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THE DSC AUTHORITY FILE: A LINK BETWEEN FIELDWORK AND FINDS

1. Working on thousands of archeological finds

In this paper, the Soprintendenza Archeologia, Belle Arti e Paesaggio per la città metropolitana di Genova e le province di Imperia, La Spezia e Savona (SABAP-LIG) describes the activities of inventorying archaeological assets that have been carried out from 2017 to 2023, based on a years-long experience in the management of this type of data (Gambaro, Costa 2016; Barbaro, Costa, Cervone 2018). The activity was carried out through the 'in batches' inventory system ('inventariazione a lotti') based on the new MINP standard module, and led to the compilation of about 13,000 modules. Each module is a record describing either one archaeological find or one group of archaeological finds that are stored in the same container (crate, box, and similar) and share the same provenance (Istituto Centrale per il Catalogo e la Documentazione 2020). In 2017, the standard was in its early stage, with two separate versions for the single item (MINP 1.0) and the multiple items (MINP 2.0). SABAP-LIG was involved in the experimental phase, compiling 7000 records about the finds from the historical city center of Genoa, resulting from decades of urban archaeology. In 2023 a new, derived standard was released, under the acronym MINV (Istituto Centrale per il Catalogo e la Documentazione 2023), with some improvements and substantially adapted for the inventory recording of any cultural heritage item, not just archeological.

Since many archaeologists were involved in the data entry phase, it was necessary to maintain consistency not only about the description of archaeological finds but also about their provenance. The short description of archaeological finds is easily made consistent thanks to the usage of standardized vocabularies and *thesauri*, an excellent set of tools developed by the ICCD. Therefore, we chose the same approach with regard to the provenance of finds, adopting the DSC standard on a region-wide scale. The DSC (Archaeological Excavation) is an authority file developed by ICCD and part of the same set of standards as MINP, which allows the harmonization of data about the research activity that led to the discovery of the asset (Istituto Centrale per il Catalogo e la Documentazione 2019). Every find from the same excavation refers to the same DSC authority file. There is a second type of authority file, named RCG (Ricognizione) that is meant for describing field surveys, but this type of activity is not very common in Liguria as a whole. Authority files are separate from catalogue records, and in this case there is

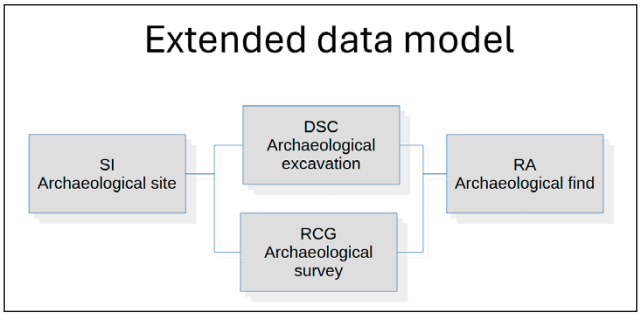

Fig. 1 – Schematic data model.

a one-to-many relationship between DSC and MINP/MINV records. Since DSC is not a record describing a cultural heritage item, but it describes an activity that is performed on archaeological sites or at least with archaeological methods, in some cases it is possible to create DSC records for which no finds are available, as in the case of some old excavations unfortunately. On the other hand, some finds are virtually 'orphan' as there is no specific information about their provenance and only a placeholder record can be linked. The introduction of the DSC authority file means that finds are not directly given geospatial coordinates for their provenance, nor linked to the record describing the archaeological site (in SI, MODI or MOSI standard) but there is a layer of added complexity, that makes more knowledge available about when their excavation took place, by whom and so on (Fig. 1). The activity of inventorying assets through the MINP module takes place on the SIGECweb platform. The DSC authority file must be compiled before the compilation of the MINP/MINV module, in order to be linked from the DSCH field (Fig. 2).

