

## LEGACY DATA GIS INTEGRATION AND SURFACE SURVEY FOR THE ARCHAEOLOGY OF THE ATELLAN LANDSCAPE (CAMPANIA, ITALY)

### 1. INTRODUCTION

This paper presents preliminary results of the research on the ancient topography of *Atella*'s extra-urban landscape, case study of the In.Res.Agro project: for this study, the legacy data integration carried out in GIS is assessed with an in-depth 'archive excavation' and systematic field survey of the central area of Campanian Plain (Campania, Italy) (Fig. 1)<sup>1</sup>.

*Atella* lies in the alluvial plain N of Mount Vesuvius and the Campi Flegrei caldera, within a volcaniclastic plain repeatedly affected by pyroclastic events (Fig. 2). The Atellan area was selected because its history complicates received narratives of topographic 'resilience', offering new insights into the long-term persistence and discontinuities of Roman urban and rural landscapes (BRANCATO *et al.* 2024a). Historic-period deposits from 79 AD onwards overlie earlier Pleistocene substrates, forming stratified tuffs and lapilli layers across the plain (DI VITO *et al.* 2021). *Atella*, an Oscan city famed for the *fabulae Atellanae*, has been securely located since at least the mid-Eighteenth century (DE MURO 1840; BELOCH 1890; LAFORGIA 2007, 2014a-b; DE CARO 2012; MATARESE *et al.* 2023) (Fig. 4). G. CASTALDI (1908) first outlined the urban perimeter; an early archaeological map records roads and walls when these were still visible (Fig. 3).

The city's origins likely date to the late fifth century BC, with urban development through the fourth (DE CARO 2012, 87). Allied with Capua against Roman expansion, *Atella* received *civitas sine suffragio* after 338 BC (FEST., 50, 126) and lost autonomy in 211 BC following support for Hannibal (LAFORGIA 2007, 18). By the first century BC, Cicero attests *Atella* as a *municipium* with jurisdiction over an *ager vectigalis* (CIC., *Fam.* 8.7). In the early first century AD, public monuments typical of Roman centres were likely present; although

<sup>1</sup> The 'Unveiling Atella Project. Una carta archeologica per la città invisibile' started in 2022 by the Department of Humanities Studies of University of Naples in collaboration with the Soprintendenza Archeologia, Belle Arti e Paesaggio (SABAP) di Caserta and SABAP Area Metropolitana di Napoli to establish a digital and open-access archaeological map of the remains of the ancient city and its territory. The project is conducted within the framework of a formal agreement between the Department of Humanities of the University of Naples Federico II (scientific coordinator: Prof. Rodolfo Brancato), the National Archaeological Museum of Naples, the SABAP for the provinces of Caserta and Benevento. The research is also part of the Atella Archaeological Project (MIC-MIC\_SABAP-CE,26/06/2024-0013094-A), which aims to investigate the buried remains of the Roman city in order to understand its urban topography through an integrated approach, combining the digitization of legacy data and its integration with survey data.

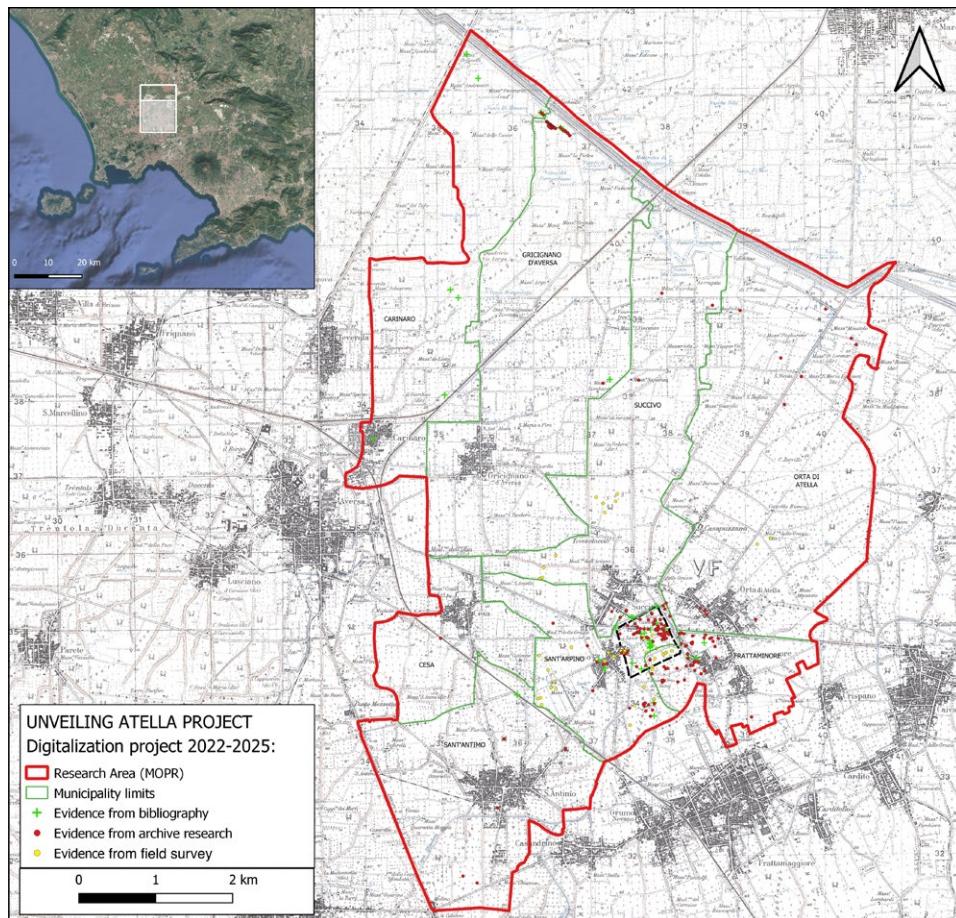


Fig. 1 – *Atella* and its territory within the Campanian Plain; project limits shown in red.

