Chapter 2

MAPPING SAINTS: CREATING A DIGITAL SPATIAL RESEARCH INFRASTRUCTURE TO STUDY MEDIEVAL LIVED RELIGION

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THIS CHAPTER presents the ongoing project "Mapping Lived Religion: the Medieval Cults of Saints in Sweden and Finland" (MLR). It focuses on the project's development of a digital spatial data research infrastructure to answer questions about historical religious circumstances.[1] The project applies digital methods in order to achieve a greater understanding of medieval lived religion. The cults of saints have been chosen as the focus of this study as they reflect a particularly local character of the Christian religion. In addition, elements and traces left by veneration for the saints are an important part of cultural heritage, and many researchers have utilized these sources to study religious networks or aspects of cultural history. Often, however, the sources used have been limited to one type, or the data have been incomplete. The current project will provide digital access to a wide range of source categories, enabling more thorough interdisciplinary studies of the material. Another aspect, of direct relevance to this volume, is the importance of mapping these manifestations of devotion to the saints, thus anchoring our understanding of the past in the landscape.

In order to answer its research questions, the project requires a spatial data infrastructure—that is, an infrastructure for geographical information analysis that includes a combination of geographic, cultural heritage, and research data. MLR approaches the question of spatiality in terms of the geographical cultural landscape and the changes it experiences over time. Combining these two aspects allows for spatial and temporal analyses of the material. Thus, combining static spatial information with other details to create rich spatial information leads to better conclusions and more detailed knowledge about the period.[2] This project uses location-based data, both that created by

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1 It represents a local or micro-infrastructure. This concept is discussed below.

cultural heritage institutions and that which we ourselves create for relevant religious places.

The following sections provide a short introduction to the project and its digital methods, with a particular focus on those related to digital spatial data. In order to demonstrate how these methods have been applied, we present several case studies related to the research platform's mapping component and how we structure our research data. All of them explore how we approach the spatiality of lived religion—that is, mapping the cults of saints. Two of the cases in particular investigate questions of visualizing time and place. Throughout, and in a concluding discussion, we also consider the challenges that this ongoing project has faced.

Project Description

The MLR project is developing a comprehensive, online, open-access database of art historical, archaeological, and historical documents, with an interactive map.[3] The resulting research resource will be one of the project's principal publications.[4] The method applies the principles of linked open data (LOD)[5]—and thus is also part of larger national research macro-infrastructures, including Swedish Open Cultural Heritage (SOCH)[6]—and it is connected to the field of digital spatial humanities in its mapping component. In addition, we use existing cultural heritage data, and by the end of the project we will publish our data in, for example, SOCH. As the international heritage e-research PARTHENOS ("Pooling Activities, Resources and Tools for Heritage E-research Networking, Optimization and Synergies") project describes it, digital scholars are encouraged "to think of infrastructure as knowledge, as networks, as people, as tools, as data, and indeed perhaps as spaces as well, but always in the service of aggregating resources to make us better connected and more informed."[7] Moreover, using the term "infrastructure" to describe what we are creating indicates that our project is not just a

2 See a similar approach in Wrisley, "Locating Medieval French," 154. As Westphal states, "While it is still conceivable to isolate time from space, or history from geography, it seems intransigent or unwise to deliberately keep the two dimensions separate": Westphal, *Geocriticism*, 26.

3 The development of the platform and digital infrastructure is being done in collaboration with GRIDH at the University of Gothenburg. The project description section is based on previous project presentations and Ellis Nilsson, "Digital History."

4 The platform, Mapping Saints, can be found at https://saints.dh.gu.se (accessed April 16, 2021).

5 Linked open data will be presented in more detail below. See also a recent example of a project developing LOD vocabularies and identifiers for medieval studies projects in Finland, which is part of the Linked Open Data Infrastructure for Digital Humanities in Finland (LODI4DH), "a joint initiative of Aalto University, Department of Computer Science, and University of Helsinki (UH), Helsinki Centre for Digital Humanities (HELDIG), for creating a national data infrastructure and Linked Data services for open science." Hyvönen, "Linked Open Data Infrastructure."

6 Swedish Open Cultural Heritage Online, www.raa.se/in-english/digital-services/about-soch (accessed April 16, 2021).

7 PARTHENOS, "What Is Infrastructure?" https://training.parthenos-project.eu/sample-page/intro-to-ri/what-is-infrastructure (accessed April 16, 2021).

research project but also a process of developing a research tool (micro-infrastructure) to enable saints' scholars, and others, to use digital maps of lived religion in their own research.[8]

In essence, we are building a research "infrastructure" in what the HESTIA ("Herodotus Encoded Space-Text-Imaging Archive") project describes as a "bottom up paradigm."[9] This includes linking datasets, and in our project it also involves combining digital and traditional scholarship, as it applies technologies for the digital mapping and analysis of historical spatiality related to place and location while also critically analyzing sources such as texts and material culture. Thus, the project aims for sustainability in terms of its digital infrastructure in order to enable future research in this field by others outside the project group.

In a project that focuses on the past, questions of where and when are integral in order to enable research analyses. The landscape encompasses the Swedish medieval ecclesiastical province—that is, most of modern Sweden, excluding the provinces of Bohuslän, Halland, Blekinge, Skåne, and Härjedalen and some areas of Dalarna, but including Finland and the Karelian Isthmus (now part of modern-day Russia).[10] The timescape has been set from the year of the ecclesiastical province's establishment, in 1164, to the consolidation of the Swedish Protestant Reformation at the Uppsala Synod, in 1593. Thus, future visualizations will be of medieval circumstances in the region. In addition, due to the nature of the source material that we are collecting, analyses of material from the seventeenth and eighteenth centuries will also be possible.

As the research platform is modular, it will be possible to build on, combine, and add functions to the research platform. For example, other regions could be added to the map in order to study additional ecclesiastical provinces. The structure of the research platform enables collaborative work within the project and with its partners in real time, and involves the import, export, editing, analysis, and publishing of data related to the cults of saints. The project uses different types of datasets for geographical data: 1) places associated with objects (e.g., churches, ruins, sculptures, and books); and 2) places in narrative texts (e.g., miracle stories and letters).

The source material is the main foundation of the database. It is comprised of medieval texts and objects, early modern inventories, and descriptions by antiquarians, as well as medieval religious places.[11] The material is in different

8 This use can be seen to be related to Deb Verhoeven's definition of infrastructure, which is similarly applied by the Time Layered Cultural Map (TLCMap) infrastructural project; infrastructure provides "the conditions of possibility for certain types of activity." Thus, our resource aims to enable future research. See TLCMap, "What Is TLCMap and Why?"

9 HESTIA investigates geographical concepts using digital tools to study ancient texts, in particular, as the name suggests, Herodotus's *Histories*. Barker et al., "HESTIA"; ESF, "Researchers' Input."

