Moving subjects, situated memory: thinking and seeing medieval travel on the Silk Road

Kathryn Franklin[1]
k.franklin@bbk.ac.uk

ABSTRACT: This article explores the power of vision and visibility in landscape archaeology, and specifically in digital mapping of movement in landscapes. Using a brief experiment in GIS, I will explore the relationship between showing and knowing in archaeology, and the relationship between seeing and understanding in medieval and modern ideas about landscape. In particular, I explore the commonality across the apparent medieval-modern divide in seeing, understanding, and especially remembering landscape in embodied ways. The experiment plays with recreating the travel 'mnemonic-scape' along a section of medieval (AD thirteenth-fifteenth centuries) mountain highway, along a branch of what is now called "the Silk Road" located in the center of the modern Republic of Armenia. Ultimately, the case study makes an argument for GIS mapping as one among multiple tools used to think playfully about historical experiences of space and movement, and about the critical link between vision, commemoration, and memory in the construction of social landscapes.

Key Words: *GIS, movement, memory, medieval, Silk Road, Armenia*

Near the heart of archeological interest in landscape is an argument that people in the past negotiated their social worlds at scales greater than the artifact or the site, and further, that these spaces were perceived, encountered, remembered and made meaningful through the situated, embodied experience of humans in motion. I start with these basic definitions so that I can support two linked premises; first, that what we currently refer to as the medieval (tenth to fifteenth centuries AD) "Silk Road" was a nested, overlapping assemblage of Eurasian landscapes. The second premise is that the global phenomena of trade and exchange which made up Silk Road culture in the middle ages were mediated by construction of and movement through these landscapes. This premise challenges archaeologists of the medieval Silk Road to conceive of the route not as lines on a map but as landscapes, and prompts us to think about the experience and representation of space as part of the material culture that made up the Silk Road world. I treat this challenge as an invitation to apply techniques of modeling and representation in GIS to draw landscape and memory into the archaeological reconstruction of the Silk Road.

[1] *Lecturer, Department of History, Classics, and Archaeology, Birkbeck University of London*
Mailing address: Department of History, Classics and Archaeology, Birkbeck, University of London Room G10, 28 Russell Square, London, WC1B 5DQ United Kingdom

I am motivated by arguments within the developing field of Digital Humanities that we can, and should, use tools like GIS to do something other than create more accurate representations of "real" physical environments--that in fact, heuristic or what has been called *playful* uses of GIS can help us think about the role of movement, perception, and memory in the construction, experience, and imagining of medieval route landscapes (Nowviskie 2010, Morgan 2017, Tenen 2018). Historical evidence left by medieval travelers suggests that they were not only aware of the landscapes through which they traveled, but also that the memory of these spaces shaped their accounts of movement, encounter, and exchange. For example, the friar William of Rubruck, traveling in AD 1253 from the eastern coast of the Mediterranean to the court of the Mongol Khan Möngke at Karakorum, described some of the landscapes that he saw while traveling with the Mongols, including the steppe lands between the Black Sea and the Don River:

> We traveled eastward, seeing nothing but the sky and the earth, only now and then to our right the sea which is called Sea of Tanais [the Sea of Azov], and tombs of Comans visible two leagues off, on account of the custom of burying the whole of a family in one spot (Jackson 2009: 108).

This brief excerpt of Rubruck's account reveals two things of note for an archaeology of the medieval Silk Road, and for applications of GIS to archaeologies of landscape. Firstly, Rubruck's account is *visual:* he describes the landscape that he passed through in ways that are analogous to one of the modes in which archaeologists conceive of landscape, as a scene viewed by an observer (cf. Cosgrove 1998). Yet Rubruck also describes his travels in other embodied ways: his account is full of smells, tastes, textures and temperatures as well. Secondly, Rubruck observes not only the mounded monuments (kurgans) which are frequently the subject of visibility and viewshed analysis by archaeologists (Chapman 2003; Llobera 2000;Tilley 1994; Wheatley 1995), but also landscape features that might be termed 'natural.' I also want to make a third observation from this excerpt: Rubruck, like his fellow travelers along long or short stretches of the Silk Road routes, experiences the landscape of the road *in motion.* This means that the viewed landscapes of the Silk Road are compounded and layered within his embodied experience. It is commonplace in archaeology to refer to landscapes metaphorically as palimpsests, comparing the layered

construction, habitation, destruction, and rebuilding of landscape to the successive partial erasures of a (medieval) vellum manuscript (Crawford 1918: 51; Wilkinson 2003: 7; Johnson 2008: 57-59). Route landscapes like the Silk Road deepen and complexify the temporality inherent to the concept of palimpsest. A traveler along a road sees and experiences a succession of landscapes, which are in turn layered in her memory. She is "moved to change how [she] think[s] at both local and global scales" (Tsing 2005: 214). Accounting not only for the visibility but also the remembrance of places and landscapes is therefore central to an archaeology of travel, and of medieval Silk Road culture.

In this essay I play with ways of modeling the temporal experience of landscapes in motion along the Silk Road, using data from an in-between place, the highlands of Armenia. I will briefly explore the role that GIS analyses play in archaeologies of landscape that rely on vision and visibility as the primary means for making landscapes representable and knowable within archaeological science. I critically engage with arguments about the ocular determinacy of GIS as a technology of visualization, but also as a space for playful modeling. In particular, I explore the potential for using basic and accessible functions in ArcMap to construct a digital approach to the construction of Silk Road landscapes not only as perceived, but also as potentially remembered. Building on extant studies on intervisibility, this model plays with the concept of *power* as it relates to visibility in archeological GIS, and produces a virtual sandbox for thinking through the medieval experience of travel in certain quantitative ways. Ultimately, I will suggest that constructive use of digital spaces like GIS hinges not on the more accurate or total showing of space, but on the heuristic representations of phenomena central to medieval (and modern) perception of places, such as mobility and memory.

Historical background: Armenia on the Silk Road

Though too-often imagined literally as merely a series of linear routes, the medieval "Silk Road" was a global phenomenon of movement, encounter, and exchange linking Europe and Eurasia through tangible ties of material culture and intangible links of practice. I am interested in the ways that such things and

doings framed the ways that people variously situated within the Silk Road world-- and with different amounts of mobility and agency-- imagined themselves in relation to a wider world. In turn, I am curious about the capacity of travel itself to shape the imagined landscapes of the Silk Road, as travelers remembered, recorded, and shared their accounts of the world-as-route-- and as their accounts circulated and were read, copied, and translated. For a decade, I have explored high medieval Armenia as a place experienced and constituted through the mobilities of people and material cultures (Franklin 2014a, 2014b, 2014c, 2015; Franklin et al. 2017; Franklin and Babajanyan 2018; Franklin 2019). In being situated within the encounter between global cultures of the Silk Road and local highland memory, the social world of medieval Armenia was not unique; rather, it exemplifies both the global reach of material and social practices in the medieval period, and the local, everyday roots of medieval cosmopolitanism. Within the broader spatial and temporal scope of the work in this issue, the case study of medieval Armenia on the Silk Road is also significant in demonstrating that medieval practices of moving, seeing, and remembering resonate across the apparent medieval-modern divide.

<<Insert Figure 1 near here>>

Historical narratives from early medieval Armenia situate the society of the Armenian highlands between political cultures and cosmologies. After the Arab invasions of the 7th century, and continuing under Seljuq rule in the 12th century, Armenian rulers, lawmakers, and clerics negotiated the boundaries of their cultural and political identity (Franklin 2019, Jones 2002; Kaegi 1968). Princes and kings in both Greater Armenia (my focus here) and Cilician Armenia defined their power in performative ways which drew on the visual and practical repertoires of Byzantium, the Arab Near East, and Central Asia. From the early medieval period (fourth century AD) onward, political life in Armenia was organized through the performative agencies of a class of dynastic princes (*išxan*) and their families, who administered local regions in the name of kingdoms and empires centered elsewhere. Political life in Armenia occupied spaces that were conceptual centers of a Venn diagram, focused both on local hierarchies and on the influence of faraway urban centers and exotic cultures. This plurality appears in architectural performance of political sovereignty through cosmological forms and epigraphic world-making, as well as through

investment in infrastructure. Medieval men and women constructed architectural testaments to their own social (and spiritual) aspirations in major trade cities like Ani and Dvin, as well as along the roads connecting them (Arak'elyan 1964; Ghafadaryan 1983; Harutyunyan 1960; Marr 1934). Part of the labor of Armenian sovereignty in the late medieval period was building a world of mobility, constructing bridges, roads and specifically caravanserais, or road inns, at daily intervals along the mountain routes. Through these constructions and the practices they contained, local politics encompassed the 'citizens of the road' who intersected with local authority within these spaces of hospitality. In turn, the settlements of the Armenian highlands situated themselves at a nexus of routes which would later be called the Silk Road (Fig. 1; Manandyan 1965).

