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The on-site surveys at Molino San Vincenzo
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The paper gives a short report on surveys conducted in the framework of the Vienna Orme and Pesa Valley Project. Focus of is laid on the comparison of two intensive on-site surveys at Molino San Vincenzo which were carried out under differing conditions in 2013 and 2016 and achieved differing results since in 2013 the visibility was much lower than in 2016 due to vegetation and therefore the only a limited number of artefacts could be found. The results of the re-survey in 2016 offered the opportunity to evaluate on-site survey methods. One of the main questions is the reliability of survey results even with low finds numbers. The pluri-methodological approach of the Vienna Orme and Pesa Valley Project enables also a discussion of assets and shortcomings of other methodologies, especially geophysical prospections and shovel-testing, in terms of their suitability to detect the sites still unexcavated.

Keywords: *survey, shovel tests; non-invasive methodologies; on-site; off-site*

1 Surveys in the Vienna Orme and Pesa Valley Project

On-site surveys and off-site surveys were planned as essential parts from the outset of the Vienna Orme and Pesa Valley Project (VOPP). Thus since 2013 several field walking campaigns were conducted in order to look for artifactual remains on the surface as traces of past human activities. The surveys were conceptualized in every case as systematic field-walking surveys – in contrast to the grab samples or purposive surveys usually practiced in Tuscany – which were characterized by the exact definition and mapping of the area searched and the collection or registration of all the artifacts found.[1]

In terms of intensity two search strategies have been implemented in the project: for surveying known or recently detected sites a fine-meshed grid of square units of 10 m side length were laid on the entire search area using a high precision differential GNSS.[2] Field walking was regularly executed by four people for each of the resulting single 100 m² units. They then walked at a distance of 2,5 m from each other looking at a strip of land of 2m width. Thus 80 m² out of a total area of 100m² were searched intensively, representing an 80% share of

[1] Characterization of in intensive survey in contrast to grab samples: Redman – Watson 1970; Barker 1991; Bintliff 2000; Mattingly 2000; Banning 2002, 113-132; Cherry 2005.

[2] All the so called sites were previously investigated by our Italian colleagues by means of grab samples; see Alderighi – Terreni 2013; for the concept 'site' cf. n. 26.

the whole which is an almost complete coverage.[3] After each grid the artefacts collected were counted and bagged separately thus accounting for a very high resolution of the distribution and enabling a detailed analysis of the material culture found.

Off-site surveys were conducted in the valley bottoms of the rivers Pesa, Virginio and Orme and the surrounding hills.[4] Because the survey areas were chosen according to actual land use the fields were much larger than the single grids of the on-site surveys and no standard size is to be determined in advance. Also these surveys, however, followed a strict intensive survey methodology. Thus the persons searching the fields walked at a distance of ca. 10m from each other looking at a strip of land of 2m width. Within these plots all pottery sherds, tile and brick fragments, glass and metal objects were collected; only modern tiles – easily recognizable by their mechanically smoothened surface, sharp edges and dark red colour – have merely been counted using a tally counter. This survey strategy is not as fine-grained as that followed for the investigation of sites but allows the coverage of much larger areas.

2 Survey and Re-Survey at Molino San Vincenzo

The archaeological significance of Molino San Vincenzo was detected in 2008 by the then responsible functionary of the Soprintendenza per i beni Archeologici per la Toscana, Lorella Alderighi, with the aid of the Gruppo archeologico of Montelupo by means of a survey during which many pottery sherds and tile fragments on the surface were found.[5] Unfortunately only a fraction of the material, the most obtrusive finds, was collected and neither the exact numbers nor the composition of that grab sample was recorded. Therefore it is not possible to quantify that surface assemblage and to use it for comparative purposes.

In the following year the Soprintendenza brought the site to our attention and offered the possibility to further study it. Thus since 2011 investigations have taken place, in 2011 only in the form of small test soundings on behalf of the Soprintendenza, and since 2012 as excavation by permission of the Ministry of Culture of the Italian Republic and the Soprintendenza granted to the Faculty of Historical and Cultural Studies of the University of Vienna.[6]

Because the Italian colleagues could not provide detailed data of the 2010 survey the opportunity was willingly taken to conduct an intensive on-site survey before starting the excavation campaign in September 2013. The main aim was to collect an artifact assemblage stemming from the surface as prerequisite and starting point for further investigations and comparative analyses. The field walking survey implemented followed the intense strategy described above. For that a grid of 229 square units was laid, covering the entire area of 2.3 ha which were searched intensively by implementing a total collection strategy. Although a state-of-the-art

3 For discussion of effective coverage rates: Banning et al. 2011; see also the critics by Bikoulis et al. 2015, 111. That practice makes it sometimes impossible to determine if actual find numbers or extrapolated numbers are indicated.

4 See the map in chap. 1: Introduction.

5 Alderighi 2010.

6 Alderighi et al. 2011; Schörner – Terreni 2012; Schörner et al. 2013; Schörner – Terreni 2014; Schörner et al. 2015a; Schörner et al. 2015b.

approach was therefore followed, the survey was heavily impaired by poor visibility. Although the field of Molino San Vincenzo was completely harvested it was not ploughed and so stubble was left which covered the ground. Furthermore, due to the very rainy summer in 2013 a more or less dense weed carpet had grown up, which additionally affected visibility.

Because of these constraints the opportunity, arising in August 2016 from a delay in the agricultural work progress, to conduct a second on-site survey at Molino San Vincenzo was willingly taken. Because the site area had been ploughed at least three times between 2013 and 2016 there were no archaeological reasons mitigating against a second collection because new find material was transported from the sub-surface to the surface.[7]

3 Re-Survey as Methodological Test Case

That re-survey offered not only the possibility to search the field under better visibility conditions, but it is also an important example of replicated collections which allows for comparing survey results, and – as A. J. Ammerman and M.W. Feldman stated more than 40 years ago – focusses on how the surface operates as a sampling process.[8] The re-survey could be conducted under almost 'laboratory conditions' as it followed exactly the procedure applied in 2013: an identical grid of 229 fields of 100 m2 was established by using a differential GPS. Only a limited number of irregular units on the fringes differed in surface area but that difference made up less than one regular square and was therefore a quantité négligeable. To make the second collection as blind as possible with relation to the first survey all the units were re-named, in spite of the fact that other individuals participated (Appendix 1).[9] According to M. J. Shott multiple factors can cause variation between survey results:[10]

1. survey intensity, for example the spacing between adjacent transects walked and the care with which the transects were inspected
2. variability of the detecting skills of individual participants caused especially by differing grades of experience
3. weather conditions
4. inherent randomness caused for example by mechanical circulation of artifacts in the plow-zone
5. conditions of the surface, especially visibility

The controllable causes of variation were restrained or were constant during the survey interval: the survey method used remained the same, only the walking direction in some units was

[7] Agricultural activities at Molino San Vincenzo were mouldboard ploughing and chissel ploughing. The mouldboard plough used reached a depth of 40 cms, the chissel plough did not go deeper than 30 cm into the ground. Thus the assemblages on the surface are renewed regularly allowing for repeated field walking, but the population in the ploughsoil remains mostly unaltered. I thank Alessandro Eleonori for his kind cooperation and the permit to do surveys on his properties. He kindly kept me informed about all the agricultural activities executed at Molino San Vincenzo.

[8] Ammerman – Feldman 1978, especially 734; cf. also Shott 1995; Ammerman 2004; Banning et al. 2006, 726s.; Kecheva 2014; Banning et al. 2017, 474-476 (with further examples)

[9] Cf. Ammerman – Feldman 1978, 735.

[10] Shott 1995, 479s. The factor ‚weathering' does not apply for Molino San Vincenzo

