The Northern and Western Borderlands of the Sasanian Empire: Contextualizing the Roman/Byzantine and Sasanian Frontier

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Introduction

As a large territorial entity, the Sasanian Empire encompassed a variety of geographical, environmental and socio-cultural zones. Even within the northern and western reaches discussed here, the empire included the high mountain ranges of the Taurus, Caucasus and eastern Anatolia, the fertile dry farming plains of much of northern Mesopotamia and Gorgan, heavily irrigated southern Mesopotamia and steppe and desert regions in various guises (Figure 1). Threats to Sasanian power were similarly diverse, from the agrarian might of the Roman Empire in the west to smaller local 'states', client kingdoms, and decentralised nomadic groups in the north and northeast. This diversity had a profound impact on the organisation and character of the frontier regions at the edges of imperial control. In this paper we make use of data acquired as part of the recent upsurge in interest in Sasanian frontiers across the study region,[2] as well as satellite imagery and textual information, to examine the structure and function of the frontier zones in different areas.

Before embarking on this analysis, it is necessary to briefly characterise our approach to frontiers. Early discussions of frontiers and borderlands focused on a judicial understanding of boundaries as the result of legal agreements or treaties between states.[3] However, during the late nineteenth and early twentieth century ideas relating to natural boundaries began to

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[2] See Daryaee 2016 for discussion of the history of Sasanian research

[3] Brandell 2006

emerge, particularly through the work of German geographers such as Friedrich Ratzel.[4] Combining social Darwinism with a biological understanding of the state as an organic system capable of growth it was possible to justify the imperial expansionism of Western states during this period as a result of inherent strengths and weaknesses in national character. In Britain, Lord Curzon[5] made a distinction between 'natural' and 'artificial' frontiers, arguing that physical barriers such as mountains, deserts, large water bodies and rivers could become important as both conceptually significant and easily defendable boundaries, but that in the absence of such features frontiers could involve manmade structures such as linear barriers or areas of depopulated land. This framework has had a profound effect on ancient frontier studies. For example, in a recent study of the frontiers of the Roman world, David Breeze[6] defined seven different types of frontier: a) Linear Barriers, b) River Frontiers, c) Desert frontiers; d) Mountain frontiers; e) Sea Frontiers; f) Forests, Marshes and Swamps and g) the Frontier in Depth.

In opposition to the ideas of Ratzel and others, scholars such as Febvre[7] argued for a more contextual approach, focusing on the particular history of the frontier in question and the different actors involved; 'in reality it is not by beginning with the frontier itself that it can be studied…it is by starting with the State'.[8] Although frontiers may form zones of exclusion or control, such a focus reminds us that they can also be areas of intense cultural encounters, enhanced human activity and growth.[9] Rather than drawing a sharp distinction between natural and artificial frontiers we would argue that analyses of frontier regions need to consider the complex interplay between social and geographic factors, especially at the broad spatial scale required to understand imperial processes. Landscape archaeology, by which we mean the investigation of the cultural landscape through time,[10] provides an ideal lens through which to examine these processes. In this paper we draw on a variety of case studies of discrete regions to compare the archaeological landscapes of the Sasanian frontiers in the northern and western borderlands of the empire. Such an approach allows us to contextualise the archaeological remains within their landscapes and to bring out broader geographical patterns.

[4] Ratzel 1897
[5] Curzon 1907
[6] Breeze 2011
[7] Febvre 1962
[8] Febvre 1962 quoted in Brandell 2006
[9] Turchin 2006
[10] Wilkinson 2003

Materials and Methods

Utilising evidence from current and archived archaeological surveys in combination with a range of remote sensing datasets we can compare the organisation of settlement and defensive structures of the Sasanian frontier zones in response to a variety of internal factors, as well as external pressures. Because of their capability of covering vast areas of the globe, satellite images are ideal for topics such as imperial frontiers which themselves cover very large regions. They can allow us to identify similar features, such as fortification types, in very different environments and landscape settings, as well as providing wider landscape context for such features. In this study we make use of recently acquired Landsat 8 multi-spectral imagery and Digital Elevation Models (DEMs) derived from the Shuttle Radar Topography Mission (SRTM) alongside declassified CORONA spy photography acquired in the 1960s. The value of the CORONA imagery when applied to Near Eastern landscapes has been discussed extensively elsewhere[11] and has proved extremely effective for identifying and mapping Sasanian features in several of the regions considered here.[12] Nevertheless, it is not possible to cover the entire western and northern blocks of the Sasanian Empire, therefore the following key examples should be seen as sample areas within a greater whole.

Before discussing the study areas in detail, it is worth noting some general limitations of the evidence available. The most important of these is the problem of dating. This is particularly acute in relation to discoveries made through satellite imagery, since without ground-truthing it is almost impossible to definitively assign settlements and features to specific periods. Even on the ground, features such as canals, earthworks and routeways which are not commonly associated with relevant material culture (in the Near East during the Sasanian period this almost exclusively means ceramics) are very difficult to date except through association with sites, excavation, or the use of radiometric techniques such as radiocarbon or OSL. Finally, the precision of dating available through ceramic periodisation is itself reliant on excavation data, and the quantity and quality of relevant sequences within a given region.[13] For the Sasanian period this is compounded by the relative paucity of ceramic types visible throughout the empire, at least in comparison to the Roman world, which make secure local sequences even more important and result in different levels of precision across the region. In the Gorgan Plain, for example, excavations at several sites have allowed the survey team to

[11] Hritz 2014, Casana, Cothren and Kalayci 2013
[12] Alizadeh and Ur 2007; Wilkinson *et al*. 2013
[13] Lawrence, Bradbury and Dunford 2012

distinguish Sasanian period ceramics fairly clearly, and in some cases to sub-divide the Sasanian period even further into Early, Middle and Late periods.[14] On the other side of the Caspian in the Mil Plain of Azerbaijan, however, ceramic sequences for the historic periods are far less clear, such that some sites can only be dated to a period encompassing the Parthian, Sasanian and Early Islamic periods, covering perhaps as long as 800 years. Recent work at Ultan Qalası on the southern side of the Araz River in Iran has provided an important, though small, assemblage for the Late Sasanian period[15] but applying this to the collections from the survey has proved challenging. In northern Syria, and to some extent southern Mesopotamia, the problem is distinguishing between Sasanian and Early Islamic ceramics, meaning some sites must be assigned to a period sometime between the end of the third century (note already within the historically attested Sasanian imperial period) and the end of the eighth century.[16] This is not to say that we cannot make statements about the nature of the Sasanian landscape at particular times, only that we need to be aware of local chronological issues when doing so.