<<Insert Figure 2 near here>>

The Kasakh Valley, a narrow vale curving to the east of the volcanic peak of Mt. Aragats (Fig. 2), bears the imprint of one high medieval family in particular: the dynasty of the Vačutyans (Franklin 2014b; Franklin et al. 2017). The Vačutyan family was installed at the end of the twelfth century as administrators by the Zakarid (Mxargrjeli) house, which ruled most of Aragatsotn and Shirak in the name of the Georgian Bagratids until the first half of the 13th century, when they and their attached princes became clients of the Mongols. The Zakarid generals Ivane and Zakare were instrumental in reclaiming the territories of central Armenia from the contracting Seljuq empire and rewarded their clients with lands and rights of rulership, while investing heavily in churches and other monumental endowments (Babayan 1976; Bedrosian 1979). In the Kasakh Valley, the Vačutyans followed the Zakarid example and undertook an intensive campaign of construction, renovation, and donation to churches and monasteries on the slopes of Mt. Aragats and the neighboring mountains—even while rebuilding a series of castles for their own habitation (Franklin 2014a). *Rebuilding* is the critical term here: the Vačutyans inherited a marked and legible landscape of medieval settlements, fortifications, and churches that dated back several centuries--as well as, of course, hilltop fortresses and settlements dating back to the Bronze Ages (Smith et al. 2009; Ian Lindsay and Alan Greene, pers. comm.). Redford (1993) has remarked on the regard expressed in thirteenth-century Seljuq architecture for the classical past of Anatolia; earlier ruins were a

source of inspiration as well as of building materials. While we have little data as yet on medieval perceptions of the ancient landscapes in Aragatsotn (though see Babajanyan and Franklin 2018 for a discussion of medieval perceptions of Iron Age material culture in Vayots Dzor), it is clear that the Vačutyans were very interested in the near medieval past. Multiple generations of Vačutyans, including fathers, wives, and sons, restored early medieval churches and martyria throughout the valley. In most cases, the new buildings incorporate the older structures: examples include Hovhannavank and the monastery of Uši, both on the broad sloping approach to the Kasakh out of the Ararat plain, and Kurd Vačutyan's reconstruction and enlargement of the fifth-century Astvatsnkal in the Kasakh canyon (Babayan 2005; Ghafadaryan 1948; Petrosyants' 1988:22-24). All of these buildings feature donation inscriptions (Fig. 3) recording the dedication by the Vačutyans of lands, rents, and other materials to the perpetuation of the monastery (and to their own memories, of course).

<<Insert Figure 3 near here>>

The Vačutyans were concerned with the administration of local monasteries, farms, and villages but also protected travelers along the highways, capillaries in the routes of trade and travel connecting the Mediterranean, Near East, and Central Asia. In 2011 I excavated a road inn built by Vače Vačutyan at Arai-Bazarjuł in AD 1213. One day's travel by caravan (30km) to the southwest, a contemporary road inn stands on the southern slope of Mt. Aragats at the medieval town of Aruč, near a high medieval church of the same name. These road inns housed travelers and their pack animals and were constructed by the same workmen and within the same programs of politics as were monasteries, mills, and bridges. This very brief history of political performance in the high medieval Kasakh valley indicates that space was a deliberate project of princely power, and that such projects resulted in the constructed intersections of multiple space-times in the valley. That is, the Vačutyans (and their peers) were invested in circumscribing the space-time of the Silk Road world quite literally within the architectures of their power. Also, they conscientiously stitched together a palimpsest landscape in the Kasakh. A medieval person passing through the Kasakh Valley would have encountered a monumental landscape that was a combination of aging or ruined early medieval structures and renovated buildings, as well as new

constructions. This last category included the caravanserais, spaced between monasteries, castles, and the villages that supported all off these institutions.

The Silk Road studied by historians and archaeologists is identical neither with the "political landscape" constructed by the Vačutyans, nor with the conceived landscape presented to us in the literary spaces written by travelers. To reconcile these is to embrace the complex relationship between *commemoration* and *memory* as practices which construct landscapes. These terms have been discussed in the Classic Maya context by Joyce, who differentiated commemoration, or "the deliberate marking of something to be remembered," from memory, or "the embodied processes of recognition and recall through which we gain access to something we already 'know'"(2003: 105). Critically, Joyce argued that these phenomena overlap in unpredictable and contingent ways, morphing the spatial and temporal scales of remembering. While the landscape of the medieval Kasakh valley was marked by monumental projects of commemoration, these projects were and are re/framed by memory, temporally layered spatial meanings mediated by human, corporeal abilities to perceive and understand them. If the archaeological landscapes of the Silk Road are socially-produced spaces co-constructed by multiple agencies and perceptions, building on complex, embodied temporalities, then we require multiple forms of evidence to think about basic questions such as the following: what was it *like* to travel through the medieval Kasakh? What are the relationships of meaning and power that emerge from the landscape of the Kasakh route as built (monuments and monumental infrastructure) and that landscape as it was experienced by people in motion? Given the immediate challenges of scale presented by these questions, the framing properties of digital humanities modalities such as Geographic Information Systems (GIS) immediately recommend themselves as a virtual laboratory. Might we think through the intersection of local and large-scale worlds of the Silk Road within GIS, with an eye (as it were) to the particular significance of travel temporality and memory?

Landscape in archaeology and in GIS: the power of seeing

The empirical power of *looking at landscape* is a sticking point for archaeological applications of GIS, manifesting in an ongoing debate within the field over the role of vision and visibility in the production of knowledge. The conventions of representation in GIS are just as rooted in genealogies of spatial perception as landscape painting (Thomas 1993: 21; Cosgrove 1998), and equally effective at solidifying fluid relations between forms, spaces and time. While that efficacy is at the root of the power of GIS as a scientific tool, the indebtedness of GIS as a way of seeing to the longer tradition of landscape means that to use such a tool is to be situated in a singular politics of vision and a "particular and distinctive way of looking" at power (Thomas 1993:20). Archaeologists of landscape and memory have argued that there is something ineffable about the experience of walking through or standing in landscape that resists representation in figures or digital maps (Tilley 1994, Thomas 1993, summarized in Llobera 2012). Critiques of mapping and quantitative approaches to archaeological landscapes have stressed the opposition between "ocularcentric" Cartesian technologies of mapping (Haraway's "god trick of seeing everywhere from nowhere," 1988: 583) and the polysemous ways in which landscape is dwelled in, moved through, or experienced (Thomas 1993, 2008). Ongoing conversation among archaeologists of landscape and especially among practitioners of GIScience have generated a robust—though by no means universal—reflexivity regarding the limitations of its *optics* (Thomas 1993, Llobera 1996, Wheatley 1993, Bourgeois 2012: 113-115).

Memory and landscape have long been conjoined terms in archaeology, as the focus of studies of landscape centered on the construction of inscribed memory paths, or landscapes of monuments, or, alternately, on the persisting significance of concepts of place and nature to people living within and constructing a landscape over time (Tilley 1994, Bradley 1998, Thurston 1999, Alcock 2002: 28). The intangible- and-yet- embodied nature of memory, and of the experience of walking through landscape and experiencing the juxtaposition of human-made structures and affective sense-memories within 'natural' vistas are likewise challenging for digital humanities, which must attempt to quantify the numinous and, in the case of GIS, to visualize the inapparent or unseen. Memory falls squarely within the so-called "interpretive" realm of phenomena which an archaeologist might attempt to map in GIS (Kosiba and

Bauer 2013: 62). Landscape archaeology's self-reflexive critique of its own dependence on Cartesian grids and top-down aerial views have led to increased attempts to compensate for this orientation, and to open up the quantitative to the ineffable. Interestingly, this frequently involves the mapping of visibility or view, whether by 3D modeling or through the use of viewsheds which take the capacity of walking through landscape—"situated subjectivity"—and reduce it to the panning of a systematic optics (Lock 2014: 23; Llobera 1996, Kosiba and Bauer 2013: 76-77, Chapman 2003, Llobera 2001, Wheatley 1995).

To paraphrase a thirteenth-century French idiom, however, it is a poor humanist who blames their tools. I agree that the questions we ask of our datasets must be shaped by the limitations of the technologies as they currently exist, especially as concerns the limited capacity of GIS to "handle time…[or] facilitate narrative," two of the key tasks of the archaeologist and historian (Bodenhamer 2007: 102). But as a tool, GIS is also only as good as the paradigms that guide it. To place the blame for an ocularcentric paradigm on GIS is to miss the long-term and broad reliance of landscape archaeology on vision as the keystone to its cultures of knowledge production, on both sides of the cherished "econometric vs. interpretive" divide. Johnson has pointed out that phenomenological approaches to the archaeological past set out to question Romantic subject assumptions lingering in empiricist methods, and ended up replicating them (Johnson 2012: 277). Chief among this corollary of lingering Romantic assumptions is the primary link between seeing and knowing as a central aspect of human-space encounters. Historically paired with this has been a cultural habit of attributing to 'natural' landscape a mystical recalcitrance to being known. Thus, techniques of knowledge production deployed by archaeology which rely on moving, gazing subjects—such as GIS—are part of a culture which has always already engendered—and gendered—the landscape through which that subject rides, drives, or walks (Thomas 2008, Rose 1993, Cronon 1995). As Johnson had pointed out even earlier, the Romantic approach to a visible and thus understandable landscape was itself highly empirical:

> [I]n a vulgar view, the message of Romanticism to the scholar seeking to understand the landscape is: walk for a long enough distance, position yourself in front of the most sublime views, and as long as you open your mind out in the proper manner and have the proper education, you will somehow, by a process that is at least partly ineffable and beyond analysis, grasp what is in front of you (Johnson 2007: 26).