10 For a discussion of the Finnish and Russian aspects of the project, see Fröjmark, "Helgon i Viborg."

stages of edition and digitization, from unedited to digitized. The major part of this source material cannot simply be downloaded. Thus, we need to do, and are already doing, an amount of editing within the project. Moreover, the project has enabled the digitization of two cultural heritage collections found at Statens historiska museer (the Swedish National History Museums: SHM) and Riksantikvarieämbetet (the Swedish National Heritage Board: RAÄ) respectively. These collaborations have digitized high-resolution images of Medeltidens bildvärld (Medieval Picture World: MB) and the analogue Ikonogafiska registret (Iconographical Register: IR). In general, the nature of the source material allows for interdisciplinary analysis in history, art history, and archaeology.[12]

Lived religion provides the project's theoretical framework for the exploration of lay religiosity and its manifestations in the daily lives of ordinary people. It is distinguished from the study of institutionally defined creeds and prescribed behaviour in that it focuses on "religion-as-lived"—that is, the attitudes, customs, and experiences of individuals. Its aim is to include in the understanding of religion the layers of everyday beliefs and practices that subtend and feed into the "explicit" religious life of a period. Religion is approached as a phenomenon that is embedded in the daily existence of people, being part of what they do rather than what they confess to believe.[13] It understands religion situationally, placing it in a social field within the domain of everyday life, practical activity, and shared beliefs. It is concerned with religion as cultural work: how people use it to construct their worlds and, in turn, are fundamentally shaped by the worlds they are making.[14] Textual and material sources for the cults of saints offer an excellent opportunity to study lived religion as it was practised by the learned and the lay alike. Calendars of saints' feast days, letters of donation to shrines, votive offerings, miracle stories, saints' images in church art, relics, pilgrim badges, and local traditions of holy wells are all testimony to the various forms that the cult of saints could take in the everyday life of the Middle Ages.

It is important to note that this chapter reflects a work in progress. Data collection is ongoing, and the database design and mapping are under development. Therefore, the visual aspects and digital methods and solutions as presented below might subsequently undergo modification. This chapter presents the state of the resource in the spring of 2022. Of the project's four main digital methods—LOD, digitization, digital spatial visualization, and digital transcription—spatialization is the focus of this chapter.

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11 For a discussion of some of the sources as used in this project, see Zachrisson, "Medieval Church Objects," and Ellis Nilsson, "Fragments of a Year."

12 For further discussion of the challenges of digitizing art historical material and including metadata for digital analysis, see Kieven, "Research Infrastructures."

13 Haakedal, "Lived Religion in Norwegian Pupils"; McGuire, "*Lived Religion*"; Orsi, "Introduction to the Second Edition."

14 Orsi, "Introduction to the Second Edition," xxxii, xxxvii.

Digital Methods

In keeping with this volume's focus on spatial data infrastructures, the project's methods related to spatialization—that is, how lived religion as expressed through the cults of saints is manifested in both time and geographical space—and the mapping component are discussed. The project's overarching and underlying infrastructure are both integrated into a larger research Infrastructure that is being developed by the Gothenberg Research Infrastructure in Digital Humanities (GRIDH), and that allows for the use of existing cultural heritage data and the publication of scholarly data as linked open data. This larger infrastructure is also responsible for the long-term availability and sustainability of data and integrated tools, and the necessary skills to maintain it. Thus, it is an institutional commitment rather than a commitment based on specific individuals. Each project on the platform is configurable according to its unique data model and specific analytical needs, such as working with the research questions related to the cults of saints as described above. This project is related to and builds on experiences previously made by others and members of this research group, which have built or are building spatial and ontological infrastructures. These include projects in the Pelagios network, the Digital Atlas of the Roman Empire (DARE), and Regnum Francorum Online.[15] Other, more recent, related projects include the World Historical Gazetteer (WHG) resource, discussed below.[16]

Our information model incorporates what we perceive is important when studying lived religion and how entities in the model relate to each other or are connected. At the centre of the model is the "Cult manifestation," which is the project's main analytical component. This term refers to when evidence for a saint's cult is "manifest", with a particular content, in a particular location, and during a specific period of time. For instance, it can refer to an object, a text, or a feature in the landscape that has been identified as having a particular connection to a saint's cult. Within "Cult manifestations," we have created "parent–child" relations in order to connect two separate, but related, manifestations.[17] The place of the "Cult manifestation" is in turn related to its physical location in the landscape and its jurisdiction in terms of parish and diocese, on the one hand, and secular authority, represented by province and kingdom, on the other. Places have a "Type of Place," such as cathedral, monastery, church, chapel, or holy well, but also town, port, or castle; these may not be related in themselves to a "Cult manifestation," but they are the parents of other places that have a manifestation. Other entities related to the "Cult manifestation" are the texts in which it is mentioned or the object in which it is observable. Texts and objects are, in turn, related to sources that help

15 See https://pelagios.org (accessed April 16, 2021); Åhlfeldt, "Digital Atlas of the Roman Empire"; and Åhlfeldt, Berman, and Wick, "Historical Gazetteer System Integration."

16 In addition, "Visualizing Medieval Places," a digital project mapping and locating places found in medieval texts, provides insight into historical, political, or geographical situations by visualizing data: Wrisley, "Locating Medieval French."

17 See below for examples.

organize the source material: digital, in printed editions, or in manuscript collections. To a high degree, this issue relates to the source material that has survived, or source material that is readily available, at least in certain groups of material. As stated above, the project aims to compile a vast majority of the sources relevant to the spatial and temporal framing of this project. The compilation of textual evidence is an important undertaking in the project, whereas the compilation of artefacts, to a large extent, is already available through digitized cultural heritage collections. This latter group is where LOD methodologies come into play, and the way it is organized within SOCH. The database model is illustrated in Figure 2.1.

LOD is a method for data exchange between information systems. By locally maintaining persistent identifiers (HTTP URIs) to external data objects, it is possible to retrieve data on that object, including a picture representation. Furthermore, linked objects need to be defined in the same or a similar way to ensure there is an identity between objects. The identity can be weak or strong. This means that the total amount of information, both in our datasets and in external datasets, is available for analysis. In this information model, scholars and curators of cultural heritage data have a distributed responsibility for the data, each party contributing data to the best of their professional abilities.

