

Documenting Migrant Graffiti in the Borderscapes of the Eastern Mediterranean

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Abstract

This study explores the under-documented conditions of clandestine migrants along Turkey's western coast during the long summer of migration in 2015. While much attention has been directed toward border crossings and asylum processes, there is limited focus on the informal migration stations where refugees and migrants wait prior to sea passage. Through archaeological and photogrammetric documentation conducted during the *Transient Traces* project, this work sheds light on the material traces and lived experiences within these transient spaces.

A central focus is the graffiti left behind in two abandoned buildings used by clandestine migrants mainly in 2015 and 2016. These graffiti are ephemeral and significant visual records of displacement, memory, and survival. Unlike urban graffiti, these markings are created with improvised tools under high-stress conditions, making them highly vulnerable to erasure and difficult to document. Their documentation poses unique challenges but also offers critical insights into the conditions of clandestine migrants. To address these challenges, full photographic coverage of the buildings was conducted using a Nikon D800 with wide-angle optics and a flash to capture geometric and textural detail. The resulting image sets enabled the creation of high-resolution 3D models of the buildings and orthophotomosaics of the graffiti-covered walls therein, forming a durable digital archive of otherwise transient marks. Despite poor lighting, narrow interiors, and stress during the documentation a comprehensive, high-quality dataset was derived, providing a strong foundation for further translation, analysis, and dissemination of these hidden visual traces.

1. Introduction

1.1 A brief overview on recent clandestine migration in the Eastern Mediterranean region

During the summer and autumn of 2015, clandestine migration from Southwest and Central Asia towards Europe intensified to extraordinary levels. By the end of the year, over 800,000 people, most of them fleeing the war in Syria, crossed the land and maritime borders between Turkey and Greece (United Nations, 2015). Many of these individuals sought to continue their journey northward, aspiring to reach countries in Central Europe. The island of Lesbos (Greece) has since then seen the highest rate of refugee arrivals (Figure 1). The sudden rise in border crossers to Europe via Greece in the summer of 2015 triggered policy changes within the European Union tightening its migration prevention mechanisms, particularly as the conflict in Syria showed no signs of abating.

In 2016, the EU implemented the *EU-Turkey Statement* also referred to as the *EU-Turkey Deal*, aiming to sharply reduce numbers in arrival of asylum seekers by controlling who could enter and claim asylum (European Council, 2016). This agreement specifically targeted Syrian nationals fleeing the Syrian conflict, with Turkey agreeing to take back Syrians who crossed into Greece. In return, the EU pledged to accept one Syrian refugee for every one returned to Turkey, prioritising those who had not previously attempted to cross, and offering Turkey financial aid and the possibility of visa-free travel talks. Although the visa discussions have stalled, the EU has renewed its financial support to Turkey, providing an additional €3 billion in 2018 and promising another €3 billion for 2021–2023. This deal had severe effects on refugee numbers but also on the lives of Syrian refugees in Turkey. The agreement aimed to keep refugees in Turkey by designating it as a *safe third country* while reducing their movement to Europe, but this has resulted

in precarious living conditions for many refugees (Demirbas and Miliou, 2024). The deal has essentially shifted the burden of refugee care to Turkey, enabling the EU to avoid its responsibilities under the 1951 Geneva Convention while creating a system where refugees' rights are restricted and their exploitation is normalized (Rygiel et al., 2016).

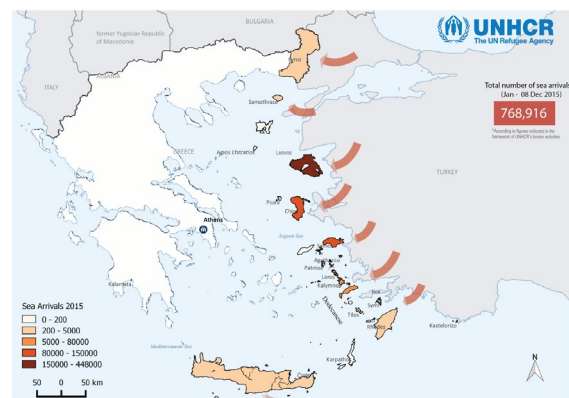


Figure 1: Sea arrivals in Greece: Breakdown by island for the period from January to December 8, 2015. (Source: <https://data.unhcr.org/es/documents/details/46550>, last accessed: 14/05/2025)

In early 2020, the Turkish president Recep Tayyip Erdoğan declared that Turkey would no longer block migrants from crossing the border into the EU, deviating from the commitments outlined in the 2016 EU-Turkey Statement (Perisic, 2023; France24, 2020). Following this announcement concerns and reports about violent and often deadly pushbacks conducted by the Hellenic Coast Guard surged with The European Border and Coast Guard Agency, Frontex, being accused of tolerating those practices (Frontex, 2020). Following reports of the Legal centre of Lesbos (Legal Centre Lesbos,

2020) survivors of expulsions reported that Greek authorities sabotaged their boats by damaging or removing the motor or fuel tank. Since 2020, there has been a notable decline in the number of (sea) arrivals in Greece, while the number of deaths and disappearances in the Eastern Mediterranean has significantly increased (Figure 2).