This culture of walking through, looking at, and knowing place is shared by archaeologists of landscape and by Thoreau, who wrote an ode to 'wildness,' that quality of nature which defies description in words, and which must be sensed by senses other than the common (Thoreau 1947: 342-260). This intrinsic resistance to representation was shared by the wilderness of Thoreau as well as the Nature of late-nineteenth century 'naturalists' like Teddy Roosevelt (Bennett 2010: xv-xvi; Thwing 1919: 170). German landscape painting of the 19th century required a *Rückenfigur*, a human figure in the foreground, seen from behind gazing upon the scene, in order to frame Nature as a landscape framed and made-known by human vision (Wilke 2015: 111; Prettejohn 2005: 56). The *Rückenfigur* as a technology of artistic representation demands that the viewer of the painting concede that what they are seeing is nature mediated by sensibility, a representation of the un-representable that only art may attempt. Landscape analysis within GIS is, of course, dependent on its own digital *Rückenfiguren,* pixelated stand-ins (so to speak) for the sensible human observer, and entry points in turn for the analysts who contemplate the abstract scene of the map. One of the best examples of this is the viewpoint in a viewshed analysis (Fig. 4). Like the human figure in Caspar David Friedrich's famous *Wanderer Above a Sea of Fog,* the red vector icon indexicalizes the human subjectivity situated in landscape and invites the viewer of the map (a representation of space) into the perceptions and understanding gained by that subject's embodied perspective. It is only by orienting ourselves back to the icon-as-situated-subject that we can ultimately make any social sense of the *viewshed*, a raster representation of surfaces seen—and presumably, socially understood—by that subject.

<<Insert Figure 4 near here>>

A further similarity between Romantic landscapes (painted or written) and many viewshed analyses in GIS is that they are temporally static; through these representative media, we consider the experience of gazing from a single location at a single view-- or frequently, in intervisibility analyses, the "mutual regard" of multiple points in a single moment (Smethurst 2012: 182). As the discussion of William of Rubruck's Silk Road views demonstrated, however, medieval travelers did not experience

landscape in static ways: they moved through places and re-encountered them as layered memories. If we want to start to think quantitatively about the making of landscapes along the Silk Road, then we need to take time and memory seriously, and to think about links between seeing and understanding not only space but also time. Interestingly, the Romantic tradition gifted us as well with a concept that encompasses the perception of distance in time and space in palpable ways, in the term *nostalgia*. Boym (2001) argued that the sensation of nostalgia, while pathologized as an ailment of modernity on the one hand (too strong a longing for return), was celebrated by the Romantics as a wellspring of patriotic feeling and as a sense of place on the other (2001: 12). The Romantic, nostalgic capacity to look at a place (a ruin, a vista, a cityscape) and feel the pull of time is a counterpoint to the sense of empirical wonderment noted by Johnson above. Both sentiments reside deep in the praxis—or as Johnson put it, the "habits of thought"—of landscape archaeology, for example in the concept of *signature landscape* which has oriented landscape archaeology in Britain and the Near East for several decades (Wilkinson 2003: 11).

By pointing out landscape archaeology's conceptual debts to Romanticism, my intent is not to 'debunk' our science, but to historicize it. In fact, I want to go further back than the Romantic period, and explore how our habits of collapsing time into space and vice versa may help us understand the experience of landscape in the middle ages. The habit of reflecting on landscape and tangling time and distance within memory was invented, in part, in the medieval period, through the literary constructions of space in travel narratives as well as poetry. Travel was a lengthy temporal unfolding of -scapes, vistas, and embodied encounters; as people traveled, they not only saw but also remembered, and the total landscape of a route was 'assembled' to the traveler as differentially seen, visited, touched, tasted, heard, and remembered places. Medieval travelers were sensitive to this assembling. For instance, the fourteenth-century traveler Ibn Battuta recounted how upon his arrival in Constantinople he encountered a monk who reverently touched his (Battuta's) body, which bore the memory of traveling to holy sites and was therefore consecrated (Mackintosh-Smith 2002: 134). The technique of regarding and understanding the history of landscape, prized as the expertise of Romantic poets and archaeologists, was developed as a trope in medieval poetry more than a millennium before Wordsworth wandered in the Lake District or

Hoskins tramped around Dorset in his stout pair of boots. Pre-Islamic poetry from Arabia frequently made use of the trope of a lovelorn narrator standing over the cold coals of an abandoned campfire in the desert, 'archaeologically' dreaming of his beloved who camped on that spot (Sells 1989: 35). The anonymous Anglo-Saxon poem known as *The Ruin*, recorded in the Exeter Book in the 10th century, likewise presents the ruminations of an observer on the passage of time and human lives, provoked by moving through and regarding a Roman ruin: "...this wall, lichen-grey and rust-stained /often experiencing one kingdom after another, /standing still under storms, high and wide…" (Hostetter N.D.). The poet muses on the tumultuous human history *legible* in the decay of the building.

The medieval perception of landscape and reading of time and space in conjoined ways is built into medieval spaces themselves. A widespread practice in the medieval period was the use of architectural spolia, or elements from older ruins or destroyed buildings, as components within new constructions. Beyond being a pragmatic re-use of pre-existing cut stones, the deliberate placing of figurative reliefs or text inscriptions demonstrates a sensibility to the power of ancient things and places. For instance, McClary describes the use of Byzantine building fragments in Rum Seljuq architecture in the high middle ages as a way of producing historical narrative in architectural space (McLary 2015: 5). Redford (1993: 154) argued that the insertion of literary as well as historical inscriptions and Antique inscribed spolia within new architecture enabled the Seljuq sultans to literally build a mytho-historical past for themselves. In medieval Armenia as I discussed above, the builders of churches frequently incorporated earlier standing ruins into their buildings, so that their monuments were deliberate *re*constructions featuring worn cross stones and faded inscribed blocks. My favorite example of medieval interweaving of time, architecture and distance comes from the ca. 10th century text known as *The Book of Strangers.* Supposedly collected by Abu al Faraj al-Isfahani, the *Book* is a record of palimpsests of verses inscribed at different times by travelers who visited the same ruins, caravanserais, paths and holy places in Iraq and the Levant (Crone and Moreh 2000). The *Book of Strangers* illustrates that medieval travelers through the Near East traced their travels in memory and were conscious of, and even nostalgic

about, the other travelers who had seen the same views they regarded, and who had touched the same stones that they wrote upon.

In collapsing the objective and subjective aspects of landscape into the nature-culture that he terms *dwelling,* Ingold proposed the term 'taskscape' to encompass the production of places in practice as well as is perception (1993: 158). I am curious about the mnemonic and imaginative properties of taskscapes, including the question of how landscapes like those of the Silk Road were constructed through everyday practices that included memory. Critically, I also want to incorporate travel as an 'everyday' activity, in the colloquial sense of everyday in that travel has rhythms, is mundane, and layers spatial and embodied memories. Unlike the layered-in-place memories of frequently visited and re-inscribed monumental landscapes, these travel task-scapes may be layered with places that are only returned to in recollection—though it was more common in the middle ages for people to walk to the same roads many times than to undertake the kinds of singular journeys narrativized by Rubruck or Ibn Battuta. These layered seen, described, remembered and imagined places congeal into a *mnemonic-scape*, the space of dwelled-in memory. How, using the modeling properties of GIS, might we think quantitatively about how landscapes were remembered? What do GIS and other digital humanities techniques have to contribute to the study of imagined medieval landscapes? As Llobera stated, one of the strengths of the 'narrow quantitative' capacity of digital modeling is that it requires that we identify our assumptions at the outset (2000: 69). For the purposes of experimentation, I am therefore going to be explicit about the entanglement within both archaeological and medieval "habits of thought" of movement, vision, memory, and the social meaning of landscapes. This means that I will play with the effects of time on vision in order to think about sensible culture of travel and the roots of medieval sociality in an embodied experience of landscape. Building on this, I want to then think about the role of memory in shaping in turn the performance of politics and the crafting of 'global publics' along the Silk Road in Armenia.

Methods: travel, views and memory along the Silk Road in Armenia

If vision and memory were important to the medieval imagination of place and the experience of travel, how might we use our methods to think not just about the perception, but also the memory of landscape? In a small experiment focused on travel through the Kasakh Valley, Armenia, I explore how it might be possible to visualize within GIS the effects of mobility and time on visibility, and therefore on the memory of landscapes. In the interest of heuristic play, I want to be explicit: the simple phenomenological assumption at the basis of this experiment is that while traveling, features, vistas or buildings that linger in view linger as well in the memory of the traveler. Like William of Rubruck traveling for days through steppe marked with burial kurgans, travelers are likely to remember the features they see for longer periods of time. Moreover, this correlation between duration of regard and strength of memory—or what I will term "mnemonic value"—is perhaps generalizable. In a playful attempt to model the mnemonic value of places and views along the Kasakh Valley branch of the Silk Road, I therefore posit that we can think systematically about the construction of memory through the process of prolonged regard, accessing practices of memory-making which are perhaps unlike the contingent recall of strange, *brief* events or visions-- what medieval travelers called wonders, marvels, or even miracles. Mnemonic value does not necessarily correlate in any straightforward way with cultural value or importance; this heuristic lets us play with visualizing in GIS the experience of regarding the landscape as it slowly changes over the course of a walk through the mountains.