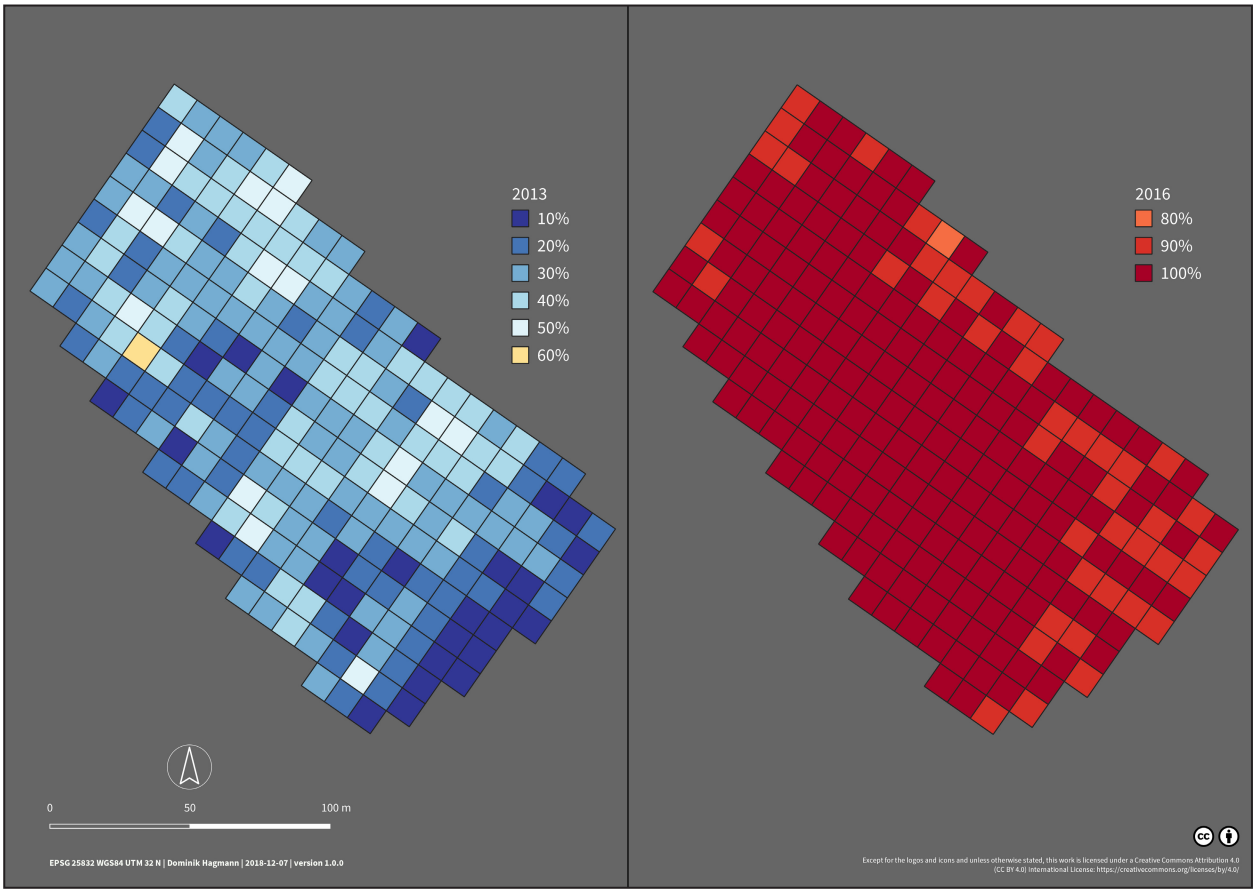

Fig. 1 Visibility ratings (D. Hagmann)

different to that in 2013. As in 2013 all the walkers were students with only limited experience in survey so no differences in qualification level affected the collection procedure. Even weather and sunlight conditions were equal, with clear to slightly cloudy skies. What was completely different in 2016, however, were the surface conditions of the field: the terrain of the site was harvested and already freshly and deeply ploughed, thus providing excellent ground visibility with less than 100 percent visibility only in the south-eastern part and on the margins (fig. 1). Thus only two of the factors could influence the survey results:

1. Surface visibility: the strongly differing vegetation cover could cause differences in artifact numbers found even if the total number of artifacts on the surface, the spatial distribution and the grade of clustering did not change at all.
2. Change in the artifact number and distribution between the two collections caused by agricultural activities.[11] Because all the finds stem from the plough soil both a change in the number of artifacts and patterning could be caused by ploughing or – to a minor degree – harrowing. The recognition of these changes can then be influenced again by the differences in visibility.

[11] Shott (1995, 478) stresses that surface documents »can contain a strong random element, such that successive episodes of cultivation do not necessarily expose similar numbers, distributions, or kinds of artifacts«.

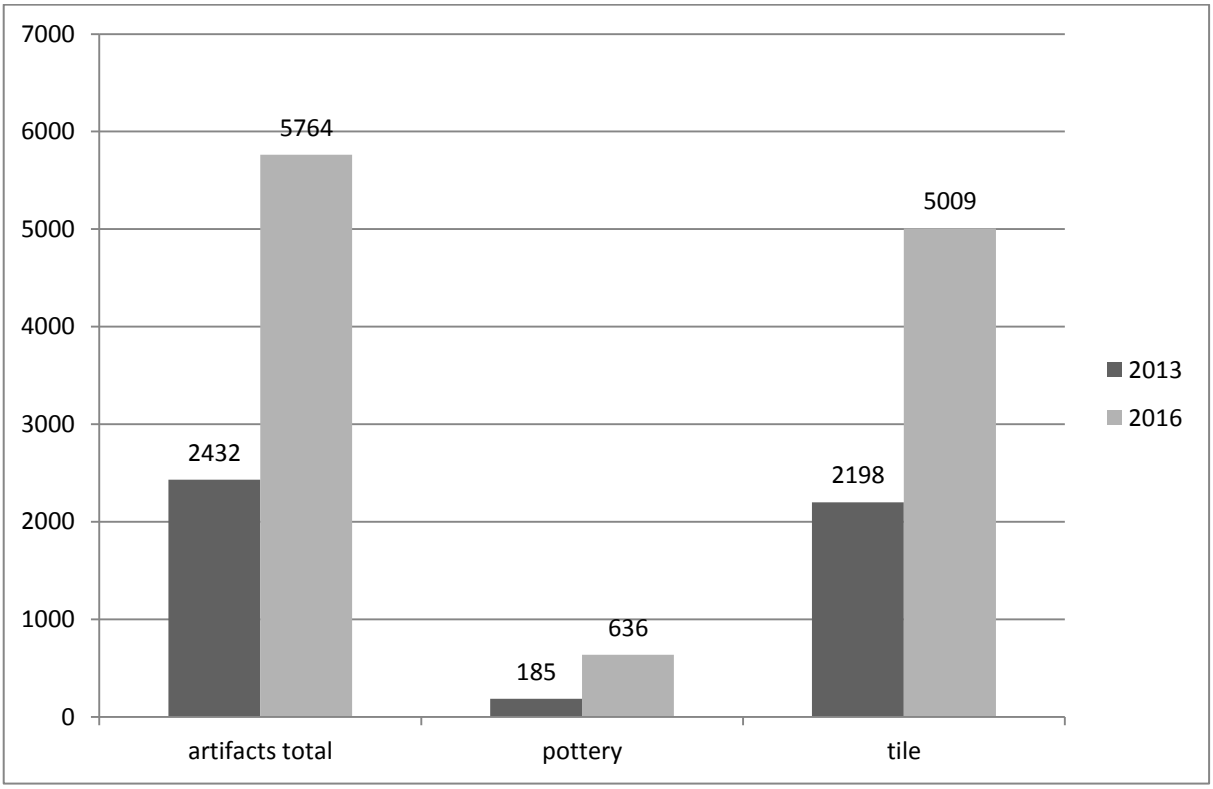

Fig. 2 Comparison of find numbers: main categories (G. Schörner)

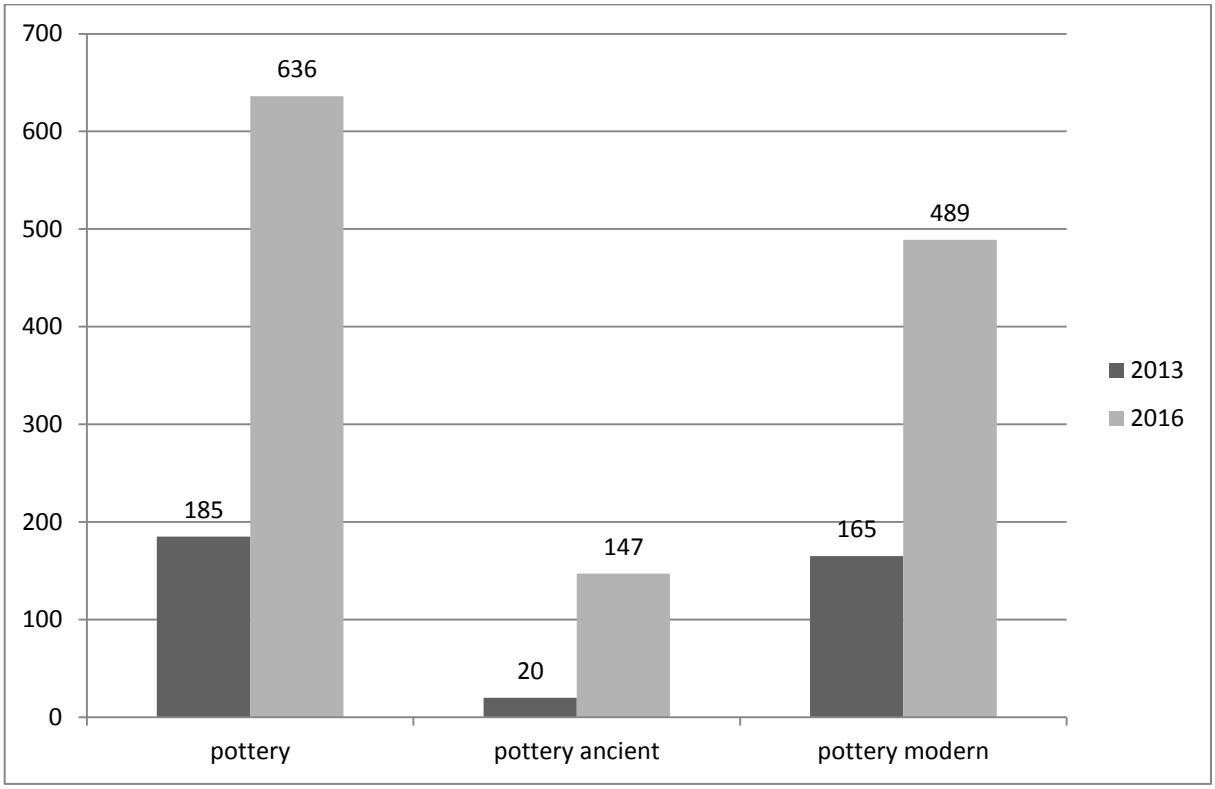

Fig. 3 Comparison of find numbers: pottery(G. Schörner)

3 Comparing the Surveys: Find Numbers

Looking at the mere quantity, a marked increase of the number of finds in 2016 is evident (fig. 2).[12] In 2013 a total of 2432 artifacts were found, whereas in 2016 more than 5700 were found (precisely: 5764). This represents an increase of a factor of 2.37. The same applies to the tiles found (2013: 2198; 2016: 5009) which form the lion's share of the material: in that category the amount of 2016 is 2.28 times that of 2013.