no ancient source mentions a theatre, Suetonius refers to an amphitheatre (SUET., *Tib.*, 75,3) in the context of AD 37. In late antiquity, the city suffered a major fire (late fourth-early fifth century AD) yet continued to prosper as an episcopal seat until at least the seventh century AD (DE CARO 2012, 88). During the Roman period, *Atella* was linked to the main Campanian centres by roads whose courses relate closely to the centuriation of the alluvial plain (QUILICI GIGLI 2002, 2005, 2025). Comparative work in the Acerra area provides key points for discussing the chronological evolution of *Atella*'s rural landscape and its relationship to the *ager Campanus* (GIAMPAOLA 1997, 2002; DI FRANCO in this volume). S of the city walls, funerary contexts currently provide the most



Fig. 2 – Sant'Arpino (Caserta), aerial view of the project area.

substantial evidence for pre- and proto-urban phases: tombs from the late fifth-early fourth centuries BC are attested, while the bulk of material comes from the fourth-century BC necropolis (BENCIVENGA TRILLMICH 1984). SA-BAP investigations at Frattaminore (Orto dei Santi) in 1995-97 documented 76 tombs dated between the first and the fourth centuries AD, with varied orientations but predominantly E-W and consistent with a crossing road axis (DE CARO *et al.* 1997, 815; DE FILIPPIS, LAFORGIA 2002, 144).

The delimitation of the centuriation in the SE sector of the *ager Campanus*, corresponding to the modern territories of Succivo and Orta di Atella, and its relationship with *Atella* remain largely unresolved (MONACO 1998; SORICELLI 2001; MONACO, CLAVER-LÉVÈQUE 2004; TAYLOR 2015). An orthogonal grid visible on aerial imagery – considered alongside the presumed centuriations of *Acerrae* and *Neapolis* – was assigned an Augustan date solely on the basis of module and orientation (CHOUQUER *et al.* 1987). Historical cartography and aerial photographs have been read to indicate overlapping field systems ('*Acerrae-Atella I*': CHOUQUER *et al.* 1987, 207, fig. 70; 226-227; 252; and '*Atella II*': 208-209, fig. 71; 228-229), but these models are topographically inconsistent with the *ager Campanus* as a whole and remain unverified on the ground.

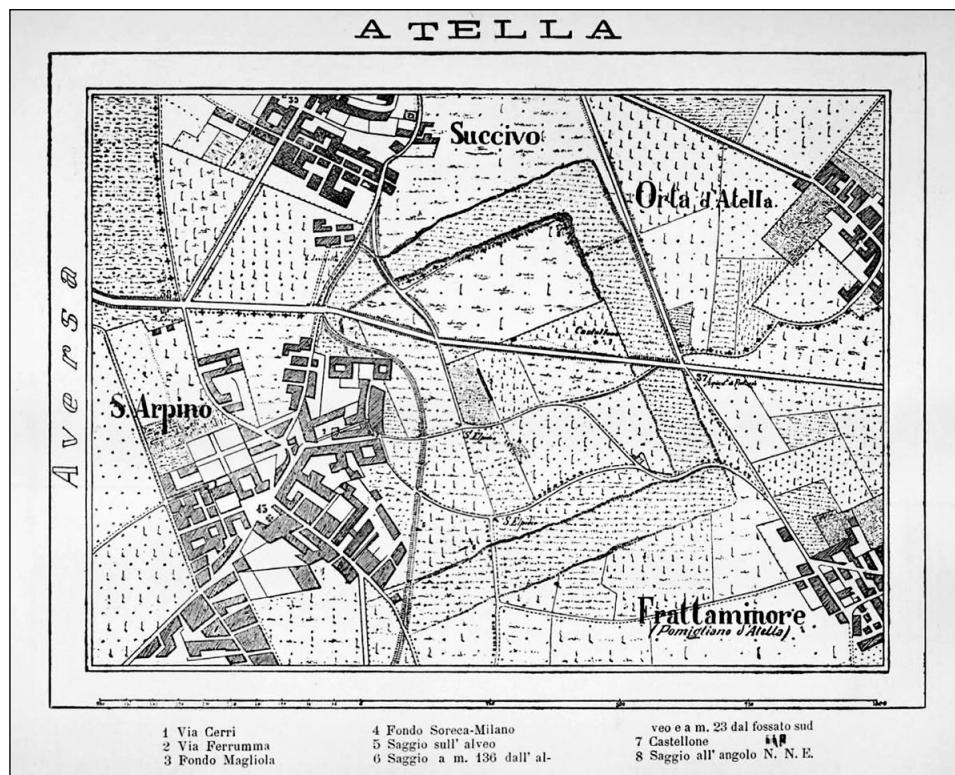


Fig. 3 – The archaeological map of Atella drafted by G. Castaldi (1908).

While ‘Acerrae-Atella I’ was originally attributed to the Augustan period on morphological grounds (CHOUQUER *et al.* 1987), excavations of canal and road sections argue for an earlier, second-century BC date (GIAMPAOLA 1997, 232). The AD 79 tephra mantled the centuriated landscape, and subsequent eruptions, most notably Pollena in AD 472, repeatedly sealed features; preventive archaeology has exposed ploughed fields and road surfaces preserved beneath these deposits that align with the centuriation, suggesting long-term cadastral persistence (DI VITO *et al.* 2021).