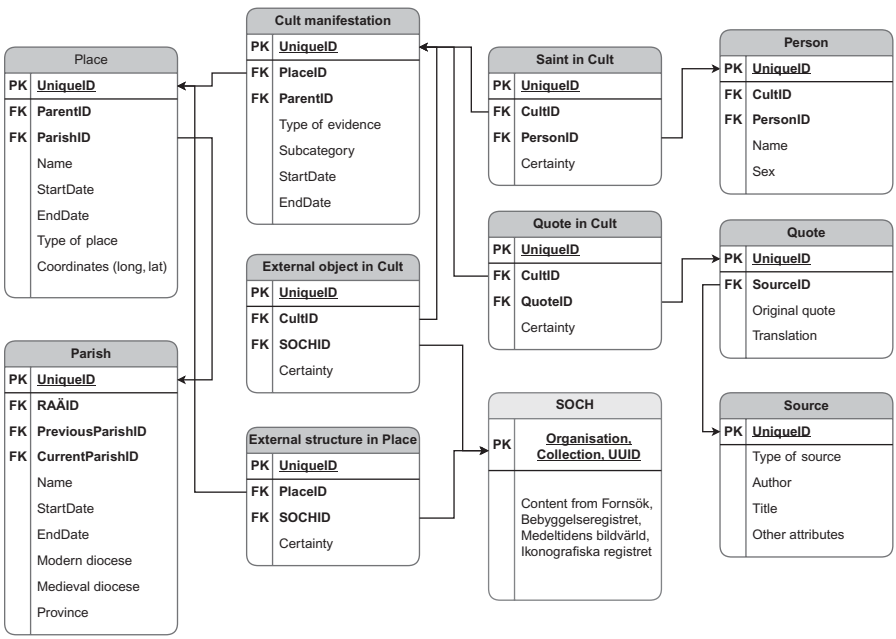

Figure 2.1. Database model of Mapping Saints (simplified). "PK" denotes primary key and "FK" denotes foreign key. Image by Johan Åhlfeldt.

Table 2.1 Medieval parish churches and origin of data in cultural heritage collections.

		Fornsök	
		Yes	*No*
BeBR	*Yes*	295	1564
	No	429	0
		724	1,564

Not only can objects be linked and shared, but also terminologies and vocabularies. Thus, the project uses authorities such as the Getty Research Institute's Art & Architecture Thesaurus (AAT) and Iconclass in order to make the data definitions talk to widely accepted scholarly vocabularies.[18] This way, the data can be used in future studies of the same areas.

In the area of medieval religious places, a great deal of work has already been done within cultural heritage collections. From the outset of this project, we realized that we would need to compile a register of all medieval cult places regardless of whether any cult activity could be attested in a specific place or not. The lack of evidence does not indicate that cults did not exist, only that we have no information about them. Although this compilation did not exist, there are various databases of religious places still in use in Bebyggelseregistret (the Swedish Protected Building Register: BeBR) and Fornsök (the archeological sites and monuments register) at RAÄ. Both registers have a very high coverage, and, in the case of Fornsök, in relation not only to archeological remains but also to sites mentioned in oral tradition or textual sources. The spatial coverage in both registers is very accurate too. Thus, the digitized geographical data for Sweden that we have used in the project is based on historical data available through BeBR and Fornsök, as well as in previous research. Our method involved extracting medieval cult buildings, parishes, holy sites, and their coordinates by means of semi-automated computer-aided processing, with minimal manual input by merging BeBR, churches still in use, and church and other related ruins in Fornsök. The outcome of the merging of the two datasets for parish churches is shown in Table 2.1.

There is a one-to-many relationship between the final register, which means that each record can have zero, one, or more references to existing cultural heritage entries in Fornsök and BeBR for Sweden; 295 medieval parish churches are defined in both BeBR and Fornsök, and 1,564 in BeBR alone. These references and their data are also available as LOD through SOCH. For the final selection of records in BeBR and Fornsök, all entries were checked manually. The initial work has therefore been complicated by the way in which these particular databases have been compiled and the fact that

18 See www.getty.edu/research/tools/vocabularies/aat/index.html and www.iconclass.org/help/outline (both accessed April 26, 2021).

the categorization provided has not always been consistent. For example, in Fornsök, the method involved selecting monasteries (*kloster*), churches/chapels (*kyrka/kapell*), and holy wells (*källa med tradition*) that belonged to our time period; we were aware, however, that most of the holy wells registered in Fornsök did not belong to the medieval period. In this database, holy wells are often assigned to a variety of categories, such as "Spring, traditional" (*källa, tradition*), "Natural object/formation with associated usage, tradition or name" (*Naturföremål/-bildning med bruk, tradition eller namn*), or "Well/cold spring" (*brunn/kallkälla*). In order to work around this challenge, all holy wells included in our database are attested in written sources and then selected from Fornsök.

In addition, church or chapel remains in Fornsök could have been built after 1600; therefore, we checked for these in the available sources. Not all of the archaeological remains of medieval churches and chapels are classified as such in Fornsök; 244 belonged to the type "Cemetery, type: deserted churchyard" (*ödekyrkogård*); twelve belonged to the type "Place with tradition"; fourteen belonged to the type "Memorial" (*minnesmärke*); and eleven belonged to the type "Village/farm site" (*bytomt/gårdstomt*). These were all added manually. As mentioned, points harvested from BeBR and Fornsök were automatically imported into the database, and these places are visualized on the map. Nonetheless, manual assessment of the data was required to ensure the validity of the resource and geographical data with regard to the specified landscape and timescape. Fornsök largely lacks information about archaeological remains within cities. In order to verify archaeological finds and ruins of medieval holy places in urban settings, the archaeological reports from the excavations and analyses of medieval towns in Sweden, the series Medeltidsstaden (the Medieval City) has been consulted.

Supplementing the references to BeBR and Fornsök, we have included URIs to Wikidata. Some church ruins even have their own entry in Wikidata. With these three independent references, we see no need for additional authority data on places and buildings. GeoNames, popular in some digital collections for LOD purposes, was not chosen as an authority reference for our religious places and buildings because of its poor coverage for our entities.[19] Another possible authority, Topografiskt register, Riksarkivet (the Topographical Register at the Swedish National Archives: TORA), is a digital, topographical register published online in 2018.[20] TORA has a mapping interface and a backend application programming interface (API) that serves LOD. Its unit of observation is the *settlement unit* in pre-industrial society, which is geographically defined as the midpoint in the landscape where its core arable land—of a village, farm, manor, or hamlet—is located. The settlement units of TORA spatially connect a number of important digital historical resources, such as the large-scale geometric maps from the seventeenth century, *Suecia antiqua et hodierna* (*Sweden Past and Present*), administrative data, and place-names. The importance of TORA for the MLR project is to see where people actually lived in pre-industrial society and how this might relate

19 See www.geonames.org (accessed April 26, 2021).

20 See https://riksarkivet.se/tora-english (accessed April 16, 2021); see also Karsvall, this volume.

to the cults of saints. Another benefit for MLR is to connect to TORA's digital sources. TORA is organized as LOD, and its data can be displayed within our interface. It remains to be resolved if and how TORA's settlement units will be referenced by our cult places, because they do not refer to the same entity.

The challenges in merging the two datasets from Fornsök and BeBR into a uniform dataset of medieval cult buildings, up to the year 1600, originate in their weaker temporal representation: almost non-existent in Fornsök, irregular in BeBR. For instance, there was a need to determine when a church was built if a later church contains part of a previous church on the same foundation. Dates for the construction of historical buildings are often available through BeBR and have automatically been imported and linked in the field "Date of construction (BeBR)," usually referring to when the current church was built, though not always. Other information had to be input manually, however, such as "Date, first indication" and "Date of destruction" for medieval buildings that share the same foundation as the current church and that are not included in BeBR, or for which previous research has a dating other than that found in BeBR. If the main parish church was originally situated in another location—a common occurrence in the Swedish material—it is not linked to BeBR but only to Fornsök. Moreover, all places need to be connected to a "ParishID" in our model; this means that, if a "ParishID" is missing, these locations do not function as they should in the database.