<<Insert Figure 5 near here>>

I set out to model the vision-in-time of a traveler walking a path between known stations of the medieval highway in the Kasakh Valley. In the last century the Kasakh Valley was intensively remodeled as part of Soviet agricultural amelioration projects. This extensive clearance of the landscape for agro-pastoral intensification severely affected the medieval and early modern landscape, flattening standing settlements, denuding hillsides, and reshaping routes of travel between re-settled villages (see Franklin and Babajanyan 2018 for a discussion). My GIS modeling is therefore an experimental reconstruction of a landscape that is no longer accessible for detection in many ways-- the field systems, hollow ways, and

other paths of medieval movement have been erased, leaving us dependent on geographic data (topography) and the standing remains of medieval sites. For the former, I used a mosaiced set of 1-arcsecond SRTM raster DEMs (available at earthexplorer.usgs.gov). For the latter, I combined site data from a combination of unsystematic and systematic survey in the Kasakh Valley, as well as published reports on medieval architecture in Aragatsotn (Table 1; Franklin 2014a Fujita et al. 2002; Petrosyants 1988). These two data sets were combined, creating a topographic surface raster *augmented* with the approximate height of the buildings within the areas of their footprints (drawn from the ESRI World Imagery Basemap). This augmented surface has the interesting ramification of merging 'natural' topography with 'cultural' constructions, which certainly raises more questions for future exploration. The premise for the experiment described here is a medieval traveler walking along the road through the Kasakh Valley, coming from the direction of Ani to the west, and heading northward towards the passes to Lori. In order to reconstruct a possible location for the medieval road this traveler walked upon, I calculated a path of Least Cost, using slope as a proxy for cost. The origin of the path is the caravanserai at Aruč, on the southern slope of Mt. Aragats, while the destination is Aparan, which was a town from at least the 5th century onward. As you can see in Figure 5, the generated path crosses over the shoulder of Mt. Aragats and passes within a stones-throw of the front door of the Arai- Bazarjuł caravanserai.
<<Insert Figure 6 near here>>

Using a metric drawn from early-twentieth century caravan ethnography (Lattimore 1928), I calculated the approximate hourly rate of travel for humans walking with laden animals and output a viewpoint for each hour to approximate an(albeit somewhat staccato 'walk' through the landscape. Given the scale of my topographic data, any more nuanced modeling of the 'walk' would be precious, ultimately modeling our hypothetical medieval traveler walking across the face of a single pixel of the DEM. As shown in Figure 6, it takes a little under 15 hours, or a good day's journey, to walk from Aruč to Arai-Bazarjuł. For each of the hourly viewpoints, I generated a viewshed, which is a raster coverage of the augmented surface visible from the viewpoint. Examples of these are shown in Figure 7. In this figure you can see as well how the viewsheds overlap to different degrees with the point data representing the

locations of medieval churches built or renovated by the Vačutyans. These subsequent viewsheds are a progressive series of vistas, within which landmarks pass in and out of view as the traveler—a pinpoint digital *Rückenfigur* —moves up the 'road' from Aruč to Arai-Bazarjuł. Each one of these is a landscape as visually perceived by an imagined medieval viewer, and collectively *represent* rhetorically and through visual conventions the experience of encountering the local political landscape while moving along a mountain road.

<<Insert Figure 7 near here>>

However, this stack of views was still frustratingly static, like individual pages torn out of a flip book. I wanted to attempt to quantify in GIS the beginning of the "double palimpsest" I discussed earlier: the views of complex landscapes accumulated on a journey and layered in the re-collected memory. The technique of "viewshed accumulation" has been used for decades as a way of quantifying the intervisibility of features or places at a given moment in time (Wheatley 1995, Chapman 2003, Wright et al. 2014, Earley Spadoni 2015). I applied a similar technique (built from standard and thus accessible functions in the ArcMap Spatial Analyst toolbox) in a different mode, compiling multiple views from a single viewing subject who is moving along a path. The summed, iterated viewsheds generated a composite image of view accumulated over the nearly fifteen- hour journey around the shoulder of Mt. Aragats (Figure 8). In this visualization, you can see areas with a relatively high 'mnemonic value,' or a greater accumulation of regard, highlighted in warm colors. Finally, I extracted the raster values from this composite at the location of the medieval buildings, generating a mnemonic value for each particular building (Fig. 9; Table 2). This model, like all models, is highly abstracted and simplified. But the practice of combining datasets and thinking in structured way about movement, vision, and time enabled me to use the GIS model as a 'digital sandbox' in which to reflect the entanglement of movement, landscape, and the medieval construction of a political mutual regard between local hosts and mobile travelers.

<<Insert Figure 8 near here>>

<<Insert Figure 9 near here>>

Results and Discussion

The results of this mnemonic mapping of travel through the high medieval Kasakh Valley is only the first step in a recursive process of reflection and re-analysis; here, I discuss a few immediate observations. The quantitative results suggest that the visual impact of the monumental constructions of the Vačutyans played only a partial and perhaps heterogeneous role in the mnemonic-scape of the Kasakh branch of the Silk Road. As shown in Figure 9 and Table 2, a number of these buildings were only briefly visible or in fact invisible from the road; this suggests that they were perhaps constructed following different logics of approach and encounter, or were intended to return different gazes. Interestingly, some of the Vačutyan's mid-thirteenth- century projects have relatively high mnemonic values, including Vače Vačutyan's renovated monastery at Uši and the monastery at Teł̄er, dedicated by Mamakhatun (Vače's wife) in 1213, the same year that the Arai-Bazarjuł caravanserai was dedicated. Both of these institutions command views of both the road and the Ararat plain below (Fig. 10; Fig. 11). The locations of newly-completed Uši and Teł̄er on the shoulder of Aragats would have also visually complemented the earlier view of the tops of the domes of the early medieval—and thus, perhaps already partially ruined—churches at Kosh and Avan as a traveler departed from Aruč.

<<Insert Figure 10 near here>>

<<Insert Figure 11 near here>>

Considering the raster map of mnemonic values (Fig. 9), a mnemonic 'hot spot' is the western slope of the small volcanic cone of Mt. Ara (Araler). This mountain commands the view as one enters the Kasakh Valley, and would have been part of the vista viewed from the entrance of the Arai-Bazarjuł caravanserai (Fig. 12). Textual evidence suggests that the mountain may have been as memorable in the medieval period. Araler figures in the literary landscape of thirteenth-century historian Kirakos Gandzakec'i's description of the travels of the Cilician Armenian king Het'um through the highlands to pay homage at the courts of the Mongols. Traveling in 1254 AD, Het'um stopped in the Kasakh Valley, where he was hosted by Kurd Vačutyan, son of Vače and Mamakhatun, at their castle at Vardenis, or modern Vardenut (see Karakhanyan and Melkonyan 1989):

> [Het'um] visited Baiju-noyin, the commander of the T'at'ar army in the East, as well as other grandees, and he was honored by them. Then he stayed in the village of Vardenis at the foot of mount Aragats, opposite Aray mountain, in the home of a prince of Armenian nationality named K'urd. [This prince] was a Christian [and lived in the village with] his sons Vach'e and Hasan, and his wife Xorishah (Ganzakec'i 1975: 302-303).

<<Insert Figure 12 near here>>

Written histories from the medieval period reinforce the bias of the architectural record in disproportionately framing the medieval landscape as the materialized vision of an elite class of princely rulers. Part of my long-term project in Armenia is to complicate this imagined landscape by revealing the settlements, activities, and material worlds of non-elite actors (Babajanyan and Franklin 2018;Franklin et al. 2017;). In the meantime, I also want to complicate the idea of a 'political landscape,' or a perceived and conceived space run through with hegemonic power. According to such a model of power, the effect of the intervisibility of built landscape and traveler is subjectification of the 'citizens of the road' through the mechanics of vision, either through surveillance or visual, architectonic power (Smith 1999, 2003) This is the argument that is invoked, explicitly or implicitly, in many intervisibility analyses which rely on a direct link between vision and domination (Kosiba and Bauer 2013, Earley Spadoni 2015: 28). Here an intervention can be made, again, by Joyce's distinction—and complication of the distinction—between commemoration and memory. The efficacy of monumental projects of commemoration such as those of the Vačutyans is contingent on the embodied experiences of space, time, and landscape which frame the making of memories. The mnemonic-scape GIS visualizes this contingency, opening a space for other possible correlations between regard and rule in the context of medieval politics-of-the-road. In thinking about the co-construction of Silk Road landscapes by princely builders, hospitable locals, and mobile traveling subjects, the context of power appears as less completely about surveillance or subjection, and more about the agency to interleave one's local projects into layered, embodied memories of global landscape. Thinking about power this way challenges us to frame the encounter of traveler and landscape in terms of *mutual regard* rather than surveillance.

It is interesting that the Arai caravanserai is not apparently a visually prepossessing landmark in terms of dominating the landscape—at least not from its southern approach. The caravanserai at Arai

Bazarjuł would have most probably been entered through an ornate *iwan*-style doorway like that preserved partially at Aruč or completely at Selim (Franklin 2014a; Harutyunyan 1960), and which perhaps also matched the *muqarnas* and geometric style of the doorways on other Vačutyan projects in the Kasakh Valley such as Astvatsnkal and Mravyan. Nonetheless, the model results suggest that it may have been the space and practices inside the building that impressed themselves on traveler's memories: the quality of locally-prepared food, or the freshness of the fodder provided for the animals that shared the space. Sources from early modern Persia in fact suggest that travelers were as or more likely to recall the quality of the service at a caravanserai as the aspect of the building itself (Floor 1999).