Explaining why elements of ancient rural and urban topography have endured, clearly visible today in historical aerial photography and LiDAR-derived digital elevation models, requires attention to the adaptive strategies of local communities and the role of political institutions. Accordingly, this paper tests the archaeological validity of earlier cadastral hypotheses while reporting the first outcomes of our integrated workflow. Since 2023 we have

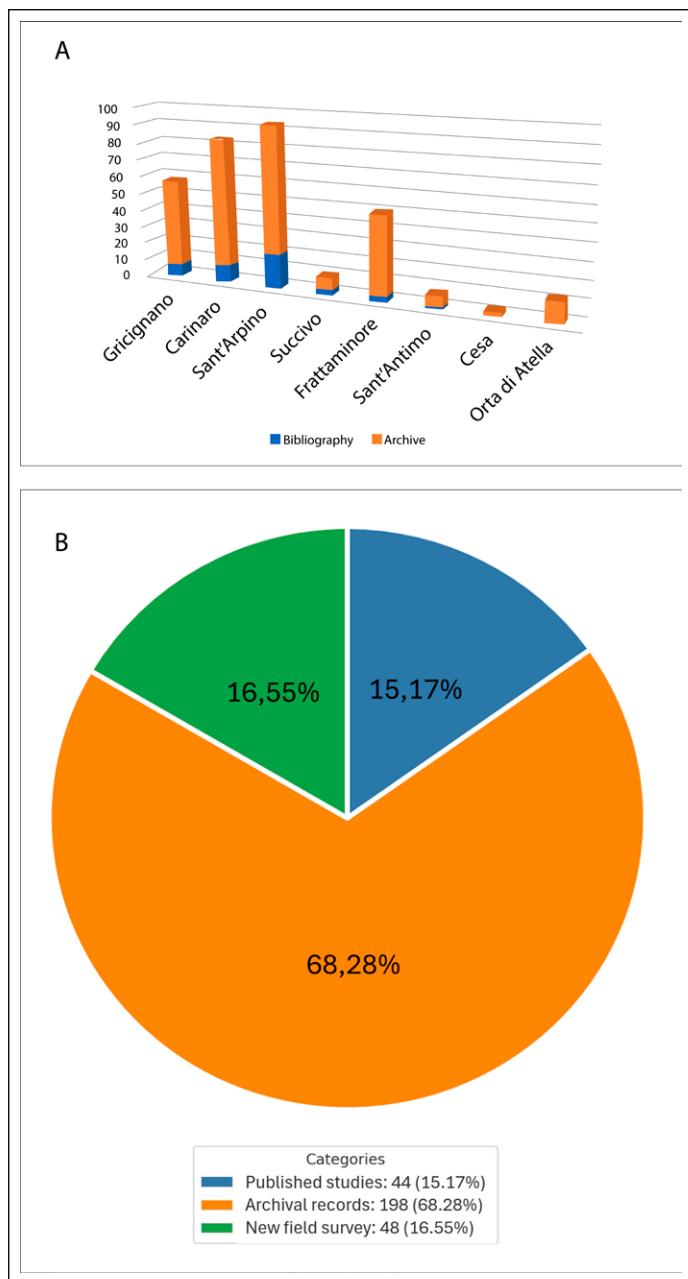


Fig. 4 – Percentage breakdown of archaeological sites identified from published studies, archival records, and new field surveys ( $n = 285$ ).

digitised legacy archival datasets and proceeded with systematic field survey and targeted excavations in selected urban and extra-urban areas (Fig. 4). We demonstrate how the integration of legacy sources and new observations refines the mapping of centuriation around *Atella* and frames specific, testable expectations for future field verification.

R.B.

## 2. DATA FROM THE ARCHIVES

A systematic bibliographic review focused primarily on the scientific literature concerning *Atella* and its territory, with particular attention to the archaeological and historical-literary study of the centuriation system. Bibliographic data were managed using the open-source software Zotero (<https://www.zotero.org/groups/5888666/in.res.agri/library>) and stored in the Digital Groma repository (see BUONO *et al.* in this volume), facilitating web-based access and integration among In.Res.Agro project participants.

A key part of the research involved collecting and digitizing archival archaeological data from the municipal territories of Aversa, Carinaro, Cesa, Gricignano di Aversa, Orta di Atella, Sant'Antimo, Sant'Arpino, Succivo (Caserta), and Frattaminore (Naples)<sup>2</sup>, preserved across different collections at the National Archaeological Museum of Naples (Fig. 4A). Initial archival research, since 2023, included archaeological data from investigations carried out between 1995 and 2007, linked to major infrastructure projects such as the US Navy base in Gricignano di Aversa and the Rome-Naples high-speed railway (BRANCATO *et al.* 2024b; BRANCATO *et al.* in press).