Geographical Case Studies

Western Iraq

The "breadbasket" of the Sasanian Empire was situated within Khuzestan in Iran and the Mesopotamian plains of Southern Iraq.[17] A series of massive irrigation canals and associated distribution systems were deployed in this region to raise agricultural yields and ensure a consistent level of production for taxation by the Sasanian state. At the same time, both urban and rural settlement rose in comparison to earlier periods[18] and the Sasanian capital, Ctesiphon, was located on the Tigris to the south of modern Baghdad. Given its importance to the Sasanian Empire, it is easy to forget that this region was located in close proximity to a major frontier, the western desert. Beyond the limits of irrigation-fed agriculture, the western desert stretched between the Mesopotamian plains in the east and the Jordan Valley in the west, an area populated by highly mobile tribal groups who negotiated a series of complex and shifting alliances with the Roman and Sasanian states.[19] Although no formal frontier between the two zones has been defined, early travellers and some scholars of the Late

[14] Priestman 2013; Wilkinson *et al.* 2013
[15] Alizadeh 2011
[16] Ur 2010; see also Wells 2015
[17] Adams 2006
[18] Adams 1965 and 1981.
[19] See Morley, this volume

Antique world[20] have recognised the presence of a distinct earthwork roughly corresponding to the western limits of the alluvial plain. This feature is known as the Jari Sa'deh or Khandaq Shapur (Trench of Shapur) and is variously described as a sub-surface trench, an upstanding linear mound or a canal by western travellers to the region. In fact it may have been all three, with the upcast from the trench excavation forming a mound on one or both sides. The feature was first described by the Danish explorer Carsten Niebuhr in the eighteenth century and parts of it were mapped during surveys by several British naval officers in the mid-nineteenth when it was thought to extend from Hit in the north to Basra in the south.[21] Although heavily truncated by later development, analysis of high resolution satellite imagery has allowed us to trace the feature for over 100km from just south of Fallujah in the north to Najaf (Figure 2).[22] A radiocarbon sample taken from one of the levees still upstanding provides a date between AD 420 and 570,[23] firmly in the late Sasanian period. This mapping has revealed the highly judicious use made of the landscape, even in this apparently flat and featureless landscape. The trench follows the eastern edge of the Al-Khir alluvial fan, a subtle topographic rise which prevents irrigation canals from extending further into the desert; indeed even today modern mechanised irrigation systems have not extended any further than the line of the Khandaq in this area.

Beyond the Khandaq, a series of pre-Islamic ruins suggest an extension of the frontier zone into the desert. These so-called desert castles, perhaps best interpreted as residential forts, have been extensively mapped in southern Syria, Jordan, Palestine and Iraq and are generally related to the Umayyad period in the eighth century.[24] Sites such as Tulul al-Ukhaidir, close to Karbala and only some 50km west of the Khandaq (Figure 2), are likely Sasanian in date and may point to a similar earlier form of settlement. Smaller forts such as Ruda, Qusair South, Nuqrat as-Salman, Dab' and perhaps Khizael Castle may have operated as way stations.[25] It seems that this scatter of desert castles served a range of functions, and it is not clear whether any of them operated as formal defensive structures for the western limits of the empire. However, we can say that a distinct form of settlement, the desert castle, is visible to the west of the Khandaq Shapur which stands in contrast to the densely occupied irrigated landscape in the Mesopotamian plains. In combination with the landscape setting at the limits

[20] Howard-Johnston 2012
[21] Ooghe 2007
[22] Much of this work was undertaken by Jaafar Jotheri as part of his PhD thesis at Durham University. A detailed discussion of the feature and its landscape will be published in a future article.
[23] Jotheri *et al.*2016
[24] Finster and Schmidt 1976
[25] Finster and Schmidt 2005; Howard-Johnston 2012

of irrigation agriculture, this does suggest that the Khandaq functioned as a genuine boundary feature.

Eastern Syria

In contrast to the irrigated plains and dry steppe landscape of the southern alluvium, Upper Mesopotamia represents a relatively homogenous landscape with sufficient rainfall to undertake dry farming agriculture. Here the Roman and Sasanian States faced one another in an area which, with the exceptions of the Euphrates and the Tigris Rivers, had no major physical features. The location of the frontier was not static for the duration of the period in question, and fluctuated eastwards and westwards between these two major rivers. Sasanian settlement across upper Mesopotamia has been comprehensively discussed by Simpson,[26] but the publication of several surveys since his important article, especially in the Khabur region in Syria, allow for an updated interpretation. The border between the two empires in the Khabur included a no-man's-land inhabited by nomadic tribes such as the Tayy.[27] Trade and movement across the frontier, which ran along the Jaghjagh River, was controlled through urban centres such as Nisibis to the north and Dara slightly further west (Figure 3).[28] Control of these cities was therefore extremely important, as evidenced by Shapur II's redistribution of populations, including nobility, from southern Iran to Nisibis in the fourth century AD[29] and the massive investment in fortifications at Nisibis after its capture by the Sasanians in AD 363.[30] However, recent archaeological surveys in the vicinity of Tell Brak,[31] Tell Hamoukar[32] and Tell Beydar[33] allow for a reassessment of the 'empty' sector of the Khabur Basin (Figure 3). In contrast to the picture provided by the textual sources, Sasanian (likely late Sasanian) occupation appears to have been reasonably dense. The Tell Brak Sustaining Area Survey (TBSAS) recorded 106 sites of Sasanian date in an area of just under 500km^2 on either side of the Jaghjagh, only a slight drop in settlement density compared with the preceding Parthian and Hellenistic periods which had 139 and 140 sites respectively (Figure 4). In addition, a possible crossing point on the Jaghjagh has been identified between the Castellum at Tell Brak and the site of Saibakh on the other side of the river.[34] In the 125km^2

[26] Simpson 1996
[27] *Ibid.*: 88
[28] See also Comfort 2008
[29] Morony 1976
[30] Howard-Johnston 2012
[31] Wright *et al*. 2006-2007
[32] Ur 2010
[33] Ur and Wilkinson 2008
[34] See discussion in Hopper, this volume

Tell Hamoukar Survey to the east of the Jaghjagh, settlement numbers declined from 16 sites to four at the beginning of the Sasanian period before expanding again in the late Sasanian/Early Islamic period. Interestingly, the decline into the early Sasanian period may be the result of a process of nucleation, with three large villages replacing the earlier more dispersed settlement. This may be interpreted as a defensive move perhaps related to greater threat from nomadic groups, although none of the villages seems to have been walled. On the other side of the Jaghjagh, to the west of the possible frontier zone, the Tell Beydar Survey (TBS) also shows a strong continuity of settlement, with 34 Hellenistic, 28 Parthian and 27 Sasanian/Early Islamic sites. Although the precise dating of many of these sites is problematic, there is good evidence from the surveys for a dense network of small to medium sized sites across the Khabur Basin during the Roman-Sasanian period, with the highest density of settlement located on the Jaghjagh River, supposedly the frontier itself (Figure 4). Quite how autonomous this network of rural settlement was in relation to the powerful urban centres which are the focus of the Classical sources must be the object of further study, but the near continuous nature of settlement suggests a high level of interaction between different groups. At the very least, this was a very different sort of frontier to that further south.

The Southern Caucasus

Recent survey and remote sensing work in the Southern Caucasus by a variety of local and foreign teams allows us to reconstruct this frontier at a regional scale. Here the mountain chain of the Upper Caucasus forms a long linear obstacle between the Caspian and Black Seas, with a narrow strip of land on the Caspian side and several mountain passes in the central part of the range offering the only viable crossing points. Although this was undoubtedly a formidable 'natural frontier', in order to function effectively it had to be supplemented at strategic points. This is most obvious along the Caspian coast, where several linear barriers, large forts and fortified urban sites were constructed (Figure 5). From north to south, these include the World Heritage Site at Derbent in Daghestan, with a fortress and parallel set of walls within the modern city and a 42km mountain section to the west,[35] the 125ha fort of Torpakh Qala, the Ghilghilchay Wall and Chirakh Qala in modern Azerbaijan[36] and the Beshbarmak Fort and possible wall further south. All of these features appear to have been constructed during the fifth–sixth centuries AD, with an initial construction of a mud

[35] Gadjiev 2008 and 2009
[36] Aliev *et al*. 2006

brick wall at Derbent followed by the Ghilghilchay Wall and later a reorganisation of the Derbent defences, now built in stone.[37]