For pottery the upsurge is even more marked (fig. 3): in 2013, 185 pottery sherds were found, in contrast to the 636 pieces collected in 2016, indicating an increase by the factor of 3.44. As Molino San Vincenzo was also re-used in post-antiquity – surely proven by excavations – two main occupation phases can be discerned: antiquity, especially the Roman Republican and Imperial eras, and the modern period, mainly 17-19th century. Both phases are represented in the record of the pottery finds. As in most surveys the younger periods are overrepresented and the same applies for Molino San Vincenzo:[13] in 2013 only 20 certainly ancient pottery fragments were collected in contrast to 165 modern fragments; in 2016, of the 636 sherds found in total, 147 specimens could be dated to the Roman period and 489 to the post-antique phase. These numbers testify that the increase of pottery finds from one campaign to the other is very uneven: for Roman sherds the factor is 7.35, for modern pottery it is 3.33.

The most likely explanation for that fact is that visibility evidently played a decisive role in spotting pottery sherds. This becomes evident when we consider the average size of sherds found both in 2013 and 2016: in 2013 obviously only the largest sherds of ancient pottery could be detected because the average sherd size is an impressive 173.15 g.[14] The sherds found in 2016 are much smaller with an average of only 5.5 g. Assuming that sherds of a completely disparate preservation state were not brought up to the surface by the plough in the meantime, the sharply differing average size of the sherds suggests that visibility and not inherent randomness is a key factor for detecting material culture on the surface, as it is – in general – the reason for the marked differences in the amounts of the main artifact categories found. Furthermore, one inference from our observations is that it is impossible to mathematically 'correct' the survey results and, by so doing, to counterbalance the restricted visibility because the amounts of pottery finds and tile finds increased in different degrees from 2013 to 2016. Thus there is no constant value which can be used universally for multiplying the find numbers of each finds group of 2013 to reach the results of the 2016 survey although 'corrections' of this kind have often been executed in survey projects.[15]

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12 Here I have had to use counts, not weights because work is still in progress

13 For example at Sagalassos: Martens et al. 2012, 87.

14 See also Ammerman – Feldman 1978, 736.

15 For visibility corrections e.g. Schörner 2014,44-46; critic: Bevan – Conolly 2002-2004, 127s.

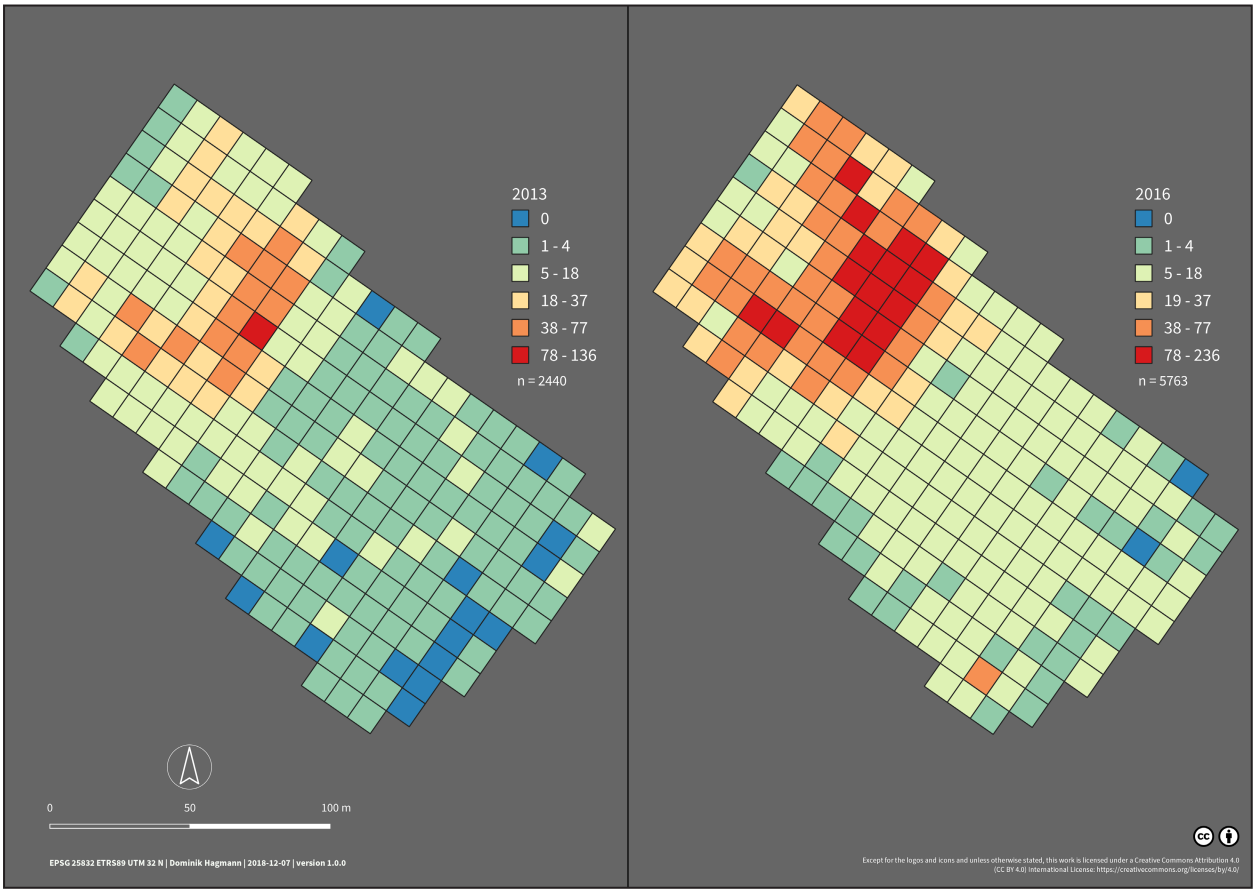

Fig. 4 Distribution of finds: all artifacts (D. Hagmann)

4 Comparing the Surveys: Distribution of Finds

The distribution and spatial patterning of the finds in 2013 and 2016 respectively is the starting point for further considerations and observations. If we map the distribution of all artifacts found by assigning each 100 m2 field a colour according to the number of finds made, the over-all picture is that Molino San Vincenzo is characterized by a strong contrast (fig. 4):[16] there is one smaller part in the northwest where most of the artifacts were found and a larger south-eastern part with clearly fewer finds. The results of the 2016 survey are much clearer in this respect, but that pattern emerges also from the 2013 survey. On both maps the highest densities are not located in the centre of that north-eastern half of the field but are shifted a little bit to the south-east. Despite these principal similarities there are some differences:

The intensity but also the extent of the artifact concentration in the north-western part is much higher in 2016. In 2016 the drop of finds was not as sudden as in 2013 because all the

[16] All spatial analysis was carried out in QGIS (2.18.x and 3.4.x) and ArcGIS 10.5.x by D. Hagmann. I thank Dominik for providing me with maps continuously.

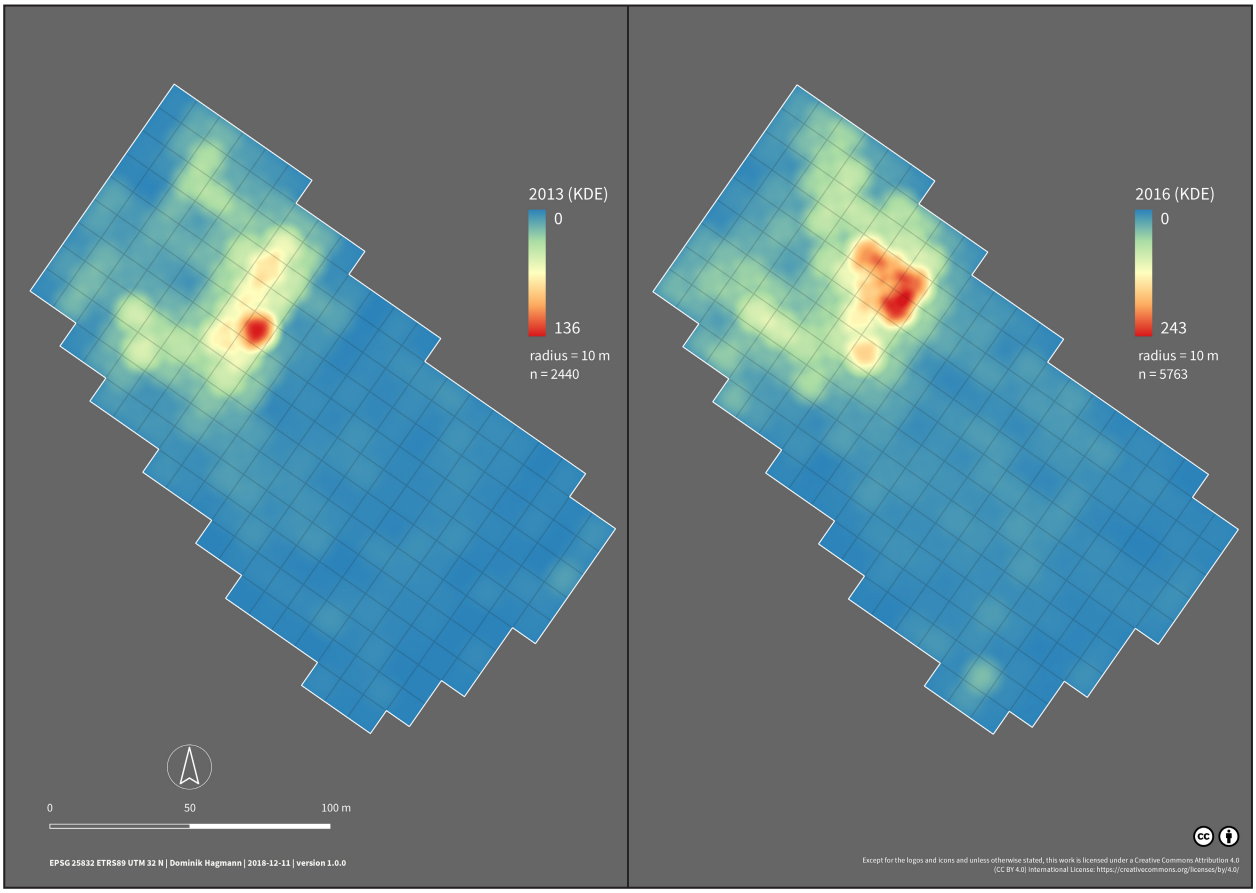

Fig. 5 Heat map (KDE) of artifacts found (D. Hagmann)

red fields where the highest density of finds was recorded are surrounded by darker and then bright orange fields. In general more artifacts were found in the south-eastern part of the field.