Archival research was crucial for retrieving and integrating topographic and semantic data from previous studies and excavations, including preventive archaeology, enabling a coherent reconstruction of the archaeological landscape. This sector of the Campanian Plain has undergone significant transformations over time, due to both natural processes and intensive human activity, which have deeply altered the historical landscape and affected the preservation and visibility of the surface archaeological records. To systematize archival data a spreadsheet was created, with fields structured according to taxonomic, typological, and spatial entities, based

<sup>2</sup> This work was initially conducted within the framework of a formal agreement between the Department of Humanities of the University of Naples Federico II (scientific coordinator: Prof. Rodolfo Brancato), the National Archaeological Museum of Naples (scientific coordinator: Dr. Emanuela Santaniello), the SABAP for the provinces of Caserta and Benevento (scientific coordinator: Dr. Ilaria Matarese). In 2024 a further formal agreement between the Department of Humanities of the University of Naples Federico II, the SABAP for the Metropolitan Area of Naples, the SABAP for the provinces of Caserta and Benevento, the National Archaeological Museum of Naples (MIC-MIC\_MAN-NA-27/05/2024-0003279-P[28.34.04/245/2024]).

on standardized models developed by the Istituto Centrale del Catalogo e Documentazione (ICCD) and Istituto Centrale per l'Archeologia (ICA), subsequently integrated into the Digital Groma repository (see BUONO *et al.* in this volume).

Preliminary analysis identified Gricignano as the municipality with the highest number of archaeological archival records (600 folders), followed by Sant'Arpino (204) and Frattaminore (160). Archival research allowed the identification of various types of archaeological interventions, mainly notifications, followed by requests for archaeological assessment. The collected data contributed to the reconstruction of the history of archaeological research in the *Atellan* territory. The earliest interventions for the study and conservation of the archaeological heritage in this area date back to 1792, with the unearthing of «columns and marbles exhumed in front of the Cathedral of Aversa» (AS-MANN, VI D5/17). A significant increase in discoveries occurred in the second quarter of the nineteenth century, particularly in the northern and southwestern sectors of the *agro atellano* (Aversa, Cesa, Parete, Sant'Antimo). These were mostly chance finds or discoveries made during infrastructure projects, such as the construction of the 'Direttissima' railway line segment between Aversa and Vico Pantano (AS-MANN, VI B7/48; ELIA 1937).

After a decline in reporting during the post-WWII period, a resurgence of interventions occurred during the construction boom of the 1960s-1980s. The majority of archaeological finds, however, are attributable to the final two decades of the twentieth century, coinciding with the emergence of urban archaeology – still mostly conducted within the framework of rescue excavations. From the late twentieth century to recent years, archaeological discoveries have largely resulted from preventive archaeology (BRANCATO *et al.* in press), which led to the identification of extensive sectors of the eastern suburban area (Frattaminore). The earliest evidence dates to the Neolithic period, as indicated by the discovery of paleosols at Gricignano d'Aversa during construction work for the high-speed railway (LAFORGIA 2014b; SACCOCCIO *et al.* 2021). More substantial evidence emerges starting from the Early Bronze Age (Palma Campania cultural *facies*), particularly in the area later occupied by the eastern necropolises of Samnite-era *Atella* (DE CARO 1992; MARZOCCELLA 1997; LAFORGIA 2014a).

Early Bronze Age sites showed clear evidence of ploughing activity (AC-MANN, F 6/24) and included agricultural settlement features (e.g., canals, production structures, road surfaces, pits, ceramic dispersal areas, etc.) (AC-MANN, F 4/30 bis, F 6/23, F 6/24, F 8/14; DE CARO *et al.* 1997; MARZOCCELLA, ALBORE LIVADIE 1999). Iron Age sites are known, mostly located to the N and NW of the urban area of ancient *Atella* (LAFORGIA 2014b). These include areas with ceramic fragments, canalization

systems, and isolated burials, as well as the well-documented settlement at Gricignano d'Aversa (US Navy) (SACCOCCIO *et al.* 2021). Archaeological evidence increases significantly beginning in the Samnite period (the end of fifth century BC), when *Atella* assumed a recognizably urban character, as seen in the remains of necropolises in extra-urban and peri-urban areas, and the city walls.

Sections of the eastern and south eastern necropolis of ancient *Atella* were uncovered, dating to the Samnite period (mid of the fifth-third century BCE) (PATRONI 1898; ELIA 1937; BENCIVENGA TRILLMICH 1984; MARZOCCHELLA 1991, 1997; MARZOCCHELLA, ALBORE LIVADIE 1999; LAFORGIA 2007, 2014a)<sup>3</sup>. A widespread occupation pattern appears during the fourth-third centuries BC, attested by small clusters of tufa cist or pit graves, likely associated with rural farmsteads, minor cultic sites, or small-scale rural settlements. These elements suggest a phase of intensive agricultural exploitation of the landscape during this period (QUILICI GIGLI 2025). Dating to the mid-fifth-century BC, a road surface, oriented SE-NW, has been found in Frattaminore (Bandolo property) (AC-MANN, F 6/16, Armadio ispettori). A marked rise in archaeological data is recorded during the Late Republican and Early Imperial periods, to which numerous burials (BENCIVENGA TRILLMICH 1984; DE CARO *et al.* 1999; GUZZO 2016), public buildings (DE FRANCISCIS 1967; JOHANNOWSKY 1970; AC-MANN, S 6/35bis, S 6/43bis, S 6/47bis, 151/6), and private structures (CASTALDI 1908; DE FRANCISCIS 1967; JOHANNOWSKY 1970; BENCIVENGA TRILLMICH 1984; AC-MANN, S 6/47bis, S 10/16, 151/6, Carta archeologica di Atella, n. 16) can be attributed.