There is insufficient space to discuss each of these in detail here (for overviews see the papers cited) but some general patterns in the organisation of the linear barriers and forts are worth mentioning. Both the Derbent and Ghilghilchay Walls make use of local topographic features to enhance their defensive capacities (Figure 5). Derbent is located at the narrowest point of the coastal strip, where a long spur of raised land extends to within four kilometres of the Caspian Sea. The major stone walls linking the fortress of Narynqala, situated on the end of this spur, to the coast could therefore be relatively short, reducing the amount of manpower and materials needed and allowing for a fairly rapid period of construction. Nevertheless, the walls within Derbent represent a substantial investment, standing at between 18 and 20m in height and including 100 round towers. Much less is known about the 42km mountain section further inland, of which there is no trace on either the CORONA or modern high resolution imagery, but it was certainly a single rather than a double wall with only around 40 forts along its length.[38] To the south of Derbent the coastal strip widens significantly, and here we find a major Sasanian site of Torpakh Qala, a walled rectangular site of 125ha with regularly spaced towers along its walls and an external ditch. Torpakh Qala closely resembles the 'mega-campaign base' at Qal'eh Pol Gonbad in the Gorgan Plain, as well as Qal'eh Gabri close to Varamin in the Tehran Plain (Figures 6 and 7).[39] The position of the site, some 20km to the south of the Derbent defences in an area of flat, fertile land, may be related to the need to provision a large number of troops. Given Sauer's estimate for campaign bases of around 40ha to hold 10,000 horsemen,[40] we might expect the mega-campaign bases to accommodate 30,000 individuals, likely a substantial drain on local resources.

The Ghilghilchay Wall makes similar use of local topography and is again situated at a point where the mountains lie close to the Caspian. Drawing on fieldwork undertaken by a joint Azerbaijani-Daghestani-American team,[41] we have used CORONA satellite imagery to examine the extant remains of the wall as it was visible during the late 1960s. The remote sensing analysis has revealed several previously undocumented sections of the wall, most of which had been destroyed by industrial and agricultural development by the time of the

[37] *Ibid*
[38] Howard-Johnston 2012
[39] Sauer *et al.* 2013: 321-22, 358-60, 372; Sauer *et al.*, this volume
[40] Sauer *et al.* 2013: 347-49, 365-71
[41] Aliev *et al*. 2006 . A detailed discussion of the results of our remote sensing work, predominantly undertaken by Edward K. East, will be published in a future article.

surveys in the early 2000s, as well as a new fortification structure in the mountain section (Figure 8). The wall extends 27km inland from the coast and includes an 8km section in the plain ending at the Yenikend Fortress, a 10km piedmont section which runs parallel to the Ghilghilchay River, and a shorter section in the mountains (9km), ending at the stronghold of Chirakh Qala. The plain and piedmont sections of the wall were constructed from mud brick and reach 7m in height in places, with a ditch on the northern side visible in the plain section, perhaps a source for the mud bricks used in its construction,[42] and clear use of the steep-sided Ghilghilchay River as an extra barrier in the piedmont section. The mountain section was not investigated by Aliev and his team but, given the similarity in size and morphology visible on the CORONA imagery, likely follows similar construction techniques and dates to the same period. Unlike the fortifications further north, there are no obvious campaign base sites in the vicinity of the Ghilghilchay Wall. However, the size of the forts incorporated within the wall itself is much larger, with Yenikend Fortress at the edge of the plain covering approximately 9ha, while Chirakh Qala and the three smaller sites in the piedmont section adding an extra two or three hectares of potential settled area. It is possible that the wider coastal strip in this area could accommodate a greater number of troops in the immediate vicinity of the wall itself.

Alongside the Caspian coastal strip, the Dariali Pass, also known as the Caspian Gates, in modern Georgia was the main route for hostile forces seeking to cross the Upper Caucasus during the Ancient and Medieval periods, and is still a major route way today.[43] This narrow gorge was controlled by several small forts the most important of which, Dariali Fort, has been securely dated to the Sasanian period.[44] Again, the landscape setting is clearly of the utmost importance here, with the fort situated at one of the narrowest points in the gorge, with areas of open land to the south available for cultivation to feed any potential garrison. There is also evidence for terracing and landscape management dating back to at least the tenth century, and potentially much earlier.[45]

To the south of the Upper Caucasus, the plains of the Kura and Araz River valleys provide ample evidence for significant Sasanian presence and capital investment. To the south of the Araz River, recent survey and excavation work has revealed several Sasanian sites and

[42] *Ibid*
[43] Sauer *et al*. 2015
[44] See Sauer *et al*. this volume
[45] Lisa Snape-Kennedy, pers. comm., January 2016

fortifications, many of which were directly associated with large scale irrigation canals.[46] The most impressive of these is Ultan Qalası, a 70ha settlement comprising a rectangular fortified complex, a substantial lower town, and an associated canal system.[47] Further north on the Mil Steppe in Azerbaijan, a similar configuration is visible at Ören Qala, ancient Beylaqan, which was excavated by a Soviet team in the 1950s and 60s.[48] Survey transects undertaken as part of the Mil Steppe Survey by the author and colleagues recovered Sasanian ceramics similar to the Ultan Qalası assemblage across a vast area, suggesting the settlement could have been as large as 300ha. Continuing north, layers described as Late Antique have been recovered from Nargiz Tepe, a site of unknown, but likely large, size very close to the disputed Nagorno Karabakh region, and at the 25ha site of Qala Tepe, both of which have been excavated by Professor Tevekul Aliyev. Recent work by a team from Oxford University at Barda has confirmed the Sasanian occupation suggested by textual sources. There is also some textual evidence that the major Islamic site at Shemkir was occupied during the Sasanian period, as the city was described as ancient at the time of the Arab Conquest by al-Baladhuri in the ninth century, although excavations have so far only recovered remains dating back to the eighth century.[49] Of these, Ören Qala, Qala Tepe and Shemkir all include substantial fortifications. Unfortunately our interpretation of all of the sites in modern Azerbaijan is hampered by significant occupation layers post-dating the Sasanian period, especially during the medieval period at Ören Qala, Qala Tepe and Shemkir, but even continuing to the present day at Barda,[50] which means dating individual features such as city walls requires excavation. The alignment of these sites is suspiciously linear, and follows the edge of the plain as it runs along the Karabakh Hills (Figure 9). It is possible that they formed nodes on a road network which may have extended as far as the Dariali Gorge in the north.

In addition to the urban centres, evidence from the Mil Plain Survey suggests a rise in rural settlement during the Sasanian period. It should be stressed that our interpretation of the ceramic chronology in this region is at best provisional and much more excavation is required to firm up the sequence. However, our preliminary findings indicate peaks in site numbers during the Iron Age, Sasanian and Medieval periods, interspersed with periods of near abandonment of the region. This mirrors the cycles of settlement seen in the Mughan Steppe,

[46] Alizadeh and Ur 2007; Alizadeh 2014
[47] Alizadeh 2011
[48] Ahmadov 1997
[49] Dostiyev 2012
[50] This situation is rather different to the sites in the Mughan Steppe, where no glazed ceramics associated with Islamic periods were recovered on the surface. The contrast between the Mil and Mughan Steppes during the Islamic period is worth exploring but is beyond the scope of this article.

although here a mid-twentieth century irrigation system and the short duration of the survey meant that recovery of small rural sites was much more limited.[51] The Sasanian sites in the Mil Steppe are small and fairly evenly distributed along the larger streams running down from the Nagorno Karabakh range, with a particular concentration close to the site of Ören Qala. Taken together, the new evidence from the Mil Plain survey and Oxford project suggests we can extend Alizadeh's argument[52] for significant investment in infrastructure during the Late Sasanian period along the Araz much further north where a similar pattern of the foundation of large urban centres and the construction of canals and forts is visible. The settlement evidence from the Mil Plain may also support Alizadeh's proposal for large-scale resettlement of local nomadic groups and population transference from central parts of the empire to frontier zones.

