classification functions.

Thermal and multispectral drone photos: During the end of April 2021, targeted flights with drones equipped with thermal and multispectral sensors were carried out in specific areas of the investigated zone. The results of these flights were then integrated into QGIS, which made it possible to extract the thermal orthophoto of the images in four channels (RGB + IR), obtained from the *structure from motion* process [14,15], and to process the vegetation indices from the multispectral photographs, which were useful for the identification of archaeological elements that were not visible on the surface [16].

Microtopographical analyses: A further level of investigation, using drone photographs, was carried out in the area of Mount Kassar through the analysis of the DEM

and related visualization techniques (VTs). Given the large size of the area, which is over 90 ha, a height of 110 m was chosen for a final GSD of the DEM of 11.3 cm/pixel. The QGIS plugin, the Relief Visualization Toolbox, developed by ZRC SAZU [17–19], was used to process the DEM. This is the first of several plugins which, as we shall see, were developed expressly by archaeologists. In this case, the plugin was used for the fast and automatic processing of 12 different VTs of the DEM of the Mount Kassara area.

**Geophysical surveys:** As a part of the SicTransit project, several magnetometry surveys were carried out in specific areas of the Castronovo di Sicilia territory [20]. These analyses were included in the GIS project of the archaeogeographical analysis using the AGT—Archaeological Geophysics Toolbox plugin, developed by the Institut national de recherches archéologiques préventives (INRAP) [21]. This plugin provides a series of tools for processing geophysical data, directly within QGIS. At present, the use of this plugin is limited to a few compatible tools, some of which are, however, among those most used in the archaeological field, such as the Bartington Grad 601, which is used in the case of Castronovo di Sicilia.

**Spatial analyses:** There are several plugins which were developed by third parties for QGIS that are useful for processing different types of spatial analyses. In this specific case, two were used, which were also developed by archaeologists.

The first, Movecost, was developed by E. Cocca based on the algorithms developed by G. Alberti for the R 4.3.2 software [22]. This plugin allowed for the elaboration of least cost paths (LCPs) both between sites within the research area, and between the main centers on the Sicilian coastline, allowing the spatial data to be compared with written sources on the subject of roadways in the Roman and Arab-Norman periods (Itinerarium Antonini and Al-Idrisi), highlighting the centrality of Castronovo along the main inland communication routes in Sicily, in all historical periods [23].