At the time of writing, the number of DSC authority files compiled on the SIGECweb platform for the territory of Liguria is about 400, out of a total of 1478 for entire Italy. Among the specifications that have been developed during this activity, the method is the one intended for assigning the unique DSC code. According to the ICCD standard, this code is a sequence of 8 alphanumeric characters that must be assigned by the local office (e.g. the Superintendency). While this allows for a large number of integer numbers to be used as unique identifiers, these identifiers are 'opaque' to the reader and difficult to manage when archaeologists with overlying tasks need to work in parallel. A proposal for an alternative 'structured' code was therefore devised, in which the first 4 characters of the DSC code correspond to the cadastral code of the municipality in which the excavation intervention is located (e.g. D969 for the municipality of Genoa) and the other 4 characters are dedicated to a specific numeric sequence for that municipality (Fig. 3). Starting in late

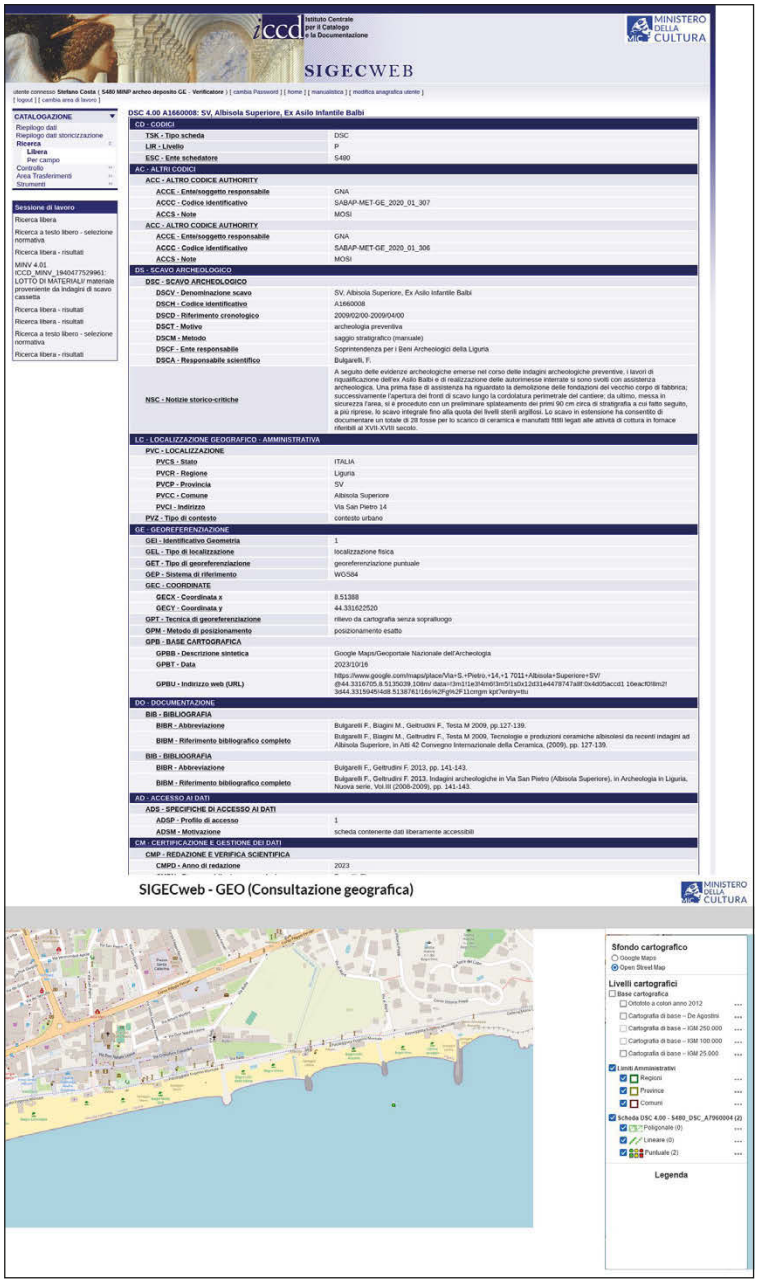

Fig. 2 – Screenshot of DSC editing in the SIGECweb platform. In the lower part, the geospatial view with the point in green.