The Gorgan Plain

The Gorgan Plain has been extensively discussed, both in this volume[53] and elsewhere,[54] and here we will confine ourselves to a brief summary of major relevant aspects. The plain extends from the foothills of the Alborz and Kopet Dag Mountain ranges to the dry steppes of modern Turkmenistan, with rainfall decreasing from south to north from 600mm to 200mm per annum in a little over 60km, and is bisected by the Gorgan River which flows roughly east to west into the Caspian Sea. During the Sasanian period the Gorgan Wall was constructed, a 195km long fired brick barrier running across the plain and up into the Kopet Dag with over 30 forts and a ditch on the northern side.[55] Water was supplied to the ditch via a complex system of feeder canals and aqueducts. Further Sasanian fortification in the region occurred to the south west where the Tammisheh Wall runs almost north to south at a narrow point between the Alborz and the Caspian coast. In the plain itself, to the south of the Gorgan Wall, a series of large fortified structures, described as campaign bases by Sauer,[56] were constructed, including the aforementioned Qal'eh Pol Gonbad, Qal'eh Kharabeh, Qal'eh Daland and Qal'eh Gug A, as well as the 300ha urban centre of Dasht Qal'eh. All of these

[51] Alizadeh and Ur 2007
[52] Alizadeh 2014
[53] See chapters by Hopper and Sauer *et al*. in this volume
[54] Most recently, and comprehensively, Sauer *et al*. 2013
[55] Sauer *et al*. 2013
[56] Sauer *et al*. 2013: 303-81

constructions can be more or less securely dated to the fifth century during a period of peace with the Eastern Roman Empire.[57]

A striking aspect of the Gorgan Plain settlement pattern is the relative paucity of landscape investment of a non-military nature. Two major irrigation canals discovered during the survey by Wilkinson and colleagues cannot have functioned later than the Parthian period judging by the associated sites[58] and those clearly related to Sasanian features all either feed the ditch on the north side of the wall or supply the campaign bases such as Qal'eh Kharabeh. The plain to the south of the wall likely received sufficient levels of rainfall to conduct rain fed agriculture at this time, especially closer to the Alborz Mountains, but this was also the case in the Mughan and Mil Steppes where, as we have seen, substantial canals were put in place. Part of the reason for this absence may relate to later landscape destruction in the more fertile areas of the plain to the south of the wall, but numerous qanat mounds are visible on the CORONA imagery and we would therefore expect some traces of similar canal features to survive. On-going analysis of the surveys carried out in the plain suggests a drop in rural settlement during the Sasanian period,[59] precisely the opposite to what we might expect if increasing agricultural yields through dry farming was a primary aim. We might, therefore, characterise the Gorgan Plain frontier as a relatively militarised zone, especially in comparison with the situation in the Southern Caucasus.

Discussion

This brief discussion of key case studies from the northern and western parts of the Sasanian Empire reveals the multiple manifestations of frontiers in this region, as well as the intimate relationship between military installations, urban and rural settlement and local geography. The Sasanians were adept at co-opting aspects of the physical landscape into local and regional defensive strategies, as in the Southern Caucasus, but were also capable of recognising the limits of rain fed agriculture or irrigable land and making strategic decisions accordingly, as in the Gorgan Plain and Southern Iraq. Comparing between the frontier zones allows us to make some general statements about Sasanian frontier strategies.

[57] Sauer *et al*. 2013: 593-629. A date in the early sixth century is compatible with the radiocarbon dates as well, but more difficult to reconcile with the sources.
[58] Wilkinson *et al*. 2013
[59] Kristen Hopper pers. comm. February 2016. This will be discussed further in Hopper's forthcoming PhD thesis.

Three of the four case studies discussed included linear barriers of one sort or another and they represent a significant aspect of Sasanian frontier policy, at least from the fifth century onwards. The placement of these barriers seems to be a function of both the local and regional landscape and the type of threat faced. It is tempting to see long walls as a response to a particular kind of enemy, namely semi-nomadic or nomadic groups with a tribal or confederate social organisation. The northern walls on the Gorgan Plain and the coastal strip on the other side of the Caspian conform to this pattern, designed to defend against the Hephthalites and subsequently the Khazar Khaganate respectively, both political organisations comprised of people of the Central Asian Steppe. The Khandaq Shapur can now also be added to this model, as it was likely constructed as a defence against the various Arab tribal groups present in the western desert of Iraq and Jordan. The absence of similar features in north Syria, where the Sasanians faced an enemy of similar strength and military organisation to themselves in the Eastern Roman Empire, lends support to this argument.

Contrary to what one might expect, all of the linear barriers conform to what Breeze has called the frontier in depth,[60] and may be interpreted as creating arenas of combat, enclosed areas 'for trapping, engaging and defeating enemy forces'.[61] This is most clearly visible in the Southern Caucasus, where almost 120km separates the Derbent Wall from the Ghilghilchay Wall, with the Beshbarmak Fort a further 30km south along the Caspian coastal strip. The opposite side of this arena may have been created by the fortified urban centres running along the edge of the Nagorno Karabakh and the string of fortified sites along the Araz River suggests this may have formed the southern edge.[62] In the Gorgan Plain a similar arena may have been created between the Gorgan and Tammisheh Walls and the Alborz Mountains, but, as Hopper shows in her chapter, Sasanian interest also projected further north. In Southern Iraq a series of fortifications extended far beyond the Khandaq Shapur out into the desert, while the dense network of irrigation canals to the east in Mesopotamia proper would have hampered movement significantly and have been argued to act as further defensive features.[63]

[60] Breeze 2011
[61] Howard-Johnston 2012
[62] At the Rome conference, James Howard Johnston suggested that the Kura River may have formed the southern barrier of this arena. However, no relevant sites are known in this area and extensive analysis of satellite imagery in the region has yielded no likely candidates for Sasanian fortifications, settlements or other features. However, the Kura has a far more active channel than the Araz, evidenced by the numerous palaeochannels visible on the CORONA imagery, meaning sites situated in close proximity to the floodplain may have been eroded away
[63] Howard-Johnston 2012

Alongside linear barriers, the frontier zones received a significant amount of capital investment through the founding or renewal of urban centres and the construction of large scale irrigation systems, as well as increases in rural population.[64] However, this investment was not uniform, even in areas with fairly similar environmental conditions. How, then, should we make sense of the variable nature of Sasanian frontier landscapes across the northern and western borderlands? A useful concept here is the network empire, first proposed by Liverani in relation to the Neo-Assyrian Empire[65] and recently expanded upon by Monica Smith.[66] Smith sees the Sasanian Empire itself as a network, with urban centres and forts acting as nodes and canals and linear barriers as connecting corridors. A notable absence from Smith's model is the rural landscape outside of the irrigated zones, in part a product of the lack of evidence available at the time. For Liverani, rural settlement is a key aspect of the model. He contrasts network empires with territorial ones, arguing that in some cases the development of imperial power should not be understood through the metaphor of an oil stain expanding outwards but of 'a network whose mesh thickens',[67] whereby increased control of territory is manifested in colonisation and a move away from urban and military nodes into occupation of the wider landscape. We can transpose Liverani's temporal model to the geographical differences between the case studies discussed above, bringing in landscape investment as a further variable. In the Mil and Mughan Steppes and Southern Iraq (as well as the Merv Oasis),[68] canal systems were put in place, cities expanded, and preliminary evidence indicates rural settlement rose, suggesting a high degree of territorial control. This investment occurred behind substantial defensive systems in the Upper Caucasus and Caspian strip and the edge of the Western Desert respectively. By contrast in the Gorgan Plain, almost all of the canal systems appear to have been of a military nature. Although irrigation may not have been required for agriculture in the southern part of the Gorgan Plain it would certainly have increased both productivity and reliability of yield. The northern part of the plain (immediately south of the wall) receives a similar level of rainfall to the Mil Steppe close to Ören Qala. Rural settlement likelyfell, and the extent of urban expansion is as yet unclear: Dasht Qal'eh represents a major city built from scratch, but may not have been the only Sasanian urban foundation to judge by recent fieldwork.[69] Here the network metaphor is more suitable and the landscape appears to have been far more militarised. In eastern Syria rural