Another challenge has been to avoid duplicates in the project's merged register. To obtain a register with highly accurate temporal coverage for religious places and buildings, a great deal of manual processing of the data was required. Data on modern parishes (1950) to which these places belonged came with the original datasets. These modern data can be used as the initial building block for a register of medieval parishes. Nevertheless, the modern parishes do not reveal the medieval parish to which they belonged if it was different from the modern parish. To create an exhaustive register of *medieval* parishes another approach was necessary, and it included a good portion of computer-aided manual processing. Fortunately, Skatteverket (the Swedish Tax Agency) keeps a list of parishes that have existed throughout history, their origin, and their cessation as independent parishes.[21] This register is largely complete.

The addition of Finnish parishes and holy places is currently under way and under development. The method applied is as follows. Karl Gabriel Leinberg's genealogical study of the forming of parishes in Finland, published in 1906, is based on thorough documentary research, and serves as a tool for the project's reconstruction of the basic parochial organization of medieval Finland.[22] Leinberg's work contains information about "mother parishes" (*moderförsamlingar*),[23] the location of church and chapels, time of establishment, historical place-names, and modern names in Finnish and Swedish.

21 Skatteverket, "Sveriges församlingar genom tiderna."

22 Leinberg, *Finlands territoriala församlingars namn*.

23 If there are many chapelries in a parish, the one in which the parish priest resides is called a *moderförsamling* (mother parish) in Sweden.

From this multitude of information, it was rather easy to find the proper entries in the digital Finnish cultural heritage collections for archaeological objects at Kulttuuriympäristön palveluikkuna (the Cultural Environment Service Window: Kyppi) and Valtakunnallisesti merkittävät rakennetut kulttuuriympäristot (Built Cultural Heritage Sites of National Interest: RKY) at the Finnish Heritage Agency (Museovirasto: FHA).[24] The coordinates are very precise and each entry has a scholarly article written in Finnish or Swedish. Unlike the Swedish registers, Kyppi and RKY are not part of a LOD solution for data exchange, although the entries have persistent HTTP URIs.[25]

The geographical information system (GIS) of the project's platform consists of background (raster) and vector layers. The background layers are the topographic web map, a Web Map Service (WMS) from Lantmäteriet (National Land Survey), Sweden, and another topographic map, a Tile Map Service (TMS), from the National Land Survey of Finland. The vector layers include the borders of Swedish parishes (polygon layer) in 1950 and Swedish provinces derived from the parish layer by RAÄ. It will be possible to produce a vector layer of all the Swedish dioceses from the parish layer, but the MLR project has not yet implemented this feature. These layers do not exactly reflect the borders of medieval Sweden but can be used as an approximation. Medieval Sweden consisted of the dioceses of Skara, Uppsala, Växjö, Linköping, Västerås, Strängnäs, and Åbo (Turku), the latter now in Finland, all founded by 1230. The Viborg diocese, in the eastern part of Finland, was founded in 1554 at the end of the timescale of this project. To our knowledge, no available dataset of the borders of Finnish parishes exists. In addition, TORA settlement units could be retrieved as a vector layer and put on the map using a WMS from Riksarkivet (the Swedish National Archives).

Vector layers with historical information about "Cult manifestations" could be produced in real time from the database and outputted as a GeoJSON dataset to be rendered on the visual map. Locations for cult places are defined only in the database table "Place." From the "Place" table, additional information can be accessed about a particular place in other tables, such as parish, diocese, or from external sources that are linked (for instance, from Fornsök or BeBR), and what took place there: "Cult manifestations" and external resources that describe and depict cult objects. It is possible to produce any layer from the attributes of a "Cult manifestation" and its related tables, such as a saint in the "Person" table, and their attributes respectively. Thus, a vector layer of "Cult manifestations" of a certain kind could be produced, involving a group of saints and within a certain time period. This way, comparisons of cults between dioceses can be made, or comparisons between types of saints or the gender of saints.

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24 See www.kyppi.fi/palveluikkuna/portti/read/asp/default.aspx, www.rky.fi/read/asp/r_default.aspx, and www.museovirasto.fi/en (all accessed April 16, 2021).

25 For example, Helsinge Parish Church, northeast of Helsinki, has entries in both Kyppi and RKY. Note that the Swedish and Finnish version of RKY resides at different domains but with the same KOHDE ID: www.kyppi.fi/to.aspx?id=112.1000014825; www.rky.fi/read/asp/r_kohde_det.aspx?KOHDE_ID=1506; www.kulturmiljo.fi/read/asp/rsv_kohde_det.aspx?KOHDE_ID=1506 (all accessed April 16, 2021).

Study of change over time is also possible through the dating of "Cult manifestations." It could be visualized with different symbols or colours or as a map animation. All vector layers are interactive and connect to all data and images, both internal and external, related to the selected feature.

Spatialization and Lived Religion

Previous research in the field of mapping and analyzing historical phenomena includes that focused on place-names, myths, historical boundaries, and travel.[26] Recently larger projects, such as WHG, have emerged that aim to enable "spatial and temporal reasoning and visualization" in historical research.[27] WHG also has "a particular interest in annotating records concerning geographic movement, including individual journeys and expeditions."[28] These content and service providers hope to operate on a global scale. In our project, the geographical scale is smaller, while the research question provides a specific focus, but the aim—temporal and spatial analysis of a historical phenomenon—is similar. That space and spatialization offer an excellent opportunity to study lived religion in the past has also been highlighted in more traditional publications.[29]

A major task for the project is locating different sites of cult activity in relation to the saints in lived religion and incorporating them into our database as the aforementioned

26 There are a growing number of examples of projects working in this general area. For an example of mapping saints via their place-names, see Saints in Scottish Place-Names, https://saintsplaces.gla.ac.uk (accessed April 16, 2021). The Icelandic Saga Map is an interactive map of places in the Icelandic sagas, http://sagamap.hi.is/is (accessed April 16, 2021; see also Lethbridge, this volume). The Map of Myth, Legend and Folklore is an interactive map created partly via crowdsourcing and developed by English Heritage, https://mythsmap.english-heritage.org.uk (accessed April 16, 2021). Norse World is an interactive map developed by the "Norse Perception of the World" project to enable research into and visualization of foreign spatial references mentioned in medieval literature from Sweden and Denmark; see Petrulevich, Backman, Adams, Skovgaard Boeck, Holmlund, Marklund, Hartmann, Lecerof, and Ljungström, www.uu.se/en/research/infrastructure/norseworld and https://norseworld.nordiska.uu.se (both accessed April 16, 2021); see also Petrulevich and Skovgaard Boeck, this volume, and Petrulevich, Backman, and Adams, "Medieval Macrospace through GIS." Mapping travel is also addressed by using gazetteers, such as those of the ancient Greek world: Digital Periegesis, www.periegesis.org (accessed April 16, 2021; see Foka et al., this volume). Peripleo is a tool developed to explore data in time and space, part of Pelagios Commons; see Simon et al., "Peripleo." For an example of a simple approach to mapping travel and sanctity in an analysis of saints' legends, see Ellis Nilsson, "Not All Those Who Wander Are Lost."