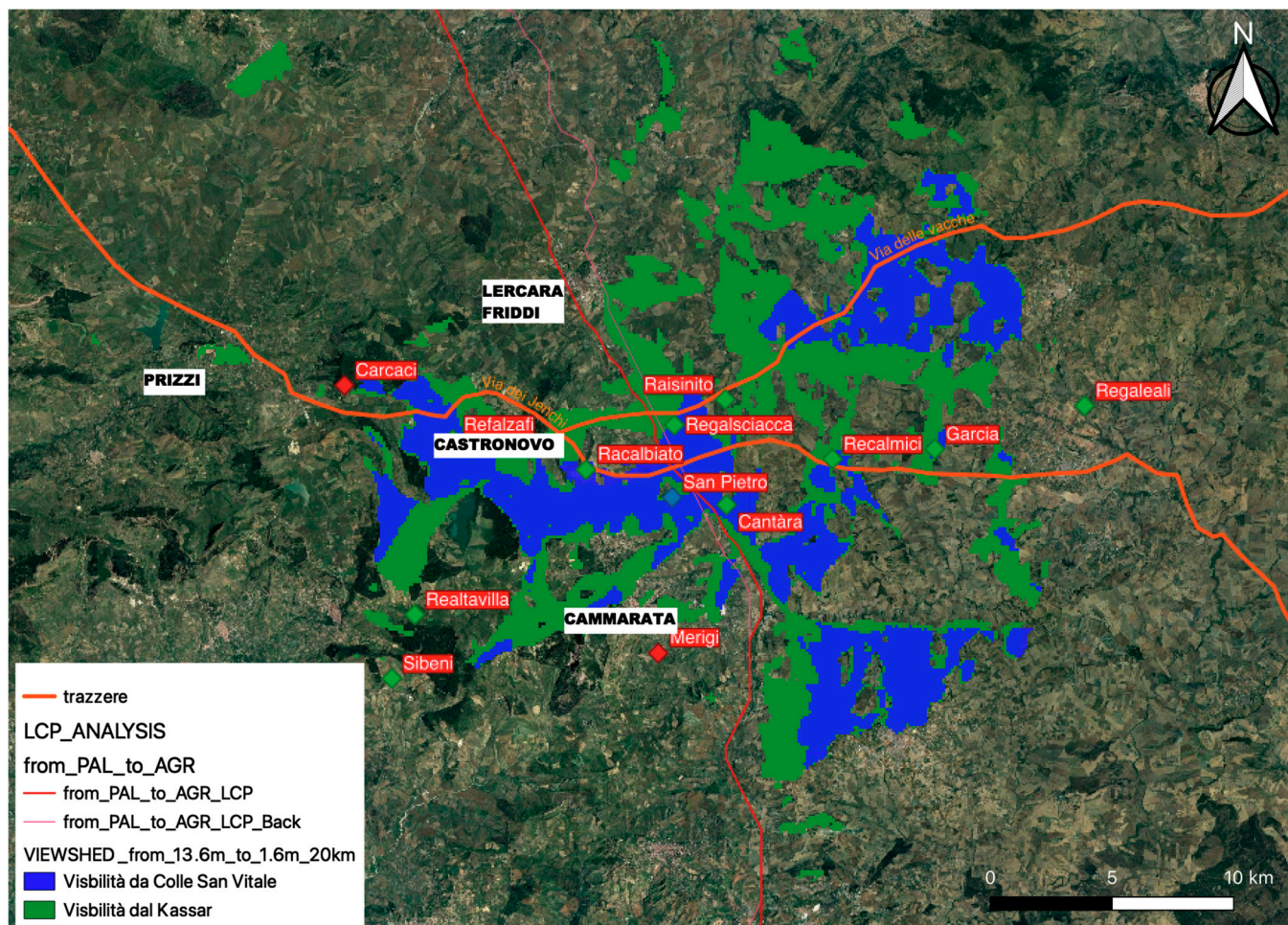
The second plugin used for spatial analysis, Visibility Analysis, was developed by archaeologist Z. Čučković [24] and made it possible to process both Viewshed Analysis (VAs) and Intervisibility or Lines of Sight (LoS) analyses. The VAs were processed from different points of the Byzantine fortification of Mount Kassara and the later fortification, located at a lower altitude, of Colle San Vitale (Figure 1), mainly highlighting how the Byzantine fortification allowed for greater visibility and, therefore, greater control, especially in the territory north of Castronovo up to the limits of the present-day municipality of Lercara Friddi, while both fortification systems, in equal measure, were useful for controlling the territory along the east—west direction (Figure 2).

A further level of visibility analysis was carried out and was limited to the inner area of Mount Kassara, in which case an LoS algorithm [25] was used to verify the visibility within the fortified plateau. The result, in this case, shows that there is no intervisibility between all of the points used. In particular, the morphology of the terrain disfavors visibility between the observers located in the main points of the south-western area of the fortified zone. In contrast, there is total intervisibility between all points and those in the northeastern area of Kassara.

Finally, as far as spatial analyses are concerned, the central area of the Castronovo di Sicilia territory was also involved in the analysis of the parcel system. This was carried out on an I.G.M. photograph taken in 1955, thus preceding the phase of urban and landscape transformation that affected the investigated territory from the 1960s onwards. The photograph was georeferenced within QGIS and subsequently served as the basis on which the 1955 parcel was vectorized. In line with other studies on the parcel system of a historical landscape [26], the analysis was limited exclusively to the identification of parcel boundaries to highlight the presence or absence of traces of a systematic organization of the agricultural landscape at one or more historical moments. For this reason, vectorization was carried out with a linear shapefile distinguishing each parcel boundary, between two points, according to the orientation (Figure 3). The analysis of the photograph made it possible to identify 2306 parcel elements over an area of approx. 26 km<sup>2</sup> including the south and east by the slopes of the hillsides, the west by the limits of the built-up area of



Castronovo, and the north by the fictitious boundary of the area included in the photograph. Subsequently, boundaries smaller than 30 m (249 out of 2306) were excluded to improve the statistical analysis. Subsequent processing was therefore carried out on 2057 elements, and the orientation of the parcels was analyzed with the main cardinal points and the road system crossing the area, according to a confidence margin of  $\pm 4^\circ$ , for a tolerance range of  $9^\circ$ .