[64] Alizadeh 2014
[65] Liverani 1988
[66] Smith 2005 and 2007. For a rather different use of this concept see Glatz 2009
[67] Liverani 1988
[68] Simpson 2014
[69] See Sauer *et al.*, this volume

settlement also declined slightly and there is no secure evidence for irrigation dating to the Sasanian period.[70] The fact that 60% of the Sasanian settlements in the Brak region were also occupied in the preceding Parthian period suggests that the new empire had limited impact on settlement patterns. In the densely settled landscapes along the Roman frontier, it seems controlling and fortifying large urban sites such as Nisibis was of greater importance to elites than raising tax revenues in the wider landscape. Again, a network model of empire works well here, with urban centres acting as nodal installations 'embedded in a native…world'.[71]

Conclusion

These are exciting times for the archaeology of the Sasanian Empire. Surveys and excavations alongside remote sensing work across the northern and western frontiers are bringing new data to light which has the potential to profoundly affect our understanding. However, our theoretical models for making sense of this wealth of information have not kept pace with our ability to generate it. The sheer size of empires, and the variability in landscape types which commonly results, means that issues of scale are a key hurdle to overcome. Frontiers and frontier installations by their nature operate at a variety of scales, utilising and impacting upon the local environment, but also functioning as part of wider regional and even imperial level systems. As we hope to have shown in this chapter, it is vital to integrate these different scales of analysis in order to understand the multiple manifestations of frontier landscapes visible in the archaeological record.

Figure Captions

[70] Although see Ur 2010; 123 for information on a canal system in the vicinity of Nisibis itself. Ur provisionally dates this to the Islamic period on the basis of associated sites.
[71] Liverani 1988

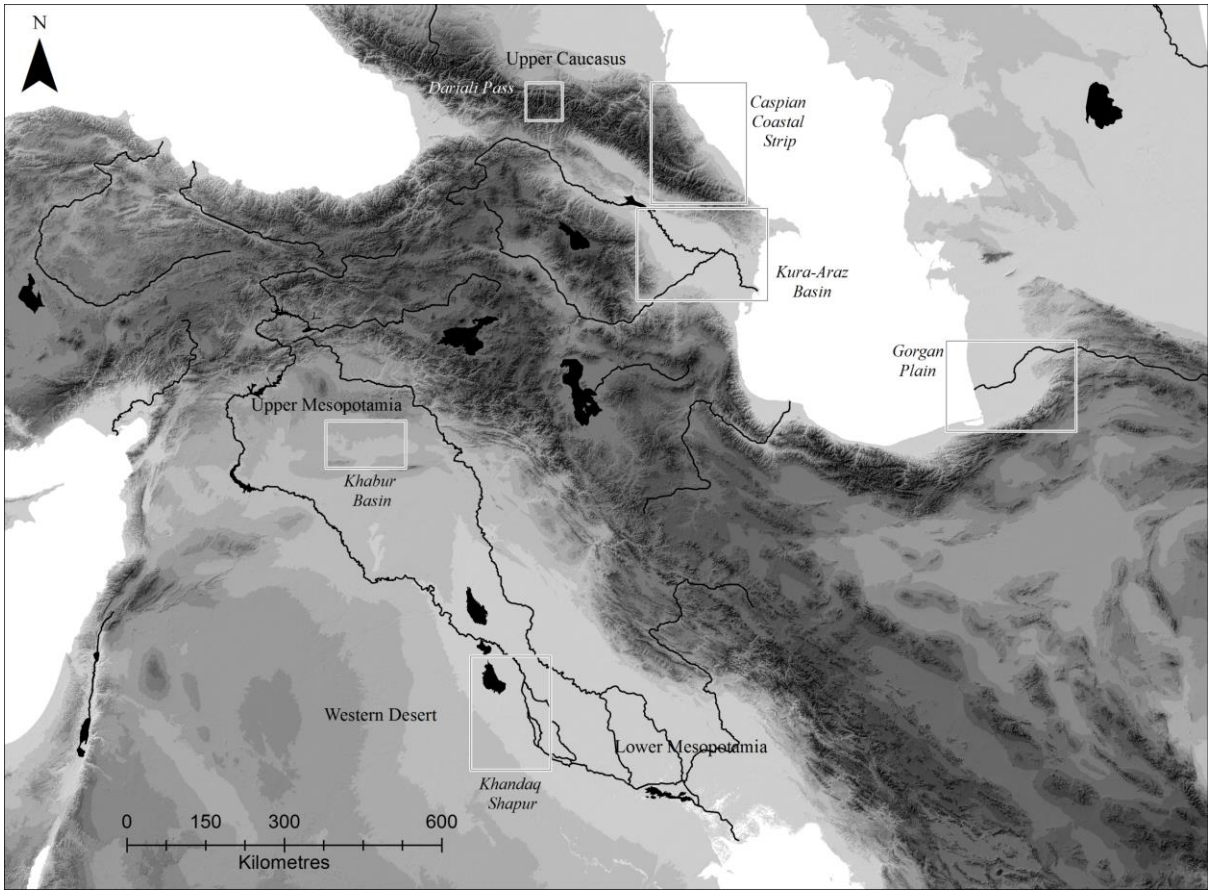

Figure 1: Map showing the location of the case study areas discussed. Background SRTM DEM courtesy of the U.S. Geological Survey

