EXPLORING THE LANDSCAPE DIMENSION OF THE EARLY MEDIEVAL CHURCHES. A CASE STUDY FROM A MARIÑA REGION (NW SPAIN)

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Abstract: Despite the long tradition of studies on early medieval churches, little is still known about the reasons behind the selection of specific places for building churches between 5th to 10th centuries AD. Thanks to some rich historical documents, the region of A Mariña (Galicia, NW Iberia) represents an exceptional case study in order to analyse

the spatial logic behind the creation of the early medieval ecclesiastical landscapes. This objective is pursued by means of the application of GIS and spatial statistics for the study of the locational patterns of these first Christian buildings. As this is a first attempt, we started from the formal analysis of topographic variables; then a settlement model for the churches was defined, next used to analyse specific trends on their locational dynamics. The results allow us to propose that the location of the early medieval churches should be related to visual and territorial control over some specific areas of the landscape (mainly settlements and natural resources). This suggests that, despite of the variety of church founders, some kind of collective planning of the church network did happen during the early middle ages. This fact can be historically explained as a key part of power strategies aimed to the creation of a new territorial articulation during this period.

Keywords: early medieval churches, predictive model, ecclesiastical landscapes, locational dynamics, Galicia

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All the analytical approaches were carried out using GRASS GIS in the versions 7.0.2 and 7.4.0 (GRASS Development Team 2015) and the *R statistical environment* (R Development Core Team 2008, especially the *spatstat* package (Baddeley, Rubak, & Turner, 2016).

1. INTRODUCTION

Churches and monasteries are undoubtedly one of the most studied elements of the early medieval landscapes (5th to 10th centuries AD) in Western Europe. Over the last 30 years many works have moved from the traditional "monumental" and "institutional" studies on the early medieval ecclesiastical sites to their contextualization into their surrounding landscapes. This change of perspective has allowed churches to become powerful indicators for historians and archaeologists of the social, political and economic transformations which took place between the fall of the Roman Empire and the establishment of the feudal society (e.g. Morris, 1997; Aston, 2000; Turner, 2006; Brogiolo & Chavarria, 2008; O'Carragain & Turner, 2016).

Despite this important shift in the research, little is still known about a key question: why was a church decided to be built on a specific place of the landscape during these centuries? This is a very important problem since in the Early Middle Ages a church was not just a religious building but also an economic, territorial, political and symbolic center in the landscape. Moreover, although in general the parish system was not consolidated in most of Western Europe until 12th-13th centuries (Morris, 1997, p. 229–232), it seems clear that the network of early medieval churches already played a territorial role in the political and economic organization of the rural landscapes in this pre-feudal period. It should be taken into account that the founding of a church in that period was not yet wholly determined or controlled by ecclesiastical authorities, but lay aristocracies created and ruled their proprietary churches following their own interests (Wood, 2006). Thus, it can be reasonably proposed that a variety of reasons such as land ownership, territorial control and accessibility to resources would have played an important role when the founder decided the exact location of a church, but so far no quantitative and spatial studies have been carried out to confirm these hypotheses.

Several problems have impeded researchers to correctly approach the location of the network of early medieval churches in the landscape. One of them is the general lack of historical information from this period, about when, why and by whom exactly a church was founded. Even when this information is available for some exceptional cases, it is difficult (at least without archaeological excavation) to identify the precise location of the early medieval buildings, since many of these churches have disappeared or were moved to new locations in the following centuries. Not to mention the problems to reconstruct the whole map of early medieval churches in a given area. Finally, another reason is the

methodological tradition of researchers working in this field; while GIS and spatial analysis tools have still little dissemination among medieval historians, archaeologists usually focus on individual sites rather than approaches to wider ecclesiastical landscapes. This paper will focus on the aforementioned issues by studying an exceptionally well-documented ecclesiastical landscape in the region of A Mariña, in the Northwest of the Iberian Peninsula, between 9th and 10th centuries (**Figure 1**). A few –but extraordinarily rich– early medieval documents allow us to largely reconstruct the network of ecclesiastical sites in this area by the year 1000. Our objective is to examine and understand the rationale behind the location of these churches –most of them still existing nowadays (**Figure 2**)–, and to test if there was any coordinated power strategy in the creation of these first Christian buildings in the Galician landscape. This goal will be approached from a computationally-informed landscape archaeology methodology.

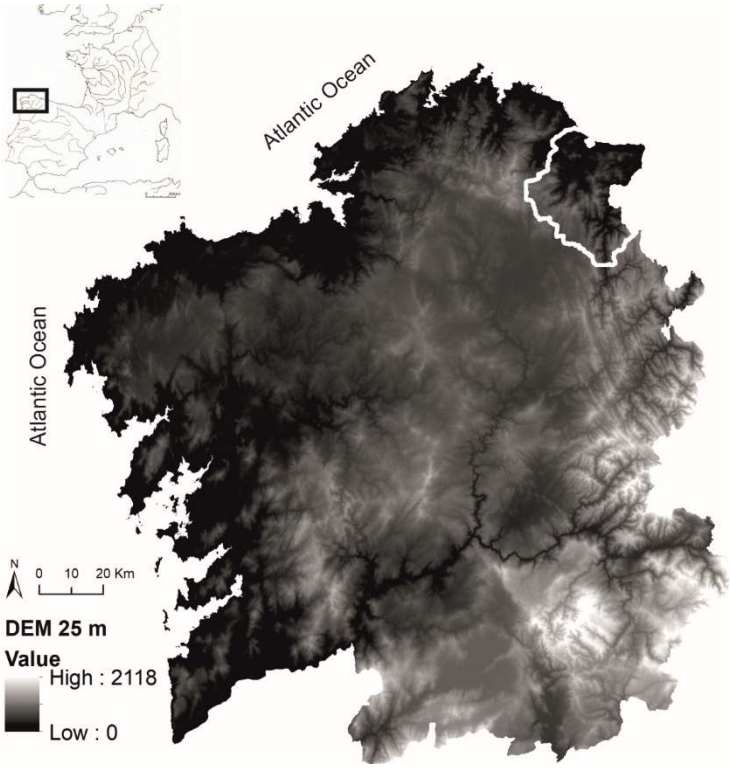

Figure 1. The study area in Galicia, NW Spain.

Figure 2. Current location of some of the early medieval churches in A Mariña region. **A:** San Xusto de Cabarcos (source: Xurdemorán.blogspot.com). **B:** San Pedro de Arante (source: Concello de Ribadeo website). **C:** Aerial view of San Xoán de Ove (image by Instituto Geográfico Nacional). **D:** San Pedro de Riotorto (source: Concello de Riotorto website). **E:** Aerial view of Santo Estevo de Oirán. Image by Instituto Geográfico Nacional. **F:** San Xurxo de Lourenzá, located on the top of a hill (source: Wikimedia.org). **G:** Aerial view of San Fiz de Lourenzá (image by Instituto Geográfico Nacional). **H:** Santiago de Lindín (source: Xurdemorán.blogspot.com). **I:** Aerial view of Santo André de Masma (image by Instituto Geográfico Nacional).

2. THE HISTORICAL AND SPATIAL CONTEXT

2.1. A Mariña region as a case study

Our study area corresponds to a natural and historical well-defined territory called "A Mariña" and more precisely "As Mariñas orientais" (**Figure 3**). It is located in the northeast of Galicia, on the border with Asturias and the Cantabrian Sea. At a geographical level it can be defined as a strip of land running on a north-south axis, evolving from the flat highlands of the south (Terra Chá region) to the coastal area of Foz and Ribadeo in the north, through a range of hills (part of Xistral mountains) with deep and narrow valleys. Nowadays, it is a mainly rural area characterised by small and

scattered villages dedicated to agrarian activities with exception of a few little towns like Lourenzá and Mondoñedo.