As I have explored elsewhere, hospitality in the medieval Kasakh Valley was critical to the performance of local politics and was part of the experience of that social landscape by travelers. In Kirakos Gandzakec'i's account of Het'um's journey, the king circumnavigates the Caspian Sea in his tour of the Mongol camps, re-entering Armenia from the south, at Baiju-*noyin*'s camp in Sisian (a medieval region containing the current Sisian and Vayots Dzor). After this long journey he returned to the home of Kurd Vačutyan, where he had left his baggage in the care of that prince (Gandzakec'i 1975: 306). The welcome of traveling strangers thus played a role in the affective memorability of the Kasakh. This raises a question for future modeling, building off of extant research on the influence of affective topographies on mobility through raising or lowering 'cost" (Llobera 1996). How might the interaction of view, memory, and desire recursively shape the route of travel as the memory of places and experience layered onto the topography of the mountain pass?

Conclusion

In this brief article I have explored some initial possibilities of playing with time and memory in GIS as a way to think across scales and datasets about the landscapes of the Silk Road. I presented the Kasakh Valley, Armenia as a case study in the entanglement of local spaces within global imaginaries and used data from the high medieval Kasakh to investigate intersections between vision, movement, and the 'power' of memory. Key within this approach was engaging with Romantic 'trace fossils' within

landscape archaeology, which link vision to understanding of space-time, whether through the contemplation of landscape or the sentiment of nostalgia. As I have shown, textual evidence from the medieval period demonstrates that these links are not so new: we have not so much never been modern, but have always been medieval.

I frequently reflect that studying space and its imaginaries in the middle ages is difficult because while the middle ages is generally considered to be the period during which our 'modern' world was being licked into shape, so too was it the time during which many of our supposedly modern techniques for imagining and representing the world were invented or perfected: the travel account, the geography, and the map. Modeling medieval movements in GIS pushes back against a "habit of the mind" practiced by many archaeologists which wants to bestow a non-Cartesian otherness to archaeological subjects (Johnson 2007: 8). The evidence we have for medieval perceptions and imaginations allows us to see them as familiar, but also demands that we treat them as complex. For example, in discussing medieval literary landscapes Howes has argued that a "pedestrian logic" underlies medieval spacetimes generally, suggesting that " medieval landscape may have been understood and experienced...processionally, sequentially, rather than all at once and from a particular vantage point" (Howes 2002: 193). There is ample space to complicate the universal nature of this argument, both on the basis of archaeological data and from a commitment to globalizing medieval imagination; however, I agree with Howes that mobility was for medieval people—as it is for us 'moderns'—a crucial mode of embodied spatial experience. Howes' "pedestrian logic" also speaks to the relevance of temporality to modeling medieval landscapes as perceived spaces. Landscapes like the Silk Road were experiences in time which were layered, overlaid, and interwoven with other spaces and times by memory situated in the mobile human body. That body itself is also grounds for contestation, of course; work on archaeologies of embodiment and on the materiality of medieval bodies in particular (c.f. Crossland 2010: 395; Gilchrist 2012: 7) emphasize that 'the medieval body' is not a category we can take for granted. Future experimentations with situated memory on the Silk Road must account for how scales of perception and encounter were mediated by

historically-framed bodies, and how, in turn, medieval bodies were construed within microcosmic cultural imaginaries of scalar worlds.

Shared ways of seeing across the apparent medieval-modern divide are helpful to digital humanities and to GIS, in that our dependence on visibility for understanding can be a conscious, situated perspective and an explicit method, rather than a Cartesian albatross around our neck. All spatial imaginaries are situated; the mistake is assuming that the non-Cartesian spaces represented in medieval maps are situated in marked opposition to the universalized objectivity of modern scientific measurement. Our maps in GIS are just as situated, within cultures of knowledge production run through with power relations (Witmore 2006: 271). As stated by Haraway: "these prosthetic devices show us that all eyes, including our own organic ones, are active perceptual systems, building in translations and specific ways of seeing, that is, ways of life" (Haraway 1988: 583). For digital archaeologies of landscape, a commitment to our own situated-ness means not just mapping what is visible, but thinking in a critical and lively way about what it means to see, to be seen, and to see again, in memory and text.

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Tables

Table 1. Medieval sites in and around the Kasakh Valley and their periods of construction or reconstruction. For the purposes of this article, early medieval is defined as fifth-tenth centuries AD, and high medieval as tenth-fourteenth centuries AD. Vačutyan sites fall within the high medieval period, and are specifically linked with the Vačutyan dynasty (thirteenth-fourteenth centuries AD).

Site name	***Primary Period***	***Number in map figures***
Aygeshat	*Early medieval*	*1*
Parpi	*Early medieval*	*2*
Avan	*Early medieval*	*3*
Aštarak, Ciranavor	*Early medieval*	*4*
Yelvard	*Early medieval*	*5*
Sb. Hripsime	*Early medieval*	*6*
Aštarak, Karmravor	*Early medieval*	*7*
Oshakan	*Early medieval*	*8*
Mirak	*Early medieval*	*9*

Koš	*Early/high medieval*	*10*
Byurakan	*High medieval*	*11*
Aruč	*High medieval*	*12*
Anberd	*High medieval*	*13*
Sałmosavank'	*High medieval*	*14*
Apnagyuł	*High medieval*	*15*
Aruč caravanserai	*High medieval*	*16*
Daštadem	*High medieval*	*17*
Teł er	*High medieval/Vačutyan*	*18*
Hovhannavank'	*High medieval/Vačutyan*	*19*
Uši	*High medieval/Vačutyan*	*20*
Astvatsnkal	*High medieval/Vačutyan*	*21*
Arai-Bazarjuł caravanserai	*High medieval/Vačutyan*	*22*
Teł enyac'	*High medieval/Vačutyan*	*23*
Vardenut	*High medieval/Vačutyan*	*24*
Mravyan	*High medieval/Vačutyan*	*25*

Table 2. Values extracted from the "mnemonic-scape"

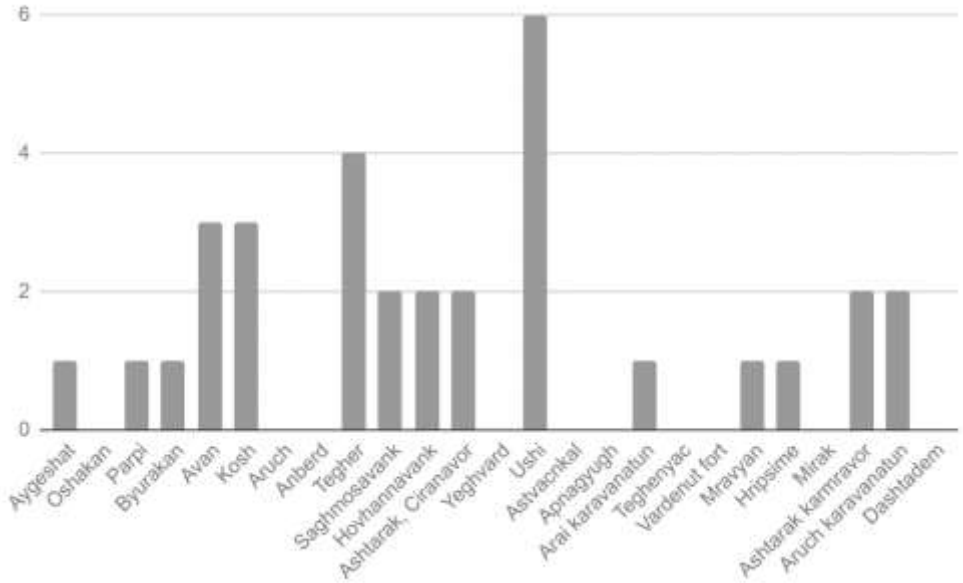


Figure Captions

Figure 1. The region of the south Caucasus, showing some of the medieval trade routes which passed through Armenia, as well as the recorded caravanserais within the modern Republic of Armenia.

Figure 2. The geographic area covered in the current study. The Kasakh Valley, east of the peak of Mt. Aragats, and medieval monastic and settlement sites. The Aruč and Arai- Bazarjuł caravanserais are indicated with chevrons.

Figure 3. An example of the 'architectural palimpsests' in the Kasakh Valley. A view inside the thirteenth-century church of Astvatsnkal, showing the juncture between an early fifth-century chapel and the high medieval renovation, including Kurd Vačutyan's dedicating inscription. Note also the Soviet-era renovations in the bottom right.

Figure 4. The *ruckenfigur* as an embodied stand-in within represented landscapes. Left: Friedrich's *Wanderer above the sea of fog* (Wikimedia common license). Right: a reconstructed view of a Silk Road landscape in GIS using a vector icon to stand in for the viewer; the white overlay indicates the view-shed.