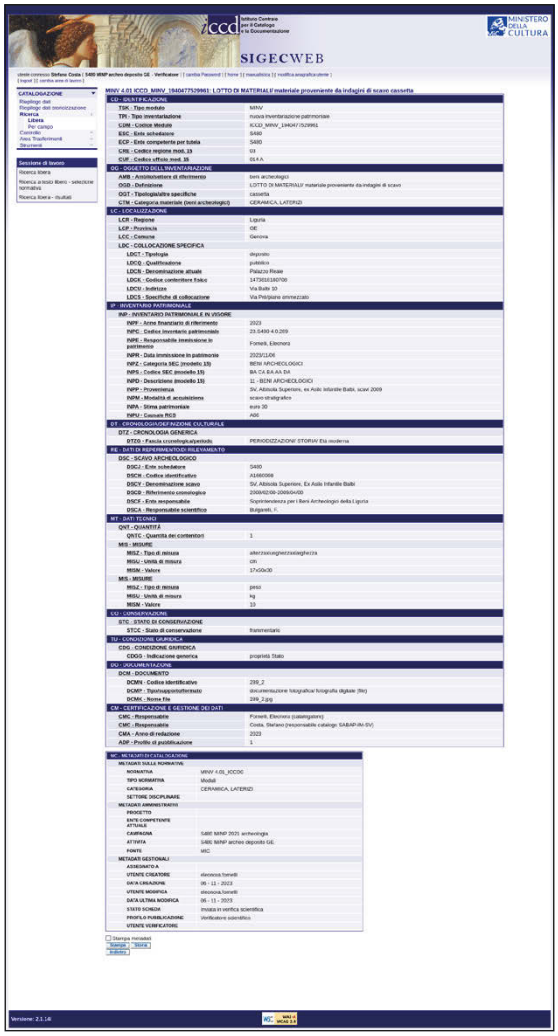

Fig. 3 – MINV record, showing the DSCH – Codice identificativo (8-character string): A166 cadastral code for Albisola Superiore municipality and 0008 progressive number.

2019, SABAP-LIG was split in two separate entities, each taking care of half of the Liguria region, nevertheless the activity continued along the same lines and with a common plan of digitization. The adoption of the structured code described above allowed the work to continue uninterrupted, since there were no new prefixes needed, and each Superintendency could continue adding new DSC records for the municipalities under their responsibility.

2. From depot to landscape and back

In 2019, in parallel with the inventorying of finds, SABAP-LIG participated in the experimentation on the collection and digitization of excavation data through GIS templates aimed at populating the National Archaeological Geoportal (GNA) (Calandra *et al.* 2021). Starting from version 1.0 of the template (released in April 2022), a layer for the DSC authority file was also included in the system and is now mandatory for all new excavations. The DSC layer is a multipolygon geometry, like other layers in the template (e.g. MOSI and RCG layers), so for each record there is one or more polygonal areas, as when multiple excavation pits are made according to the same project and with the same depth, and all data entry is made in a QGIS form that follows the same structure as SIGECweb (Gabucci 2024). Separate excavations at the same site can be described in full detail, each with the specific area, and a clear separation between the concepts of excavation and site is made, with the MOSI layers dedicated to sites and material remains in general (Fig. 4). This new feature made it possible to connect two parts of the 'data model' concerning archaeological assets that had so far been essentially disconnected from each other. The GNA data are publicly available, and all areas recorded as MOSI are part of the webGIS platform.

An example from the current dataset from the municipality of Albisola Superiore can show how all the various types of records are linked. The 2009 excavation in the area of the former Asilo Infantile Balbi is described by the authority file DSC A1660008. The record describes the archaeological evidence of 28 pits where discarded ceramics from the 16th and 17th century were buried, in the context of a large production center. In SIGECweb, the DSC authority file is only recorded with a point geometry (i.e. latitude and longitude coordinates). There are 8 MINV records linked to the A1660008 authority file, and each record describes a single container (in this case, a plastic crate) with multiple finds from the excavation. The DSCH field of each MINP/MINV record contains the 'foreign key' to the DSC authority, and other fields record in more detail the type of archaeological finds, their quantity, the current storage location and some metadata. On the GNA side, there is a mirror DSC record, where all the information is kept as aligned as possible with the existing SIGECweb record, and the DSCH value is the same (A1660008), but the geometry is a multipolygon and the exact area of excavation is recorded, not just a representative point. Furthermore, MOSI records can be attached to the DSC authority file when there are archaeological findings, as in the case of the former Asilo Infantile Balbi.

It is important to stress that the GNA platform was developed to be entirely interoperable with the existing ICCD standards, but there are some subtle differences regarding the DSC that affect data exchange. The DSCH