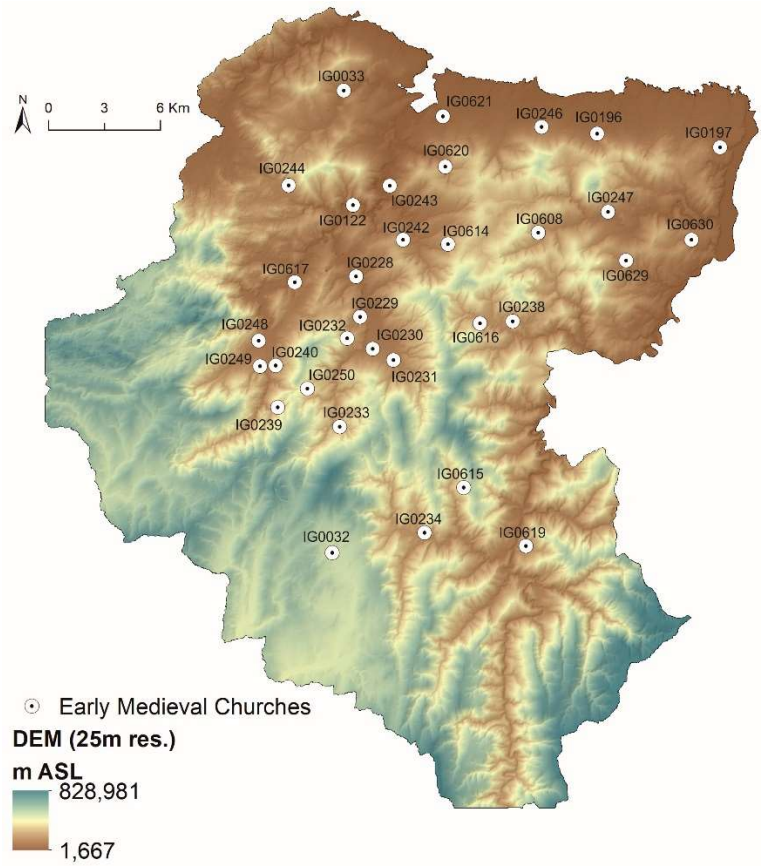

Figure 3. The distribution of the study sample in A Mariña region, located in the north-east part of Galicia. Identification codes are included.

It is important to note that the structure of the present landscape in the study area, as in most of the Galician rural landscape, has its roots precisely in the early medieval period (Bouhier 2001; García 1975). Of course, important changes happened in the landscape during the following centuries, but we can assume that the basic structure of the landscape (settlement pattern, parish organization, fields systems, road systems…) was set up in the early medieval period and still preserves its main features. In this sense, most of the current churches that we have identified as heirs of those early medieval churches are still parish churches, placed more or less close to traditional rural settlements, as we will see later (**figure 2**).

The historical frame for our study starts here with the end of the Roman Empire and the establishment of the Sueve Kingdom (411-585 AD), which saw the creation of the first

episcopal see in this area: *Britonia* (Young 2004). The Sueve Kingdom was then conquered and integrated into Visigothic *Hispania* (585-711 AD) until the muslim conquest of the Iberian Peninsula. This conquest seem to have had very little impact in this northern area of Iberia, so the ecclesiastical structure was not altered at all (López Alsina 2002). Between the 8th and the 10th centuries, the area was integrated in the realm of the new Asturian-Leon Kingdom, being the period that more written sources has left to us to reconstruct the ecclesiastical landscapes of Northwest Iberia (Sánchez-Pardo 2013).

The geographical and historical characteristics of this study area makes it an interesting case study on how churches contributed to politically articulate a landscape of scattered settlements in early medieval Europe. A Mariña region can be considered as representative of the scattered historical settlement pattern of Northwest Iberia, which contrasts with other more studied areas like the more urbanized Mediterranean Iberia or the concentrated territorial pattern of Castile. In this sense, this case study can ultimately offer an insight of how power strategies worked in a peripheral area of Atlantic Europe, outside the Carolingian realm, in a similar (but not identical) way to Brittany, Wales or Cornwall (Turner, 2006; O'Carragain & Turner, 2016).

2.2. The historical information: a well-documented ecclesiastical landscape

Concerning the available historical information about medieval churches in this area, we must start with the document number 40 from the documentary collection of the archives of the cathedral of León (henceforward "León 40"). This document, written in the year 916, indicates that King Ordoño I (who ruled between 850 and 866) gave 22 churches located in this territory to Frunimio I, Bishop of Leon, and states how the following kings confirmed repeatedly such donation.[1] This granting should be understood as part of an important political strategy of ecclesiastical reorganization in the Northwest Spain by King Ordoño I (López Alsina, 2002).

For the purposes of our work, this document shows that these 22 churches already existed at least by 866, and the vast majority of scholars consider this source as true (Linehan, 1994, p. 428; García-Álvarez, 1963-1965, docs. 154 and 254 vs. 149 and 305; López-

[1] The total number of churches given by the king is 24, but 2 of them lie outside our study area.

Alsina, 2002, p. 435; Carriedo, 2009, pp. 53 ff). In addition, we have also been able to verify that 5 of these 22 churches are also mentioned later again in other documents from the 10th century,[2] which certified that they already existed by that time and allows us to know a bit more about them.

The second document is the will of Count Osorio, which is listed as document numbers 1 and 2 in the collection of the monastery of Lourenzá (Lourenzá 1-2). This text describes a large donation of properties made by this Count to his monastery of Lourenzá in 969, including 14 churches in this territory.[3] Some scholars consider that this document might have been altered later in order to legally support a claim to property (Freire, 1998, p. 750 and pp. 1033–1053). However, we have confirmed that 5 of those 14 churches are mentioned in other previous documents,[4] so we can be sure they existed by 969. Based on this evidence, it seems very likely that the other 9 churches of the testament also did exist by the year 969, and it would not be strange that they actually belong to the Count.

In addition to these two main sources, which inform us of no less than 35 churches between the 9th and 10th centuries in our study area, we have found some textual references to other 8 early medieval churches in this territory. 4 of them appear in the document number 6 included in the documentary collection of the cathedral of Mondoñedo dated in 1002 (Mondoñedo 6). By that date, these churches belonged to a wealthy local owner called Iquilo. Other 2 further churches (*Sede Britonorum* and *Monasterium Maximi*) are mentioned in a very interesting and early text called "Parrochiale Suevorum", written probably around 570 (David, 1947). They have traditionally been identified as Santa María de Bretoña and San Martiño de Mondoñedo, which became an episcopal see from the end of the 9th century (Sánchez-Pardo, 2012; Carriedo, 2009). Another church mentioned in this area is *Sancti Iacobi de Vallebrie*, which was donated sometime between 984 and 1000 by an abbot and a priest (both who had founded it some years before) to Count Gutier, son of the aforementioned Count Osorio (Lourenzá 10). Finally, there is a mention to the monastery of *Sancti Felicis et*

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[2] These are: *Sancti Martini de Sperautano* (mentioned in the "King Silo's charter" from 775, that is, in León 1, and then in Lourenzá 9), *Sancti Iohanni de Vallebrui* (Lourenzá 9), *Sancte Eolalie in Ermolfi* (Celanova 35 and Mondoñedo 6), *Sancte Marie in Triauada* (Lourenzá 1-2) and *Sancti Iusti in Cabarcos* (Lourenzá 1-2 and 9).

[3] In addition to these, there are other 5 churches located outside our study area.

[4] Sancti Georgii in Laurenzana (Lourenzá 9), Sancti Stephani in Auriam (Lourenzá 9), Sancta Maria in Triuada (León 40), Sancti Iusti in Cavarcos (León 40) and Sancto Adriano in Laurentiana (Celanova 40).

Macabei in a suspicious document from 933 (Lourenzá 185), which states that this monastery already existed at the time of the king Alfonso II, i.e. before 842. Even if this document has been later altered, it seems probable that this church existed at least in 933, regardless whether the rights over its property had been falsified.

In sum, we have documented 43 churches before the year 1000 in the region of A Mariña, a number which is very high and it constitutes a case study of great interest as there are not many regions in Europe with such a density of early medieval churches. The fact that very little overlapping (only 2 cases) is detected among the churches controlled by different owners at different periods seems to support the veracity and historical value of this sample in order to study their landscape dimension.

Even more importantly, we have been able to identify, with different degrees of reliability (high, medium and low), the location of the majority of the mentioned churches: 41 out of 43 cases. Only *Sancte Marie de Iconi* and *Sancti Stephani de Vitiscli* have remained unidentified. The identification has been based mainly on the affinity of the place names cited in the documents with the current toponymy, since unlike other areas of the Iberian Peninsula, Galicia has preserved a high number of early medieval place names (Menéndez de Luarca 2000). Moreover, we have also based our identification on the hypothesis that most of the Galician early churches lie under current parish churches and chapels, with little changes of location. This is a phenomenon that can be archaeologically observed throughout Galicia (Sánchez-Pardo, 2012), and at least in three specific cases in our work: Santa María de Bretoña (Chamoso, 1975), San Martiño de Mondoñedo (Sánchez-Pardo, 2012) and San Salvador de Lourenzá (Yzquierdo, 1993, p. 155). In these 3 cases, early medieval phases have been archaeologically detected under the current church. Obviously there are some exceptions, but we believe that in most cases it is possible to identify (and in consequence to spatially analyze) those early medieval churches. Anyway, spatial analysis will only be applied to those churches identified with a high level of reliability, which amount a total of 33 churches (**Figure 3**), leaving aside for accuracy reasons 8 churches with lower degrees of reliability (**Table 1**).