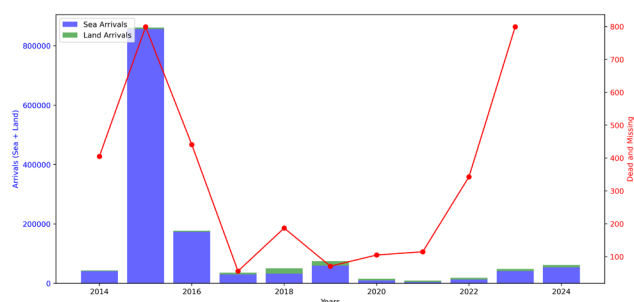


Figure 2: Evolution of clandestine sea and land arrivals from Turkey to Greece between 2014 and 2024 including the number of missing and dead people. (Data source: <https://data.unhcr.org/en/situations/europe-sea-arrivals/location/24489>, last accessed: 14/05/2025)

1.2 Status-quo in documentation of clandestine migration stations

Generally, clandestine migration events are well-documented by national government institutions, the United Nations High Commissioner for Refugees (UNHCR), various non-governmental organizations, and journalists. For instance, the Turkish Coast Guard Command records and publishes data on pushback incidents conducted by Greek authorities. Table 1 provides a short excerpt of the information they collect and share. Each documented incident is accompanied by a written report, supplemented with photographs and video footage (Republic of Turkey, 2024).

Date	Place and Time	Asset	Total
31/12/2024	Kuşadası 23:40	2 Life Boats	39
29/12/2024	Kuşadası 10:50	Inflatable Boat	38
25/12/2024	Ayvalık 16:50	2 Life Boats	22
25/12/2024	Ayvalık 05:30	2 Life Boats	40
20/12/2024	Seferihisar 11:55	Inflatable Boat	28
20/12/2024	Dikili 04:50	Inflatable Boat	27
19/12/2024	Didim 10:15	Inflatable Boat	27

Table 1: Pushback incidents as documented by the Turkish Coast Guard Command. The *Total* column refers to the number of migrants involved in the incident (Republic of Turkey, 2024).

Given the collected data and media coverage concerning this topic, knowledge about the various stages of the refugee journey, from the sea passage between the Turkish mainland and the Greek islands to the process of applying for asylum in Central Europe, appears, at first glance, to be extensive. Nevertheless, the conditions migrants face while waiting along Turkey's western coast before crossing to the Aegean islands are hardly documented and understood compared to other stages of their journey (Anonymous, 2023). If covered by the media, such events are often sensationalized, what Jason de León (De León et al., 2015) starkly describes as *immigration pornography*.

In this context, contemporary archaeology, also through the use of photogrammetric methodologies, can make a significant contribution to the field. By providing tangible evidence of this *backstage world of violence* (Andersson, 2014), such work

plays a critical role in contextualising past, present, and future migration events and policies.

Establishing a comprehensive overview of the documentation of clandestine migration stations is challenging due to the diverse forms and interpretations within this field. A traditional literature review is complicated by the wide range of terminology used. For instance, terms like migrant and refugee are sometimes treated as synonyms and at other times as distinct categories. A comprehensive literature review on this topic is thus beyond the scope of this study. Nevertheless, this contribution seeks to offer an overview of projects and key publications that have engaged with this subject, while also providing a broader overview of other relevant studies.

Various studies on the Mexico-US border have highlighted the importance of documenting migrant stations. These archaeological works emphasize material culture's role in survival, the growing dangers of migration due to stricter and more violent border controls, and the human experiences of migrants, offering crucial insights into the urgent social and humanitarian issues surrounding clandestine migration (De León, 2012; De León et al., 2015; De León, 2013; Gokee and De León, 2014; Anonymous, 2023). A notable initiative in this context is the *Undocumented Migration Project*, a long-term anthropological study combining archaeological surveys of migrant trails and stations in the Arizona desert (De León, 2012).

In the European context, the events of 2015 and 2016, widely referred to in media as *refugee crisis*, had profound effects on policies and politics. Various studies have correlated the number of refugees and related media coverage with variables such as rising euro-scepticism (Harteveld et al., 2018), declining trust in national political leaders and parties, and increasing support for populist movements like the Alternative für Deutschland (AfD, eng. *Alternative for Germany*; Solodoch, 2021). Given this historical significance of events, it seems crucial to document the very circumstances under which those migration events happen. Despite the importance of this topic, only a few researchers have so far focused on the material remnants directly linked to the clandestine crossing of sea or land borders within the European context.

Notable exceptions include documentation projects in Puglia, Italy (Farina and Iacono, 2023), on the island of Lampedusa, Italy (Wilts, 2023), and in Moria, Greece (Hamilakis, 2016; Hamilakis, 2022). In the Eastern Mediterranean, a study examined material traces of recent migration to Europe by investigating sites along the Turkish west coast, the island of Lesbos, and Athens in 2017 (Anonymous, 2023). Another notable contribution is the work by Seitsonen et al. (2016), who documented and reflected on abandoned vehicles left behind by refugees of various nationalities at border checkpoints in Finnish Lapland during the winter of 2015–2016.