The marked concentration of finds, however, as a common feature revealed by both surveys can be proven by GIS procedures and statistical operations: to map the partial densities of surveys the kernel interpolation or the Kernel Density Estimation (KDE) method can also be used and so-called heat maps created (fig. 5).[17] The kernel is a mathematical function that describes the intensity produced by each point in relation to a given radius, in our case a 10 m radius.[18] The result of this analysis is a so-called heat map which provides a smoother representation of the raw data, hence facilitating both the presentation and comparison of several data sets in a single figure. In the case of Molino San Vincenzo it is easier to perceive the zones of greater finds density and the emptier spaces. The image by kernel density estimates shows an articulated concentration of finds in the north-western third with a density maximum on the south-western edge of that zone and a zone poor in finds in the south-eastern half of the field.

17 For a recent application (with discussion): Grau Mira 2017.

18 Discussion of method: Baxter et al. 1997; Ducke 2015.

Fig. 6 Distribution of finds: tile (D. Hagmann)

If we analyse the finds numbers statistically and calculate the most usual measures of central tendency the results are a mean/average of 25.17 finds per unit and a median of 12 finds per unit.[19] The difference between average and median is still greater if only the finds of ancient artifacts are analysed with an average of 17.88 finds per unit and a median of 4.[20] The marked contrast between mean and median indicates the existence of a small quantity of fields where many finds have been made and a vast majority of fields with only a few finds. The outliers heavily affect the mean but they leave the median unaffected, causing the strongly differing values. The fields with the very elevated find numbers can archaeologically be defined as find concentrations because the more divergent the outliers are, the more pronounced and clearly defined is the concentration. So the statistical operations confirm the results of the spatial GIS analyses. The distribution of tiles not surprisingly repeats these observations, as tile is the most numerous artifact category (fig. 6). The distribution maps show again a concentration of tiles found in the north-western part of the field and a marked decrease in the number of finds to the southeast. Main differences between the results of 2013 and 2016 are again the extent and the intensity of the find concentration. The pattern is repeated also if only the finds of ancient

19 For the statistical operations: Drennan 2009, 17-20.

20 The category 'ancient artifacts' is the sum of ancient pottery fragments and ancient tiles found.

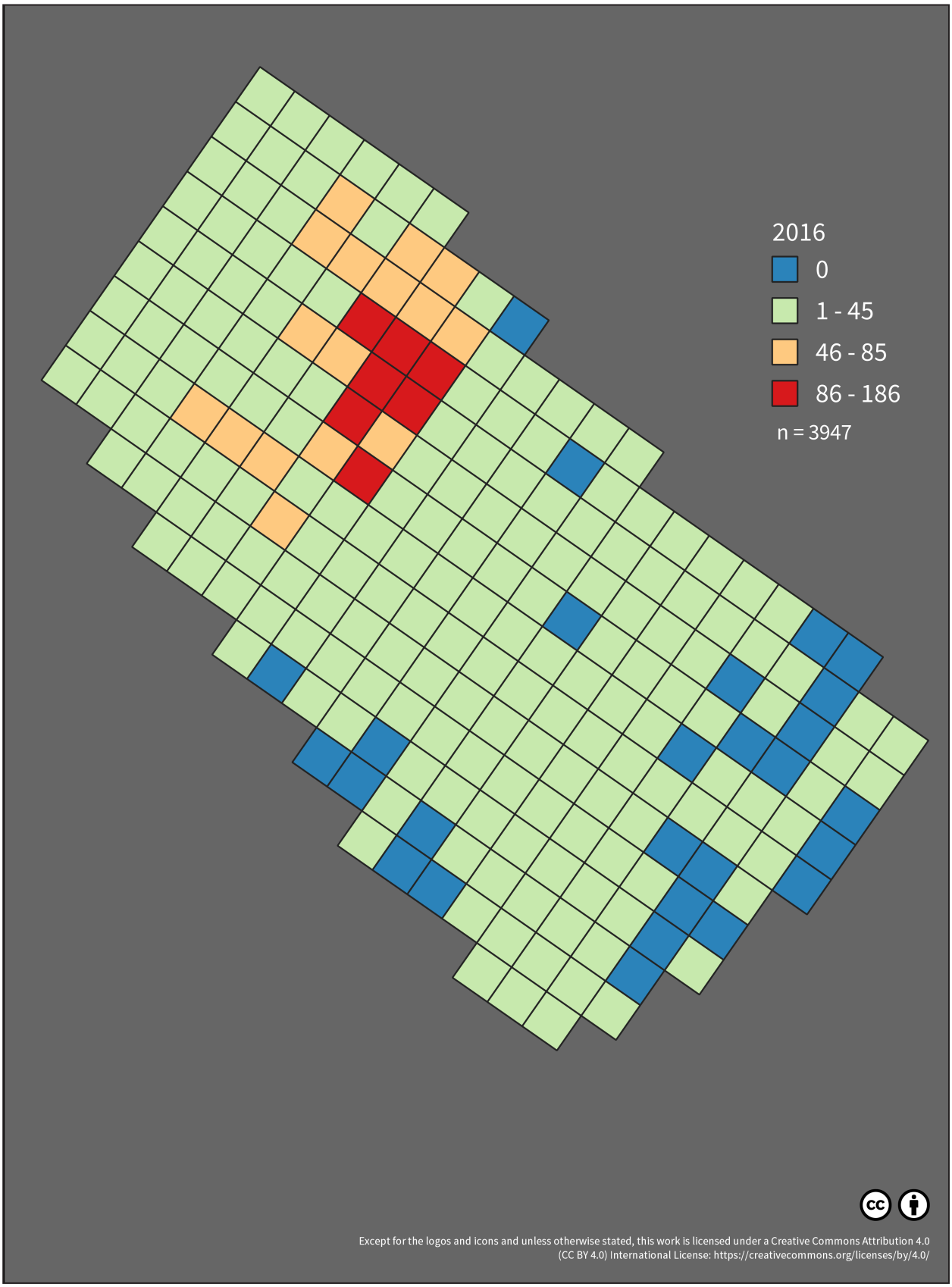

Fig. 7 Distribution of finds: ancient tile (2016 only) (D. Hagmann)

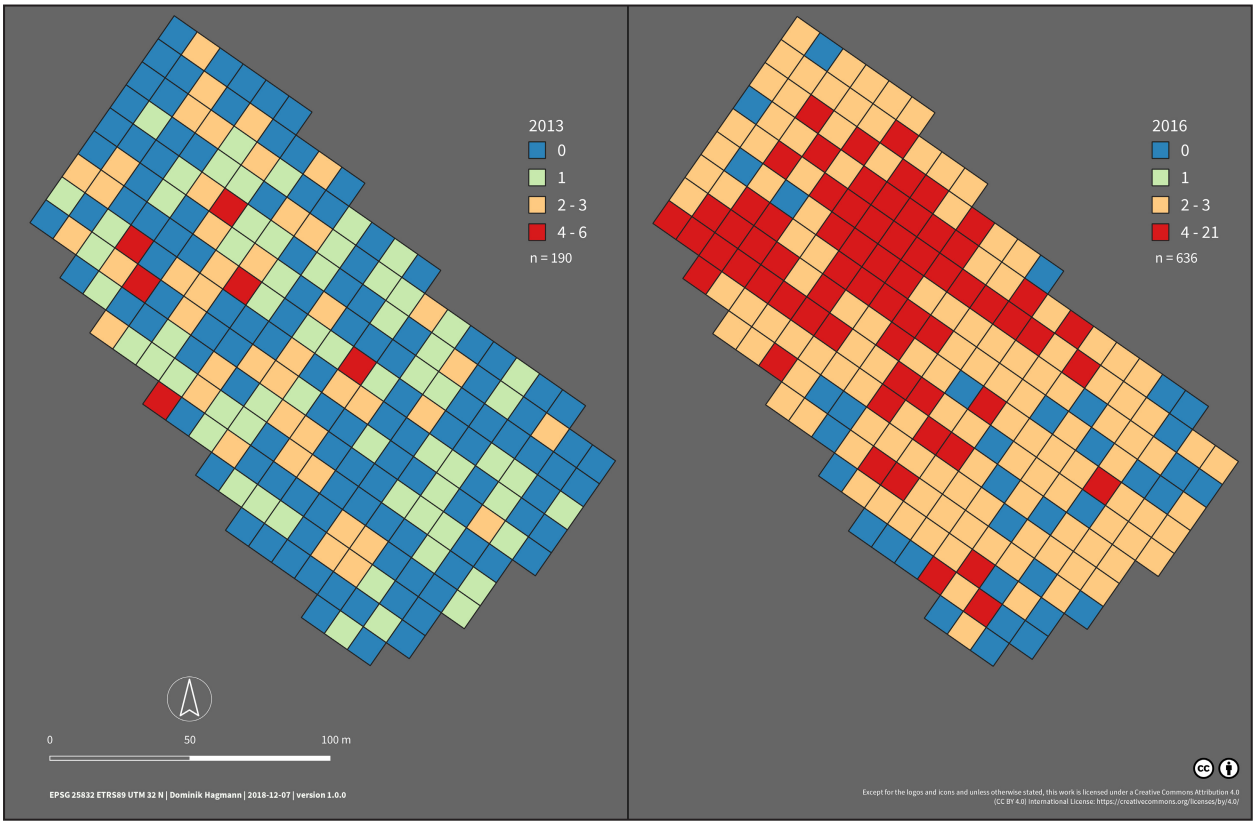

Fig. 8 Distribution of finds: pottery (D. Hagmann)