Code	Name	Identification	Landscape situation	Relation to traditional settlements	Reliability of the identification	First documented	Patron
IG0232	*Eremita Sancti Saluatoris*	Probably chapel of Santo Estevo da Folgueirosa, Lourenzá, Lugo	Hidden summit	Isolated	High	969	Count Osorio

IG0239	*Ermida Sancti Cosmede in Argumusu*	San Pedro de Argomoso, Mondoñedo, Lugo	Mid valley slope	Isolated	High	969	Count Osorio
IG0233	Monasterium *Sancte Marie Maur*	Santa María Maior, Mondoñedo, Lugo	Mid valley slope	Lateral	High	969	Count Osorio
IG0033	*Monasterium Maximi / Locus Sancti Martini*	San Martiño de Mondoñedo, Foz, Lugo	Mid valley slope	Integrated	High	c. 570	Bishop of Mondoñedo
IG0196	*Monasterium Sancte Eolalie de Ermolfi*	Santalla da Devesa, Ribadeo, Lugo	Plain	Isolated	High	c. 860	King-Bishop of León
IG0122	*Monasterium Sancti Felicis et Macabei*	San Fiz, Lourenzá, Lourenzá, Lugo	Hidden summit	Isolated	High	c. 830	?
IG0243	*Sancte Christine*	Santa Cristina de Celeiro de Mariñaos, Barreiros, Lugo	Valley bottom	Integrated	High	969	Count Osorio
IG0240	*Sanctae Eulaliae de Ambroza in Uallebria*	Old chapel of Santa Eulalia de Rilleira de Ambrós, Mondoñedo, Lugo	Mid valley slope	Center of polinuclear pattern	High	969	Count Osorio
IG0238	*Sancte Marie in Triauada*	Santa María de Trabada, Trabada, Lugo	High plateau	Integrated	High	c. 860	King-Bishop of León
IG0630	*Sancte Eolalie de Uiladosindi*	Santalla de Vilausende, Ribadeo, Lugo	Plain	Center of polinuclear pattern	High	1002	Local elite (Iquilo)
IG0619	*Sancte Marie de Osorici*	Santiago de Vilaoudriz, A Pontenova, Lugo	Valley bottom	Lateral	High	c. 860	King-Bishop of León
IG0617	*Sancti Andree de Masma*	Santo André de Masma, Mondoñedo, Lugo	Plain	Center of polinuclear pattern	High	c. 860	King-Bishop of León
IG0229	*Sancti Georgii in Laurenzana*	San Xurxo de Lourenzá, Lourenzá, Lugo	Visible summit	Isolated	High	958	Count Osorio
IG0614	*Sancti Iacobi de Gundema*	Probably chapel of Gondán, San Xulián de Cabarcos, Barreiros, Lugo	Mid valley slope	Center of polinuclear pattern	High	c. 860	King-Bishop of León
IG0250	*Sancti Iacobi de Nannino*	Santiago de Lindín, Mondoñedo, Lugo	Mid valley slope	Lateral	High	c. 860	King-Bishop of León
IG0246	*Sancti Iacobi in villa Plana*	Santiago de Reinante, Barreiros, Lugo	Hidden valley bottom	Center of polinuclear pattern	High	969	Count Osorio
IG0248	*Sancti Iohanni de Vallebrui*	Probably chapel of San Xoán en Seivane-Portugalete, Mondoñedo, Lugo	Mid valley slope	Lateral	High	c. 860	King-Bishop of León
IG0242	*Sancti Iusti de Cabarcos*	San Xusto de Cavarcos, Barreiros, Lugo	Mid valley slope	Center of polinuclear pattern	High	c. 860	King-Bishop of León

IG0629	*Sancti Petri de Pignario*	Probably chapel of Virxe do Carme, Piñeiro, Valboa, Trabada, Lugo	Mid valley slope	Lateral	High	1002	Local elite (Iquilo)
IG0234	*Sancti Petri in Riu Torto*	San Pedro de Riotorto, Riotorto, Lugo	Mid valley slope	Lateral	High	969	Count Osorio
IG0228	*Sancti Saluatoris et Sancte Marie de Uillanoua*	San Salvador de Vilanova de Lourenzá, Lourenzá, Lugo	Valley bottom	Integrated	High	947	Count Osorio
IG0620	*Sancti Stephani*	Hermitage of Santo Estevo do Ermo, San Cosme de Barreiros, Barreiros, Lugo	Hidden valley bottom	Isolated	High	c. 860	King-Bishop of León
IG0615	*Sancti Stephani de Recessuindi*	Sancto Estevo de Rececende, A Pontenova, Lugo	Mid valley slope	Lateral	High	c. 860	King-Bishop of León
IG0616	*Sancti Stephani de Tabulata*	Hermitage of Santo Estevo, Santa María de Trabada, Trabada, Lugo	Mid valley slope	Center of polinuclear pattern	High	c. 860	King-Bishop of León
IG0244	*Sancti Stephani in Auriam*	Santo Estevo de Oirán, Mondoñedo, Lugo	Mid valley slope	Lateral	High	958	Count Osorio
IG0230	*Sancti Thome*	San Tomé de Lourenzá, Lourenzá, Lugo	Plain	Integrated	High	969	Count Osorio
IG0247	*Sancti Vincenti in Asanza*	San Vicente de Covelas, Ribadeo, Lugo	Mid valley slope	Center of polinuclear pattern	High	969	Count Osorio
IG0231	*Sancti Adriani in Laurentiana*	Santo Adrao de Lourenzá, Lourenzá, Lugo	Plain	Integrated	High	934	Count Osorio
IG0197	*Sancti Iohannis de Eoue*	San Xoán de Ove, Ribadeo, Lugo	Plain	Integrated	High	1002	Local elite (Iquilo)
IG0608	*Sancti Petri de Alanti*	San Pedro de Arante, Ribadeo, Lugo	Mid valley slope	Center of polinuclear pattern	High	c. 860	King-Bishop of León
IG0621	*Sanctorum Cosme et Damiani*	San Cosme de Barreiros, Barreiros, Lugo	Plain	Center of polinuclear pattern	High	c. 860	King-Bishop of León
IG0249	*Santi Iacobi de Vallebrie*	Probably Santiago de Mondoñedo, Mondoñedo, Lugo	Valley bottom	Integrated	High	c. 960	Local elite
IG0032	*Sedem Britonorum*	Santa María de Bretoña, A Pastoriza, Lugo	Plain	Integrated	High	c. 570	?
IG0198	*Sancti Iohannis de Monterraso*	Perhaps chapel of Virxe do Carme de Vilela, Covelas, Ribadeo, Lugo	Mid valley slope	Isolated	Medium	1002	Local elite (Iquilo)

IG0048	*Monasterium Sancti Martini de Sparautani*	Perhaps A Graña, San Xoán de Ove, Ribadeo, Lugo	Mid valley slope	Isolated	Medium	775	King-Bishop of León
IG609	*Sancte Eulalie de Marzane*	Perhaps Santiago de Foz, Foz, Lugo	Plain	Integrated	Medium	c. 860	King-Bishop of León
IG610	*Sancti Iohannis de Viscos*	Perhaps Bicos, San Martiño de Galgao, Abadín, Lugo	Hidden summit	Isolated	Medium	c. 860	King-Bishop of León
IG611	*Sancti Iacobi de Rimuli*	Perhaps San Pedro de Rinlo, Ribadeo, Lugo	Plain	Lateral	Medium	c. 860	King-Bishop of León
IG612	*Sancti Iacobi Lattarici*	Perhaps Ladrido, San Xusto de Cabarcos, Barreiros, Lugo	Mid valley slope	Lateral	Medium	c. 860	King-Bishop of León
IG613	*Sancti Romani de Gunti*	Perhaps Dompiñor, San Xoan de Piñeira, Ribadeo, Lugo	Plain	Center of polinuclear pattern	Medium	c. 860	King-Bishop of León
IG622	*Sancti Iuliani de Gulfari/Giliari/Iliari*	Perhaps chapel of San Xulián de San Xillao, Vilaframil, Ribadeo, Lugo	Plain	Center of polinuclear pattern	Medium	c. 860	King-Bishop of León
-	*Sancte Marie de Iconi*	Unidentified			Low	c. 860	King-Bishop of León
-	*Sancti Stephani de Vitiscli*	Unidentified			Low	c. 860	King-Bishop of León

Table 1. Early medieval churches documented and identified in A Mariña region

2.3. Churches and spheres of political power in the region of A Mariña: the qualitative information

Despite its limitations, the volume of data gathered in this work offers interesting information about the creation of the first network of churches in this area, as well as about the political dynamics behind them during the early middle Ages. In this regard, we see how, by the end of the 6th century, there must have been an incipient network of churches in this territory, since the "Parrochiale Suevorum" document does not only mention the *Sede Britonorum* and the *Monasterium Maximi* but also other "ecclesias que sunt intro Britones" (David, 1947). Also we find in this territory the earliest mention of a church in the Asturian kingdom: the church of *Sperautano* in the year 775 (León 1). Similarly, as we have already pointed out, we have evidence of at least 22 more churches

that already existed before the year 866. Finally, we know other 19 churches recorded for the first time in the 10th century. So, it seems clear that the dense network of churches that we observe in this area by the year 1000 was developed during previous centuries.