**Figure 2.** Viewshed analysis of both fortifications (starting height of 13.6 m, target height of 1.5 m, visibility distance of 20 km), in relation to the trazzere, the north–south LPC analysis, and the location of hamlets with toponyms of Arab origin.

The results of the parcel study have shown that, from the situation immortalized in the aerial photograph of 1955, no precise moment of planned organization of the agrarian landscape appears to have emerged, which redefined the limits of the cultivated fields in an evident manner. The substantial balance of alignments, which results from the analyses, does not allow us to exclude, with absolute certainty, that a moment of systematic organization occurred for this area of the historical landscape, but if it had happened, it did not leave particularly evident traces. Thanks to the data analyzed, it is also possible to hypothesize that this area of the agrarian landscape was the subject of moments of continuous and constant evolution and transformation of the limits of cultivated fields rather than moments of caesura and radical reorganization of the territory.

Data from excavations and archaeological surveys: Again, as part of the SicTransit project, various archaeological excavations (both punctual and extensive) and field surveys were carried out in different areas of the Castronovo di Sicilia territory. These analyses were included within the GIS project through the use of the pyArchinit plugin (Figure 4),



developed by L. Mandolesi and E. Cocca, to manage all of the data from archaeological contexts directly in QGIS [27].

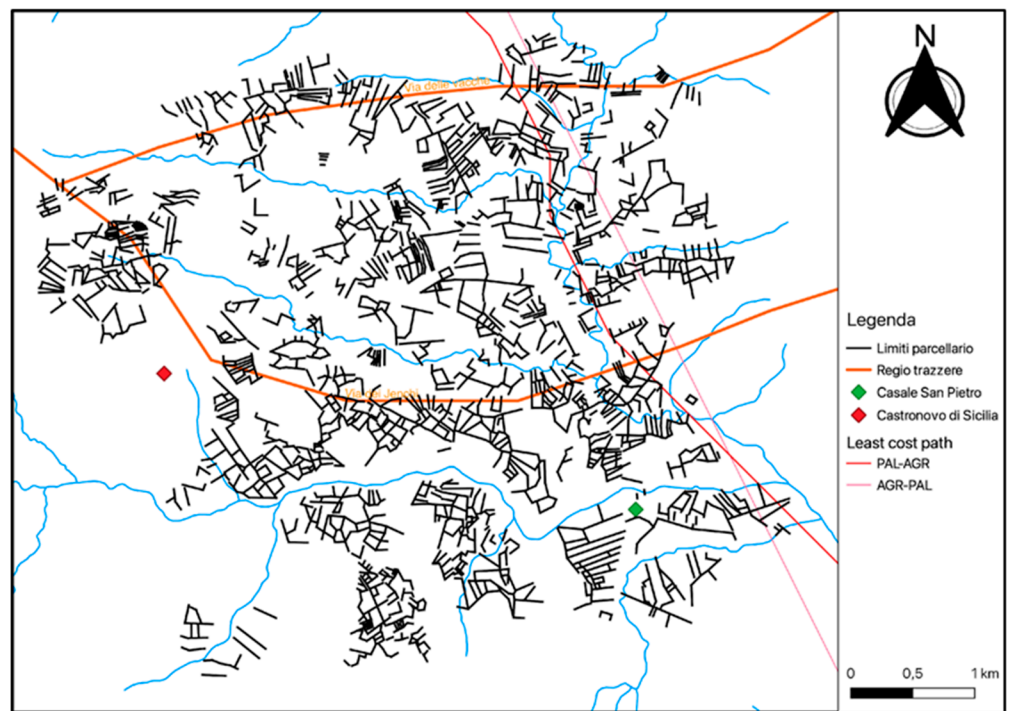


Figure 3. Parcel boundaries identified in the central area of the Castronovo territory on the 1955 I.G.M. photograph.