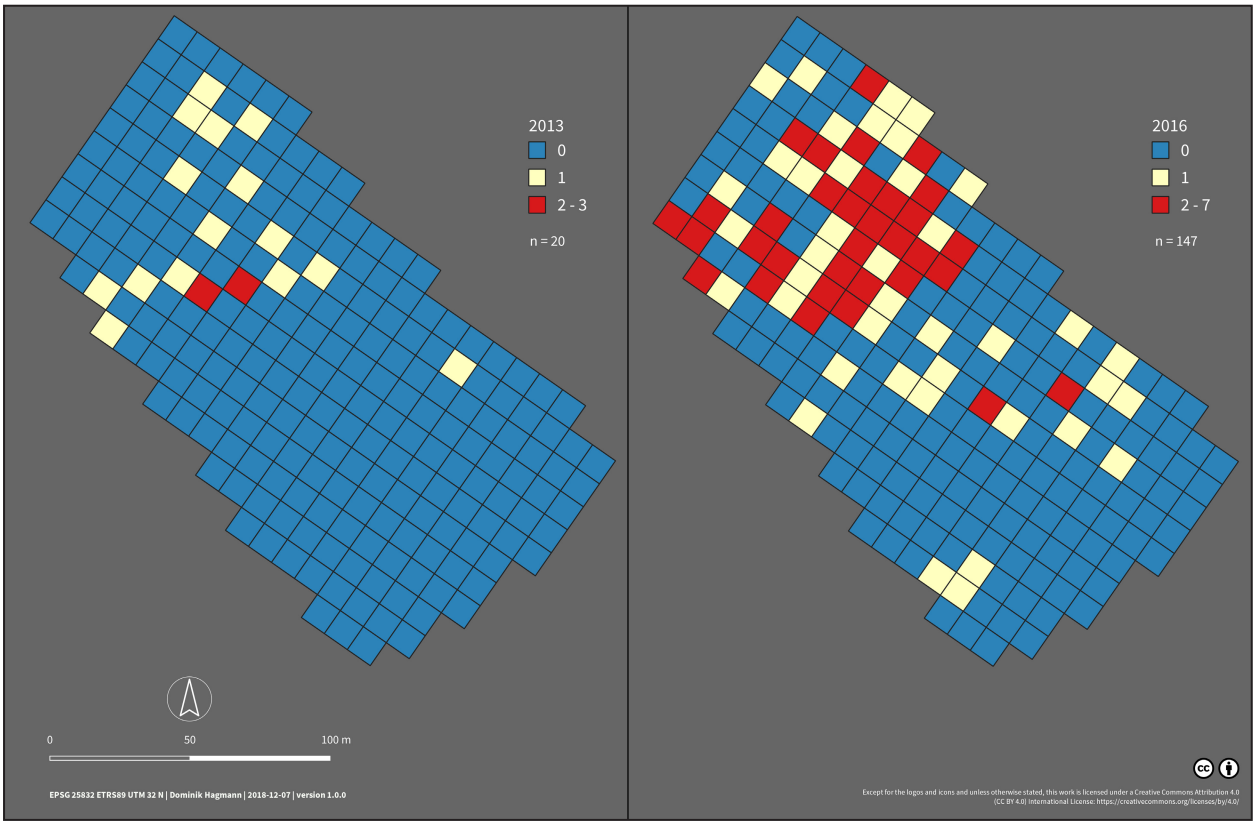

Fig. 9 Distribution of finds: ancient pottery (D. Hagmann)

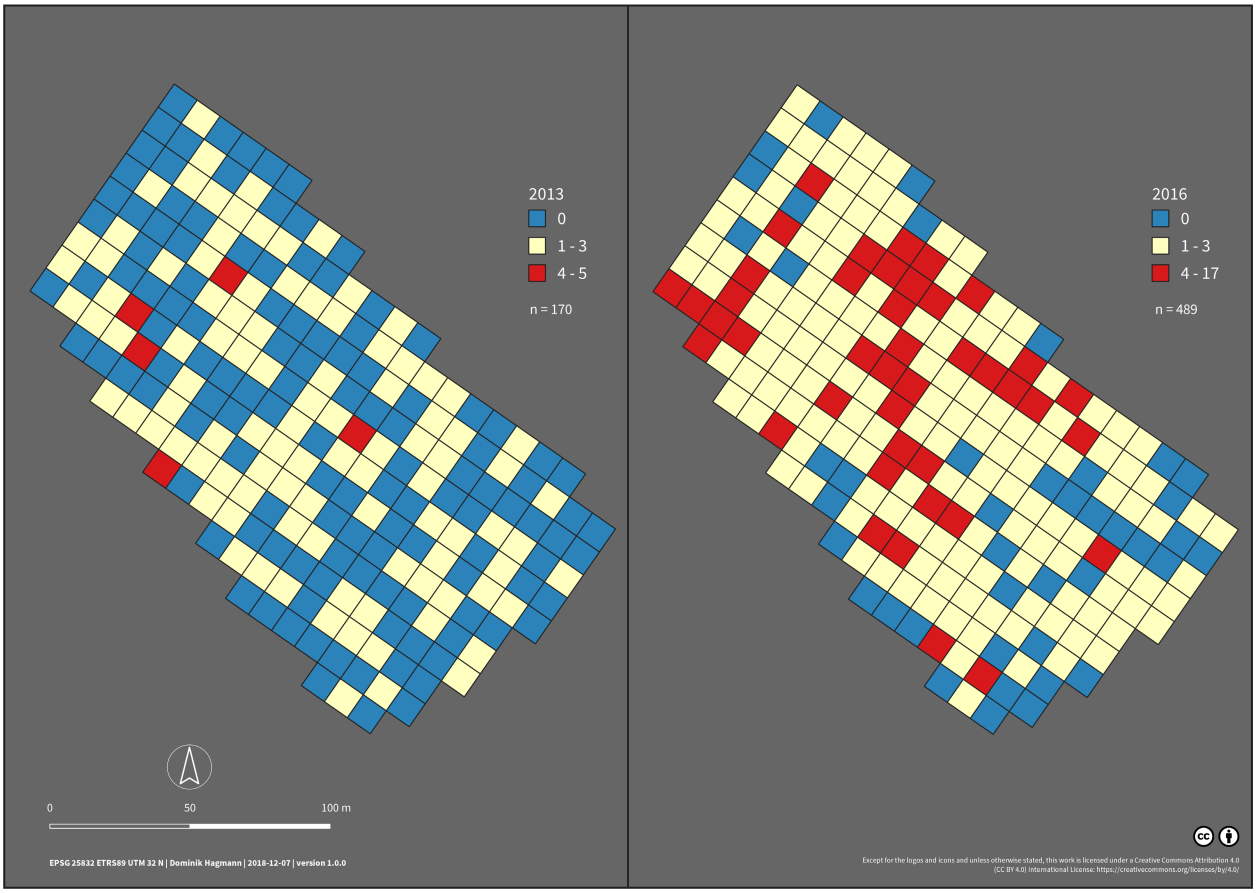

Fig. 10 Distribution of finds: modern pottery (D. Hagmann)

tiles in 2016 are recorded (fig. 7).[21] If the distribution of sherds is mapped, a more diverse picture is revealed – both in terms of differences between the two surveys and differences in the distribution of tiles (fig. 8). That may be caused or influenced by the smaller number of sherds found, but if the data are analysed more closely they also become more instructive.

As already mentioned the differences between the 2013 survey and the 2016 survey in terms of pottery found are much stronger, to the extent that it is difficult to see common characteristics. The picture based on the finds of 2013 is very patchy and it is difficult to recognize a meaningful pattern. The results of the 2016 survey show a strongly differing result mostly caused by the much higher number of finds. So the map is more 'uniform' indicating more fields with more sherds found. At first glance no clear concentration can be discerned, and the red fields with the most finds extend over almost the entire field, namely the north-western and middle part. That seems to be in marked contrast to the distribution of artifacts and tiles where a clearer concentration on a smaller part of the field has been noted.