Figure 5. A map showing the modeled path of least cost between Aruč and Aparan passing along the valley of the Kasakh River (blue), and beside the Arai-Bazarjuł caravanserai. Medieval sites are indicated in green: see Table 1 for the names of numbered sites in Figs. 4-5.

Figure 6. Modeled viewpoints, one hour's walk apart along the modeled path.

Figure 7. Examples of the viewsheds produced from successive viewpoints along the route.

Figure 8. The result of overlaying and summing the total viewsheds from the journey between caravanserais. The 'mnemonic value' of landscape as seen from the route is indicated along a color scale.

Figure 9. The result of extracting mnemonic values for each of the medieval sites in the survey (to see the value for each named site see Table 2).

Figure 10. *Mutual regard:* the shoulder of Aragats, the Arax river valley and the peaks of Ararat from the windows of Uši monastery.

Figure 11. The thirteenth-century Tełer monastery as seen from the road below.

Figure 12. Mt. Ara (Araler) as seen from the location of the entrance to the Arai-Bazarjuł caravanserai.

Fig 1.

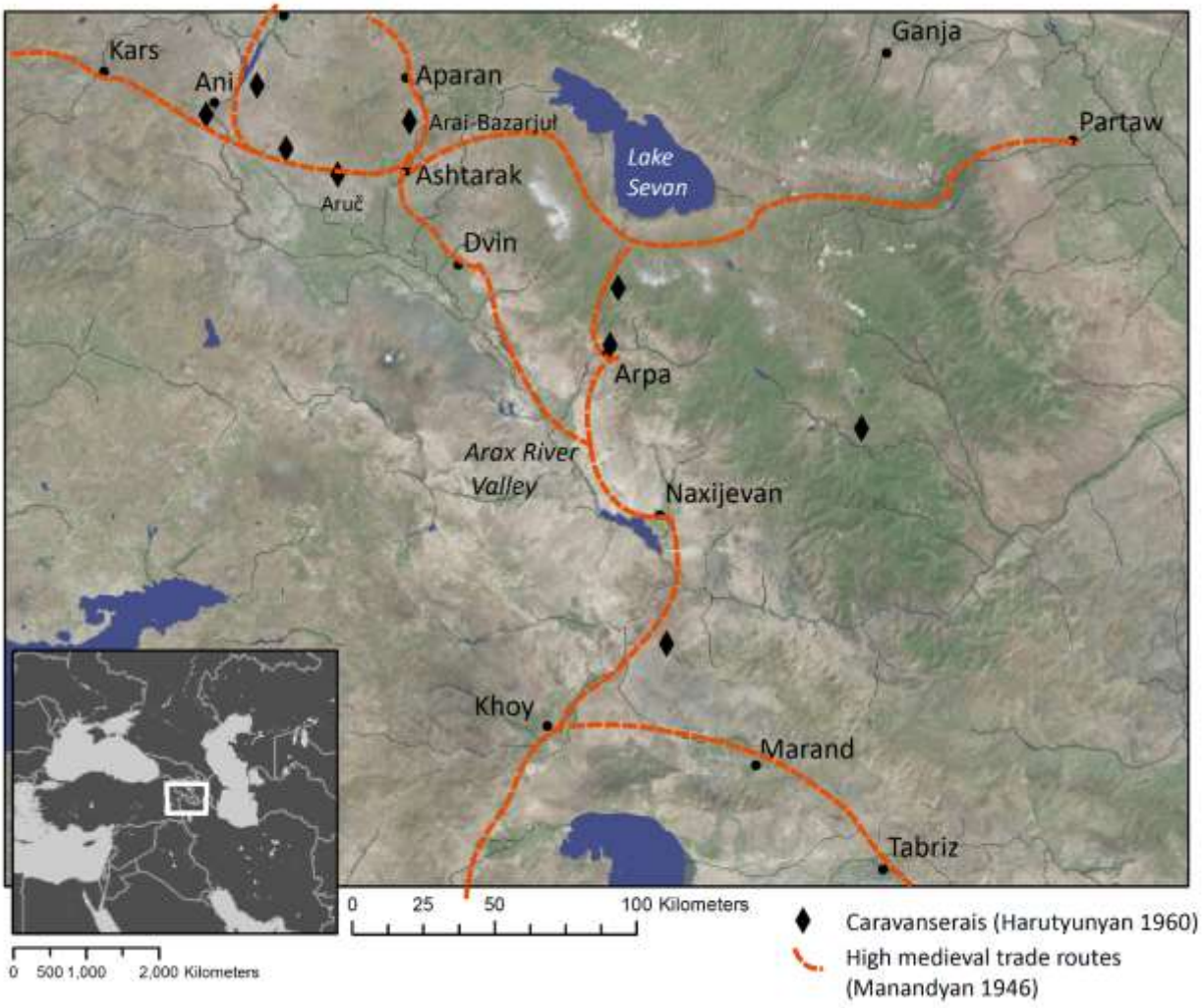

Kars
Ani
Aparan
Arai-Bazarjul
Ashtarak
Aruč
Ganja
Partaw
Lake Sevan
Dvin
Arpa
Arax River Valley
Naxijevan
Khoy
Marand
Tabriz
0 25 50 100 Kilometers
0 500 1,000 2,000 Kilometers
Caravanserais (Harutyunyan 1960)
High medieval trade routes (Manandyan 1946)

Fig. 2

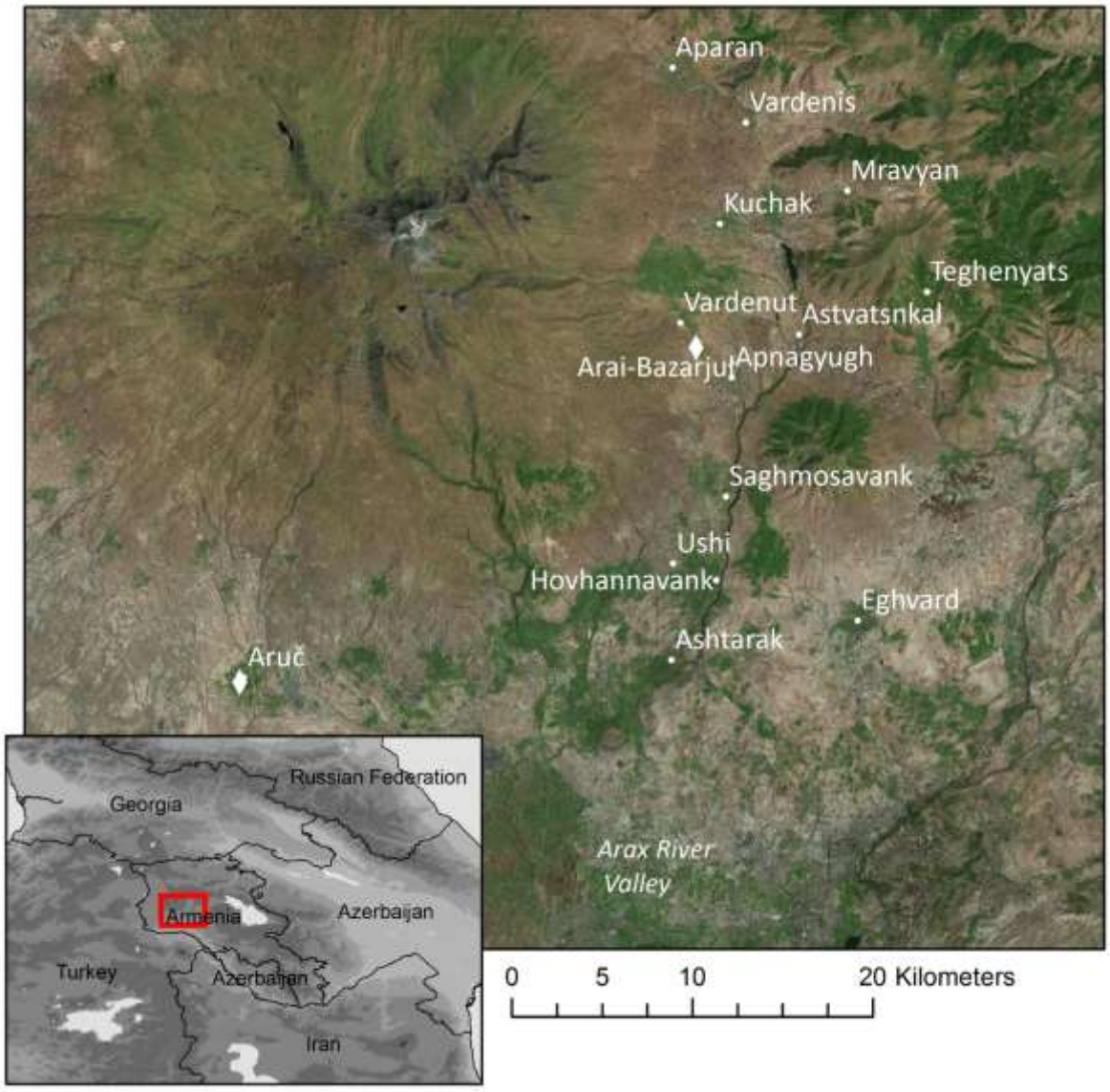
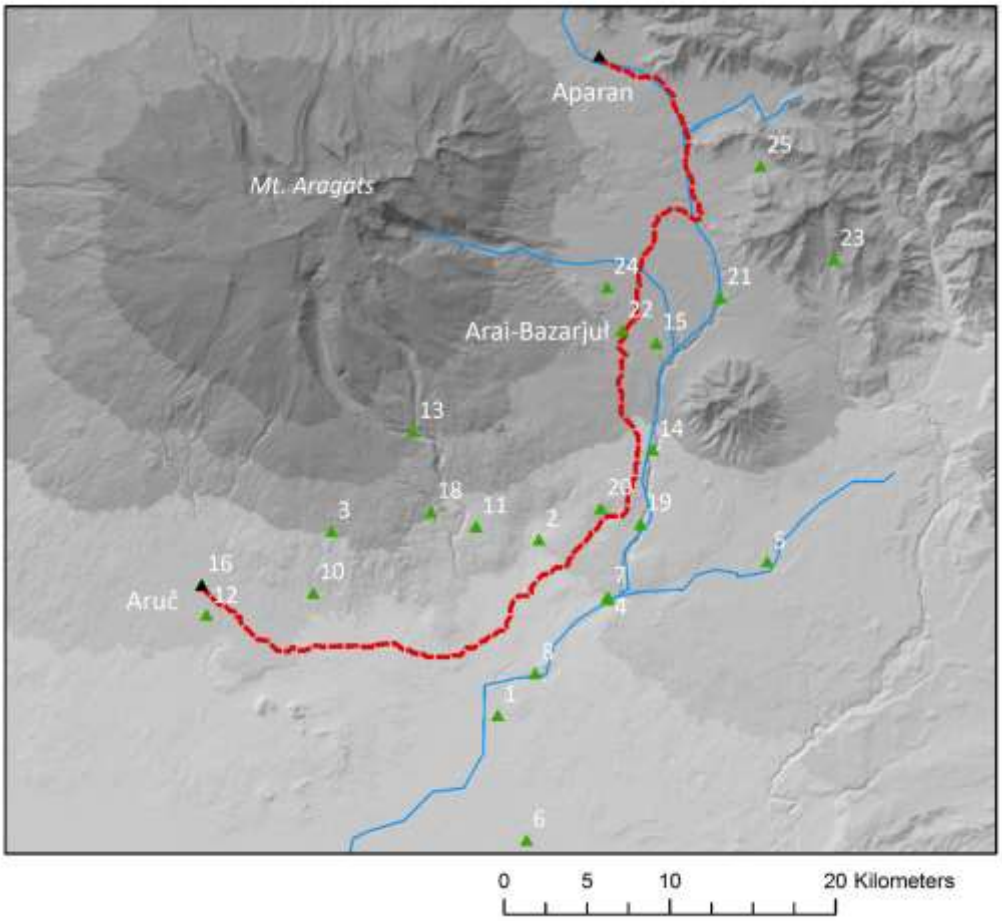