As stated at the beginning, it is possible to obtain some information about the social and political dynamics behind the creation and control of this network of churches. Although in most cases we do not know who was the founder of each of them, there are some cases in which we can guess it. We know that the church of *Sperautano* was promoted by King Silo around 775, the monastery of Lourenzá by Count Osorio, probably around 945, and that the church of *Sancti Iacobi de Vallebrie* was founded by a priest and abbot (possibly members of local elites) around 960-970. Moreover, two of the churches donated by King Ordoño I in the mid-9th century to the episcopal see of León belonged or had belonged to a priest called Mateo, so it is possible that he was its original founder or at least its patron.

Similarly, in some cases, the person who controlled the whole ecclesiastical network between the 9th and 10th centuries can be identified. It is evident that the bishop of León controlled at least 22 of these churches, received from King Ordoño I, by the year 866. We do not know whether the king was really his owner (or even the founder or promoter), or whether he just had a jurisdictional dominion over them. In any case, it is evident that the monarchy controlled these buildings and used them to reorganize the diocesan landscape. One century later, Count Osorio seems to have control over 15 churches in this territory. Changing the scale, we also have evidence of how Iquilo, another rich local owner, had 4 churches around 1002, donating 2 of them to the monastery of *Ermulfe* (which, in turn, had been donated by king Ordoño I to the bishop of León in the middle of the 9th century), probably as an strategy to get control over it (Mondoñedo 6).

Therefore, we can see a panorama in which three types of political power promote and control the churches in this area between the 9th and 10th centuries: the local elites (represented by abbots and priests), intermediate or regional elites (case of the Count Osorio) and the highest political and ecclesiastical authorities such as the kings and the bishops. We can also glimpse that the kings somehow contributed to the formation of great aristocratic patrimonies, especially of their relatives, while local elites used diverse (not always successful) strategies to grow socially through the few churches they were able to control. Informally, it seems that we are witnessing a process in which the small foundings of local aristocracies are slowly but progressively passing into the hands of the

greatest powers of the Asturias-Leon kingdom, who use them to organise or rearrange their territorial domains in this area (Pérez, 2012).

3. THE ENVIRONMENTAL AND TERRITORIAL PATTERN OF THE EARLY MEDIEVAL CHURCHES

3.1. Definition of variables and locational model

Basing on the previous information, it is now time to move to the study of the spatial patterns behind this network of early medieval churches in the region of A Mariña. This will be approached in first place by creating a locational model for these churches.

Site location modelling has been one of the most important applications of GIS in Archaeology. Since those first developments during the eighties of the last century much has been researched, and with some phases of criticism too (Gaffney & van Leusen, 1995). However, nowadays there is a renewed interest thanks to the possibilities opened by current computer technology and the application of statistical modelling to study the past human behaviour (see e. g. Conolly & Lake, 2006; Nakoinz & Knitter, 2016).

The first part of a locational model is always focused on the study of possible locational factors which may have determined the selection of the places in which the churches were built. As a premise we have to accept that behind the decision of where to specifically build the churches there was a logic, which can respond to multiple reasons: control of resources, visual dominance, proximity to transit routes, etc.

The conventional approach is to start considering basic environmental variables (Conolly, Lake 2006; Fábrega-Álvarez, Parcero Oubiña 2006), later introducing qualitative variables if exist. Using geographical covariates such as, for example, altitude or slope, allow us to analyse and define topographic regularities that may not have changed a lot since medieval times. In order to do that, as a starting point we defined ten geographical variables which potentially can explain the spatial location of the early medieval churches: altitude, slope, aspect, hydrology, wetlands areas, geomorphology, topographic prominence, visual prominence, land use and territoriality (see **Table 2**). This has to be considered an elementary-first attempt to consider the locational preferences of the churches, and future works will consider in depth the relevance of specific factors such as proximity to medieval roads.

LOCATIONAL ANALYSIS		VARIABLE	AIM	METHOD	HYPOTHESIS
First-order factors	**Raw variables**	Altitude	To detect patterns in elevation	DEM analysis	Spatial regularities on the position of the churches
		Slope	To detect patterns in slope	DEM analysis	
		Aspect	To detect patterns in aspect	DEM analysis	
		Hydrology	To define the spatial relation between churches and rivers	Raster of distance from rivers	
				Raster of distance from watershed edges	
		Wetland areas	To define the spatial relation between churches and wetlands	Raster of topographic wetness index	
		Geomorphology	To create a landform classification	Topographic classification of the DEM	Human-decision on specific locations for churches
	Modelled variables	Topographic prominence	To analyse the	Differential height between	

			topographic prominence of the landsape	the churches and surroundings (short, mid and long range)	Churches as landmarks in territory
		Visual prominence	To analyse the visibility of the territory	Identification of the areas of the landscape which are more visible	
		Land use	To analyse the potential land use	Raster of potential land use	Churches control a portion of the landscape
Second-order factors		Territoriality	To study the spatial influence of a church on its neighbours	Second-order dynamics	Territoriality between chuches?

Table 2. Locational variables modelled in this work.

From a statistical point of view, a distribution map composed by a set of points (**Figure 3**) can be analysed from spatial approaches in order to define their locational preferences. Some of them allow us to study the shape of the distribution while others explain the interaction between the set of points. All the variables summarised on **Table 2** have been classified for the sake of explanation in first and second order factors. The first-order factors (the first nine variables) are external variables to the distribution of points which explain their intensity over the analysed region, and usually coincide with environmental variables (O'Sullivan & Unwin, 2003, p. 36). In informal terms, these are factors which change the distribution of sites in two separated areas (e.g. for explanation purposes now, the slope can be considered a first-order factor as it is extremely rare to find a church in

steepest slopes). On the other hand, it is frequent to analyse the distance between points, or the relation of a point with its neighbours, both called second-order dynamics (Bevan, Crema, Xiuzhen, & Palmisano, 2013, p. 31). They describe the intensity of points influenced by the configuration of other points in the same study area, and can be analysed in terms of spatial dependence, for example the attraction or repulsion between sites (second-order effects) (Nakoinz & Knitter, 2016). In informal terms, second order dynamics can be understood as the area of influence of a specific church ("territoriality").

The selected environmental variables were mainly built from standard GIS work. To be more specific, a set of raw geographical variables were firstly defined, such as the altitude, slope and aspect. Rasters were created from a 25 m resolution Digital Elevation Model obtained from the Spanish National Geographic Institute.[5] As we know that early medieval churches were granted with lands in their immediate surroundings (Wood 2006, p. 21), we can explore their catchment areas and their control of the economic resources. In this sense, two kinds of maps were created, which consider the distance between churches and rivers: a) Euclidean distance from rivers; b) Euclidean distance from watershed edges (**Figure 4A, B**). The study of both variables could point out the spatial relation watershed edges, areas which are, by self-meaning, related to natural transit.

A raster of wetlands was also created in SAGA GIS 6.0.0, using a topographic wetness index on which cells represent runoff values, considering that a high humid area is more susceptible to saturate and being converted into a wetland (Böhner et al., 2002). Finally, in order to establish trends in the specific topographical location of the churches, a landform classification was carried out, based on the DEM. The analytical approach was done in SAGA GIS 6.0.0 using the Topographic Position Index Based Landform Classification (Weiss, 2000), which allowed us to classify the whole terrain in 10 types: high ridges, midslope ridges, local ridges, upper slopes, open slopes, plains, valleys, upland drainages, midslope drainages, streams.

On the other hand, a second group of variables was modelled again via GIS work. In order to check if churches could be acting as visible landmarks in the landscape, two kinds of analyses were accomplished:

[5] http://www.ign.es/web/ign/portal

a) The study of the topographic prominence, defined by M. Llobera (2001, p. 1007) as a function of height differential between an individual and his/her surroundings as apprehended from the individual's point of view. Technically, the percentage of locations that lie below the individual's location (terrain altitude plus individual's height) within a certain radius. This variable was calculated in SAGA GIS 6.0.0 with the module Topographic Position Index, which compares each cell of the DEM with the mean of their surroundings, under a defined threshold (Weiss, 2000). We calculated it for three radii: 100 m (local range), 800 m (medium range), and 3000 m (large range) (**Figure 4C**).

b) The visual prominence of the landscape, defined as the inherent visibility of all the locations in the territory (Llobera, Wheatley, Steele, Cox, & Parchment, 2010). This was calculated in a GIS context through a cumulative viewshed analysis of all the cells in the DEM, mainly carried out in GRASS GIS 7.0.3. The viewshed analysis uses the elevation value of each cell of the digital elevation model (DEM) to determine the visibility to or from a particular cell. The cumulative viewshed can be defined as a sum of individual binary viewsheds, where cells contain values of 0 when they are not visible and 1 when they indicate visibility. Thus, when they are added together, the resultant raster indicates the number of times that a cell is seen from the viewer points (Wheatley & Gillings 2002: 206-207). So, if we calculate the visibility of all cells in the DEM, the resultant map can be interpreted as the visual prominence of each location in the landscape (**Figure 4D**).