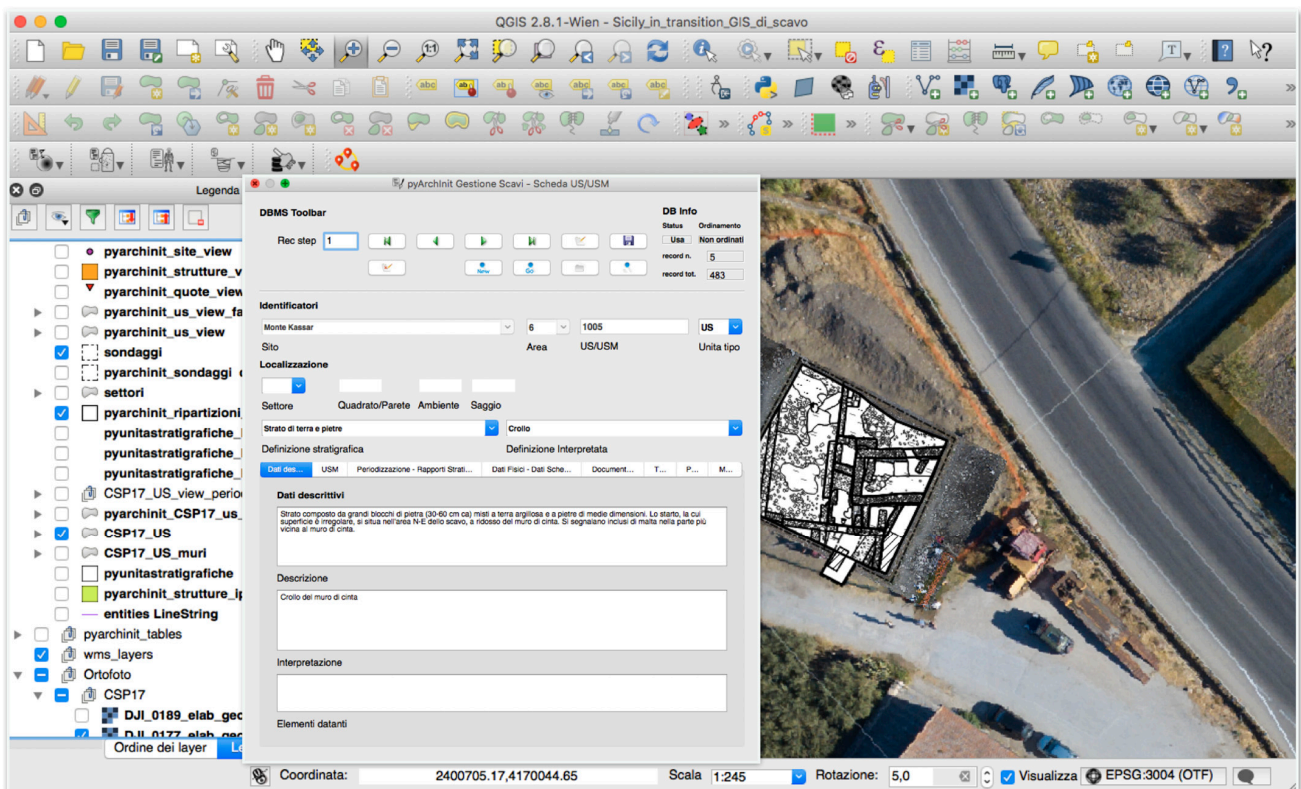
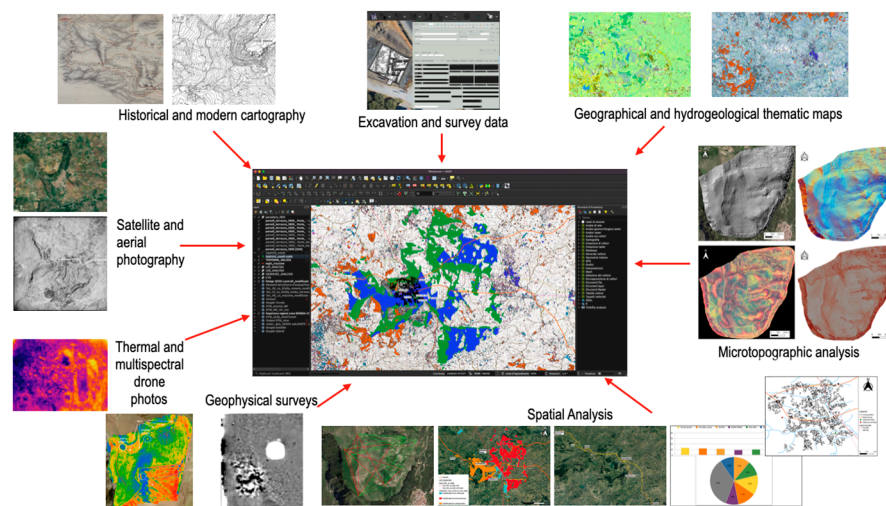