1.3 Research project *Transient Traces*

A recent research project named *Transient Traces* (German: *Flüchtige Spuren*) set out to build upon this work by focusing on migration stations along the Turkish west coast close to the Greek island of Lesbos. This project involved a 12-day research trip in mid-October to Turkey, featuring an international team of archaeologists and a photogrammetrist.

A key focus of this project was the documentation of various open-air migration stations along the coast, which were visited

and, in some cases, archaeologically and photogrammetrically recorded. This aspect of the work included the systematic gathering, documentation and description of materials left behind by clandestine migrants while waiting for their passage across the Mediterranean. This part of the work is only briefly and very selectively illustrated here (Figure 3). It is anticipated to disseminate and discuss the extensive documentation results in a separate, more suitable format.



Figure 3: Collection of photos acquired during visits at different clandestine migration stations along the Turkish west coast. A: Overview of a typical migration station within an olive grove only meters away from the Mediterranean. B: A collection of socks found and assembled by the research team. C: A selection of packaging for rubber inner tubes, used as less visible and secure alternative means of sea rescue. D: Empty tuna cans. E: Life jacket for infants.

However, this study will focus on the second key objective of the trip: the documentation of two abandoned buildings and the graffiti created therein (Figure 4). These structures were primarily used by clandestine migrants in 2015 and 2016, but the conducted research revealed that one of them remained in use as recently as 2024. Of particular interest in these buildings are the extensive graffiti left behind by migrants during their periods of waiting inside. Most of the graffiti can be found in Building 1 (Figure 4), while Building 2 contains only a few, though still notable, examples. Although the abandoned buildings were discovered during earlier field trips, they were only photographically documented at that time due to limited resources. Revisiting those sites offered the opportunity to comprehensively capture the sites using photogrammetry. Key info about the buildings can be found in Table 2.

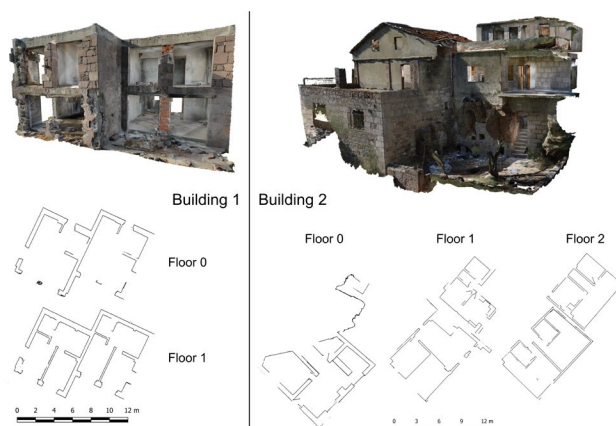


Figure 4: Textured 3D mesh of the two buildings and the extracted floor plans per building. The floorplans were extracted

at ca. 1m room height and are based on the results from the dense image matching point cloud.

Building	Date	Number of Floors	Number of Rooms	Total Area
1	9/10/2024	2	10	140 m ²
2	15/10/2024	3	16	325 m ²

Table 2: Details of the surveyed buildings.

2. The importance and challenges of documenting migrant graffiti

Graffiti is an omnipresent yet understudied phenomenon, particularly in the context of clandestine migration. This lack of scientific engagement is surprising, given that these graffiti serve as visual records of experiences that profoundly affect hundreds of thousands of lives, shaping political debates and public discourse. Notable contributions in this area include studies by Uzureau et al. (2024), Wagner and Franck (2019), and Soto (2016), the latter of which examines migrant graffiti hidden beneath rural highways, created by clandestine migrants crossing the border from Mexico into Arizona. The 85 inscriptions Soto documented at two sites in southern Arizona bear witness to migrants' encounters with border patrol and convey messages to future travellers. Alongside names, places, and greetings, the word *recuerdo*, Spanish for *remember*, appeared most frequently, underscoring the commemorative purpose of these markings. Other inscriptions reflected themes of sex, sadness, and religion, as well as the hardships of migration, such as warnings like *The Border Patrol was here* and records of sleeping in hiding under rural highways. These markings transform sterile transit routes into spaces of memory, reflecting both the migrants' agency and the profound precarity of their journeys (Soto, 2016).

At the same time, documentation of graffiti created during events of clandestine migration poses other, more fundamental challenges than the documentation of graffiti that are created in urban areas.