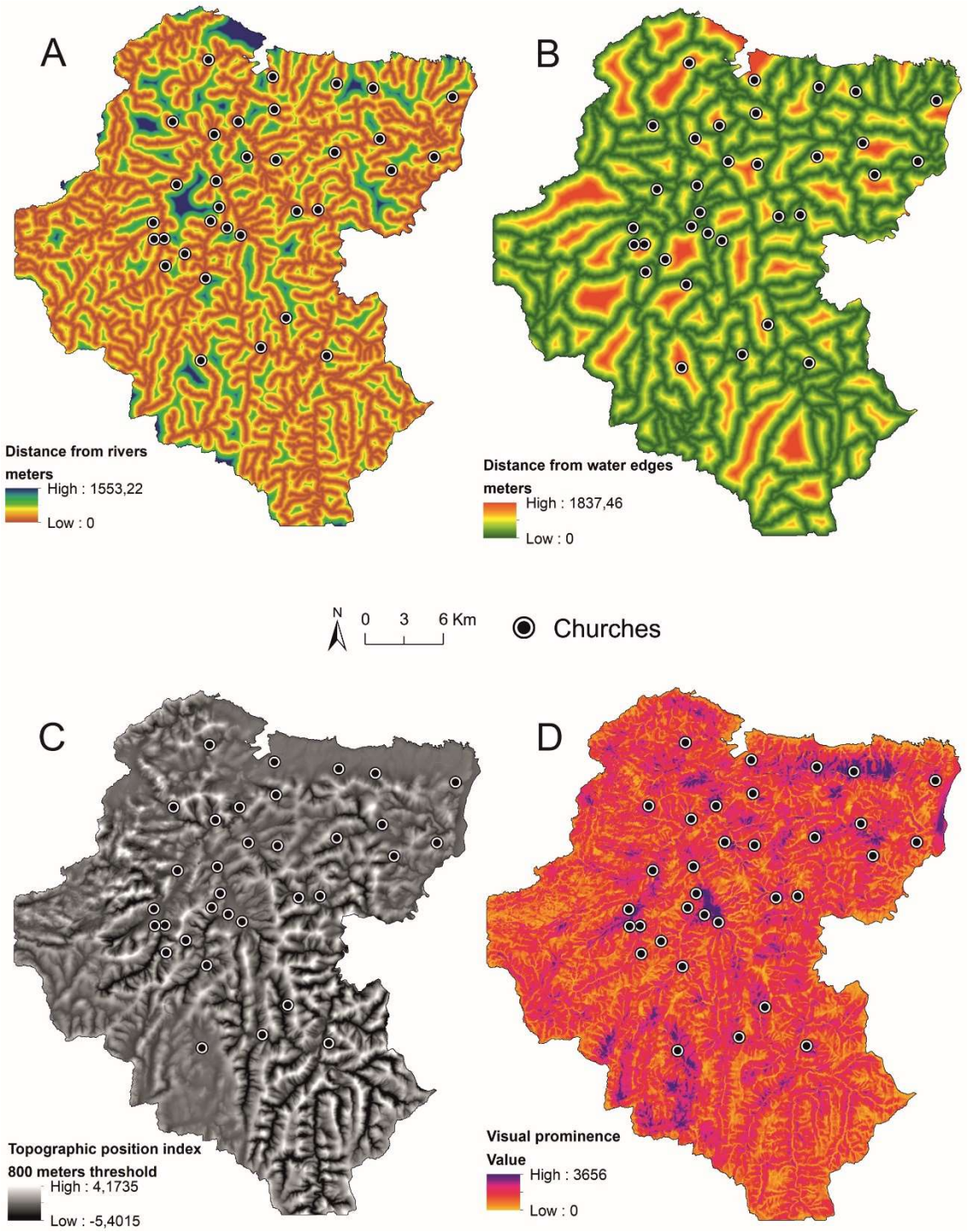

Figure 4. Some of the first-order covariates. **A:** Distance from rivers. **B:** Distance from watershed edges. **C:** Topographic position index (800 m threshold). **D:** Visual prominence of the landscape.

Next, we analysed the land use and the relation of churches with the potential use of soil under historical conditions. We followed the approach defined by Currás Refojos (2014),

who created a map of potential land use of Galicia, adapted to a reclassification of three types of potential land use (null, extensive, intensive), established using historical criteria. The final set of variables analysed in this work are the second-order factors, reduced for simplicity to one approach to territoriality. In order to study the spatial influence of a church on its neighbours, the interaction between points was defined, mainly via the exploration of the clustering processes that may affect the churches. Starting from a control of the first-order factors through site predictive modelling, we analysed in a second step the spatial clustering of churches, in order to see if the point pattern that they show can be explained by environmental variables. The final step was to compare the residual clustering in the observed point distribution with a known point process, through the use of Ripley's K Function and variants (PCFunction). This approach has been already successfully applied in other archaeological contexts (Bevan et al., 2013; Carrero-Pazos, 2018).

3.2. First-order dynamics: geographical patterns in the distribution of early medieval churches in the region of A Mariña

In order to analyse the influence of a specific variable in the location of the churches, we carried out a non-parametric summary of each univariate relationship between the dependent variable (presence of churches) and all the covariates (**Figure 5A-C**). Furthermore, in order to avoid collinearity problems (two variables strongly correlated), a Pearson correlation test was performed (**Figure 5D**). With this analysis we eliminated from our locational model the topographic prominence indexes and the landforms, as they present high correlation values.

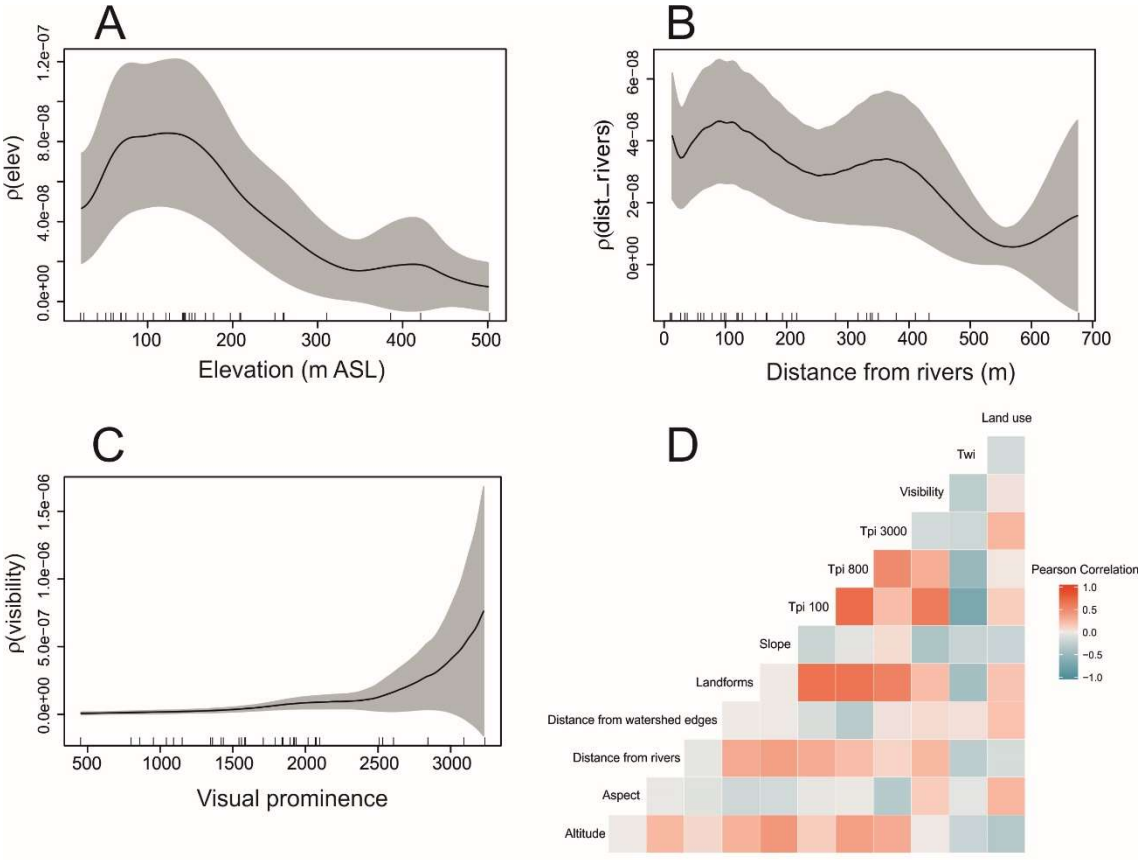

Figure 5. A-C: Intensity as a function of some of the first-order covariates for the churches. Solid lines show function estimate while grey shading is pointwise 95% confidence band. **D:** Pearson correlation test for the first-order covariates.