The twentieth and twenty-first century excavations revealed several features associated with both intra-urban and extra-urban road systems, including what is likely the *cardo* and the *decumanus* of the ancient city of *Atella*, an E-W road parallel to the *cardo* of the centuriation system of the *ager Campanus* (AC-MANN, F 4/31, F 6/16; DE FILIPPIS, LAFORGIA 2002, 144, fig. 21), and a segment connected to the *via Consularis Campana* (MELILLO *et al.* 2009; AC-MANN, A 3/4, fasc. 4, A 4/14, A 5/17bis). Among the more recent discoveries, the 2007 excavation at Sant'Arpino – near the current cemetery in the northern sector – revealed the remains of a rural villa, evidenced by two *dolia* still on site and other pits likely intended for additional large containers. The site also yielded a kiln, presumably active between the fifth and seventh centuries AD (NAVA 2008).

<sup>3</sup> Frattaminore: AC-MANN A 4/14, F 4/19, F 3/25, F 4/23, F 4/24, F 4/30bis, F 5/10, F 6/16, F 6/17, F 6/18, F 8/22; Orta di Atella: AC-MANN, O 1/2, fasc. 1, O 1/4, O 1/6, O 1/8, O 1/9, O 1/11, O 1/12, O 1/14, O 1/15, O 1/16. Sant'Arpino: AS-MANN, b. VIC3, 26, AC-MANN, F 4/17, O 1/2, fasc. 2, S 10/16; Carta archeologica di Atella (n. 22); Sant'Antimo: AC-MANN, S 1/9, S 1/18, S 1/31 S 1/35, S 1/50, S 7/16, S 12/12. Succivo: AC-MANN, A 2-19, N 11/12, Carta archeologica di Atella (nn. 31-32).



Fig. 5 – Sant'Arpino (Caserta), the paved road in via Cerri: A) photographed by G. Castaldi (1908); B-C) present remains.

Settlement dynamics between Late Antiquity and the Early Middle Ages remain poorly understood at present, apart from clear evidence of spoliation and/or reuse in several parts of the ancient city (ARENELLA *et al.* 2015) and the extra-urban area (MELILLO *et al.* 2009).

T.T.

### 3. DATA FROM THE FIELD SURVEY

In light of the evidence emerging from the bibliographic and archival research, systematic surface surveys were initiated in the field. The investigations covered extensive sectors of the urban and extra-urban area of ancient *Atella*, within the municipalities of Sant'Arpino (CE), Succivo (CE), Orta

di Atella (CE) and Frattaminore (NA), for a total of c. 130 hectares. The design strategy phase, conducted entirely within a GIS environment, proved essential for the execution of the surveys. Using QGIS, a project was created to host and vectorise the collected legacy data, progressively integrated with the results of the archival research (cf. *supra*). This approach enabled the rapid identification of areas with the highest archaeological potential. In parallel, a layer was created for the vectorisation and recording of the survey areas, here termed Unità di Osservazione/Observation Units (UO), with an attribute table based on the standards and terminology proposed by the ICA (cf. *infra*). The project was subsequently deployed on a mobile device (iPad Pro) via the QField application (MONTAGNETTI, GUARINO 2021), allowing real-time visualisation, immediate localisation of sectors of greatest interest, and on-the-spot vectorisation and recording of the units during fieldwork.

In the first phase, surveys focused on the urban area of *Atella*, with particular attention to traces of fortifications and the road network already noted in the literature (CASTALDI 1908; BENCIVENGA TRILLMICH 1984), also with the aid of photo-interpretation of historic aerial imagery (BRANCATO *et al.* 2023, 408-412). In this phase, the remains of the paved road already identified by G. CASTALDI (1908, 84-85) in Sant'Arpino were documented and georeferenced: this is the best preserved trace of the extra-urban axis in line with *Atella*'s main *decumanus* (Fig. 5).

To understand the relationship between the urban space and its hinterland, investigations were extended into those sectors of the Campanian Plain where the supposed grids of agrarian divisions overlap (cf. *supra*). Few, however, are the published topographic plates at a legible scale that can be georeferenced in the GIS; consequently, the data derivable from such archaeographic material are not immediately integrable. In this area of research, an important role is played by research carried out by the Besançon School which, through the technique of so-called 'filtering' (CHOQUER *et al.* 1987, 60-61), identified traces interpretable as a palimpsest of agrarian systems ('Acerrae-Atella I' and 'Atella II'). However, their metrology and orientation are incompatible with those of the *ager Campanus* (QUILICI GIGLI 2025).

The 'Acerrae-Atella I' I system is particularly interesting, as it would seem to share the same orientation as *Atella*'s urban layout. However, the topographic reconstructions by French scholars of ancient cadastres lack reference points and thus proved unusable, as they could not be georeferenced. An exception is M. MONACO's (2004) contribution on the south-eastern boundary of the *ager Campanus*, provided with figures that report coordinates in the WGS 84/UTM 33N reference system. Once the tables had been positioned within the GIS environment, the traces of the ancient cadastral systems were vectorised, enabling the identification of targeted areas for survey validation.