Ephemerality: Graffiti are often created spontaneously, though the degree of spontaneity can vary. In urban contexts, the prevalence of tags and quick drawings often reflects a combination of long-term preparation, such as carrying a marker or spray can, and opportunistic action, seizing the moment when circumstances allow (Wild et al., 2024). As observed at graffiti sites linked to migration, the logistical and strategic planning required for clandestine border crossings rarely includes consideration or preparation for mark-making. The graffiti examined in this study are defined by the basic tools used for their production, including wooden pencils, soft limestone as chalk, sharp stones for scratching, burnt sticks as improvised charcoal and, as found in one instance, lipstick (Figure 5). Aside from scratched graffiti, these methods are inherently transient. Although these graffiti are often created, or at least found, in enclosed spaces like abandoned buildings, they are still susceptible to weathering from air moisture, heat, solar radiation, and wind exposure. Soto et al. (2016) explicitly demonstrated this fragility by revisiting the two Arizona study sites three and six years later, where most of the chalked graffiti had faded and become illegible.

Additionally, the medium on which the graffiti are created is ephemeral. The buildings where these graffiti are typically found along the Turkish west coast are abandoned, making them

probable subjects to removal or demolition, either through natural processes or human intervention, in the foreseeable future.

Accessibility: Graffiti created in the context of clandestine migration is inherently difficult to access, as migration stations are typically located in hidden or remote areas. As a result, a substantial portion of the work involves identifying potential sites, which necessitates both prior analysis of the area using satellite imagery and, more importantly, extensive landscape exploration by foot. Once potential locations, such as abandoned buildings in proximity to the coast, are identified, it is essential to assess their safety for entry and verify whether they were indeed used as migrant stations.

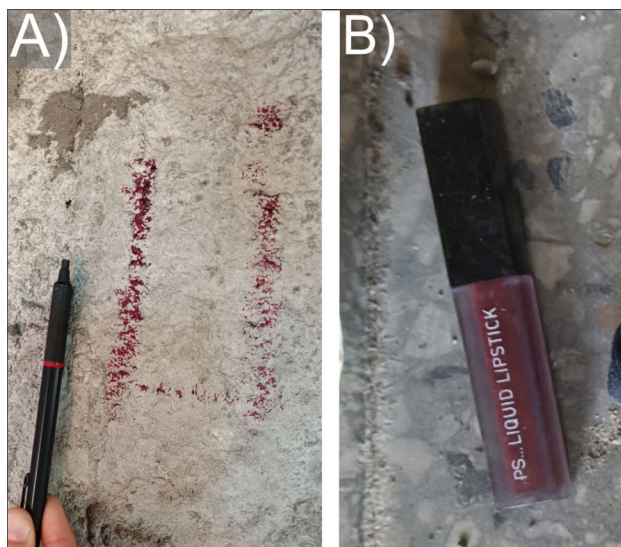


Figure 5: A) A (presumably) unfinished graffiti found in Building 2. A pen is placed for scale. B) A red lipstick, matching the colour of the graffiti, found just a few meters away from the mark.

Visibility: Adequate photographing inside abandoned buildings is not trivial due to the challenging lighting conditions. Even though every room in the researched buildings receives some natural lightning through windows, it is for some rooms barely sufficient to adequately see the graffiti. Another challenge concerns the high contrast between brightly lit areas and dark areas, making it hard to capture details in both. To state the obvious, there is no pre-installed artificial lightning present in those abandoned building, thus the usage of artificial illumination in the form of a flash which was mounted on the camera's hot shoe was imperative, enabling the documentation of dark rooms but creating challenges during the subsequent generation of orthophotomosaics due to substantial differences in illumination across and within the image (Figure 8).

Stress: A constant factor during on-site documentation was stress. There is always the risk of being noticed by the police or encountering people involved in smuggling, both of whom could react unpredictably. Police may mistake researchers for migrants or smugglers, which can lead to uncertain outcomes. Similarly, people involved in smuggling might see researchers as law enforcement, creating the potential for conflict. Also, they simply do not want anybody snooping around. While there was no encounter with smugglers, the police often became aware of research activities and intervened with varying levels of involvement. Fortunately, with the help of a native Turkish speaker with a calmative approach, no situation escalated.

These situations, however, caused considerable mental strain. The scenes being documented added to this, as they often carried heavy emotional weight. For instance, locations where large groups of migrants had clearly waited under precarious conditions just days earlier to the documentation left a particularly strong impact. The work in the group was beneficial to mitigate the stress but it still influenced the documentation process.

This photogrammetric survey aimed to document the graffiti in the two abandoned buildings (Figure 4) geometrically and texturally. Although not every room contained graffiti, documenting the entire buildings, from the outside as well as from the inside, was deemed essential for comprehensive and seamless visualisation and dissemination.

Eventually this survey shall set the basis for a thorough analysis and contextualisation of the present artefacts and graffiti. Essentially the output of this work shall be a virtual yet tangible reconstruction of events by providing comprehensive and accurate reconstruction of the scenes and artefacts.