Figure 4. Use of pyArchinit in QGIS for the management of the archaeological excavation of Casale San Pietro, Castronovo di Sicilia (PA).

### 3. Results and Discussion

It is already evident from the quick list of sources used, set out above, that today the use of a GIS platform in the context of archaeogeography studies, or historical landscape analysis in general, is truly indispensable. The possibility of comparing, in a single workspace, a good number of different types of sources is certainly an added value in archaeogeographical research (Figure 5).

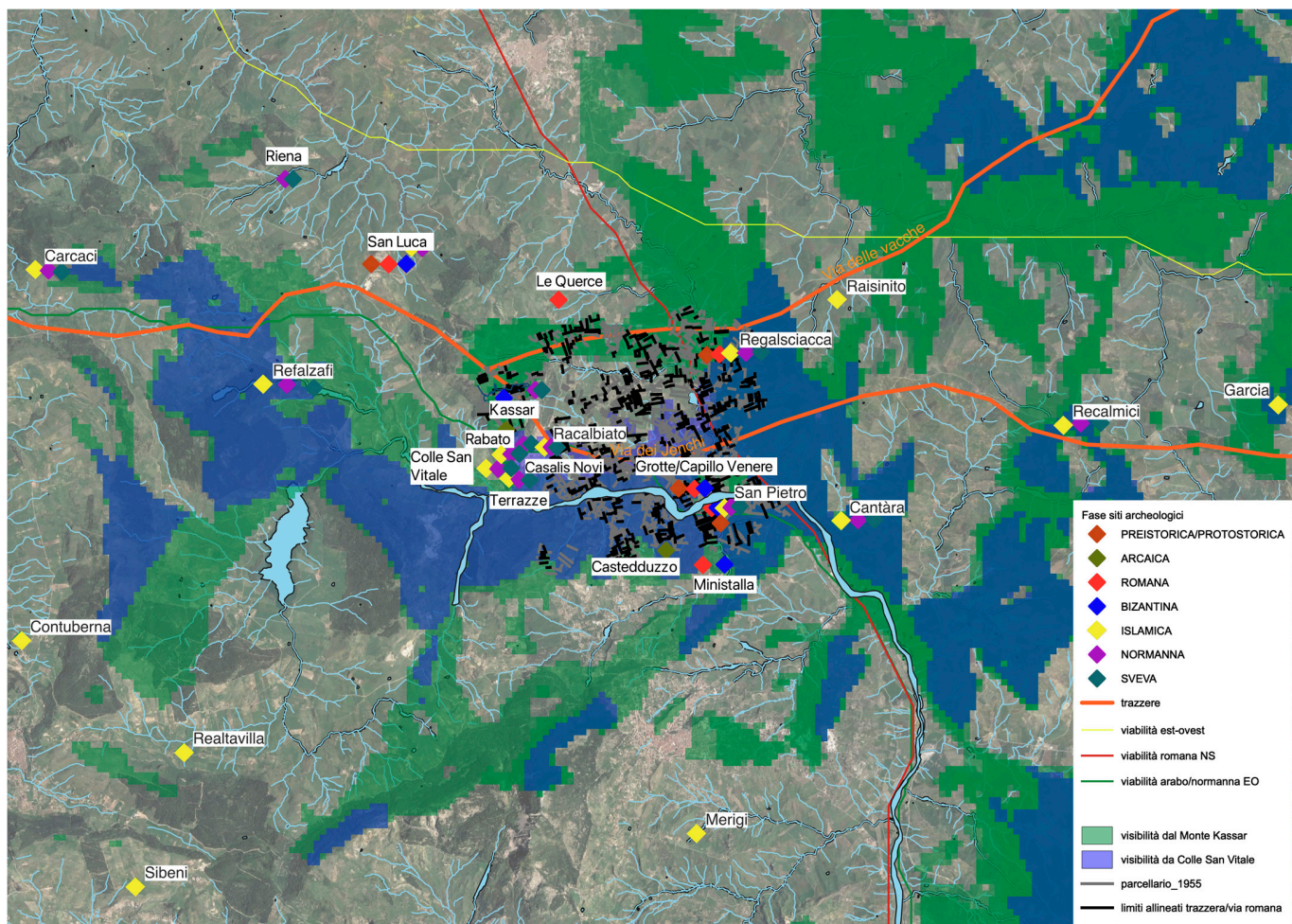


**Figure 5.** Summary of the archaeogeographical sources entered in QGIS for the analysis of the Castronovo di Sicilia territory.

In the case analyzed here, the use of QGIS has made it possible both to confirm several interpretations that had already arisen in the context of the Sictransit project [12] and to highlight new information that has made it possible to enrich the history of the area under investigation. In particular, among the main novelties that emerged from the archaeogeographical analysis carried out in QGIS, the territorial transformation that took place between the Byzantine and Arab-Norman eras is notable; this was when the area of Castronovo di Sicilia saw the transition from a main road system oriented along the N–S axis, which has been central since the Roman period, as evidenced by the *Itinerarium Antonini* [23,28,29], to a primary road system oriented along the E–W axis. This interpretation was possible thanks to the direct comparison, in the GIS environment, of the road network data according to the LCP algorithms, with the visibility data processed from the two different fortified areas of Monte Kassar and Colle San Vitale, and with the topographical data from the Arab-Norman period obtained by comparing written sources with historical and modern cartography. All of these sources, analyzed together from a geographical point of view, have made it possible to understand how the main evidence of this change in the orientation of the road network is precisely the Arabs’ complete abandonment of the Byzantine fortified area of Monte Kassar to move a little further south, at a lower altitude of approximately 500 m, and build a new defensive area (probably initially consisting only of a tower, and then certainly extended in the Norman period) on Colle San Vitale. This choice was determined by the desire to bring the fortification closer to the new settlement, which, in the Arab age, arose around the Rabato spring in the heart of the present-day municipality of Castronovo while maintaining visual control of the territory along the E–W axis, where the rural centers of the Arab age were located, as proven by the surviving toponymic evidence, and where the main roads must have passed, as confirmed in the Norman age by the writings of the Arab geographer Al-Idrisi [23,28,29].

Returning to the purely methodological elements, there is no doubt that the GIS environment has enabled a faster and clearer elaboration of the cumulative map of the territory of Castronovo di Sicilia (Figure 6), the ultimate goal of this archaeogeographical research.





**Figure 6.** Cumulative map of the investigated area (Castronovo di Sicilia, PA).

On this occasion, it is important to highlight the further benefit offered by QGIS to the archaeogeographical survey: if many of the analyses carried out, and described above, can be carried out with any GIS software, some of them can only be processed, at the moment and in the manner described above, in QGIS. In this case, the open-source workspace is a highly advantageous element, which allows QGIS to stay one step ahead of the main and more emblazoned proprietary GIS software. The possibility offered by the open-source license, to integrate and modify the GIS software to one’s description has allowed several archaeologists to develop the plugins they needed. In addition, the presence of an active open-source community, which gravitates around QGIS, has also favored a constant dialogue between end users and developers, allowing for continuous updating to be carried out and, at the same time, better integration between the different plugins.