Further this monovariate approach, we implemented a first-order generalised regression model (henceforward GRM) in order to see what specific covariates can accurately predict the presence of churches and, therefore, explain their distribution. These variables are the elevation, aspect, distance from rivers, distance from watershed edges, slope, visual prominence, topographic wetness index and land use.

GRM results depend on how the covariates are combined each other, and it is necessary to test different combinations by eliminating some and adding others to get the best possible model. This was done in *R Statistics* via stepwise comparison (minimising and Akaike Information Criterion, AIC) which evaluates the relative merit of different models (Baddeley, Rubak, & Turner, 2016, pp. 335–336) (**Table 3**).

Generalised Regression Model				
Coefficients:	Estimate	Std. Error	z value	Pr(>|z|)
(Intercept)	0.1025758	1.1355957	0.090	0.9280
elevation	-0.0044269	0.0020378	-2.172	0.0298
slope	-5.0527647	2.8597595	-1.767	0.0773

total viewshed	0.0012713	0.0005788	2.196	0.0281
(Dispersion parameter for binomial family taken to be 1)				
Null deviance: 91.495 on 65 degrees of freedom Residual deviance: 65.675 on 62 degrees of freedom AIC: 73.675 Number of Fisher Scoring iterations: 4				
Df Deviance AIC <none> 65.675 73.675 - slope 1 69.179 75.179 - elevation 1 71.205 77.205 - t_view 1 71.225 77.225				

Table 3. Multivariate regression model and AIC's best model.

The results of AIC suggest that the best combination of variables would be a cluster of the elevation, slope and the visual prominence of the landscape, excluding the aspect, land use, distance from watershed edges, distance from rivers and topographic wetness index. With the coefficients of the regression, we built a predictive surface of the Galician early medieval churches in the region of A Mariña, a composition of the first-order environmental factors (**Figure 6**).

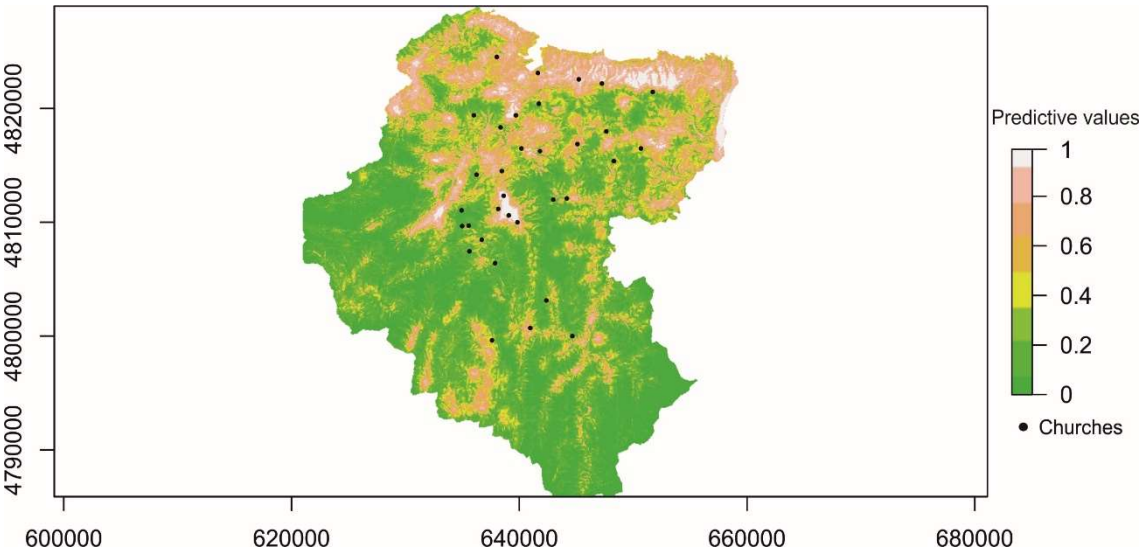

Figure 6. Prediction surface.

Both the results of the intensity approach and the predictive modelling indicate that the point pattern of early medieval churches in this region is inhomogeneous, with singular intensity of churches concentrated at specific elevations and low slopes, being important

as well the visibility of their topographic location. This is specially clear in the case of the several valleys of the study area, in which we often find one church for each valley system. Thus, we can accept that these variables are to some extent explaining the spatial pattern behind the distribution of the churches.

3.3. Second-order dynamics: towards a notion of territoriality

Second-order dynamics refer to how points relate to each other, and typical approaches such as nearest neighbour analysis consider the distance between them in order to see if sites are random, clustered or regularly distributed. Following former works (Bevan et al., 2013; Carrero-Pazos, 2018), to analyse the second-order dynamics of the early medieval churches we will use the pair correlation function in order to analyse the spatial patterning of the churches at a multi-scalar level. From **Figure 7A** we can retain that churches (black line) show a regular distribution in all distances up to approx. 4300 m, when they become clustered. Such result cannot be considered significant as the observed distribution falls over a 999 Monte Carlo random simulation envelope (grey envelope) and we are not taking into account the environmental variables in this calculus. To examine whether this observed pattern is the result of the preference for the specific landscapes or whether this trend could be a consequence of the attraction or repulsion of the churches, the intensity of the first-order factors in the calculation of the pair correlation function can be considered (Baddeley, Moller, & Waagepetersen, 2000, p. 330). The proposed logic is developed through the following steps:

a) Analysing the influence of first-order factors in the spatial patterning of churches using a pair correlation function in which the envelope of random simulations is conditioned by the first-order regression model (Baddeley & Turner 2005, p. 23). This will allow us to see if the observed point pattern of the churches can be explained by environmental variables.
b) Comparing the residual clustering (if exists) with that of a known statistical point process. This will allow us to explore the reasons behind the creation of the point process.

The inhomogeneous version of the pair correlation function conditioned by the first-order regression model (**Figure 7B**) shows that sites (black line) are regularly distributed

through the study area up to 4 km, when they become clustered, and this trend seems to be striking as the black line falls near the upper limit of the envelope, meaning that there could be some further clustering (from 4 to 6 km) that cannot be explained by environmental covariates neither by randomness (**Figure 7C**). This suggests that the aggregation of sites at these distances is not the result of chance, and there might be some second-order clustering processes taking part here, i.e. a specific interaction between points which is causing them to stay away regularly up to approx. 4300 m, and to come close together at further distances (Baddeley et al., 2016, p. 487).

In order to further analyse this trend, and to draw conclusions about the interactions that conformed the spatial pattern, we can fit a known point process model to the observed pattern. Following the work of Bevan et al. (2013), a good approach here could be the Widom-Rowlinson penetrable sphere model or area-interaction process (Baddeley et al., 2016, p. 519), a statistical model which generates inhibition and clustering patterns with reference to a buffer created for all the points of the distribution. That is to say, churches have an area of influence (a notion of territoriality), interacting with neighbours being away from them (inhibition) or close (attraction), under a specific threshold. The model was built with *spatstat* package (Baddeley et al. 2016) using 1335 m radius of interaction (half of the nearest neighbour distance) with inhibitive effects that are very strong but not absolute within this zone (Bevan et al., 2013). This distance could match as well the smallest catchment area for a church, as currently estimates round 300 ha at minimum depending on the specific case for current parishes. The results (**Figure 7D**) indicate that now the black line (sites) falls better under the Monte Carlo envelope, indicating that first and second order factors are able to account for the point pattern, suggesting that the location of churches may be influenced by an inhibitive effect caused among them (second-order dynamic), aka some kind of territorial catchments.