2.1 Ethical considerations

Documenting objects and graffiti left behind by refugees crossing the Mediterranean involves navigating ethical challenges in a sensitive and evolving landscape (Soto, 2018). Many of these objects, such as blankets, clothes, money or food, may appear abandoned but could still be needed by future migrants, local communities, or NGOs. Removing or disturbing them potentially risks disrupting survival strategies. Thus, seemingly abandoned but potentially useful objects were left at the sites (Jungfleisch, 2025)

Another, ethical risk associated with this research concerns the potential disruption of this sensitive system possibly even redirecting migration routes, thereby further increasing dangers. Thus, efforts were made to avoid presence during active migration events by only being present at those sites during bright daylight when the probability of disruption is minimised. This risk mitigation, however, did not fully eliminate the ethical tension of working in such contexts. On the other hand, there is an urgency to document arising from the fact that these objects and their context can disappear quickly, making timely recording crucial to preserve evidence. Balancing the need to document with the responsibility to avoid harm is essential.

Lastly, in the following sections specific geographical details are intentionally withheld. Although unlikely, state authorities could potentially use such information about events before and during border crossings, even long after they occurred, in their efforts to prevent migration. Consequently, the following sections do not mention exact geographical location. As geographical reference, this study focuses on the region along the Turkish coast, where the Greek island Lesbos is visible to the bare eye (Figure 6).



Figure 6: The island of Lesbos (Greece) as seen from the Turkish mainland. The photo was taken during a field trip to collect data supporting this use case.

3. Photogrammetric workflow

3.1 Photogrammetric Data Acquisition

Full photographic coverage of the buildings was conducted using a Nikon D800 camera (Figure 7) with a Sigma 14mm f/2.8 lens. Following photogrammetric protocols, it was aimed at taking the photos with a fixed focus distance per building to maintain the camera's interior orientation. This was achieved by manually focusing at approximately 2 meters from the wall at the beginning of each building's photographic session. This focus distance was a compromise, balancing multiple factors: capturing sufficient textural detail, navigating the narrow interiors, ensuring proper illumination with the mounted flash, and keeping acquisition times manageable.

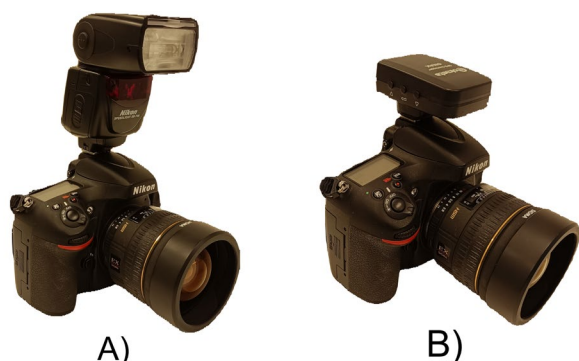


Figure 7: The two camera setups used for the image acquisition of the two abandoned buildings. A) The Nikon D800 with the Nikon Speedlight SB-700 flash for the building's inside. B) The Nikon D800 with the Solmeta GMAX geotagger which was used for the photos taking on the outside of the buildings.

In tight staircases and smaller rooms, some images were inevitably out of focus. These areas were rephotographed using adapted auto-focus immediately after completing the main photographic session to ensure adequate coverage. Images of the buildings' exteriors were taken afterward, using an infinite focus distance, to capture the facade and surrounding environment. The different focusing were considered in the processing. Not the entire exterior of the buildings could be captured due to some inaccessible parts around the houses. The entire image acquisition for each building was completed within an hour (Table 3).

Lighting conditions posed a major challenge, as anticipated based on prior site visits by parts of the research team. All indoor images were captured using a Nikon Speedlight SB-700 flash mounted on the camera's hot shoe (Figure 7A). This ensured generally sharp and well-lit images, even in dark environments. However, the flash sometimes failed to fully illuminate the wide field of view of the 14 mm wide-angle lens (Figure 7), and the combination of the flash and camera setup increased the overall weight, adding to the difficulty of non-stop image acquisition. Variations in lighting conditions, sensor-to-object distances, and inconsistent natural light further contributed to underexposed and overexposed areas in some images (Figure 8). Lastly, shadows cast during the photography on some of the walls were impossible to avoid creating some artefacts in the final texture. Despite the rapid pace and challenges, such as narrow spaces and poor lighting, most images were successfully acquired.

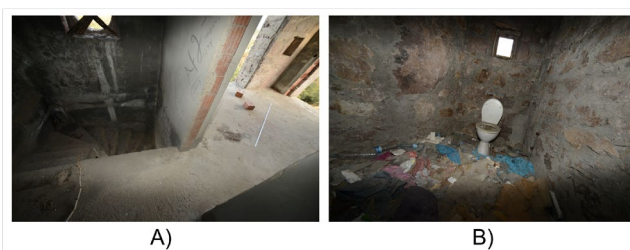


Figure 8: Two example photographs of the buildings' interior. A) Example from Building 1 showing the vastly varying sensor to object distances and the effects it has on the resulting image. B) A dark room within Building 2 showing the challenge of using a wide angle camera in combination with a flash.

3.2 Photogrammetric processing

The collected image sets were processed using Agisoft Metashape Professional 1.8.4 to determine the exterior orientations of the photos and to calculate camera calibration parameters. Calibration parameters were estimated separately for image sets based on their focus distances, resulting in three calibration groups per building: one for the 2-meter focus distance, one for the infinity focus distance, and one for images captured with short, varying focus distances. The orientation process successfully aligned 96% of the images for Building 1 and 95% for Building 2. It was possible to establish tie points also between the images taken from the façade and from the inside (Figure 9). A visual inspection of the calculated exterior orientations and the resulting tie point cloud revealed no significant errors.