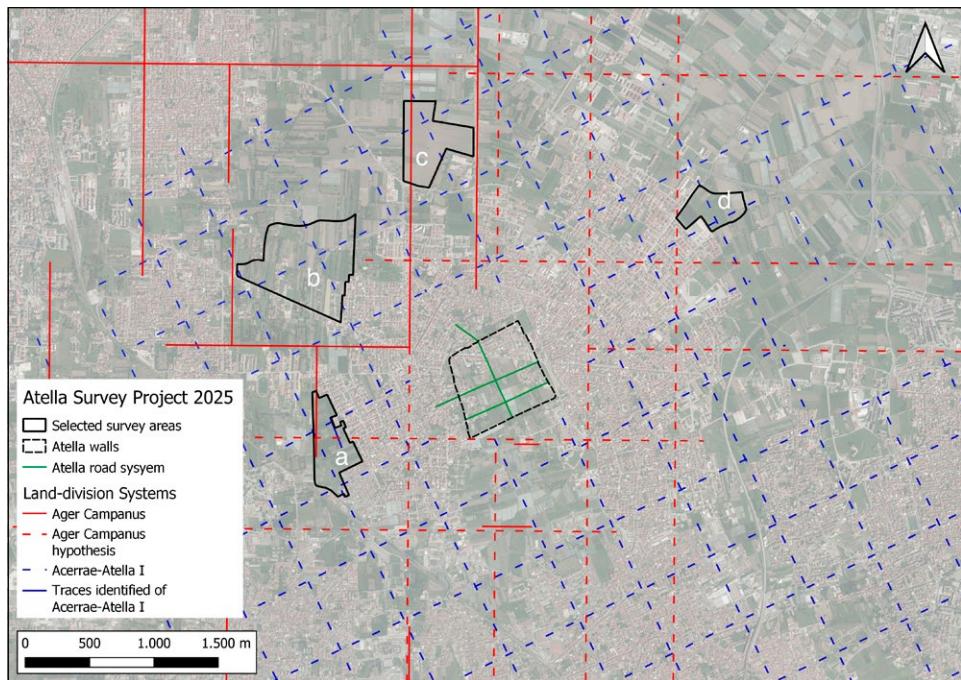


Fig. 6 – Campanian Plain (Province of Caserta), areas (a-d) identified as priority targets for archaeological survey, selected on the basis of archaeological visibility and the integration of legacy data (traces of ancient agrarian divisions).



Fig. 7 – A) Succivo, Campanian Plain: the team during survey operations in a ploughed field (UO 223); B) Sant'Arpino, extra-urban area: view of UO 206.

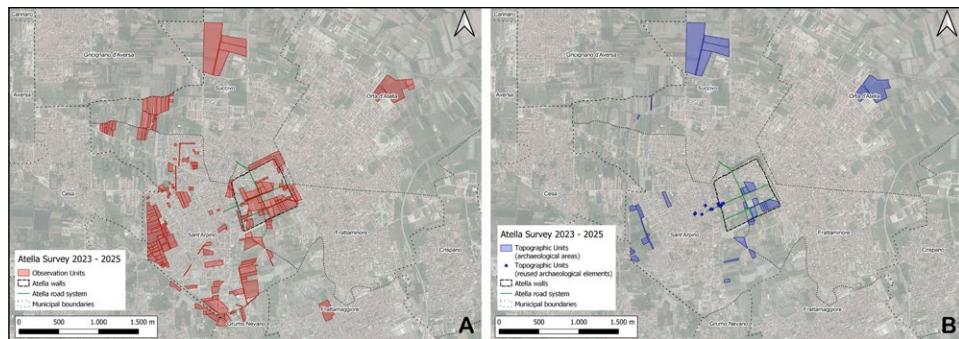


Fig. 8 – Campanian Plain (Province of Caserta): A) Observation Units and B) Topographic Units identified during the survey.

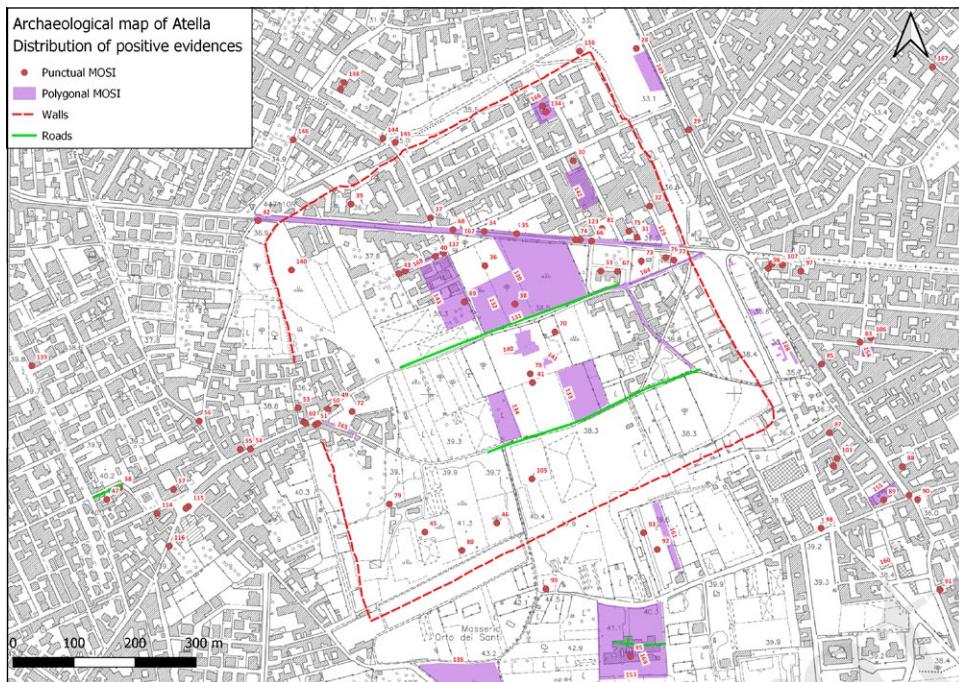


Fig. 9 – Archaeological map of the study area plotted on a 1:10,000 topographic base.

The vectorised traces were first compared with available historic aerial photographs (RAF sorties of 3 December 1943 and 10 March 1945; the Base Flight of 9 October 1954), available orthophotos (1988, 1994, 2012), and

satellite imagery from Google Earth (BRANCATO *et al.* 2023). This allowed positional error on the traces to be reduced; nevertheless, no previously unknown features were identified.