#### 4. Conclusions

In conclusion, all of the above elements allow QGIS to be identified as the ideal workspace for an archaeogeographical analysis. Indeed, the case study of Castronovo di Sicilia highlighted the enormous advantages of its use: first of all, the possibility of having all of the data collected from heterogeneous sources in a single software makes it possible both to avoid the risks of losing entire or partial data when passing them from one software to another and transforming formats, and to obtain new data and information quickly and intuitively; furthermore, the presence of a good number of plugins expressly dedicated to archaeological purposes is a decisive element that translates into the reduction in time and, consequently, in research costs, while increasing the quality of the final product in terms of both data collection and display and the possibility of comparing them. In a



nutshell, paraphrasing the words of Magali Watteaux quoted in the introduction, today, archaeogeographical processing must be carried out in QGIS.

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## References

1. Choquer, G. *Les Formes du Paysage. Tome 1—Études sur le Parcellaires*; Errance: Paris, France, 1996.
2. Choquer, G. *Les Formes du Paysage. Tome 2—Archéologie des Parcellaires*; Errance: Paris, France, 1996.
3. Choquer, G. *Les Formes du Paysage. Tome 3—L'analyse des Systèmes Spatiaux*; Errance: Paris, France, 1997.
4. Watteaux, M. Archaeogeography of planimetric landscapes. In Proceedings of the Lecture at the International Summer School Grosseto, Predictivity in Archaeology, Grosseto, Italy, 13 May 2014.
5. Giustolisi, V. *Petra. Atlante delle Antiche Strutture Rupestri dell'alta Valle del Platani (Castronovo)*; Sicilia Archeologica che Scompare: Palermo, Italy, 1999.
6. Canzonieri, E.; Vassallo, S. Castronovo di Sicilia. In *Archeologia nelle Vallate del Fiume Torto e del San Leonardo*; ISPE Archimede s.r.l.: Palermo, Italy, 2007; pp. 44–66.
7. Tirrito, L. *Sulla Città e Comarca di Castronuovo di Sicilia. Ricerche Storiche, Topografiche, Statistiche ed Economiche, 1873–1877*; Palermo, Italy, 1983; Volume I-II. Available online: <https://www.associazioneculturalekassar.it/wp-content/uploads/2019/02/Sulla-Citt%C3%A0-di-Comarca-vol.-2.pdf> (accessed on 26 July 2023).
8. Villa, A. Indagini archeologiche e ricognizioni nel territorio di Castronovo di Sicilia. In *Atti II Giornate Internazionali di Studio sull'area Elima (Gibellina, 22–26 Ottobre 1994)*; Pisa: Gibellina, Italy, 1997; pp. 1385–1398.
9. Maurici, F. *Castelli medievali di Sicilia, Dai Bizantini ai Normanni*; Sellerio Editore: Palermo, Italy, 1992; pp. 36–42.
10. Vassallo, S. *Archeologia Nelle Vallate del Fiume Torto e del San Leonardo*; ISPE Archimede s.r.l.: Palermo, Italy, 2007.
11. Catrorao Barba, A. *Ricognizioni Archeologiche nel Territorio di Castronovo di Sicilia (Palermo): Aggiornamento di siti Noti e Nuovi Dati*; Notiziario Archeologico della Soprintendenza di Palermo: Palermo, Italy, 2016.
12. Carver, M.; Molinari, A.; Orecchioni, P. Castronovo di Sicilia Archaeological Investigations and research 2014–2021. 2024; *in press*.
13. Congedo, L. Semi-Automatic Classification Plugin: A Python tool for the download and processing of remote sensing images in QGIS. *J. Open Source Softw.* **2021**, *6*, 3172. [[CrossRef](#)]
14. Khelifi, A.; Ciccone, G.; Altaweel, M.; Basmaji, T.; Ghazal, M. Autonomous Service Drones for Multimodal Detection and Monitoring of Archaeological Sites. *Appl. Sci.* **2021**, *11*, 10424. [[CrossRef](#)]