	Building 1	Building 2
Number of acquired/oriented Photos	414/399	1309/1247
Number of tie points	407k	1,031k
Duration of acquisition	47 min	59 min
Control scalebar + residual length	100 cm + 6.7 mm	28 cm + 6.1 mm

Table 3: Summary of photo acquisition and processing results for the two surveyed buildings. The duration of acquisition refers to the time difference between the first and last photo acquired.



Figure 9: Example of tie points established between one outdoor photo of Building 1 and one photo taken from the inside.

Following orientation, a dense point cloud and a triangle-based polymesh was generated using depth-map-based multi-view stereo matching (Seitz et al., 2006). The texture of the polymesh was computed using all collected images (Figure 10). While it would have been possible to remove blurry or poorly exposed images, such removal was avoided, prioritising a complete texture over avoiding suboptimal areas. Rendered views of the resulting meshes are depicted in Figures 4, 10, and 11.

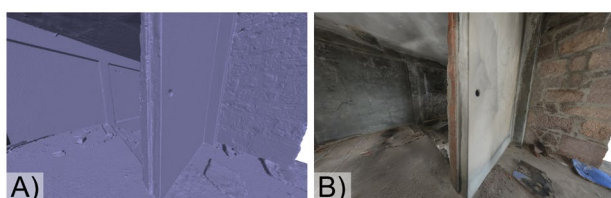


Figure 10: A) Generated polymesh of one room in Building 1 without texture and B) the same polymesh rendered from the same perspective with texture.



Figure 11: Diagonal cross section of the textured 3D mesh of Building 1.

The Solmeta GMAX geotagger provided coarse absolute georeferencing for outdoor images by embedding GNSS-

derived coordinate triplets into the metadata. For scaling, the folding rulers photographed during image acquisition were used. Measurements between clearly identifiable points on the rulers (Figure 8A) were taken. These measurements were introduced as additional observations to constrain the photogrammetric models. Residuals from the scaling process were used as accuracy estimates. For Building 1, three rulers were used for scaling and one for quality control, while Building 2 relied on two rulers, supplemented by comparisons with the dimensions of a rubber inner tube package for quality control (Table 3).

3.3 Deriving value-added products

Despite challenges with lighting and geometry, the polymesh and texture processing produced satisfactory results. Issues such as underexposed and overexposed regions due to inconsistent lighting conditions, as well as flash-related shadows in wide-angle shots, created some suboptimal result (Figure 12C). Nonetheless, detailed, accurate, and nearly complete 3D models of both buildings were created, providing a foundation for the generation of other value-added products. The derived dense point cloud and polymesh serve as basis for the derivation of floorplans (Figure 4) and orthophotomosaics (Figure 12).



Figure 12: A, B, C, and D: Examples of graffiti orthophotomosaics created based on data collected in Building 1.

For the floor plans, horizontal cross-sections per floor at ca. 1m floor height were generated using the *Cross Section* tool implemented in CloudCompare. The resulting cross section were manually filtered for artefacts created by objects such as a sinks, toilet or staircase. These floorplans provide a quick and easy-to-understand overview of the building's geometry, allowing for room counting and area estimation (Table 2). Additionally, they may serve as a foundation for visualising graffiti occurrences, which are unevenly distributed across the rooms and tend to cluster within specific areas of the houses, thereby enabling a deeper understanding of the graffiti's geography.

Orthophotomosaics of most graffiti covered walls were derived using the oriented images, the derived 3D model and a projection plane manually defined in Agisoft's Metashape (Figure 12). The resulting orthophotomosaics are exported with a raster cell size of 1 mm, which closely matches the native

ground sampling distance, typically slightly smaller in most cases. This approach simplifies retrieving the dimensions of the graffiti within the image by converting measurement in the image with simple conversion factors, e.g. 1 pixel corresponds to 1 mm on the object. To date, orthophotomosaics of ca. half of the graffiti covered walls in the buildings have been generated. The remaining data will be processed in a similar fashion. The derived 2D floorplans and the orthophotomosaics are especially suitable for the dissemination in 2D formats such as this contribution and other written publications. The orthophotomosaics can serve as a foundation for translating the predominantly Farsi and Arabic graffiti content, a task intended to be performed by a professional translator.