Aparan
Vardenis
Mravyan
Kuchak
Teghenyats
Vardenut
Astvatsnkal
Arai-Bazarjur
Apnagyugh
Saghmosavank
Ushi
Hovhannavank
Eghvard
Ashtarak
Aruč
Arax River Valley
Russian Federation
Georgia
Armenia
Azerbaijan
Turkey
Azerbaijan
Iran
0 5 10 20 Kilometers

Fig. 3

Fig 4

Fig 5


Aparan
Mt. Aragats
Arai-Bazarjuł
Aruč
25
23
24
21
22
15
13
14
18
11
3
2
19
16
10
12
6
7
4
8
1
6
0
5
10
20 Kilometers

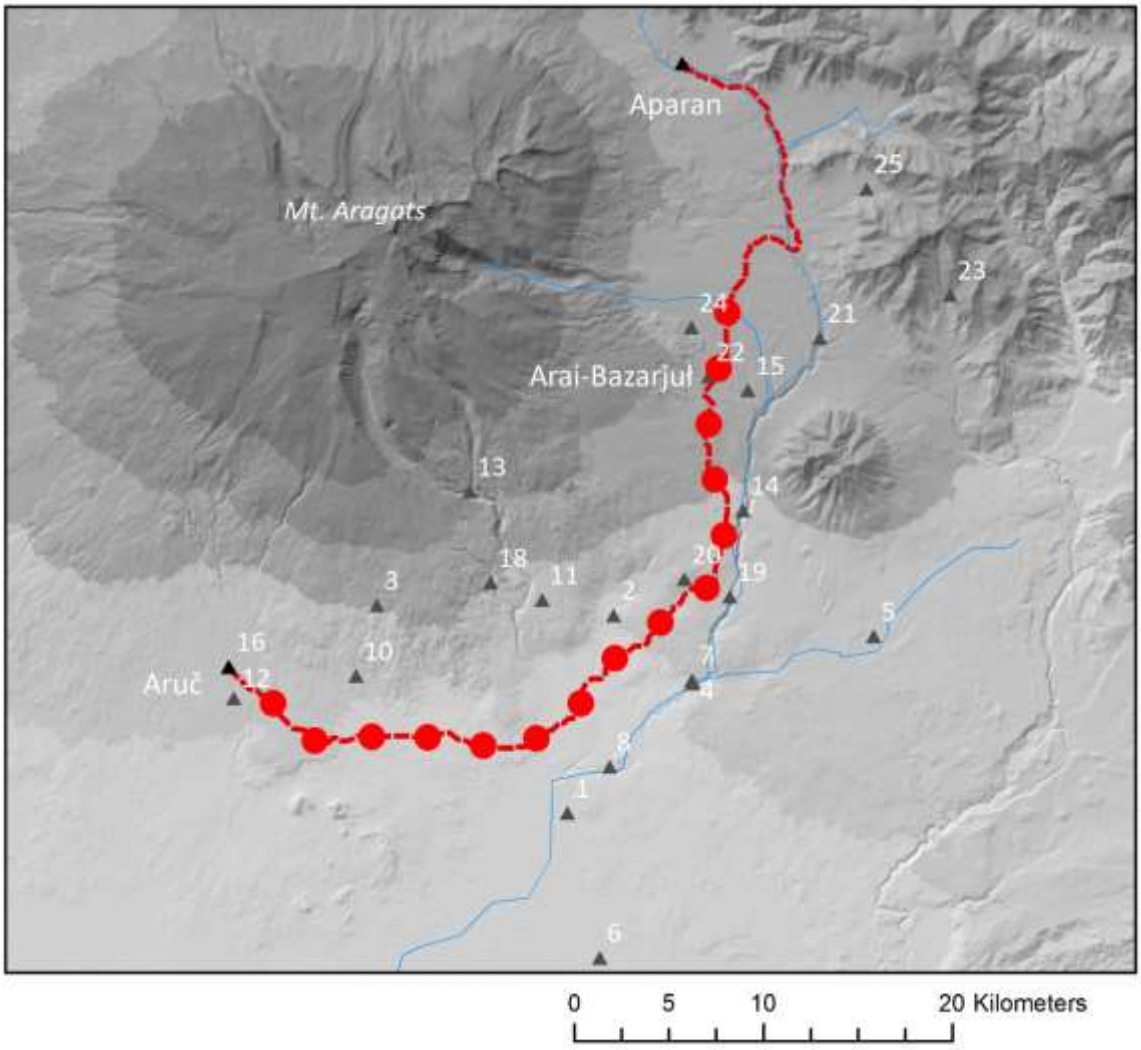
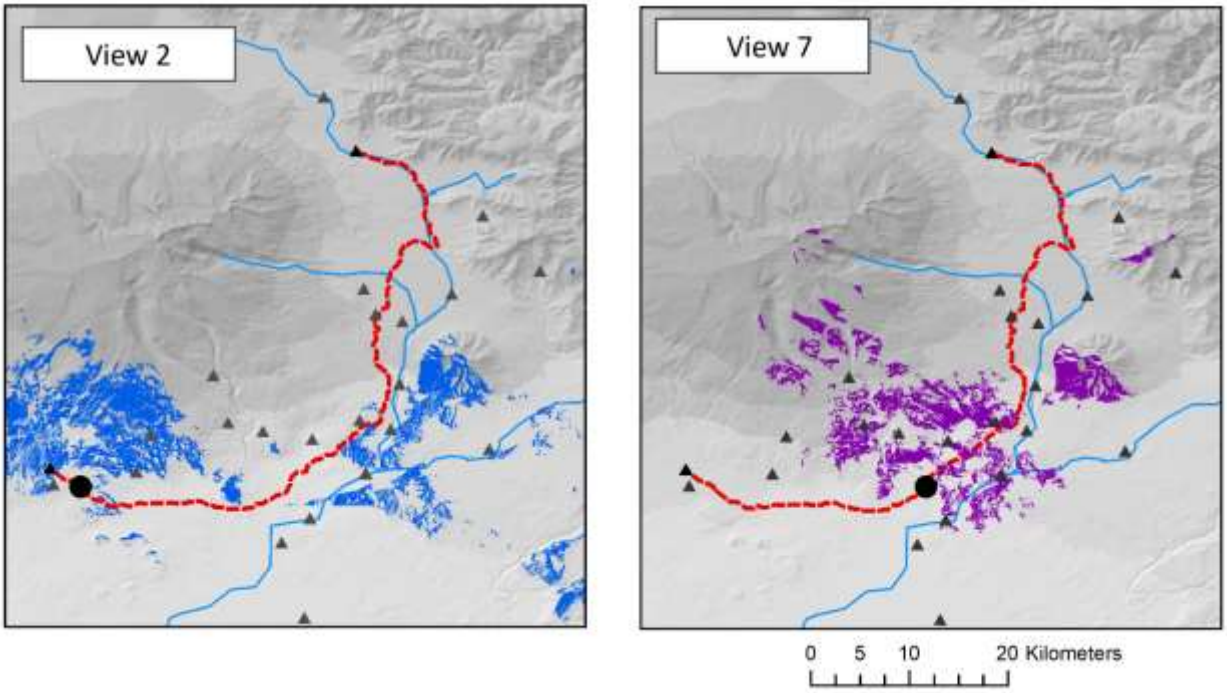