27 WHG, "Introducing the World Historical Gazetteer." See also the Australian TLCMap project, which is developing strategies and tools to enable humanities scholars to use maps in historical research. Viewing change over time and "deep maps" are two of their key areas. See TLCMap, "What Is TLCMap and Why?"

28 WHG, "Traces."

29 See, for instance, Walsham, *The Reformation of the Landscape*, and Coster and Spicer, *Sacred Space in Early Modern Europe*.

analytical entity, "Cult manifestation." This task includes not only more obvious sites, such as churches, chapels, and monasteries, but also sites in the natural landscape that in one way or another had a connection to lived religion and the cult of saints. One such category of cultic sites includes holy wells and sacred springs. Locating these is often a challenge, since the landmarks and directions given in the sources are often vague. As mentioned, however, we use the data from Fornsök that provide locations, which significantly facilitates identifying these sites. Once the coordinates for the spring or well have been established and created as a place on the map, further information is added to the template, such as the dates of the first indication of the site and the level of certainty as to its location, after which "Cult manifestations" connected to the site are created. An example is "Helge Svens källa" ("Holy Sven's spring") in Arboga ("PlaceID" 4942).[30] At this particular spring, only one "Cult manifestation" is known: the patronage of St. Sven of Arboga, mentioned in a court record from 1459.[31] This is entered into the database as "Patronage > Holy well > Sven of Arboga" ("ManifestationID" 291), according to the category hierarchies described in Table 2.2.[32] At other sites, multiple manifestations may be added, such as votive offerings ("Prayers and devotional acts > Votive offering"), and erected crosses ("Cult objects > Cross").

There are also cases when an exact location for a site cannot be established due to the fragmentary state of the sources, which presents another challenge to the visualization of religious sites. The extant correspondence of King Gustavus I indicates that the construction of a chapel was under way in 1526 in the hundred of Mark, only to cease the following year by order of the king.[33] The chapel was dedicated to an otherwise unknown local saint, in this source known only as the "Holy maid", and the foundation of the chapel had been made possible by gifts and contributions from the local populace; see Figure 2.2.[34] We know only the hundred in which the chapel was being built, not the parish. This omission initially presented an obstacle, since our database is built around the concept of parishes, and all our cult places are tied to specific "ParishIDs," enabling communication with external resources and other databases. Therefore, we created a fictional parish designated as "Unknown" and belonging to the diocese in which the hundred of Mark is located, as well as its modern municipality. This invention of a specific "unknown parish" makes it possible to distinguish it from similar locations in other parts of the country where the parish identity is also unknown.[35] The coordinates for the "Holy maid" chapel were placed next to the traditional administrative centre of

30 See https://saints.dh.gu.se/place/4942 (accessed February 17, 2023).

31 *Arboga stads tänkebok*, 111.

32 See https://saints.dh.gu.se/cult/291 (accessed February 17, 2023).

33 *Konung Gustaf den förstes registratur*, 3:217, 4:79.

34 See https://saints.dh.gu.se/place/5483 (accessed February 17, 2023).

35 A similar "Unknown parish" can be found in the (modern) diocese of Härnösand: https://saints.dh.gu.se/parish/2701 (accessed February 17, 2023). In addition, the identifier "All parishes" is used for a diocese, such as, for instance, Skara.

Table 2.2 In the database structure, "Type of evidence" for "Cult manifestations" is divided into five categories. These are further divided into a number of more specific subcategories of which a selection is shown here; vocabularies are based on the Getty AAT authority where applicable.

Two database categories related to "Cult manifestations"		
Type of evidence → Type of evidence, subcategory		
Cult objects → Altar cloth, altarpiece, architectural sculpture, baptismal font, bell, book (other), candelabra, chalice, chasuble, collection box, cope, cross, crown, devotional image, liturgical book, monstrance, mural painting, panel painting, paten, pilgrim badge, processional banner, processional cross, pyx, relic, reliquary, sculpture, seal, stained-glass window, tomb, unknown object.	**Feast day** → Calendar, dating by feast day, feast of the dedication of a church, festival, *festum chori*, *festum terrae*, indulgence granted on a feast day, letter, liturgical celebration, market, unknown observance.	**Patronage** → Altar, chapel, chapel in church, church, guild, holy well, hospital, natural object, prebend, religious house, shrine, tower, town.
	Narratives → Legend, miracle, oral tradition.	**Prayers and devotional acts** → Adornment of sculpture, candle, devotional act, indulgence, letter of donation, liturgical celebration, physical interaction, pilgrimage, prayer, procession, runic inscription, supplication, votive offerings.

the hundred, but the "Location certainty" box is marked as "Unknown" in the record; see Figure 2.2.

Sometimes challenges with correlations and overlappings with our key concepts of landscape and timescape have arisen when cult objects have changed their location at some point during the period of investigation. A case from Offerdal parish in northern Sweden provides a clear example of this issue. At the very end of our timeframe, in the 1580s, three sculptures were moved from the parish church and reinstated in three woodland chapels, maintained solely by the laity—which very much actualizes our perspective of lived religion. The sculptures remained in these chapels until 1621, when the situation was brought up in court as a case of "idolatry," resulting in the sculptures being burned, the chapels demolished, and parishioners fined. Among other things, it was revealed that several people had been involved in making votive offerings to one of the sculptures mentioned above, an image of St. Lawrence placed in a chapel in Landön. For instance, a woman named Magdalene from the village of Åse had made a promise

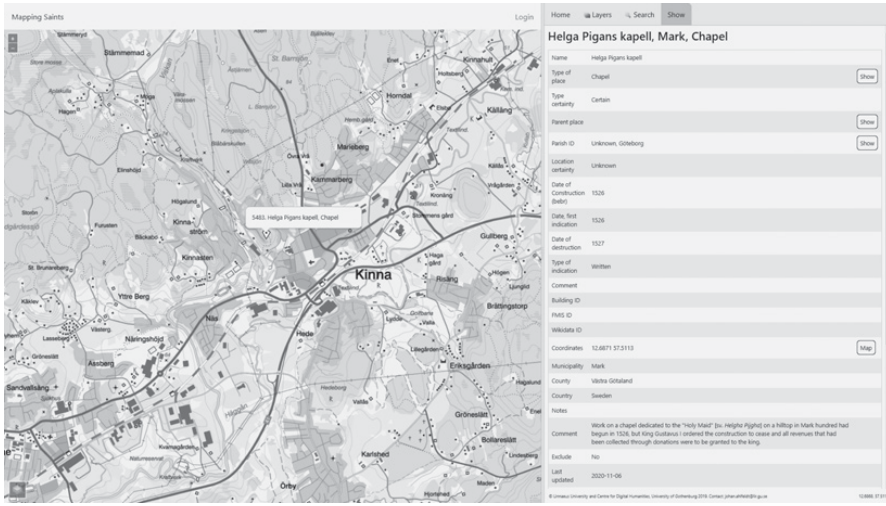

Figure 2.2. "PlaceID" 5483, the chapel of the "Holy maid" in Västergötland. Image by Sara Ellis Nilsson and Terese Zachrisson.