With the aim of recognising new topological relationships between systems of agrarian land-organisation, we sought to identify areas where the superposition of different centuriary axes might be hypothesised, by projecting hypothetical extensions of the already vectorised traces. Four broad sectors thus emerged, characterised by large fields still under cultivation (Fig. 6): a) to the E, along the western boundary of the municipality of Sant'Arpino; b) to the NW, between Sant'Arpino and Succivo; c) to the N, within the territory of Succivo; d) to the NE, near Orta di Atella. These are not the only sectors marked by such superposition; however, intense urbanisation across the Campanian Plain has largely compromised archaeological legibility, and many other identified areas of interest are now largely built over or covered by extensive illegal waste dumps. In the NW sector in particular, the density of waste dumps was such as often to hinder survey operations, inevitably conditioning the results.

Even so, the surveys yielded new data (Fig. 7). In the SW sector (Fig. 6a), we identified the trace of a linear archaeological feature, a path with a compacted surface (UO 206), formed of re-used Roman age material (Fig. 7B); located in an extra-urban area of *Atella*, its orientation, inconsistent with the *ager Campanus*, appears rather to accord with the *Acerrae-Atella I* system (dotted line in blue in Fig. 6). In total, 260 Observation Units (UO) were identified (Fig. 8A), of which 43 Topographic Units (UT) can be defined as archaeological sites (Fig. 9B).

G.L.

#### 4. THE GIS INTEGRATION

The geocoding of both legacy datasets and newly acquired archaeological data was carried out using the application developed by the ICA (Template GNA ver. 1.4.2; CALANDRA 2022). The application is based on a pre-configured project in the open-source software QGIS and employs two vector modules: Modulo Progetto (MOPR), which gathers general information and defines the project area, and Modulo Sito (MOSI), intended for the inventory of individual archaeological features identified (Fig. 9).

To optimise data management, we created a separate MOPR record for each municipality involved in the project (Fig. 1). This choice reflects the needs of the research, given that the case study spans territories falling within the provinces of Naples and Caserta and thus under the remit of two different heritage authorities (SABAP for the Metropolitan Area of Naples; SABAP for the Provinces of Caserta and Benevento). Eight distinct MOPR

records were therefore established, each aligned to municipal boundaries and assigned a unique code.

MOSI entries are positioned on the basis of historic and modern cartography where available, together with information gathered through bibliographic and archival research, including plans recorded on cadastral maps. Each feature is digitised as points, lines, or polygons according to its type and the reliability of its location, which may be exact, approximate, or symbolic (the latter used when precise placement is impossible but the general locality is known). In detail, polygon geometry was used exclusively for those features for which a plan exists and limits can be defined with confidence; the availability of a two-dimensional representation permits precise georeferencing of the topographic unit and consistent spatial placement. Where the plan documentation was absent or fragmentary, point geometry was adopted. This solution – consistent with ICA standards – still assigns a geographic location calibrated to the source's reliability, with the point acting as an indicator of archaeological presence for inventory and consultation purposes without generating forced or arbitrary spatial representations. Completing the representational toolkit, linear geometry was used for elongated or axial features, for which such a solution is graphically and analytically more appropriate. The use of lines affords a closer fit to the real development of structures and enables targeted spatial analyses, such as studies of territorial connectivity or reconstructions of urbanistic and infrastructural dynamics.

A central, strategic step in integrating archaeological data within the GIS environment was the precise positioning of trenches excavated as part of developer-led (preventive) archaeology. These were digitised as individual polygons corresponding to single MOSI records and grouped within the broader excavation area, for which an additional MOSI was created and labelled as a 'multi-stratified site'. This multi-level representation preserves the analytical detail of each intervention while restoring a coherent overview suited to interpreting settlement dynamics, reading stratified contexts, and comparing contiguous evidence. In parallel, the application also records preliminary exploratory sondages with negative results which, although devoid of material finds, are nonetheless significant for reconstructing the archaeology of the territory.

A.B.

## 5. CONCLUSIONS

In total, 290 MOSI have been entered into the database. Of these, 44 sites (15.17%) derive from studies already published in the literature, 198 (68.28%) from the systematic review carried out in the historical archives of