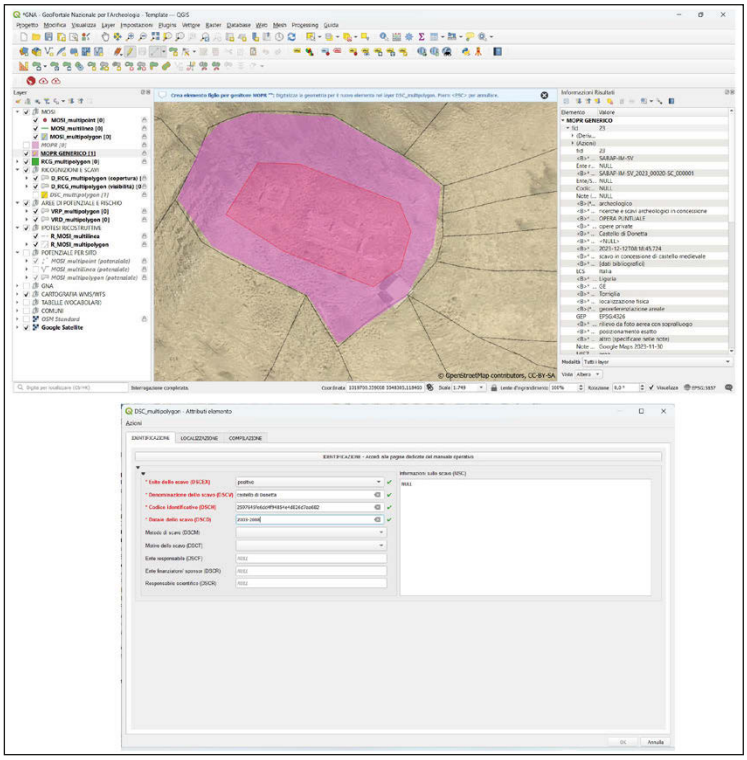

Fig. 4 – GNA QGIS template. Data entry of DSC record for the authority file.

field, already mentioned above, is automatically filled with a UUID-4 value, that avoids any complex work needed to ensure unique values across the entire national database, but the field size is longer than the maximum value allowed by the current standard and this choice partially undermines local efforts, requiring manual entry.

In the official specification of ICCD, the DSC authority file can be recorded in SIGECweb only as a point geometry: on the other hand, the GNA template allows to create a multipolygon geometry that fits more closely the nature of excavation at the detailed scale of documentation available. At the operational level, when new or existing records are edited in SIGECweb, it is possible to link from the archaeological site record (e.g. SI) to the DSC authority file, but not the other way around, and the geospatial coordinates can be effectively entered only as a point geometry. Convergence towards multipolygon geometries and universal unique identifiers seems the most promising approach.

Looking forward, there are other opportunities to improve the framework. Millions of catalogue records are publicly available on the public frontend at https://www.catalogo.beniculturali.it, including MINP and SI records that are exposed as linked open data. However, DSC is not shown at all, and while it is a relatively minor authority file, it would have a transformative effect, giving more relevance to the research activity rather than showing finds and sites as merely sharing a common geospatial location. The same kind of limitation applies to the GNA webGIS, too. From a general point of view, the main objective can be summarized as making the DSC a first-class object in the online viewers, since the data is already collected and recorded. A direct link between the GNA platform and SIGECweb is planned, but according to the current documentation it needs manual entry of DSCH codes in the GIS platform, a burdensome and error-prone operation.

3. Conclusion

In conclusion, the intervention of SABAP-LIG has led to significant improvements in the activity of inventorying archaeological assets, without developing new tools or standards, but rather consolidating good practice in the adoption of existing ones, year after year. The use of the DSC authority file made possible to harmonize information and to connect two parts of the 'data model' that had remained disconnected. The assignment of a unique 'structured' code has made the work of operators more efficient. Finally, the insertion of the DSC authority files in the recovery of previous information made possible to improve the quality of the data: the most common case is that of researchers who are interested in the study of material from past excavations. Since the current storage location is a result of previous research activity and even small archaeological sites have their finds dispersed in many different places, keeping track of the precise location and provenance is necessary, even though time consuming because of decades of neglect and late digitization.

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ABSTRACT

Starting in 2017, the Soprintendenza Archeologia, Belle Arti e Paesaggio per la città metropolitana di Genova e le province di Imperia, La Spezia e Savona (SABAP-LIG) began activities to inventory archaeological assets through the 'in batches' inventory system based on the new MINP standard module. The activity was carried out with funds allocated by the General Directorate and has continued annually until 2023, leading to the compilation of about 13,000 modules. Since the first experiment, the DSC (Archaeological Excavation) authority file, which has been developed among the ICCD authority file standards for a while, but used sparingly. It has been identified as a crucial element of the activity because it can be used as a link between catalogue of records describing finds (MINP, MINV) and records describing archaeological sites. Despite the relative simplicity of the data model compared to state-of-the-art initiatives in archaeology data modelling, still it allows an improvement in finds management and knowledge about archaeological heritage.