during a difficult childbirth to give something to St. Lawrence in Landön if her baby was safely delivered.[36]

In the case of this sculpture of St. Lawrence, there are several identifiable "Cult manifestations." First, the sculpture is added to the database as "Cult object > Sculpture > Lawrence." In its association with a particular saint, St. Lawrence, this model does not present a challenge; the challenge presents itself in the spatial and temporal sense. The sculpture needs to be added to the database in a sense that illustrates its spatial change over time: before about 1587 as placed in Offerdal parish church (PlaceID 2496), but after 1587 as placed in the Landön chapel (PlaceID 4716). As our definition of a "Cult manifestation" is that it is something that takes place in a specific location at a specific time, a manifestation cannot exist at more than one location at any given time. Thus, the sculpture in Offerdal parish church is considered a different manifestation of the cult of St. Lawrence from the sculpture placed in the Landön chapel, even though the manifestations are related to the same physical object.

In an attempt to visualize this relationship, the two manifestations of the sculpture of St. Lawrence are tied together in a hierarchical relationship: a parent "Cult manifestation." A copy of the post of the sculpture in Offerdal parish church (ManifestationID 2688) is entered into the database (ManifestationID 164), but with a different location (Landön chapel) and associated with a different time frame (1587–1621). Then, in order to

36 Zachrisson, "The Saint in the Woods," 8.

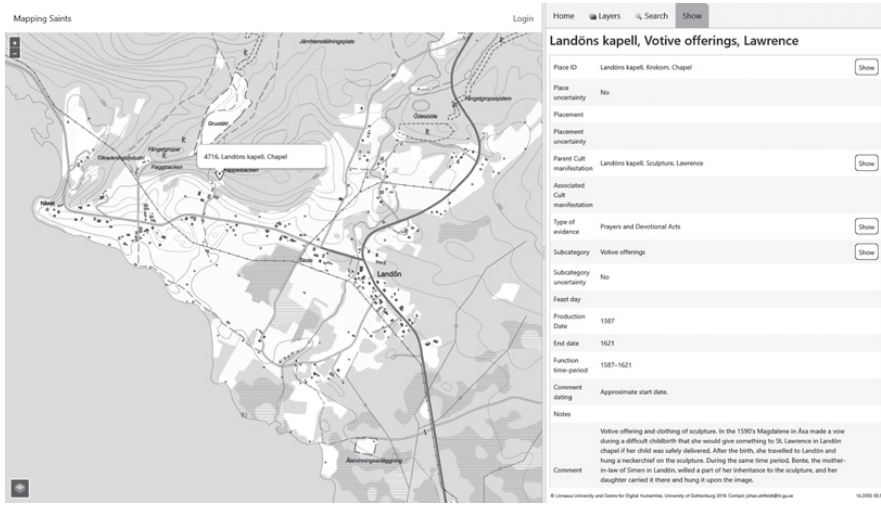

Figure 2.3. "Cult manifestation" #581, illustrating the votive practice associated with a sculpture of St. Lawrence in Landön chapel. Image by Sara Ellis Nilsson and Terese Zachrisson.

register the cult activity that took place in relation to the sculpture—that is, the votive practice—a second parent–layer connection is applied. Since we know only of this devotional practice from the period when the sculpture was placed in the Landön chapel, this manifestation ("Prayers and devotional acts > Votive offering > Lawrence") is tied to the second manifestation of the sculpture (#164), but not the first (#2688), as seen in Figure 2.3.[37]

Visualization of Miracles and Pilgrimage

The following section explores another central aspect of the project's application of timescape and landscape by discussing the movements of pilgrims. Lived religion in the medieval period was often a question of movements in the landscape by individual actors.[38] Some churches were especially attractive to pilgrims because of the presence of a saint's tomb, relics, or certain images that were regarded as miracle-working.

37 See https://saints.dh.gu.se/cult/164 and https://saints.dh.gu.se/cult/2688 (both accessed February 17, 2023).

38 These individuals belonged to all social groups and will be identifiable in the database as "Person (other)," "Type of living person", and—in a "Cult manifestation"—as "Role other person" (if not a saint).

Different categories of source materials are important for understanding the phenomenon of pilgrimage and its place in the landscape, such as miracle stories and pilgrim badges.

Miracle stories are stories told by pilgrims about the interventions of saints in situations of illness, distress at sea, troubles in childbirth, and many other difficult circumstances. In these situations, they, or the people around them, had turned to some saint and implored him or her for intercession before God. If they experienced relief in their situation, this appeal to the saint was followed by a pilgrimage to a shrine where the saint was venerated, usually the tomb of the saint. Help from the saints was also often sought directly at the shrines.

Miracle stories are thus a very important source material for the understanding of lived religion in the Middle Ages.[39] For our project, it is also important to know that many different places may be present in a miracle story.[40] Among them are the pilgrim's or *miraculé*'s home, the home of other people who act in the story, the shrine to which the pilgrimage is directed, and in some cases other shrines that were sought and/or places between which the *miraculé* made a voyage. As stated above, a number of places, typically at least two, figure in the miracle stories. In the following, examples of how we have dealt with multiple places within the same "Cult manifestation" are explored.

For instance, on May 18, 1407, Ingrid, a pregnant woman living near the bridge in Motala, was severely injured by a soldier for refusing to serve him a free drink. As a result, she was bedridden and the child in her womb was believed to be dead. The soldier evaded justice, but nevertheless made a vow to the Blessed Nils of Linköping to take the child to Linköping and make an offering if the woman was saved and her child born alive. Ingrid also promised to fulfil the vow even if the soldier did not. Ingrid improved and gave birth to a living child, and she made a pilgrimage to Linköping in the following year on the day of Apostles Peter and Paul (June 29, 1408). John, steward at the episcopal mansion in Vadstena, gave testimony and said that this was known by almost all of Motala parish. The deposition was made in the presence of Anund Markusson, vicar at the church of St Lars in Linköping.[41]

This dramatic story is rather uncomplicated when it comes to the places mentioned. Ingrid lived near the bridge in Motala. This location, as well as the circumstances of the events, makes it probable that she was an innkeeper. The vow

39 See Krötzl, "Parent–Child Relations," Österberg, *De små då*, and Myrdal and Bäärnhielm, *Kvinnor, barn & fester*, to mention just a few examples. A catalogue of miracle stories can be found in Myrdal and Bäärnhielm, *Kvinnor, barn & fester*, 133–54, and Myrdal and Bäärnhielm, "Katalog över nordiska mirakelberättelser".