The picture, however, becomes much more consistent and fitting when the modern pottery is filtered out and only the ancient pottery is mapped (fig. 9). Looking at those maps the concentration of finds with which we are already familiar in the north-western part of the field

21 Unfortunately in 2013 no distinction was made between ancient and modern/recent tiles.

can be recognized. The concentration of the 2016 map shows not the same high numbers as those based on finds of all artifacts and tiles, but it is clearly remarkable even if two fields with more pottery finds lay in the south-east of Molino San Vincenzo. In contrast, the 2013 map is clear-cut in indicating a finds maximum in the familiar area although it is based on a very restricted number of pottery finds. Thus it is only the distribution of the modern pottery which obscures the results and in fact both the 2013 and 2017 maps show a completely random distribution (fig. 10).

Molino San Vincenzo as a case-study is also designed to assess the validity and reliability of the survey results because further methods of investigation were implemented.[22] Molino San Vincenzo is especially apt for answering or at least discussing questions concerning the possibilities of site detection, site extent and site interpretation based on survey results.

5 Comparing the Methods: Survey and Shovel Tests

One of the most important questions posed is how representative are the finds made on the surface during the surveys in terms of distribution and extension. The answer is directly related to the relation between surface finds and sub-surface finds.[23] In order to consider this question (and to address the drawback of limited visibility) already in 2013 a shovel test was performed.[24] In total 11 pits with a diameter of 1.1 m and a depth of 40 cm were dug. It was therefore guaranteed that only the plough horizon from which the survey finds also originated was touched. With the given measures each pit contains a volume of ca. 200 litres of soil. The test pits were placed in a row and at a distance of 20 m, thus extending over a length of 200 m, which is the length of the entire field.

For the number and category of finds made during the shovel test a clear-cut result is obtained (fig. 11): the greatest number of finds in the subsoil were made in pit TP 30+40 – and so by far the largest circle – located where also the densest distribution of artifacts on the surface has been registered. The adjacent pits on both sides (TP 30+20 and 30+60) yielded an elevated number of finds. Subsequently, the quantity of material decreases sharply and at pit 30+80 reaches a level which remains stable till the end of the field. In terms of find categories, ancient pottery is found only in the pits 30+20 and 30+40, whereas modern pottery and tiles are more widespread. These observations corroborate the results from the surveys conducted both in 2013 and 2015. The stated close relationship between surface assemblages and plough zone assemblages confirms the observations made at Il Monte some years ago[25] and shows that, in general, the surface record is a sample of the plow-zone artifact population.[26]

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22 For an example of a similar methodologically broad investigation and discussion of methods: Faust – Katz 2012.

23 See Schörner 2012. C. Haselgrove (1985, 10) requires case-studies to detect the relation between the different kinds of populations.

24 Methodological discussion of shovel tests: Nance – Ball 1986; Kintigh 1988; Nance – Ball 1989; Shott 1989; comparison of surface surveys and shovel tests: Faust – Katz 2012.

25 Schörner 2012, 38s.

26 Shott 1995, 476.

Fig. 11 Results of the shovel tests 2013 (D. Hagmann)

6 The Site Molino San Vincenzo as Seen by Surveys

The following questions touch on the distribution of the artifacts and thereby the problematic concept of site.[27] Even if we are absolutely aware of the problems connected with the term 'site' to describe the high-density zones, we are confronted with the question of what high-density means.

Looking at the numbers of the ancient artifacts found during the 2016 survey which are used because of the higher find numbers, a very uneven distribution emerges, as is indicated by a low median of 4 artifacts and a high mean of 17.88. These statistical values indicate a small number of squares with many finds in contrast to a large number of squares with only a few finds. Following the customary approach for interpreting survey results that means that (1) it must be unambiguously distinguished between a site with a relatively high density of finds and an off-site area with a low density, and (2) that 'smearing' of artifacts or the so called halo effect, as observed in various other surveys, does not really matter.[28] The clear clustering of finds at Molino San Vincenzo facilitates the spatial definition of the site. Thus, all the fields with more than the average find numbers (≥ 18) form an almost contiguous area which can be considered as 'site'. The densities, however, are not very high: although we observe a maximum of 1.9 artifacts per sqm as the peak, the site Molino San Vincenzo regularly shows densities of less than 1 artifact per sqm and therefore very low numbers in comparison to the yields of surveys in the Eastern Mediterranean.[29] It is therefore of great importance to take relative contrasts in find densities into account and to consider not only quantitative aspects but also qualitative aspects of the surface record as highly significant.[30] Thus, a high value of the tile-pottery-ratio indicates a building as is the case at Molino San Vincenzo.[31]

The reliability of the survey could be assessed by geophysical prospections conducted in 2013 and 2017.[32] It is possible to correlate the extension of the site as defined by the surface scatter with sub-surface structures. By means of the geomagnetic measurements, the heavily damaged remains of a building complex measuring 60 m long and 50 m wide could be detected. According to the geomagnetic measurements the building stood exactly in the area where the highest densities of surface material were detected by the surveys. When the heat-maps of

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27 Definition of the term: Plog et al. 1978, 389; Gallant 1986, 416; Wagstaff 1991, 9f.; Menchelli 2008, 33s.; problem of the concept addressed by: Schiffer et al. 1978, 14; Cherry 1984; Gaffney – Tingle 1984; Dunnell 1992; Wandsnider – Camilli 1992; Shott 1995, 476s.; Winther-Jacobsen 2010, 39.

28 Smearing is mainly caused by modern agricultural practices like tilling: Lewarch – O'Brian 1981; Odell – Cowan 1987; Yorston et al. 1990; Boismier 1997; cf. also Winther-Jacobsen 2010, 34-36. The halo as a gradually declining density zone around sites is explained as the result of mostly ancient activities like waste disposal, garden culture and infield spreading of manure : Hayes 1991; Bintliff – Howard 1999; Bintliff et al. 2007, 23-26; Waagen 2014, 418s.

29 For examples and discussion: Schörner 2017, 178-180. For a rural Italian example: Waagen 2014, 421 (5 sherds/sqm).

30 See n. 19; cf. also Fentress 2000, 48.

31 The value is 3947/147 which equals 26,85. For the tile-pottery-ratio Bintliff et al. 2007, 39; Tol 2012, 146; fundamental: South 1977, 31-45.

32 See the contribution of K. Freitag in this volume.

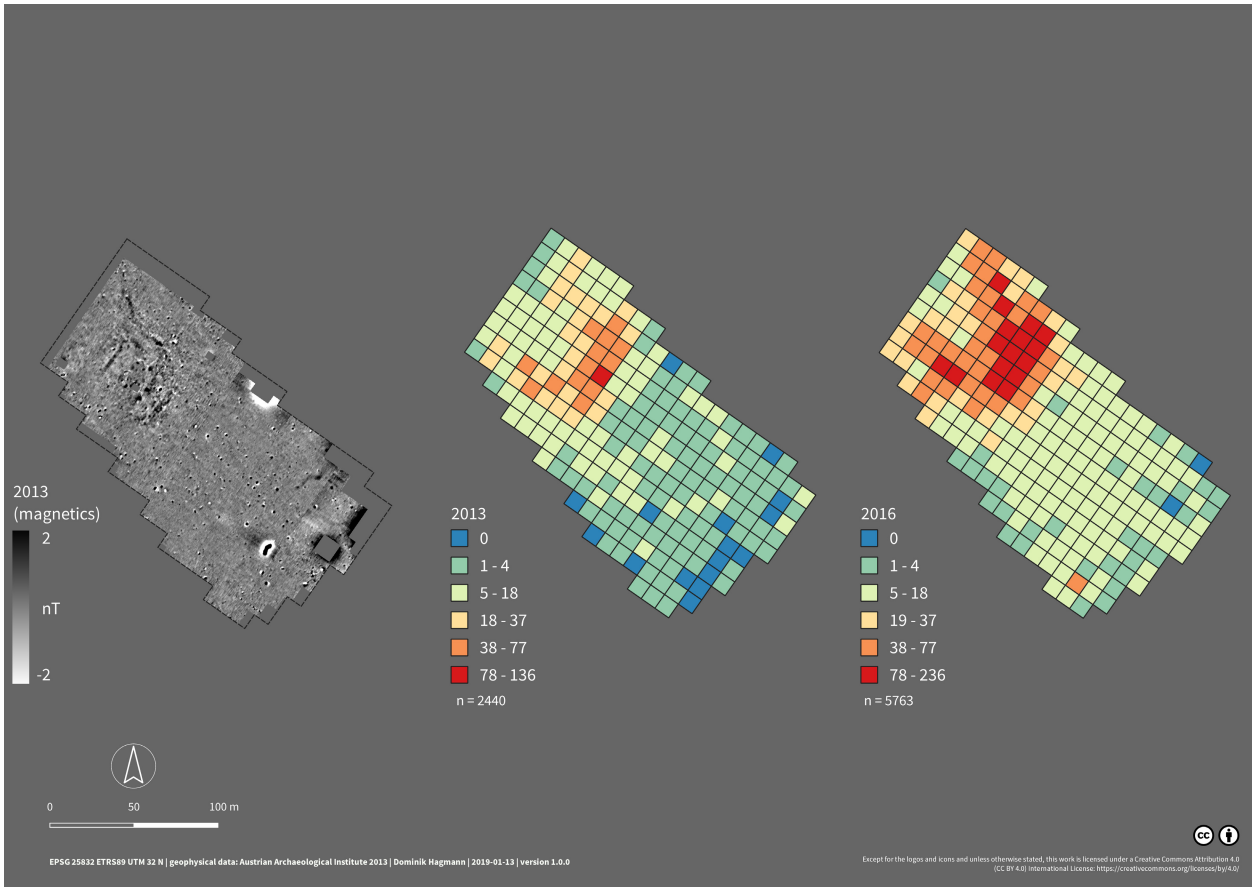

Fig. 12 Compilation of the results of survey and geomagnetic prospection (D. Hagmann)

the surveys and the measurements of the geomagnetic prospections are juxtapposed both data sets match perfectly (fig. 12).