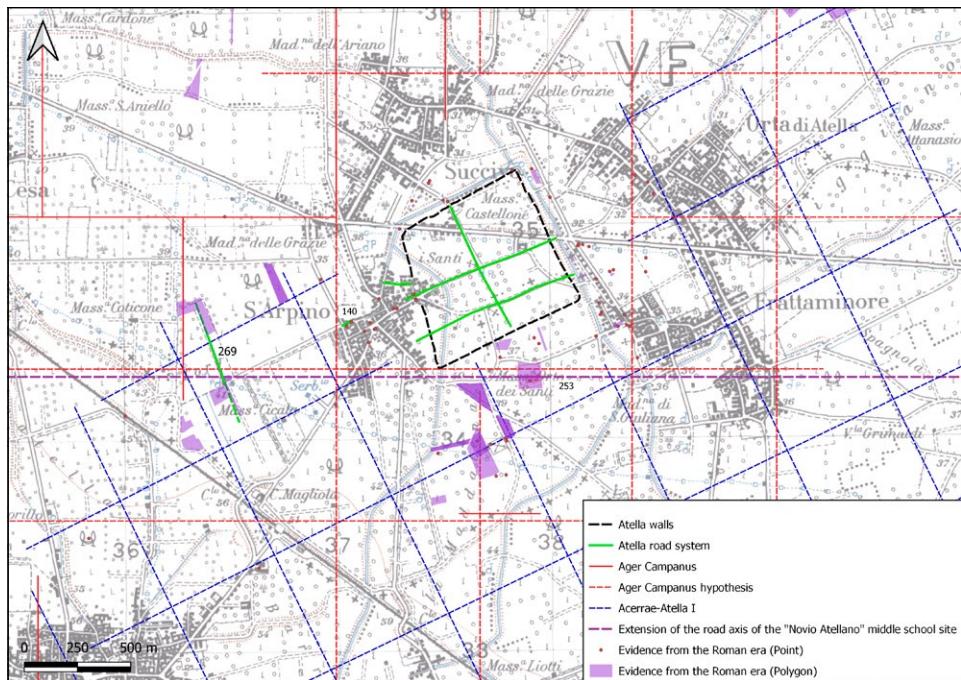


Fig. 10 – Extent of the road axis discovered during construction of the Frattaminore 'Novio Atellano' middle school, compared with the centuriation proposed by M. MONACO (1998).

the Soprintendenze, and 48 (16.55%) from the new surveys: the integration work has thus yielded an increase of approximately 548% in the archaeological knowledge of the area compared with the previously available picture (Fig. 4B). A notable datum concerns the provenance of the information: 139 MOSI (47.93% of the total) derive directly from trial trenches or sondages undertaken preventively in connection with building works; to these are added 21 MOSI (7.24%) relating to rescue excavations, conducted mainly in the 1970s and 1980s. In several cases, unfortunately, the structures found in such contexts have been partially or completely destroyed, precluding adequate documentation, as brought to light by the field surveys. Finally, 12 MOSI originate from academic studies and research (4.14%), confirming the central role played by archival documentation in defining the current state of knowledg.

Among the sites of particular significance is the multi-stratified context investigated between 1996 and 1998 during construction of the Frattaminore middle school 'Novio Atellano'. The area does not display anomalies of archaeological interest in the aerotopographic analysis; the excavation data,

however, oblige us to treat the site as a meaningful case study for reconstructing the topographic configuration of *Atella*'s extra-urban area (Fig. 10). The correction in GIS of the orientation of the excavation drawings made it possible to highlight two road axes perpendicular to each other within the area of the largely unpublished necropolis (DE CARO 2012). The E-W axis is the more significant, and may be referable to the ancient cadastral landscape: this axis shows two principal phases: a roadway (US 294), c. 3-4 m wide and datable to the first and second centuries AD, overlaid by the compacted surface of unpaved road (US 124), c. 6 m wide and datable to the 4<sup>th</sup> century AD, both sharing the same E-W orientation.

This finding invites reflection at a scale no longer limited to the site, but extending to *Atella*'s extra-urban organisation and its relations with the surrounding landscape. The orientation is consistent with the *ager Campanus*, hitherto undocumented archaeologically south of *Atella*: one may hypothesise its coherence with limits referable to a theoretical grid composed of *centuria* whose *limites*' distance is ca. m 704-706 (QUILICI GIGLI 2025, n. 3; cf. BENCIVENGA TRILLMICH 1984; MONACO 1998) (Fig. 10). The relationship between these axes and the city's topography nevertheless remains problematic, as the locations of the city gates are not yet known.

The intersection of excavation data, surface evidence, and traces from aerial-photographic analysis together contributes to outlining a complex picture of *Atella*'s extra-urban landscape, whose *disiecta membra* (necropolis, farmsteads, traces of ancient roads) allow the history of continuity-and discontinuity-in the evolution of this sector of the Campanian Plain to be read, an area affected by the division of the *ager Campanus* that may have obliterated earlier cadastral organisations.

Thanks to the In.Res.Agri project, we now possess a solid informational basis for future research on the ancient topography of *Atella*'s agrarian landscape. At the end of the project, the geodata will be exported to the Digital Groma platform (see BUONO *et al.* in this volume), but also to the National Geoportal for Archaeology via the dedicated ICA plugin (template version 1.4). In line with the data-sharing strategy, and in agreement with the relevant Soprintendenze, each MOPR – together with its associated MOSI – will be uploaded to the webGIS system and made immediately available online.

R.B.

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## ABSTRACT

This paper presents preliminary results of the In.Res.Agro (PRIN 2022) case study on the ancient topography of *Atella* (Campania, Italy). We integrated legacy archival datasets – standardised to ICCD/ICA models – within a QGIS environment and guided systematic surface survey (c. 130 ha) using mobile mapping (QField). Preventive archaeology trenches and sondages were digitised as MOSI records alongside newly documented features, enabling multi-scale analyses of settlement and infrastructure. The database now comprises 285 MOSI ( $\approx 548\%$  increase over the pre-existing picture), with c. 69% of entries derived from archival review. Fieldwork refined the mapping of extra-urban axes,

including the paved road at Sant'Arpino and a compacted path (UO 206) plausibly aligned with the 'Acerrae-Atella I' system. Re-oriented excavation drawings from the Frattaminore 'Novio Atellano' site reveal orthogonal roadways whose E-W axis accords with the *ager Campanus*, suggesting long-term cadastral persistence despite mantling by AD 79 and later tephras. The integrated workflow tests earlier hypotheses on centuriation, clarifies urban-rural relations, and delivers reproducible, georeferenced expectations for targeted verification. At project close, all geodata will be published via Digital Groma and the National Geoportal for Archaeology.