40 On boundaries and identifying places in narrative sources in relation to "geocriticism", see Westphal, *Geocriticism*, 116–19.

41 "De miraculis S. Nicholai," 367–68.

was directed to the Blessed Bishop Nils Hermansson, whose tomb was in Linköping Cathedral, so this is where the pilgrimage was directed the following year. One more place is mentioned, namely Vadstena, since a steward of the episcopal mansion of this town gave testimony to the miracle. Such testimonies were required when miracles were written down. Anund Markusson, vicar at St Lars church, may here be ascribed to the cathedral since he is known to have served there as a recorder of miracles. The original vow-maker, the soldier, cannot be ascribed to any particular place other than Motala, where he may have been a temporary visitor. On our map we would therefore need only to plot "Motala bridge," "Linköping Cathedral," and "Vadstena" (the episcopal mansion).

Many other cases, however, involve neighbours or other bystanders, influencers, and vow-makers, who may also give testimony at a later stage, during the canonization process. In these cases, the presentation of the miracle includes more factors to consider, both temporal and spatial. A good example is the case of a forty-year-old man in Ask parish near Motala who was struck by grave mental illness in September 1473. The neighbours did not see any other choice than to lock the poor man up, but they also united in a vow to the Blessed Katherine. They promised that the man would make a votive offering of an ox if he was cured. This took place, and the man fulfilled his vow in March the following year, adding a mass in honour of the Blessed Katherine. This story is known only because it was retold by the people involved in the canonization proceedings in Vadstena on August 28, 1475. The man, Amund, and two neighbours from the village of Alma in Ask parish, who had participated in making the vow, then gave testimony.[42]

The presentation in the database thus includes the original miracle that was experienced by Amund in his home parish, Ask, around September 8, 1473; his pilgrimage to the tomb of the Blessed Catherine in Vadstena Abbey church, which took place around March 25, 1474 (or possibly 1475); and the testimony in Vadstena by Amund himself and two people from the village of Alma, Nils and Johan, on August 28, 1475. Furthermore, the donation for the celebration of a mass in honour of the Blessed Catherine is also a manifestation of lived religion that is included in the database; see Figure 2.4.[43]

The places mentioned in this miracle story are located within a short distance from each other: Ask parish in the northeastern part of the map (see Figure 2.4), where the miraculously healed person Amund had his dwelling; and Vadstena, near Lake Vättern, where the tomb of the Blessed Katherine was located. In future versions of the map, the road between them will be visualized.

Pilgrim badges, which are artefacts, are another important source material for evidence of pilgrimage. They were manufactured at the shrines that were pilgrimage

42 *Processus seu negocium canonizacionis*, 97.

43 See https://saints.dh.gu.se/cult/2582 (accessed February 17, 2023).

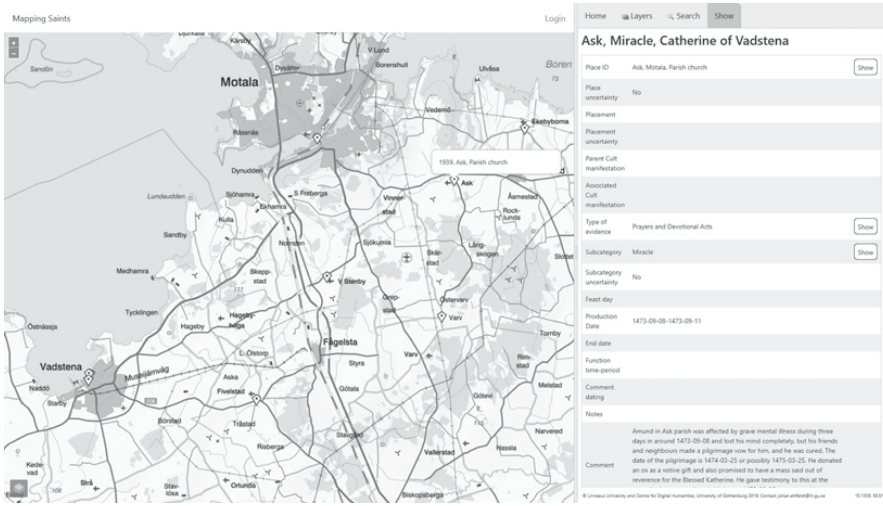

Figure 2.4. "Cult manifestation" #2582, a miracle of the Blessed Catherine of Vadstena. Image by Sara Ellis Nilsson and Terese Zachrisson.

sites and carried by pilgrims as a kind of souvenir. Some were attached to their clothes, and some were fastened on church bells in the pilgrims' home parishes.[44]

As stated, "Cult manifestations" that are related to each other need to have links between them in the database. These links may be either hierarchical ("parent–child") or non-hierarchical ("associated"). Discussions of how a certain connection should be classified are recurrent in our team. If, for example, a pilgrim badge from Vadstena Abbey is found in Källunge church on Gotland, a likely interpretation is that a person from Källunge made a pilgrimage to Vadstena and returned with this badge.[45] In the case of pilgrim badges, we have decided to input the pilgrimage to Vadstena as the parent "Cult manifestation," and the pilgrim badge as its child, since there would not have been any pilgrim badge had it not been for the pilgrimage. In the case of the miracle tales discussed above, it is instead the miracle that is the parent, since the pilgrimage to the tomb of the saint would not have occurred had it not been for the miracles.

The goal of pilgrimage associated with a certain pilgrim badge is not always known, but, with this reservation, every pilgrim badge generates at least two places on the project map: the place where it was found and the goal of the pilgrimage. A good number of the known pilgrim badges have not been found in archaeological excavations but

44 An overview of the state of research and a catalogue of the then–known pilgrim badges in present-day Sweden is found in Andersson, *Pilgrimsmärken och vallfart*.

45 Andersson, *Pilgrimsmärken och vallfart*, 30.

attached to church bells. In such cases, we consider the fastening of the pilgrim badge on the bell as its own "Cult manifestation," associated with the pilgrim badge. The pilgrim badge in most cases carries the image of a saint, and by fastening the badge on the bell, which is the property of the parish, this saint becomes in a way a patron for the whole parish, and not only for the person who made the pilgrimage. This "Cult manifestation" does not generate a new place, since it is identical with the finding place, but the "Cult manifestations" at this geographic location are two: a pilgrimage and the fastening of the badge on the bell.

Some Additional Challenges with Mapping Lived Religion

The above presents a clear picture of our methods in developing this spatial data research infrastructure and provides concrete examples of its application, as well as addressing some of the issues inherent in these specific methods. There are, of course, additional challenges when developing this type of research platform. This final section addresses those that have been encountered up until this point and some that we anticipate. In certain cases, it also proposes a number of possible solutions.