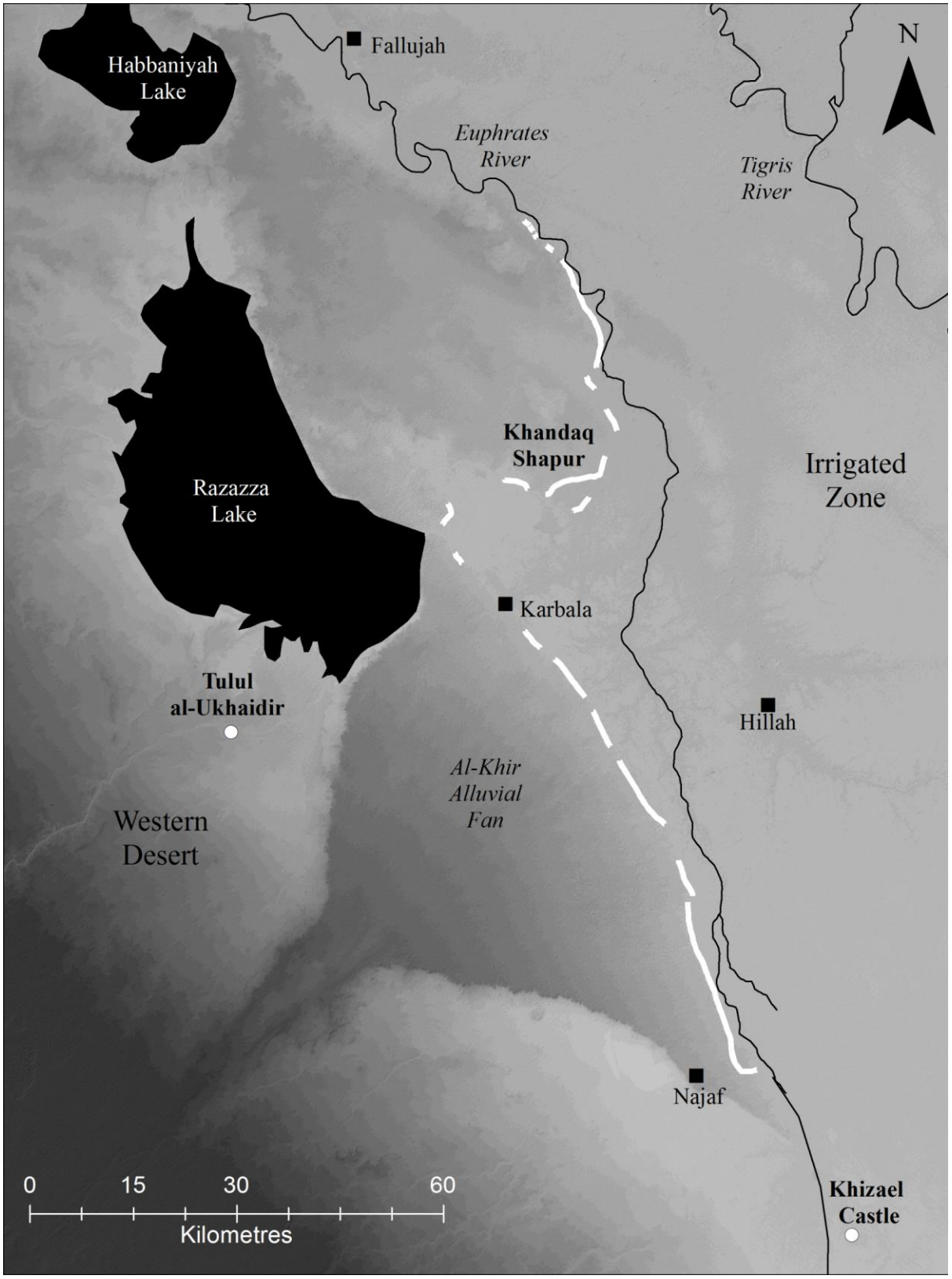

Figure 2: Map of the Khandaq Shapur region. Black squares are modern towns, white circles are ancient sites and white lines represent sections of the Khandaq Shapur. Background SRTM DEM courtesy of the U.S. Geological Survey

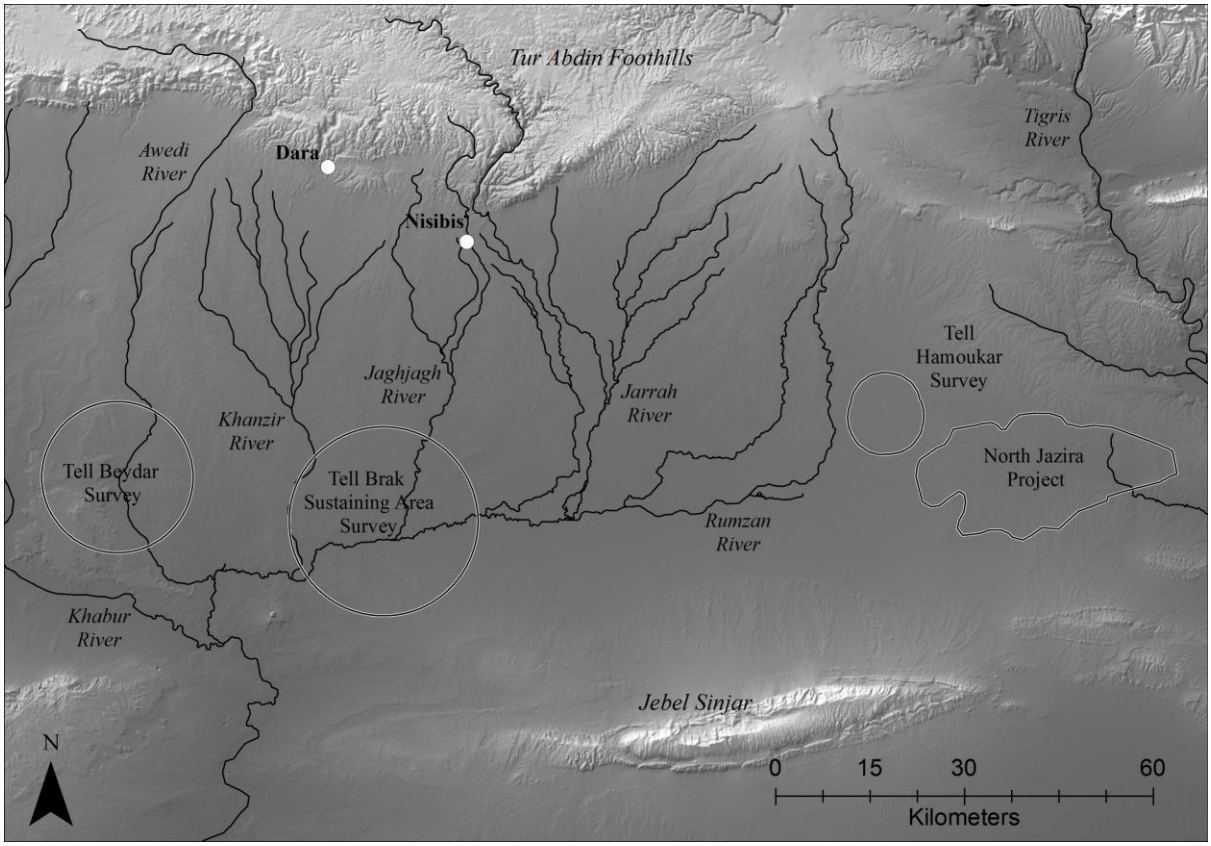

Figure 3: Map of the Khabur Basin region. White circles are ancient sites, black on white lines represent survey limits. Background SRTM DEM courtesy of the U.S. Geological Survey

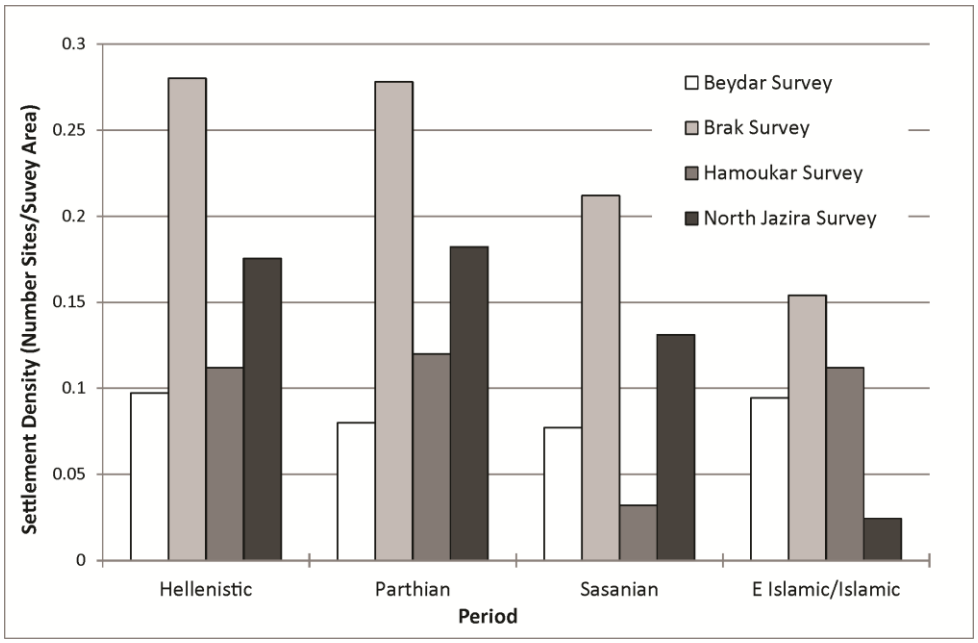

Figure 4: Graph of settlement density (number of sites/survey area in km^2) by survey across the Khabur Basin (arranged west to east)