Presuming that the underlying structure is the origin of the surface finds, it is surprising that the dispersal of the artifacts on the surface is not as widespread as might be suspected even if some tiles were transported all over the field as could be seen by the test pits. Especially lateral movement of tile and pottery fragments caused by tillage is not so great that the ancient patterning is heavily disturbed, considering that the building structure detected by geophysics has an extent of around 3000 m2 and the scatter – depending on the criteria for site definition – one of ca. 6000 m2.[33] The question as to what we detected in Molino San Vincenzo is much more difficult to examine by survey results alone. Site classification is one of the most difficult and loaded problems, especially if a distinction should be drawn between the designation as a farmstead or as a villa.[34] In the case of Molino San Vincenzo no equivocal result can be achieved if we use the site classification schemes of other surveys in Italy (tab. 1).[35]

33 Calculated from 60 fields with 18+ ancient artifacts found.

34 Ikeguchi 2000, 8–11; Viitanen 2010, 23-25; Witcher 2012.

35 Information is taken from Viitanen 2010, 24 tab. 2.1; Witcher 2012, 19 tab. 3; Bowes et al. 173 n. 9 (with further references)

Project	Scatter size	Qualitative Attributs
Roman Peasant Project	10000-30000	abundant ceramic, presence of luxury architectural remains
South Etruria	av. 3500	building rubble, hypocausts, cisterns, bathhouses, columns, glass, etc.
Liri Valley	>2200	building evidence; plaster, marble, mosaics; fine wares
San Giovanni	small: 2000-5000; large: >5000	-
Northern Campania	-	stone/tile built structure; differentiated functional and residential areas; wall paintings, mosaics, stone revetments
Albegna Valles	>2500	traces of architectural complexity (e.g., cryptoporticus, decoration such as columns and mosaics)
Rieti Basin	-	Evidence for luxurious accommodation
Potenza Valley	most 3000-6000	great diversity of building materials; some signs of luxury (crustae, tesserae, fragments of columns, tubuli, etc.); greater variety of pottery (more fine and/or imported products)
Ager Venusinus Project	>1000	high quality materials (marbles, mosaics, etc.)
Via Gabina	-	architecture: platform, cistern, debris; decoration: wall paintings, stone revetments, mosaics; pottery: many classes
Ager Veientanus	-	architecture: cistern, bath, etc.; decoration: wall paintings, mosaics, stone revetments; pottery: fine wares
Biferno	>7500	building materials; various classes of pottery; glass, metal, etc.
Gubbio	large area	architecture: building stones, box tiles, columns; mosaics
Sicily	4000-6400	architecture: columns; mosaics
Molino San Vincenzo	5500-8000	no luxury architectural remains; very few fine ware sherds

Tab. 1 Villa site classification in Italian survey projects and the results of the Molino San Vincenzo survey (G. Schörner)

In general mostly two different categories were used for classifying a surface scatter as villa, on the one hand the more quantitative category of scatter size, which varies considerably from region to region (and survey to survey); and, secondly, the more qualitative category of finds' attributes which homogeneously emphasises the presence of luxurious architecture and furnishing. Based on those criteria, the survey of Molino San Vincenzo provides an ambiguous portrait, with a scatter size which meets or exceeds the villa criteria but with finds that did not indicate architectural complexity or luxury because fragments of marble revetments and wall paintings or tubuli were not found. The other investigations also do not help because the excavations yielded only a limited number of black and white tesserae and few segmental bricks for building columns. Even the ground plan which can probably be reconstructed based on the geophysical measurements is not clearly identifiable as a villa.[36] Thus the investigations at Molino San Vincenzo show the self-imposed dilemma of making a clear distinction between villa and farmstead, and show that such a dichotomy forced by recent stereotyped thinking

[36] For villa plans in Central Italy: Marzano 2007.

does not reflect the Roman reality.[37] The attribution to one settlement type even hinders a better understanding of historical processes and functions, as analysis is then sometimes limited to that classification, but classification is by no means explanation.[38]

Further questions regarding the finds assemblages shall be examined. For example, the question of how representative the survey finds are, in terms of composition and date compared to finds made in the plough soil and various earth-bound features, will be investigated. All these analyses may affect the assessment of the survey, but it can be stated that surface survey alone would have been a reliable method to detect and to locate the building complex of Molino San Vincenzo.

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[38] I thank the participants of the workshop, especially Kim Bowes, for encouraging me to abandon older survey interpretation schemes.

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Appendix 1

Results of the Surveys at Molino San Vincenzo (G. Schörner)

Grid 2013	Grid 2016	artifacts 2013	artifacts 2016	pottery 2013	pottery 2016	tile 2013	tile 2016	ancient pottery 2013	ancient pottery 2016	ancient tile 2016	ancient artifacts 2016
A-01	A-09	3	20	0	2	3	18	0	0	10	10
A-02	B-09	14	42	2	0	12	42	0	0	35	35
A-03	C-10	19	56	0	1	19	55	0	0	42	42
A-04	D-10	10	23	0	3	10	20	0	2	18	20
A-05	E-11	7	19	0	2	7	17	0	1	11	12
A-06	F-11	5	11	0	1	5	10	0	1	10	11
B-01	A-08	2	16	0	2	2	13	0	0	9	9
B-02	B-08	16	40	0	3	16	36	0	1	23	24
B-03	C-09	36	56	2	2	34	54	1	0	41	41
B-04	D-09	15	78	0	3	15	73	0	0	63	63
B-05	E-10	14	22	2	3	10	18	1	1	11	12
B-06	F-10	17	67	0	4	17	62	0	1	57	58
B-07	G-10	21	56	0	2	21	54	0	2	50	52
B-08	H-11	18	29	3	1	15	28	0	0	24	24
B-09	I-11	3	14	0	2	3	12	0	1	0	1
C-01	A-07	3	13	0	1	3	12	0	1	8	9
C-02	B-07	6	10	0	2	5	8	0	0	5	5
C-03	C-08	34	57	2	4	32	52	1	0	36	36
C-04	D-08	37	71	3	3	34	67	1	1	56	57
C-05	E-09	27	78	1	6	26	70	0	3	52	55
C-06	F-09	25	68	2	3	22	65	0	0	60	60
C-07	G-09	62	82	1	5	61	77	0	1	76	77
C-08	H-10	34	89	0	7	34	82	0	3	81	84
C-09	I-10	4	26	0	3	4	23	0	0	17	17
C-10	J-10	6	14	1	4	5	10	0	0	1	1
C-11	K-11	0	13	0	2	0	11	0	0	9	9
C-12	L-11	4	9	1	1	3	8	0	0	5	5
C-13	M-12	1	5	0	0	1	4	0	0	3	3
D-01	A-06	2	4	0	0	2	4	0	0	3	3
D-02	B-06	1	22	1	1	0	21	0	0	18	18
D-03	C-07	20	21	0	2	20	19	0	2	17	19
D-04	D-07	10	76	0	4	9	72	0	2	45	47
D-05	E-08	20	49	1	2	19	47	0	1	36	37
D-06	F-08	46	192	1	10	44	181	1	5	172	177
D-07	G-08	77	181	0	10	74	169	0	3	152	155
D-08	H-09	46	210	2	11	44	199	0	5	186	191
D-09	I-09	15	49	2	7	12	42	0	1	25	26
D-10	J-09	12	19	1	5	11	14	0	2	7	9
D-11	K-10	1	19	0	3	1	14	0	0	2	2
D-12	L-10	3	5	1	2	2	1	0	0	0	0
D-13	M-11	5	18	1	7	4	11	0	0	4	4
D-14	N-11	5	12	3	2	2	10	0	0	2	2
D-15	O-11	7	18	1	5	6	13	0	1	1	2
D-16	P-11	3	6	0	1	3	5	0	0	1	1
D-17	Q-12	4	3	0	2	4	1	0	1	1	2
D-18	R-12	3	6	1	2	2	4	0	0	2	2
D-19	S-12	0	4	0	0	0	4	0	0	0	0
D-20	T-11	3	0	0	0	2	0	0	0	0	0
E-01	A-05	13	11	0	1	13	10	0	0	4	4
E-02	B-05	8	17	0	1	8	16	0	0	14	14
E-03	C-06	16	36	0	5	16	31	0	1	28	29
E-04	D-06	16	24	1	2	15	21	1	1	16	17
E-05	E-07	19	72	2	5	16	67	0	2	64	66
E-06	F-07	32	110	5	21	26	88	0	4	79	83
E-07	G-07	68	156	1	6	67	150	0	4	131	135
E-08	H-08	50	236	1	11	49	224	1	5	175	180