In addition to geometric processing, digital image processing algorithms can be employed to enhance features such as the visibility of partially faded graffiti and low-contrast images. For example, Figure 13 showcases a noteworthy graffiti from Building 2, likely inscribed with an ordinary pencil during the autumn of 2015. This graffiti, initially difficult to read, was revealed through the application of Sobel Edge Detection followed by morphological opening, which significantly improves its readability. The inscription, written in Turkish, was first documented and published by Jungfleisch et al. (2025) and contains a striking economic calculation:

Original Text (Turkish)	English Translation
27/09/2015	27/09/2015
418 Bot Geçirildi	418 boats sent
× 50,000 \$ Dolar	× 50,000 \$ Dollar
=20,900,000 \$ Dolar elde edildi	=20,900,000 \$ Dollars earned

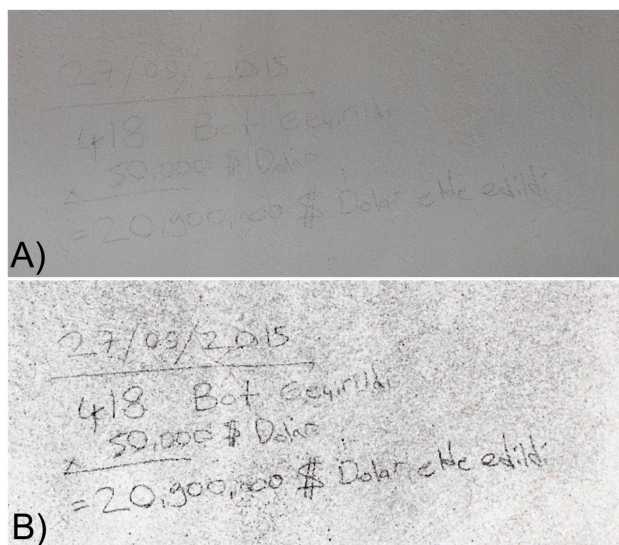


Figure 13: A) Original image of one graffiti from Building 2. B) The same image after applying Sobel Edge Detection and morphological opening to enhance readability.

4. Conclusion

Much work remains to be done with the collected data. The graffiti shall and will be transcribed and professionally translated, enabling a deeper analysis of their messages and forms. This will hopefully provide valuable insights into the thoughts and experiences of those being in the process of risking their lives during migration.

Photogrammetry with flash for indoor and geotagger for outdoor acquisitions proofed to be a reliable methodology also under the unfavourable conditions of poor lighting and stress. The strategy to keep the interior orientation fixed, especially because of limited external control, is suggested. However, this requirement proofed to be infeasible in the examples presented, and additional focus distances were allowed and correspondingly considered in the bundle block. For the building types investigated, an acquisition time of 3 to 5 minutes are required on average per room.

This contribution highlights graffiti created at so-called migration stations in the Aegean and its documentation, a field that has received little attention, whether scientific or otherwise. These silent witnesses reflect events that not only shape individual lives but, through policy changes, impact entire societies and generations. By providing a thorough documentation of these expressions, this study seeks to bring them to the forefront, not only for current researchers and the general public but also for future historians, who will have to rely on tangible evidence and concrete facts, which disappear unnoticed every day.

Acknowledgements

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References

- Andersson, R., 2014. *Illegality, Inc.: Clandestine migration and the business of bordering Europe*. University of California Press.
- Anonymous, 2023. Materielle Spuren der rezenten Migration nach Europa: Ein archäologischer Blick auf die türkische Westküste, Lesbos und Athen im Jahr 2017. In: Renger, M., Schreiber, S., Veling, A. (Eds.), *Theorie | Archäologie | Reflexion 1: Kontroversen und Ansätze im deutschsprachigen Diskurs. Theoriedenken in der Archäologie*, 453–490. <https://doi.org/10.11588/propylaeum.1092.c15034>.
- De León, J., 2012. Victor, archaeology of the contemporary, and the politics of researching unauthorized border crossing: a brief and personal history of the Undocumented Migration Project. *Forum Kritische Archäologie*, 1, 141–148.
- De León, J., 2013. Undocumented migration, use wear, and the materiality of habitual suffering in the Sonoran Desert. *Journal of Material Culture*, 18(4), 321–345. <https://doi.org/10.1177/1359183513496489>.
- De León, J., Gokee, C., & Schubert, A., 2015. "By the Time I Get to Arizona": Citizenship, Materiality, and Contested Identities Along the US–Mexico Border. *Anthropological Quarterly* 88(2), 445–479. <https://dx.doi.org/10.1353/anq.2015.0022>.
- De León, J., 2012 "Better to Be Hot than Caught": Excavating the Conflicting Roles of Migrant Material Culture. *American Anthropologist*, 114: 477–495. <https://doi.org/10.1111/j.1548-1433.2012.01447.x>
- Demirbaş, E., Miliou, C., 2024. Looking at the EU-Turkey Deal: The Implications for Migrants in Greece and Turkey. In: Zapata-Barrero, R., Awad, I. (Eds.), *Migrations in the*