15. Ciccone, G. Un Workflow Open-Source per l'Elaborazione Delle Immagini Termiche Da Drone. In *ArcheoFOSS XIV 2020, Proceedings of the 14th International Conference, Online, 15–17 October 2020*; Archeopress: Oxford, UK, 2021; pp. 35–43.
16. Ciccone, G. Droni Commerciali Con Sensori Termici e Multispettrali per Il Telerilevamento Archeologico a Bassa Quota. In *Nuove Tecnologie Open Source per La Gestione Dei Beni, Delle Attività Culturali e Del Turismo 16–17 Dicembre 2021, Sala Della Fortuna, Museo Nazionale Etrusco Villa Giulia, Roma*; Edizioni Arheoares; 2022. Available online: [https://www.academia.edu/101790289/Droni-commerciali\\_con\\_senso-ri\\_termi-ci\\_e\\_multispettrali\\_per\\_il\\_telerilevamento\\_archeologico\\_a\\_bassa\\_quota](https://www.academia.edu/101790289/Droni-commerciali_con_senso-ri_termi-ci_e_multispettrali_per_il_telerilevamento_archeologico_a_bassa_quota) (accessed on 26 July 2023).
17. Kokalj, Ž.; Somrak, M. Why Not a Single Image? Combining Visualizations to Facilitate Fieldwork and On-Screen Mapping. *Remote Sens.* **2019**, *11*, 747. [[CrossRef](#)]
18. Zakšek, K.; Oštir, K.; Kokalj, Ž. Sky-View Factor as a Relief Visualization Technique. *Remote Sens.* **2011**, *3*, 398–415. [[CrossRef](#)]
19. Zakšek, K.; Oštir, K. Application of Sky-View Factor for the Visualization of Historic Landscape Features in Lidar-Derived Relief Models. *Antiquity* **2011**, *85*, 263–273.
20. Lyall, J. *Geophysical Survey at Castronovo di Sicilia, Sicily*, (Report no. GB 72, Geophiz.Biz, West Heslerton, York). SICTRANSIT Archive. 2018; *Unpublished report*.
21. Simon, F.X. *Agt Archaeological Geophysics Toolbox for QGIS*. ISAP Newsletter. 2017. Available online: <https://github.com/enzococca/movecostTOqgis> (accessed on 26 July 2023).
22. Alberti, G. movecost: An R package for calculating accumulated slope-dependent anisotropic cost-surfaces and least-cost paths. *SoftwareX* **2019**, *10*, 100331. [[CrossRef](#)]
23. Ciccone, G. From the Itinerarium Antonini and al-Idrisi to the movecost plug-in: Study of the Road network in the Castronovo di Sicilia area by comparing traditional sources and least-cost path analysis. *Arc. Calc.* **2023**, *34*, 183–192.
24. Čučković, Z. Advanced viewshed analysis: A Quantum GIS plug-in for the analysis of visual landscapes. *J. Open Source Softw.* **2016**, *1*, 32. [[CrossRef](#)]

25. Wheatley, D.W.; Gillings, M. Vision, perception and GIS: Developing enriched approaches to the study of archaeological visibility. In *Beyond the Map*; IOS Press: Amsterdam, The Netherlands, 2000; pp. 1–27.
26. Citter, C.; Arnolfus-Huyzendveld, A. *Uso del Suolo e Sfruttamento delle Risorse Nella Pianura Grossetana nel Medioevo*; Verso una Storia del Parcellario e del Paesaggio Agrario; Artemide: Roma, Italy, 2011.
27. Mandolesi, L. Pyarchinit—Python, QGIS e PostgreSQL, per la gestione dei dati di scavo. *Arc. Calc.* **2009**, (Suppl. S2), 209–222. Available online: [https://www.archcalc.cnr.it/indice/Suppl\\_2/20\\_Mandolesi.pdf](https://www.archcalc.cnr.it/indice/Suppl_2/20_Mandolesi.pdf) (accessed on 26 July 2023).
28. Uggeri, G. *La Viabilità della Sicilia in età Romana*; Congedo Editore: Galatina, Italy, 2004.
29. Stangati, L. *La Sicilia di al-Idrisi ne “Il libro di Ruggero”*; Sciascia Editore: Caltanissetta, Italy, 2010.

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