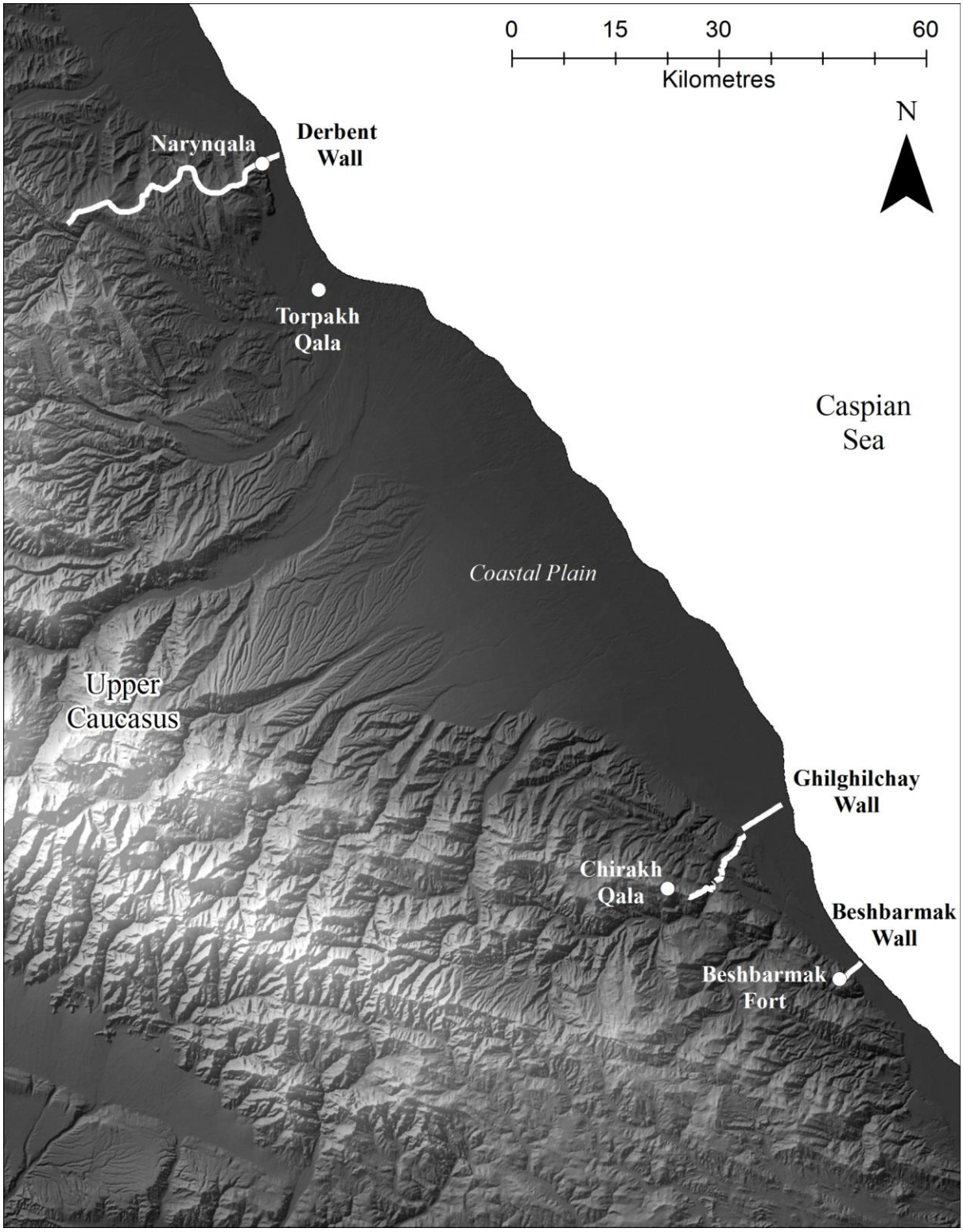

Figure 5: Map of the coastal strip between the Caspian Sea and the Upper Caucasus. White circles are ancient sites and white lines represent linear barriers. Background SRTM DEM courtesy of the U.S. Geological Survey

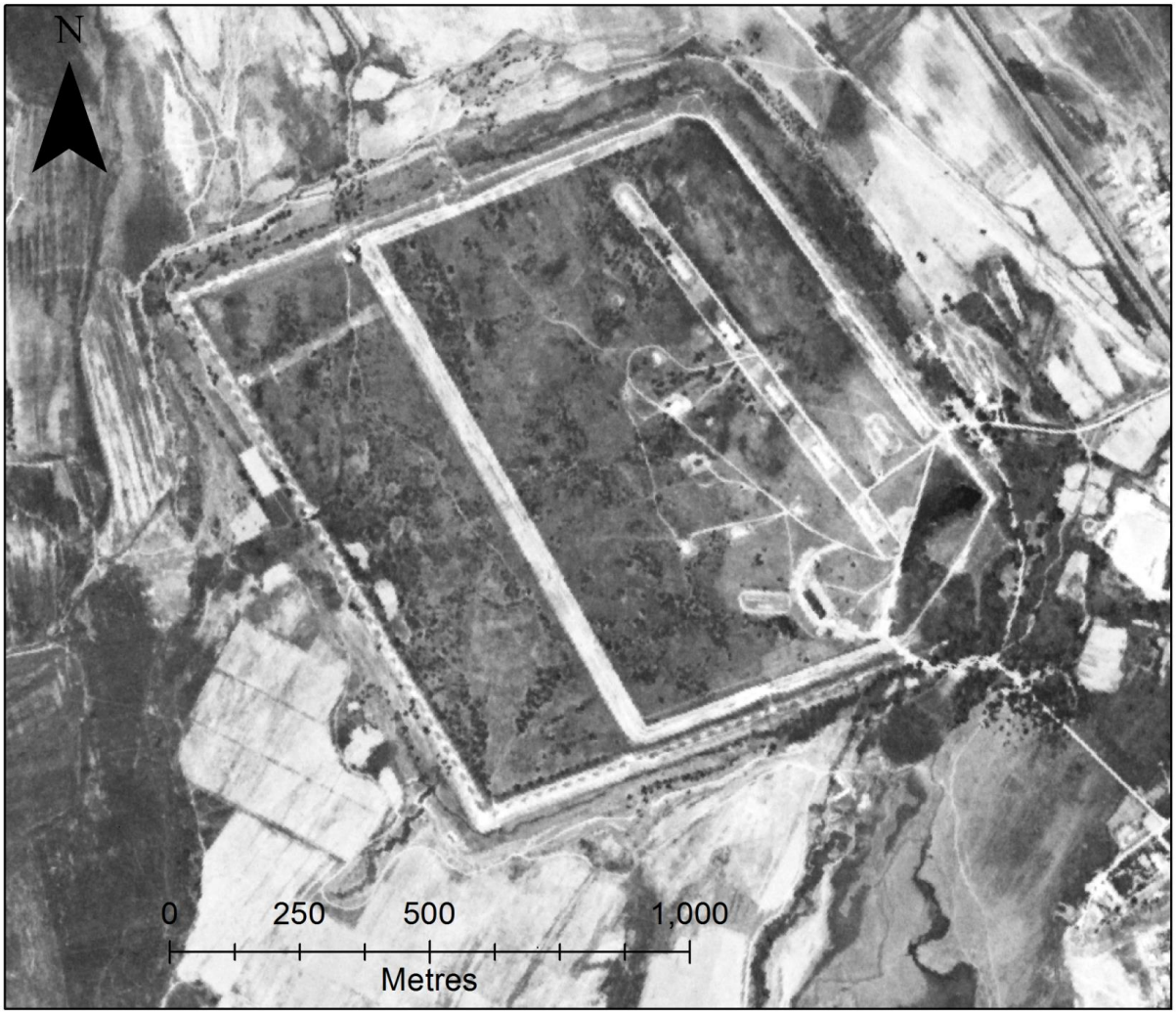

Figure 6: CORONA image of Torpakh Qala. Mission 1110-1057DA111 acquired 24 May 1970, reproduced courtesy of the U.S. Geological Survey