E-09	I-08	6	53	0	10	6	43	0	7	26	33
E-10	J-08	7	26	1	7	6	19	1	5	3	8
E-11	K-09	1	15	0	5	1	9	0	0	6	6
E-12	L-09	3	18	0	6	3	11	0	0	6	6
E-13	M-10	2	10	1	5	1	4	0	0	3	3
E-14	N-10	4	16	0	6	4	10	0	0	8	8
E-15	O-10	2	15	1	2	1	13	0	0	9	9
E-16	P-10	6	14	2	4	4	10	1	0	3	3
E-17	Q-11	3	16	0	2	3	14	0	1	6	7
E-18	R-11	3	5	1	2	2	3	0	1	1	2
E-19	S-11	1	8	0	2	1	6	0	0	4	4
E-20	T-10	2	5	2	0	0	5	0	0	0	0
E-21	U-08	1	3	0	1	1	2	0	0	2	2
E-22	V-05	6	4	0	1	5	2	0	0	1	1
F-01	A-04	12	6	0	2	12	4	0	0	3	3
F-02	B-04	8	26	2	0	6	26	0	0	14	14
F-03	C-05	13	30	0	1	12	29	0	0	28	28
F-04	D-05	10	18	1	0	9	17	0	0	16	16
F-05	E-06	6	42	0	2	6	39	0	0	39	39
F-06	F-06	27	54	2	4	24	48	1	1	40	41
F-07	G-06	64	129	1	5	62	123	0	2	121	123
F-08	H-07	136	83	2	4	134	79	0	1	77	78
F-09	I-07	13	43	1	7	12	36	1	3	20	23
F-10	J-07	6	10	0	1	6	8	0	0	6	6
F-11	K-08	2	4	2	1	0	3	0	0	2	2
F-12	L-08	4	6	0	3	3	3	0	0	2	2
F-13	M-09	2	8	0	2	2	6	0	1	3	4
F-14	N-09	3	5	0	3	2	2	0	0	1	1
F-15	O-09	1	11	1	1	0	10	0	0	3	3
F-16	P-09	4	12	1	3	3	8	0	2	5	7
F-17	Q-10	5	8	0	0	5	6	0	0	4	4
F-18	R-10	2	7	0	3	2	4	0	0	0	0
F-19	S-10	1	5	0	1	1	3	0	0	2	2
F-20	T-09	3	3	0	2	3	1	0	0	0	0
F-21	U-07	0	5	0	0	0	4	0	0	2	2
F-22	V-04	4	3	0	0	4	3	0	0	2	2
G-01	A-03	6	25	2	3	4	21	0	0	11	11
G-02	B-03	18	39	2	2	16	37	0	1	34	35
G-03	C-04	13	52	0	7	13	45	0	0	41	41
G-04	D-04	14	50	0	9	14	41	0	6	31	37
G-05	E-05	18	39	0	1	18	38	0	0	36	36
G-06	F-05	26	54	0	2	21	52	0	1	43	44
G-07	G-05	72	81	2	5	69	70	0	3	67	70
G-08	H-06	62	155	6	14	56	141	3	7	139	146
G-09	I-06	21	48	1	5	20	43	0	1	38	39
G-10	J-06	4	20	0	7	4	13	0	0	10	10
G-11	K-07	4	11	1	4	3	6	0	1	4	5
G-12	L-07	2	12	1	3	1	9	0	0	6	6
G-13	M-08	6	17	4	2	1	15	0	0	8	8
G-14	N-08	3	15	1	2	2	13	0	0	0	0
G-15	O-08	2	5	0	1	2	3	0	0	1	1
G-16	P-08	2	4	2	0	0	3	0	0	2	2
G-17	Q-09	4	14	0	1	4	13	0	1	6	7
G-18	R-09	3	4	0	0	3	4	0	0	1	1
G-19	S-09	2	2	1	1	1	1	0	1	0	1
G-20	T-08	1	0	1	0	0	0	0	0	0	0
G-21	U-06	0	3	0	0	0	3	0	0	2	2
G-22	V-03	11	8	1	3	10	5	0	0	0	0

H-02	B-02	10	47	1	5	8	42	0	3	35	38
H-03	C-03	20	48	0	9	20	37	0	1	31	32
H-04	D-03	14	93	1	6	13	87	0	3	72	75
H-05	E-04	50	90	4	5	46	85	0	4	85	89
H-06	F-04	35	74	0	3	35	69	0	1	67	68
H-07	G-04	41	51	3	4	38	47	1	2	34	36
H-08	H-05	33	40	2	3	31	37	2	2	37	39
H-09	I-05	48	31	0	3	48	28	0	1	24	25
H-10	J-05	25	20	0	4	25	16	0	0	14	14
H-11	K-06	2	6	0	1	2	5	0	0	2	2
H-12	L-06	3	10	2	3	1	7	0	1	7	8
H-13	M-07	4	7	0	0	4	6	0	0	2	2
H-14	N-07	5	15	2	6	3	7	0	3	1	4
H-15	O-07	6	15	2	2	4	13	0	1	3	4
H-16	P-07	2	12	0	1	1	10	0	0	2	2
H-17	Q-08	2	14	0	2	2	12	0	0	3	3
H-18	R-08	3	6	1	1	2	5	0	0	0	0
H-19	S-08	5	8	1	4	3	3	0	0	3	3
H-20	T-07	1	5	0	2	1	3	0	0	2	2
H-21	U-05	1	5	1	1	0	2	0	0	2	2
H-22	V-02	4	9	0	2	4	5	0	0	0	0
H-o1	A-02	3	26	0	3	3	23	0	0	18	18
I-01	A-01	4	34	0	6	4	27	0	2	22	24
I-02	B-01	20	31	2	7	18	20	0	2	14	16
I-03	C-02	6	18	1	6	5	11	0	0	6	6
I-04	D-02	22	40	3	5	18	34	0	0	28	28
I-05	E-03	53	38	5	4	47	34	1	2	33	35
I-06	F-03	26	35	0	4	25	30	0	1	25	26
I-07	G-03	19	61	3	5	16	55	0	3	54	57
I-08	H-04	24	23	0	4	24	19	0	0	19	19
I-09	I-04	14	16	0	1	14	15	0	0	8	8
I-10	J-04	10	17	2	1	8	16	0	0	14	14
I-11	K-05	4	11	2	5	2	6	0	1	5	6
I-12	L-05	6	12	1	5	5	7	0	1	1	2
I-13	M-06	2	11	0	2	2	8	0	0	2	2
I-14	N-06	2	9	0	3	2	6	0	0	1	1
I-15	O-06	2	8	1	0	1	7	0	0	2	2
I-16	P-06	1	17	0	2	1	14	0	0	10	10
I-17	Q-07	5	11	0	2	5	9	0	0	2	2
I-18	R-07	3	5	1	1	2	3	0	0	2	2
I-19	S-07	0	6	0	0	0	6	0	0	4	4
I-20	T-06	4	6	2	1	2	5	0	0	1	1
I-21	U-04	1	6	1	2	0	4	0	0	3	3
I-22	V-01	2	5	0	1	2	4	0	0	0	0
K-03	C-01	4	33	0	7	2	25	0	2	14	16
K-04	D-01	14	48	1	3	12	43	1	1	36	37
K-05	E-02	18	20	0	2	17	18	0	0	14	14
K-06	F-02	6	15	0	1	6	13	0	0	11	11
K-07	G-02	7	13	1	1	6	12	0	0	11	11
K-08	H-03	8	6	0	1	8	4	0	0	3	3
K-09	I-03	10	19	2	3	8	16	0	1	10	11
K-10	J-03	9	11	0	3	9	6	0	0	5	5
K-11	K-04	7	14	1	5	6	9	0	0	4	4
K-12	L-04	6	13	3	2	3	10	0	0	4	4
K-13	M-05	6	9	2	4	4	5	0	0	2	2
K-14	N-05	4	14	0	5	4	9	0	0	1	1
K-15	O-05	2	12	0	3	2	9	0	0	3	3
K-16	P-05	5	7	0	0	5	7	0	0	1	1

K-17	Q-06	4	16	1	3	3	13	0	0	8	8
K-18	R-06	3	8	1	0	2	7	0	0	6	6
K-19	S-06	2	3	1	1	1	2	0	0	0	0
K-20	T-05	0	3	0	1	0	2	0	0	0	0
K-21	U-03	0	3	0	1	0	2	0	0	2	2
L-05	E-01	9	37	2	3	7	33	1	0	32	32
L-06	F-01	7	18	1	1	1	16	0	0	12	12
L-07	G-01	7	8	1	5	6	2	0	0	2	2
L-08	H-02	5	10	1	1	4	9	0	0	3	3
L-09	I-02	4	1	3	0	1	1	0	0	1	1
L-10	J-02	10	6	1	0	9	6	0	0	5	5
L-11	K-03	9	16	1	3	8	11	0	0	10	10
L-12	L-03	4	7	0	2	4	4	0	0	1	1
L-13	M-04	6	7	2	1	4	6	0	0	3	3
L-14	N-04	7	7	3	3	4	4	0	0	2	2
L-15	O-04	0	9	0	2	0	7	0	0	2	2
L-16	P-04	1	7	0	2	1	5	0	0	4	4
L-17	Q-05	3	7	0	0	3	7	0	0	3	3
L-18	R-05	2	6	0	1	2	5	0	0	4	4
L-19	S-05	2	6	1	2	1	4	0	0	3	3
L-20	T-04	0	2	0	1	0	0	0	0	0	0
L-21	U-02	3	6	1	3	2	2	0	0	0	0
M-08	H-01	6	4	5	1	1	2	0	0	2	2
M-09	I-01	4	2	0	2	4	0	0	1	0	1
M-10	J-01	2	3	1	0	1	3	0	0	3	3
M-11	K-02	4	4	2	1	2	3	0	0	3	3
M-12	L-02	7	9	0	4	6	5	0	0	0	0
M-13	M-03	2	10	0	5	1	4	0	0	3	3
M-14	N-03	1	8	0	2	1	6	0	0	1	1