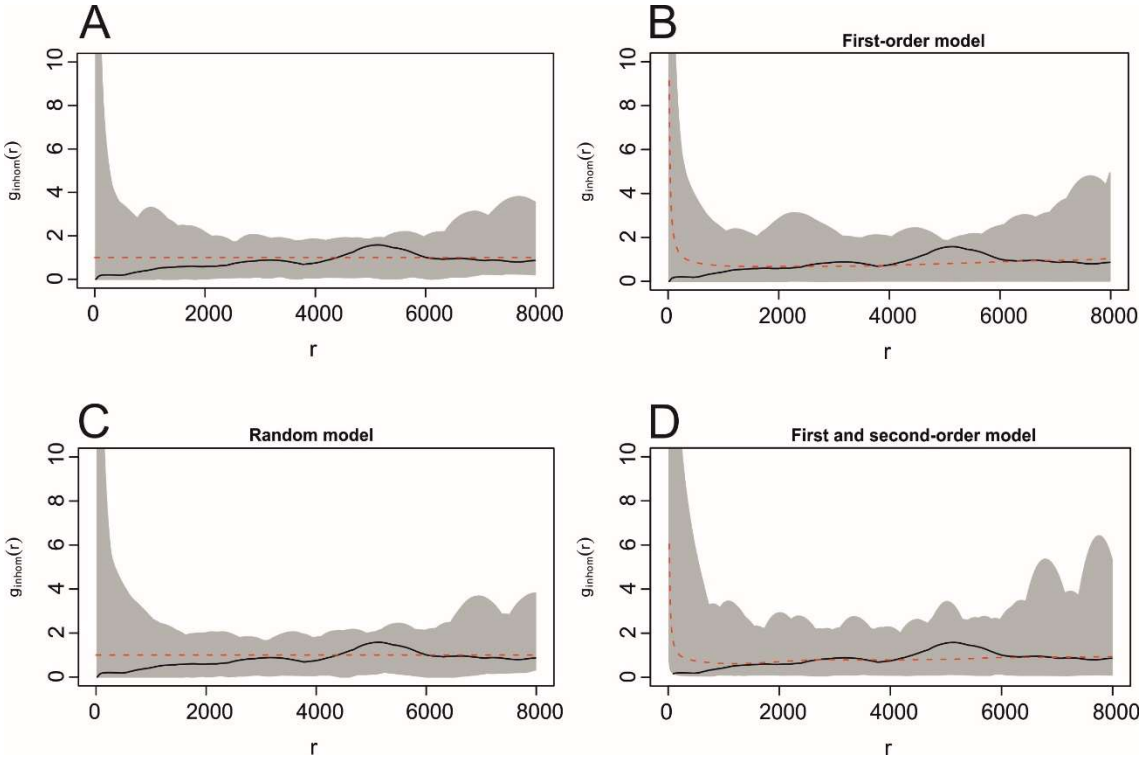

Figure 7. Approaches to site distance and confidence. **A:** Pair correlation function of the observed sites with a 95% envelope. **B:** Pair correlation function of the observed sites with a 95% envelope conditioned on the first-order covariates model. **C:** Pair correlation function with a 95% envelope from wholly random Poisson process. **D:** Pair correlation function with a 95% envelope also conditioned on both the first-order covariates and a second-order, area-interaction model (r = 1335 m).

3.4. Summing up: physical and economical factors

In the first part of our analysis we focused on the environmental factors that may have determined the spatial location of early medieval churches in A Mariña region. Basing on a locational model that includes 9 physical variables (altitude, slope, aspect, hydrology, wetlands areas, geomorphology, topographic prominence, visual prominence and land use), the results of the computationally-informed analysis suggest that the set of geographical variables that best predict the location of early medieval churches in this region is the sum of altitude, slope and visibility. This fact indicates that the location of churches in specific areas of the landscape (i. e. tipically in a middle slope with good visual control over a valley) seems to be important. Moreover, a specific pattern has been detected: the churches are regularly distributed throughout the landscape up to 4 km; however if we zoom out, we can see that after that limit they appear clustered in specific areas. So it is possible to think that 4 km would be the control area for each church. The

clustering between the churches from 4 km onwards cannot be explained only by the geographical position, but by the interaction between them, which suggests some kind of territorial planning. This allows us to explore the political and social meanings of these locational choices in the following section.

4. POLITICAL AND SOCIAL FACTORS

4.1. Political control and spatial patterning

The results of our study suggest that the specific location of churches may be responding to some kind of territoriality, as these ecclesiastical buildings could have acted as political landmarks with an evident controlling power over the surrounding economic resources. However, things seem to be much more complex as churches, in 9th and 10th centuries, were controlled by a variety of powers such as local and regional elites, as well as the highest political and ecclesiastical authorities, as explained above. Therefore, we want to examine now if the spatial patterns change depending on these different patrons. In the case of the available data for this area, we have three types of patrons: local aristocracy, count and a shared king-bishop's order (**Figure 8**). Local aristocracy will not be analysed as we have a very small database with only three cases.

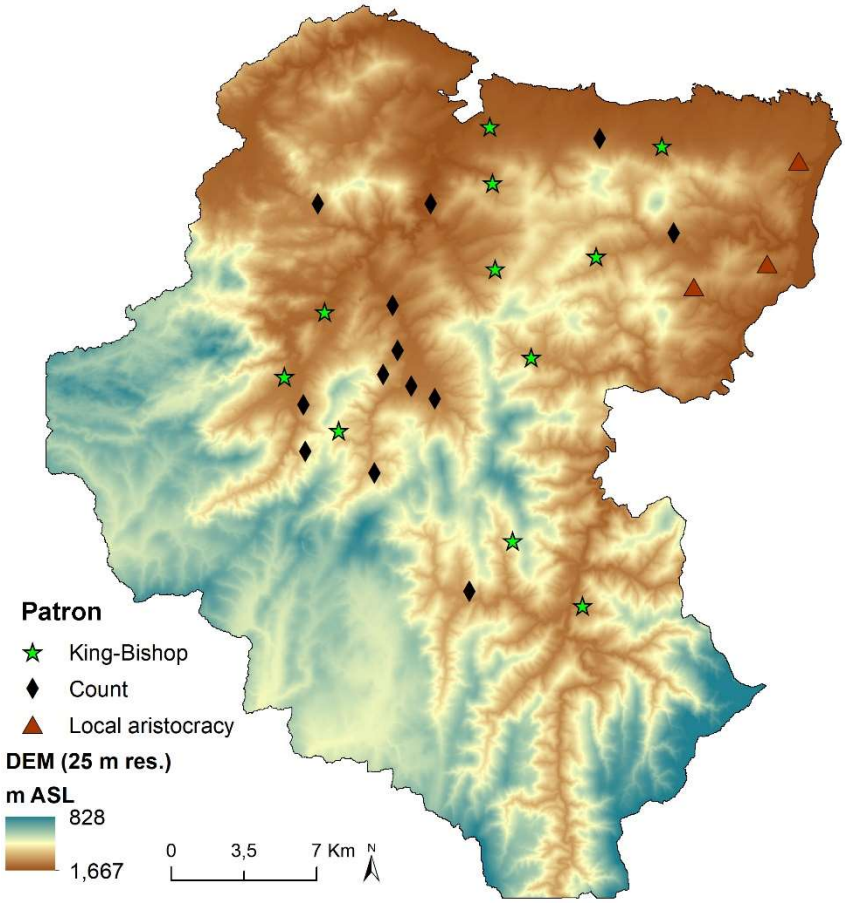

Figure 8. Early medieval churches of A Mariña region, classified by patron.

In order to further explore the differences in the political control, we applied a linear logistic regression among the presence of churches (dependent variable), and all the geographical covariates, divided by patron. This analysis allows us to evaluate the statistical relationship between a dependent variable (churches divided by owner), and each of the defined covariates, to see which of them can (individually) predict the presence of churches. This will help to establish differences in their spatial location depending on the owner. The results are shown in **Table 4**, and indicate differences on the variables that are good predictors of the churches.

Linear logistic regression	**Founder: Count**	**Founder: King-Bishop**
Covariates	***p value***	
Elevation	**8.754247e-05**	0.1161118
Aspect	0.1879009	0.1879009
Distance from rivers	0.127065	0.08393554

Distance from watershed edges	0.7133032	**0.04178233**
Landforms	0.3287032	0.08700137
Slope	**0.03354002**	0.4657672
Topographic prominence index (100m)	0.9563199	0.3861598
Topographic prominence index (800m)	0.06515691	**0.003440071**
Topographic prominence index (3000m)	**0.004979139**	**0.002465529**
Visual prominence	**0.001952142**	0.05280751
Topographic wetness index	0.9747729	0.2677963
Land use	0.6360089	0.847465

Table 4. Results of the linear logistic regression between the presence of churches (dependent variable) and all the covariates.

In the case of churches controlled by the count, the elevation, slope, topographic prominence at large scale and visual prominence of the landscape are good predictors, while in the case of churches controlled by the king-bishop, the important variables seem to be the distance from watershed edges, topographic prominence index at medium-large scale and visual prominence of the landscape (p-value very closed to 0.05). This can be read again in terms of territoriality, being clearer in the case of king-bishop's churches than in count's one. Anyway, despite these slight differences, our results suggest that in both cases the churches may have acted as political landmarks in specific territories, making explicit use of natural features of the landscape related to control, such as the visual power inherent to a significant topography.

4.2. The social control: churches and settlement

So far we have confirmed that the location of the early medieval churches in the study area pursued an intentional environmental and territorial control; it is now time to analyze the social object of this control, the human communities.

In order to do this, we need to evaluate the spatial relation among churches and the settlements in which the early medieval human communities lived. Unfortunately, little

is still known about early medieval villages in Galicia (Sánchez-Pardo 2013) and specifically, no archaeological research on this topic has been carried out in this study area. However, as explained before, we can assume that the basis of the traditional rural settlement pattern in A Mariña region was settled during our study period (Bouhier 2001; Sánchez-Pardo 2011; García 1975). Basing on this premise, we have classified the location of each church in respect to their spatial relation to the nearest traditional village (**tables 1 and 5**). This approach should be considered as a first attempt to analyse the settlements of the early medieval communities, and further work is needed here to confirm our hypothesis, surely fieldwork-based.