As stated, our project connects the field of digital spatial humanities with traditional humanities through its use of texts and material culture as sources and its goal of mapping where expressions of lived religion took place.[46] This interdisciplinary approach, particularly in terms of combining disparate source material, is exciting but also presents a number of challenges. One of these challenges has been to ensure that texts and objects are both of equal weight in the database and that these forms of evidence for the cult of saints can be visualized in their associated locations. Our solution has been to interpret how a source reveals an expression of a saint's cult—that is, a "manifestation" of a saint's cult: the aforementioned "Cult manifestation." These "Cult manifestations" are all connected to a particular location, either a point or an area, on the map, and they are all dated. In theory, each manifestation—connected to a specific, overarching "Type of evidence" and a more specific "Type of evidence, subcategory," plus a place and a date—will provide a way of analyzing the development of a cult of particular saints in both space and time.

As is clear, each manifestation relies on extant source material, which presents challenges in terms of which sources have been preserved and the unevenness of their preservation, both within and across source categories. Indeed, this inequality of preservation affects in turn future visualizations or analyses of locations or places associated with these entities. For instance, the locations associated with pilgrimages found in the miracle stories are concentrated in and around Vadstena, and they are mostly connected to a handful of saints. This imbalance is due to source preservation as well as the activity and focus that, in particular, Birgitta of Sweden's and Katherine of Vadstena's cults enjoyed. The challenge in this case is to communicate that this aspect

46 See Dunn, *A History of Place*, 2–7, 13, 16–17.

of our resource might provide skewed results in visualizing pilgrimages spatially due to the available source material.

In terms of geographical area, the project has also faced the challenge of changing borders over the centuries and nationalist history writing. The geographic limit of the project is the medieval ecclesiastical province of Uppsala, which includes territories in three modern countries, each with its own particularities in terms of archival traditions and availability of source material relevant for the project. As mentioned above, one of the project's goals and results is the creation of a register of medieval holy places not limited by current national boundaries, and which includes, among other places, churches, holy wells, and chapels. Creating this register has allowed us to connect "Cult manifestations" to potential holy or cult places identified in previous research and resources.

In relation to the above, and the digitizing of source material, the project has also made non-spatial material "spatial." In other words, work has been required in order to identify locations in the geographical landscape associated with particular "Cult manifestations." In the case of the art historical material, we have used the medieval locations of the artwork, when known. In the case of the medieval calendar fragments, their provenance has been determined to the diocese in the best case; in many instances, however, the only reliably identifiable provenance is the ecclesiastical province, a much less precise geographical reference than a specific church in a particular parish. In contrast, making the newly digitized, non-spatial material in Ikonografiska registret and Medeltidens bildvärld spatial has led to more precise locations, albeit often requiring an "Uncertain" marker for their medieval location. These variations in the associated spatial information create a challenge when analyzing or visualizing "Cult manifestations" in the landscape.

The project is developing a model and inputting data from sources that were produced over an approximately 400-year period. One of the challenges associated with this work has been inputting dates when the source material has been dated using different methods. For instance, some objects are dated to the "first half of the twelfth century" or "mid-twelfth century," while in some cases a more exact date, such as 1489, is available. These different dating conventions, or more or less precise dating practices, have required that we create date intervals ("notbeforedate" and "notafterdate") that are consistently applied throughout.[47] In addition, these variously dated sources have presented a challenge in terms of how "Cult manifestations" can best be visualized on our planned interactive map.

As indicated, the project has had to apply a critical perspective in its methods and in relation to previous research and previous datasets. This resource is also intended to be used by others for their own research; therefore, it is important that we are transparent about what our interpretations are based on. This transparency will be achieved in the contents of the introduction to the resource and the way in which the data is presented and searchable via the user interface. Furthermore, the person who inputs data will be

47 These intervals are based on the Syriac Reference Portal authority, "Approximate Dates," http://syriaca.org/documentation/dates.html (accessed April 16, 2021).

acknowledged on each entry so that the user is aware of who is responsible for a certain interpretation.

One of the most important aspects, and challenges, of developing a digital research resource is ensuring its sustainability and preservation. Indeed, as increasingly required by funding bodies and other organizations, including the European Science Foundation, "researchers need to be sure of the accessibility, authoritativeness, context, stability and longevity of such resources" when doing research.[48] In fact, these considerations formed an important part of our initial discussions while planning the resource. The relatively short lifespan of other invaluable maps, inventories, and databases related to our work on the cults of saints were discussed.[49] Our project is hosted by GRIDH, where the material will be published and persistent identifiers of all the database objects will be made available, together with visualizations and other tools. GRIDH is responsible for maintaining data and integrated tools for the foreseeable future. In addition, data dumps will be stored at the Swedish National Data Service, and the relevant data will be published via SOCH at the project's conclusion.

The long-term perspective is very important for several reasons. As the resource is intended to be used by others, we need to be able to ensure that information can be updated at a later date. Moreover, the database needs to be searchable and interesting for the user in the long term. In addition, this resource is intended to be modified and supplemented in the future, such as by adding new data related to the cults of saints. The challenge in this instance is ensuring that the information provided is accurate and in line with the resource's aims.

Conclusions

The above describes and explores how digital research tools and methods can contribute to our understanding of medieval lived religion by studying its expression in the material and textual sources related to the cults of saints. This work is part of an ongoing digital infrastructure and research project that is building a comprehensive online database and mapping function so as to provide users (researchers, educators, and the public) with access to data from previously digitized cultural heritage collections and previous research, as well as research undertaken by the project. As part of this process, the project involves the digitization of material from the Swedish National Historical Museums and the Swedish National Heritage Board. Previously digitized material is put into a historical context in the framework of our research question. The project's digital methods, such as linked data, digitization, transcription, and spatialization, have been presented and discussed with a special focus on spatiality. In order to exemplify the process, we have presented several case studies that illustrate our application of the concept of "Cult manifestation," including how to input objects so that they can be

48 ESF, "Preservation and Sustainability."

49 For instance, Saints and Geography, www.saintsgeog.net/index.html (accessed April 16, 2021).

mapped in time and space, even when the precise locations are unknown or an object has been moved. In addition, we have discussed how another type of "Cult manifestation," miracles, requires a different model that allows for multiple locations within the same manifestation. Finally, we have discussed an example of how one object, a pilgrim badge, can identify several different types of "Cult manifestation," which, in turn, are located in different places.

One of the most important results of this project will, of course, be the publicly accessible research infrastructure, consisting of our database (linked data) and map. In essence, the resource fits into the category of scholar-driven research publications that the ESF indicates need to be accepted as valid output of research projects and interdisciplinary tools.[50] It is of great importance that those who input the data—whether project members or collaborators—and the database are attributed in future research and future platforms.

A further aspect to consider in terms of long-term perspectives is that the future interface and map need to be user-friendly and have an attractive and intuitive design. This latter point is vital for a resource without a formal helpdesk.

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