- Mediterranean: IMISCOE Regional Reader*. Springer International Publishing, Cham, 11–27. https://doi.org/10.1007/978-3-031-42264-5_2.
- European Council, 2016. Press Release: EU-Turkey Statement, 18 March 2016. <https://www.consilium.europa.eu/en/press/press-releases/2016/03/18/eu-turkey-statement/> (accessed 15 May 2025).
- Farina, E. B. and Iacono, F., 2023. Migration flows and concrete walls: an archaeological perspective on early migrant detention facilities. The C.P.T “Regina Pacis” (Italy, Puglia), *World Archaeology*, 55(2), pp. 206–226. doi: 10.1080/00438243.2024.2382136.
- France 24, 2020. Erdogan warns Europe to expect ‘millions’ of migrants after Turkey opens borders. March 2020. <https://www.france24.com/en/20200303-erdogan-warns-europe-to-expect-millionsof-migrants-after-turkey-opens-borders>(accessed 15 May 2025).
- Frontex, 2020. Frontex launches internal inquiry into incidents recently reported by media. October 2020. <https://www.frontex.europa.eu/media-centre/news/news-release/frontex-launches-internal-inquiry-into-incidents-recently-reported-by-media-ZtuEBP> (accessed 15 May 2025).
- Jungfleisch, J., 2025. From Transient Traces to Material Witnesses: An Archaeological Investigation of Contemporary Border Crossings in the Eastern Mediterranean. *International Journal of Historical Archaeology*. <https://doi.org/10.1007/s10761-025-00777-7>
- Gokee, C., De León, J., 2014. Sites of Contention: Archaeological Classification and Political Discourse in the US-Mexico Borderlands. *Journal of Contemporary Archaeology*, 1(1), 133–163. <https://doi.org/10.1558/JCA.V1I1.133>.
- Hamilakis, Y., 2016. Archaeologies of Forced and Undocumented Migration. *Journal of Contemporary Archaeology*, 3(2), 121–139. <https://doi.org/10.1558/jca.32409>
- Hamilakis, Y., 2022. Border Assemblages Between Surveillance and Spectacle. What Was Moria and What Comes After? *American Anthropologist*, 124, 212–220. <https://doi.org/10.1111/aman.13693>
- Harteveld, E., Schaper, J., De Lange, S.L., Van Der Brug, W., 2018. Blaming Brussels? The Impact of (News about) the Refugee Crisis on Attitudes towards the EU and National Politics. *JCMS: Journal of Common Market Studies*, 56(1), 157–177. <https://doi.org/10.1111/jcms.12664>.
- Legal Centre Lesvos, 2020. *Collective Expulsions in the Aegean*, July 2020. <https://legalcentrelesvos.org/wp-content/uploads/2020/07/Collective-Expulsions-in-the-Aegean-July-2020-LCL.pdf> (accessed 15 May 2025).
- Perisic, P., Ostojić Domika, P., 2023. Pushbacks of Migrants in the Mediterranean: Reconciling Border Control Measures and the Obligation to Protect Human Rights. *Poredbeno Pomorsko Pravo*, 61, 614–658. <https://doi.org/10.21857/yvjrdcvpry>.
- Republic of Turkey Ministry of Interior Directorate General of Migration Management, 2024. Push-Back Incidents in the Year of 2024. <https://en.sg.gov.tr/push-back-incidents-in-the-year-of-2024> (accessed 15 May 2025)..
- Rygiel, K., Baban, F., Ilcan, S., 2016. The Syrian refugee crisis: The EU-Turkey ‘deal’ and temporary protection. *Global Social Policy*, 16(3), 315–320. <https://doi.org/10.1177/1468018116666153>.
- Seitz, S.M., Curless, B., Diebel, J., Scharstein, D., Szeliski, R., 2006. A comparison and evaluation of multi-view stereo reconstruction algorithms. *Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, 1, 519–526. <https://doi.org/10.1109/CVPR.2006.19>.
- Soto, G., 2016. Place making in Non-places: Migrant Graffiti in Rural Highway Box Culverts. *Journal of Contemporary Archaeology*, 3, 174. <https://doi.org/10.1558/jca.31830>.
- Soto, G., 2018. Object Afterlives and the Burden of History: Between “Trash” and “Heritage” in the Steps of Migrants. *American Anthropologist*, 120(3), 460–473. <https://doi.org/10.1111/aman.13055>.
- United Nations, 2015. *UNifeed: UNHCR / EUROPE MILLION REFUGEES*. [Video] <https://media.un.org/unifeed/en/asset/d154/d1540981>
- Uzureau, O., Rota, M., Verhaeghe, F., Lietaert, I., Elhaj, R., & Derluyn, I., 2024. ‘NO MORE WALLS IN THE SEAS’: Migration graffscapes and migrants’ messages while en route to and in Europe. *Journal of Refugee Studies*, 1–20. <https://doi.org/10.1093/jrs/feac014>
- Wagner Tsoni, I., & Franck, A. K., 2019. Writings on the Wall: Textual Traces of Transit in the Aegean Borderscape. *Borders in Globalization Review*, 1(1), 7–21. <https://doi.org/10.18357/bigr11201919243>
- Wild, B., Verhoeven, G., Muszyński, R. & Pfeifer, N., 2024. Detecting change in graffiti using a hybrid framework. *The Photogrammetric Record*, 39, 549–576. <https://doi.org/10.1111/phor.12496>
- Wilts, G., 2023. Aktivismus in der Archäologie als Chance. *Forum Kritische Archäologie*, 12. <https://dx.doi.org/10.17169/refubium-40269>