	RELATION TO SETTLEMENT				TOTAL
CHURCH LOCATION	Integrated	Lateral	Center of polinuclear pattern	Isolated	
Mid valley slope	1	7	6	1	15
Plain	5	0	3	1	9
Valley bottom	2	1	0	0	3
Visible summit	0	0	0	1	1
Hidden summit	0	0	0	2	2
High plateau	1	0	0	0	1
Hidden valley bottom	0	0	1	1	2

Table 5. Spatial relation among churches and traditional settlement in the study area

Regarding the spatial location of the churches, we observe two main patterns which cover the 81,8% of the studied sample. On the one hand, 15 of the 33 churches (45,4%) are located in the middle of the valley slopes, with a good visual control of the whole valley and, consequently, being usually clearly visible from the most of its surface. This pattern is shown by the majority part (75%) of the churches located in non-flattened areas (a total of 20 churches). On the other hand, 12 churches are located in plains (9 cases) or in the bottom of wide valleys (3 cases). Despite some minor differences, both can be considered as a unique pattern, which includes the vast majority of the churches (92,3%) from non-mountainous areas of the study zone (a total of 13 cases).

There are only 6 cases (18,2%) outside these two groups. *Sancti Georgii in Laurenzana* is placed on the visible top of a mount, over an ancient Iron Age Hillfort. The *eremita Sancti Salvatoris* and the *Monasterium Sancti Felicis et Macabei* are also placed in the summit of mounts but in hidden positions which are not visible from the surroundings.

Sancte marie in Triuada is located on a sort of high plateau. Finally, *Sancti Stephani* (currently identified as San Estevo do Ermo, a name that refers to an eremitic location) and *Sancti Iacobi in Villa Plana* are placed in hidden locations in the bottom of valleys.
As we can see in the corresponding table, churches located in the middle of valley slopes usually stand in external positions to the villages: in 7 cases they stand in a lateral part of the village, and in 6 cases they are located in a more isolated position acting as a centre for several nuclei. There is only 1 case of a church in a middle valley slope position that stands in the centre of a village. In opposition, churches located in plains or in the bottom of big valleys show a stronger physical relation with the village structure: 7 of these 12 churches are currently placed in the middle of the village, and in other 3 cases the church lies in the centre of a polinuclear settlement pattern. There is only one case of a church located in a plain, an isolated monastery(*Monasterium Sancte Eolalie de Ermolfi*).

4.3. Summing up: the political and social factors

Although we don't know the original settlement pattern during the early Middle Ages, it seems clear that the church location was really specific. The strong differences in the present-day position of the church with regard to the traditional villages in flat or non-flat areas suggest that some kind of intentional strategy for settlement control could have been taken into account when each church was founded. In flat areas, churches appear mostly integrated in the centre of the villages, while in mountain areas they are mostly located in the middle of valley slopes, with good visual control over the surroundings and placed in external parts of the village, or in an intermediate position of a network of polinuclear villages. The only exceptions are hermitages and some monasteries, which intentionally looked for isolated places, probably contributing to their reputation and prestige.
As seen, this pattern does not change too much depending on the type of the patron of the churches. It rather seems that different patrons set up different power strategies in order to obtain control over specific churches: while the Count Osorio was interested in creating a dominion area around his main monastery, the King and the Bishop of León were interested in the control of a regular network of churches over the whole study area, which can be identified as a pre-parish system. But both the Count's and King-Bishop's churches share similar locational patterns. It is how each patron played with the regular or concentrated distribution of churches what seems to define his power strategy.

5. INTERPRETATION: CHURCHES, LANDSCAPES AND POWER IN A MARIÑA REGION IN THE EARLY MIDDLE AGES

Before trying to explain the previous results from a historical perspective, we must remember that we are working with theoretical models, which means that we are trying to simplify the complexity of the reality in order to detect general trends through available historical data. Thus, it is possible that a few cases will not fit into the general model, but most of them will do. Moreover, we must not forget that the analytical approaches developed in this work only consider geographical regularities of the church location, which seem to be very important basing on our previous knowledge of the Galician landscape. However, it is likely that more variables (religious, social, political, etc) that have not been modelled here also influenced the location of the churches.

From qualitative perspectives, previous works already showed that churches played an important role in the political strategies of local consolidation of the different power structures and political agents that controlled Northwest Iberia during the early Middle Ages, mainly the Sueve-Visigothic and the Asturian-Leon kingdoms (i. e. Freire, 1998; López Alsina 2002; Pérez 2012; Sánchez-Pardo 2013). Thanks to the exceptional, well-documented, case study of A Mariña, this is the first time that a quantitative approach demonstrates that a landscape collective planning of the network of churches took place in Northwest Iberia during the early Middle ages. Although we don't know who founded and decided the location of most of these churches, a supralocal logic can be detected in their collective spatial distribution. This also moves us to think that some kind of regional authority, like bishops or kings, had at least some degree of control over the locational decision for each one of these Christian buildings. This does not mean that bishops or kings directly founded all these churches, but they probably controlled or approved most of the ecclesiastical foundations made by local and regional elites.

Whether it was punctual or, more likely, gradual, this spatial planning can be defined as a real power strategy -together with the architecture, dedication, donations, etc of the church- since it is clearly linked to visual and territorial control of settlements and resources, as well as to create political and religious milestones in their surrounding landscapes. In this sense, churches in this region could have been key elements in the construction of a politicised religious landscape: in addition to their visual control over the local realm, something which is specially clear in the case of valleys but also by their central position in the villages of plain areas, churches may also reflect and make the

political and economic power of their owners visible. Moreover, the distribution of the churches seems to create a network of centres of power and homogeneous economic exploitation, as showed by the absence of overlapping and regular size of the territories controlled by each of them.

Based on the landscape dimension of the early medieval churches, the effectiveness of this power strategy is demonstrated by the fact that most of them still exist and have a religious function nowadays. Again, this proofs the strength of the traditional Galician parish system, which traditionally has been admitted to have its remotest origin in the early Middle Ages (Bouhier 2001). Anyway, the case study presented here goes further and shows that most of the parish churches of the study area already existed and played a territorial function well before the year 1000 AD. In this sense, we can reasonably suggest that some kind of ecclesiastical territoriality already existed by the end of 10th century in this area, which can be conceived as a sort of "pre-parish system". If this is confirmed in future works in other areas, we should start changing the accepted idea that the traditional parish system in North Iberia was created during the central Middle Ages (12^{th}-13^{th} centuries) (López Alsina 2002).

As said, our results suggest that visual and territorial control about human communities and natural resources had priority over direct economic reasons like, for example, vicinity, to the best agricultural lands. But obviously, economic exploitation would have also played a role in this ecclesiastical landscape. All churches seem to have equal access to natural resources, and it is clear that competition for the appropriation of these churches with their corresponding resources and rents existed among different kinds of powers. Thus, we can see both a complementary and competitive control of access to resources, as well as the construction of a politicised sacred landscape.

However, this competition was based on different strategic and political decisions linked to each one of these political agents. The fact that there are not important locational differences among churches controlled by different patrons seems to suggest that kings, bishops, counts and local elites played similar cards but at very different scales. It is the number of churches they controlled and especially their geographical distribution what seems to make the difference in the power strategies. In general, churches controlled by Count Osorio are distributed with special intensity in the valleys of Mondoñedo and Lourenzá, mainly around his monastery located in the latter. These valleys are located at strategic communication axes between inland and coastal North Galicia, and seem to be the nuclear area of dominion by this count by the middle of the 10th century. However,

the churches controlled by the king-bishop show a slightly more regular distribution throughout the territory and seem to form a parish network in a certain way. Finally, the few churches controlled by Iquilo, the local owner, are concentrated in the same area, near the river Eo, reflecting that it was her small dominion area.

The results of our analysis suggest that in this region, at the end of the 10th century (but probably earlier too), obtaining the ownership of a church meant to get access also to some degree of political and symbolic control over the communities, settlements, rents and natural resources in a territory -usually valleys- of around 4 km radius.

6. CONCLUSIONS

Despite the important progresses in landscape studies and GIS applications to the analysis of historical territories in the last decades, medieval historians in North Spain have scarcely embraced these approaches in order to better understand the spatial dimension of the numerous early medieval churches and monasteries that are mentioned in the documents. Thanks to the combination of the study and mapping of a few -but rich- historical documents with computationally-informed landscape archaeology, this study has been able to reveal part of the spatial logics behind the creation of the early medieval ecclesiastical landscapes in Northwest Spain. The results allow us to propose that the specific location of the early medieval churches was often related to visual and territorial control over specific catchment areas and settlements as well as territorial articulation, suggesting that some kind of collective planning was taken into account when each one of these churches was founded. This is just a first step and further work from this perspective will undoubtedly help to improve our knowledge of early medieval ecclesiastical landscapes.

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