Figure 7: CORONA image of Qal'eh Pol Gonbad. Mission 1103-2218DA035 acquired 7th May 1968, reproduced courtesy of the U.S. Geological Survey

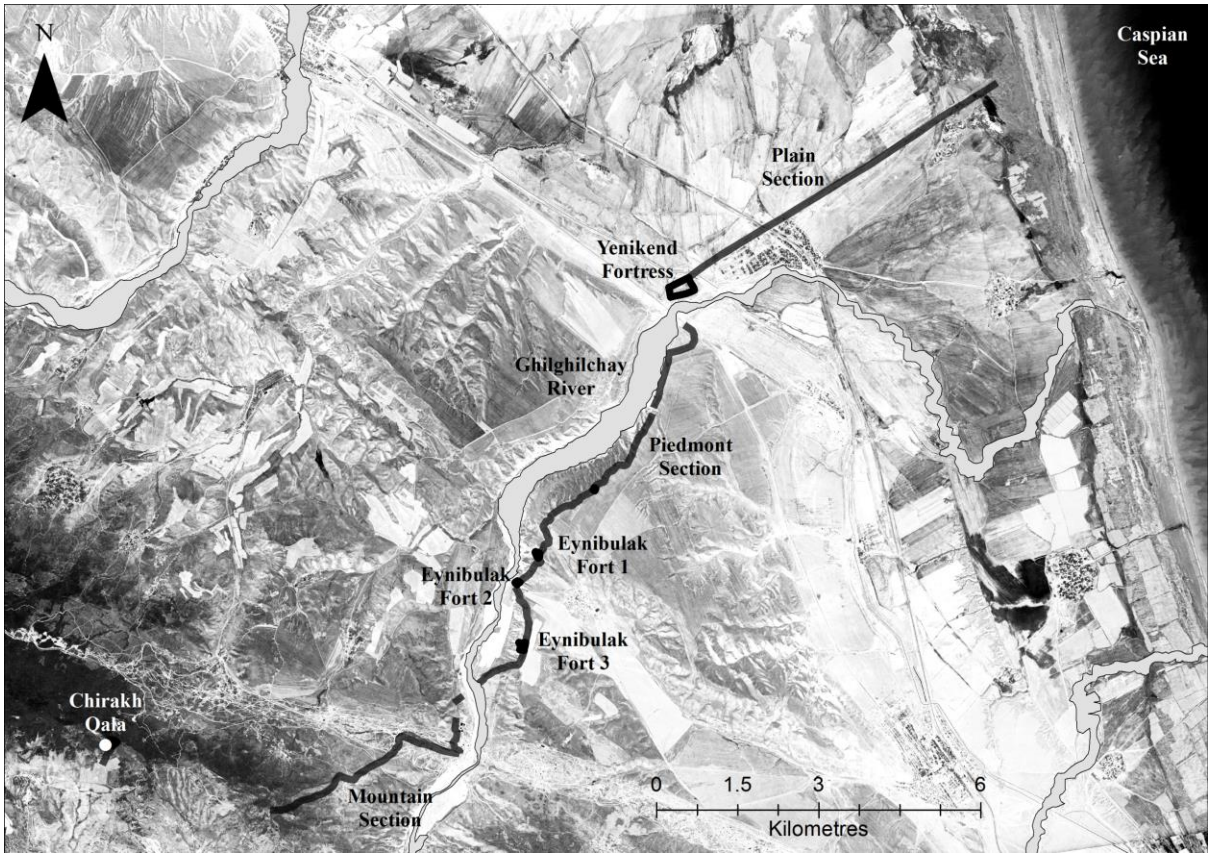

Figure 8: Map of the Ghilghilchay Wall sections and fortifications. Background CORONA Mission 1110-1057DA111 acquired 24 May 1970, reproduced courtesy of the U.S. Geological Survey

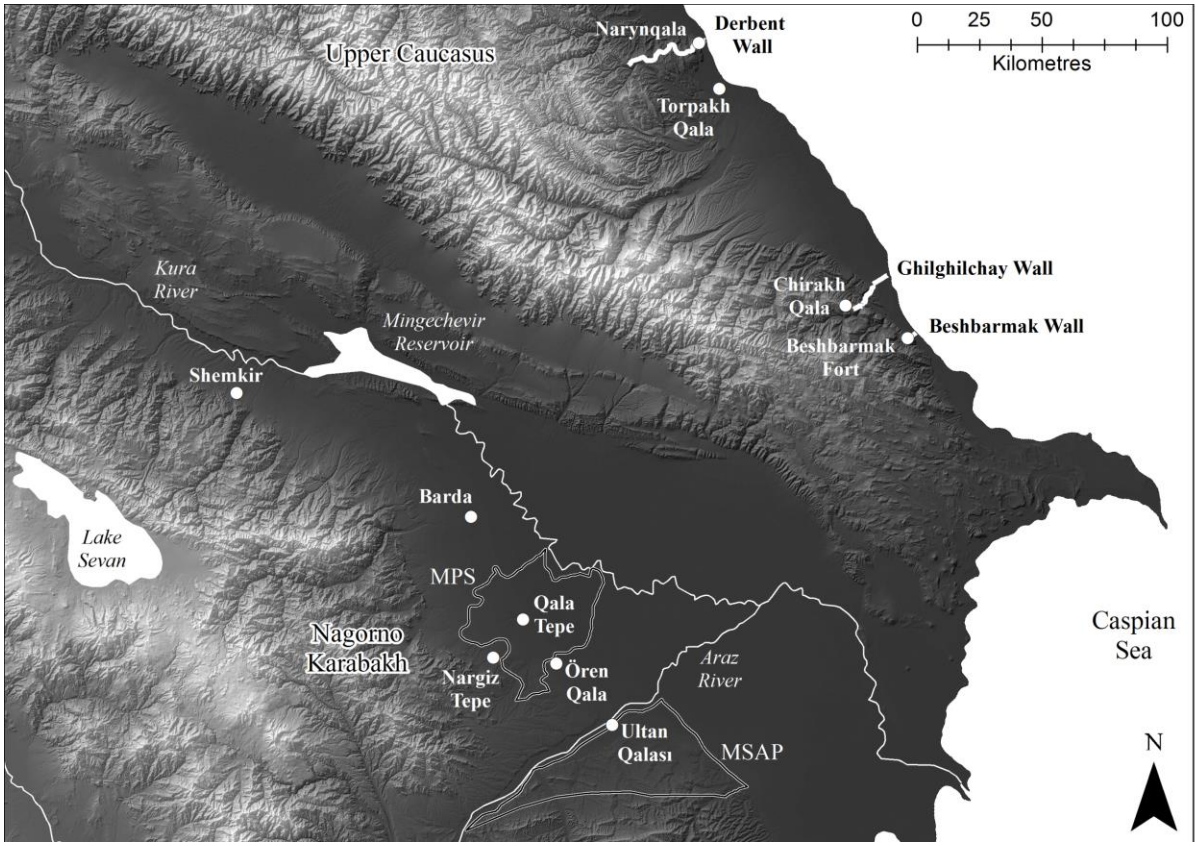

Figure 9: Map of the Southern Caucasus region (excluding the Dariali Pass). Background SRTM DEM courtesy of the U.S. Geological Survey

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