Aparan
Mt. Aragats
Arai-Bazarjuł
Aruč
25
23
24
21
22
15
13
14
18
11
20
19
3
2
5
16
10
12
7
4
8
1
6
0
5
10
20 Kilometers

Fig 6


View 2
View 7
0 5 10 20 Kilometers

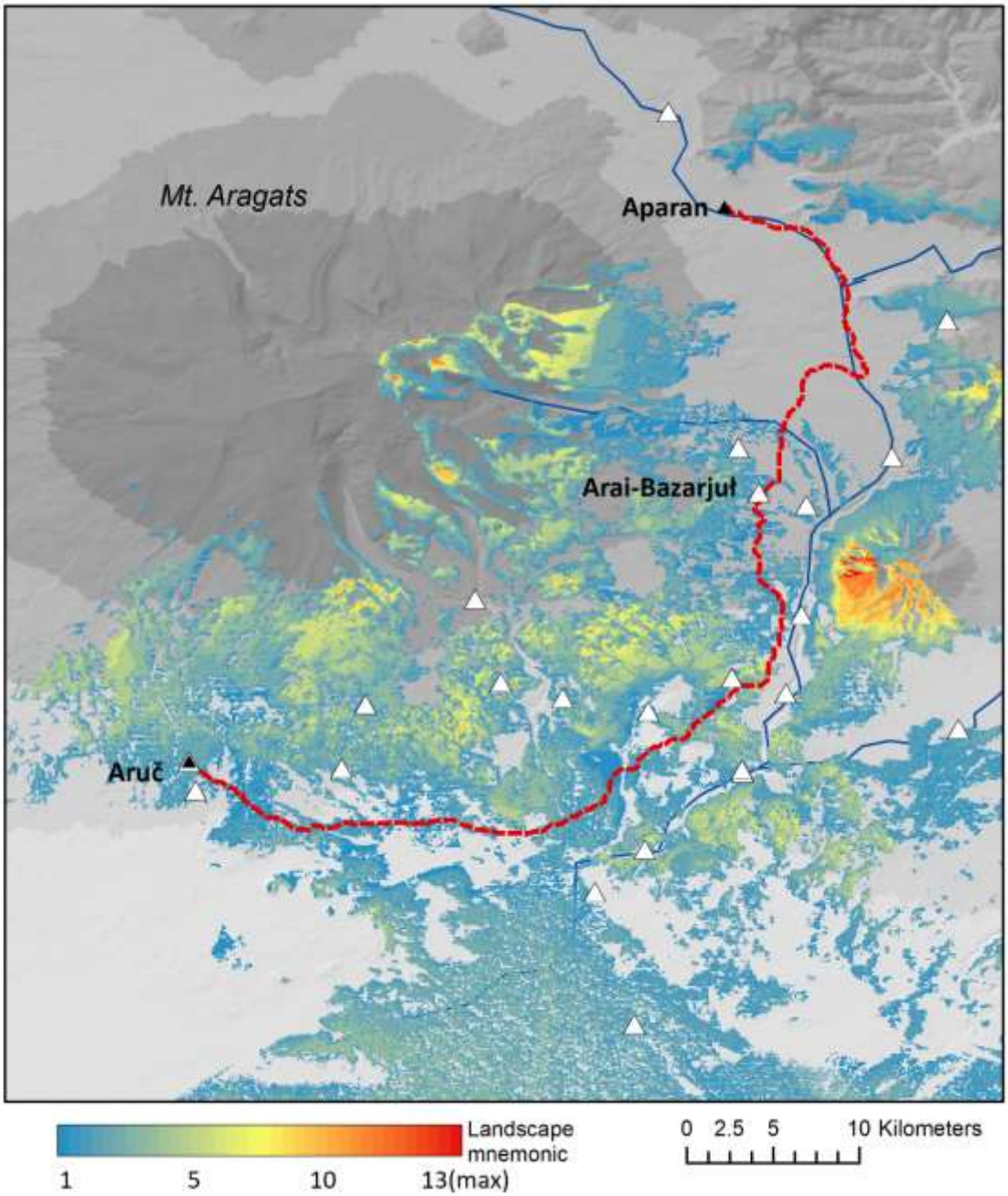

Mt. Aragats
Aparan
Arai-Bazarjuł
Aruč
Landscape mnemonic
1
5
10
13(max)
0 2.5 5 10 Kilometers

Figure 7

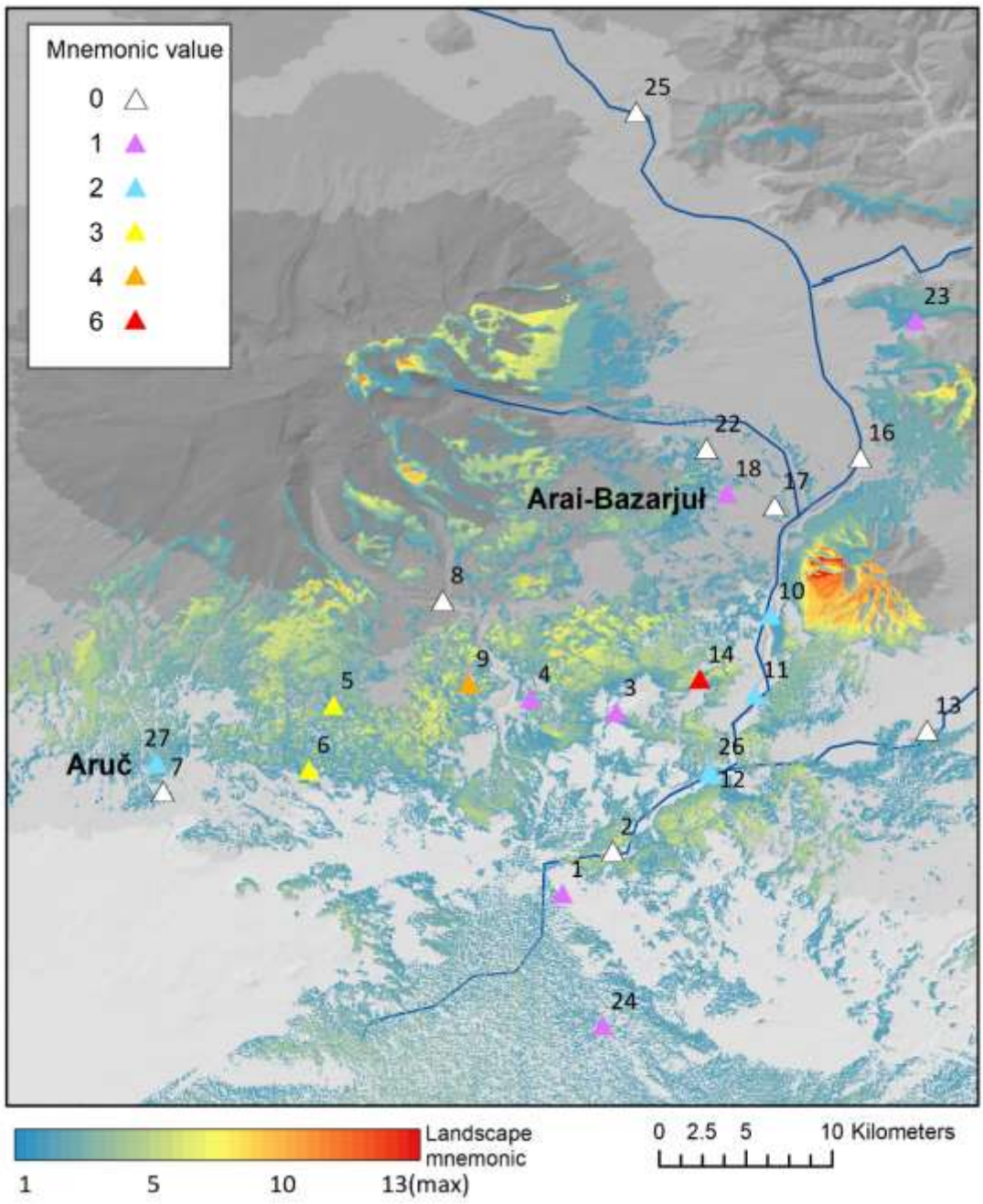

Mnemonic value
0
1
2
3
4
6
Arai-Bazarjuł
Aruč
25
23
22
16
18
17
8
10
9
4
14
11
5
3
13
27
6
26
7
12
2
1
24
Landscape mnemonic
1
5
10
13(max)
0 2.5 5 10 Kilometers

Fig 8

Fig. 9

Fig 10

Fig 11