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Expanding Horizons

Settlement Patterns and Outfield Land Use in the
Norse North Atlantic

Dawn Elise Mooney, Lísabet Guðmundsdóttir, Barbro Dahl,
Howell Roberts and Morten Ramstad (eds.)



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Editors of the series UBAS

Nils Anfinset

Randi Barndon

Knut Andreas Bergsvik

Søren Diinhoff

Lars L. Forsberg

Proofreading

Gwendolyne Knight Keimpema

Layout

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The wood artefacts on the left side are from Borgund, Norway while the artefacts on the right side are from Norse Greenlandic sites.

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List of authors

Irene Baug

Department of Archaeology, History, Cultural Studies and Religion,
University of Bergen (UiB),
P.O. Box 7805,
5020 Bergen, Norway
irene.baug@uib.no

Douglas J. Bolender

Fiske Center for Archaeological Research,
University of Massachusetts Boston,
100 Morrissey Blvd,
Boston, MA 02125, USA
douglas.bolender@umb.edu

Susanne Busengdal

Møre and Romsdal County Council,
Julsundvegen 9,
6412 Molde, Norway
susanne.iren.busengdal@mrfylke.nov

Kathryn A. Catlin

Department of Chemistry and Geosciences,
Jacksonville State University,
Martin Hall, 700 Pelham Road North,
Jacksonville, AL 36265, USA
kcatlin@jsu.edu

Writing of this article was carried out while the author was employed by the Institute at Brown for Environment and Society, Brown University, 85 Waterman St, Providence, RI 02912, USA

Barbro Dahl

Museum of Archaeology,
University of Stavanger (UiS),
4036 Stavanger, Norway
barbro.dabl@uis.no

Solveig Roti Dahl

Rogaland County Council,
Arkitekt Eckhoffsgate 1,
4010 Stavanger, Norway
solveig.roti.dahl@rogfk.no

Kristoffer Dahle

Møre and Romsdal County Council,
Julsundvegen 9,
6412 Molde, Norway
kristoffer.dable@mrfylke.no

Lísabet Guðmundsdóttir

Department of Archaeology,
University of Iceland,
Sæmundargata 2,
102 Reykjavík, Iceland
lisabetgud@gmail.com

Ramona Harrison

Department of Archaeology, History, Cultural Studies and Religion,
University of Bergen (UiB),
Postboks 7805,
5020 Bergen, Norway
ramona.harrison@uib.no

Kari Loe Hjelle

University Museum of Bergen,
University of Bergen (UiB),
Postboks 7800,
5020 Bergen, Norway
kari.hjelle@uib.no

Dawn Elise Mooney

Museum of Archaeology,
University of Stavanger (UiS),
4036 Stavanger, Norway
dawn.e.mooney@uis.no

Therese Nettet

University Museum of Bergen,
University of Bergen (UiB),
Postboks 7800,
5020 Bergen, Norway
therese.nettet@uib.no

Élie Pinta

Institut d'Art et d'Archéologie,
Université Paris 1 Panthéon-Sorbonne,
3 rue Michelet,
75006 Paris, France
elie.pinta@gmail.com

Lisbeth Prøsch-Danielsen

Museum of Archaeology,
University of Stavanger (UiS),
4036 Stavanger, Norway
lisbeth.prosch-danielsen@uis.no

Morten Ramstad

University Museum of Bergen,
University of Bergen (UiB),
Postboks 7800,
5020 Bergen, Norway
morten.ramstad@uib.no

Jennica Einebrant Svensson

Rogaland County Council,
Arkitekt Eckhoffsgate 1,
4010 Stavanger, Norway
jennica.einebrant.svensson@rogfk.no

Preface

This volume stems from the Expanding Horizons project, which began in 2018. The project was funded by a Workshop Grant from the Joint Committee for Nordic Research Councils in the Humanities and Social Sciences (NOS-HS), held by Orri Vésteinsson, Ramona Harrison, and Christian Koch Madsen. Funding was awarded for two workshops, as well as a subsequent publication of the material presented. Workshop organisation and grant administration were carried out by Morten Ramstad, Lísabet Guðmundsdóttir, Howell Roberts, Barbro Dahl, Birna Lárusdóttir, and Dawn Elise Mooney. The workshops gave researchers and practitioners from across the North Atlantic region an opportunity to forge new connections with each other, not only through academic presentations but also through shared experiences of archaeological sites, standing Medieval structures and their surrounding landscapes.

The first Expanding Horizons meeting took place in Norway, on June 1st–4th 2018. The program began in Bergen with a tour of the city's Medieval sites, led by Prof. Gitte Hansen, before travelling to Mo in Modalen for two days of presentations and discussions. The workshop was attended by 36 participants, 27 of whom gave presentations on topics including archaeological survey in mountain regions, driftwood, seaweed, stone, birds and feathers, and fishing and marine mammals. The two-day seminar was followed by an excursion visiting sites including the stave churches at Borgund, Hopperstad and Kaupanger, the Viking trading sites at Kaupanger and Lærdal, and Norway's oldest secular wooden building, Finnesloftet in Voss, built around AD 1300. In between archaeological sites, the excursion also took in the dramatic fjord landscape of western Norway. Here and in Iceland, both the upstanding structures and their surrounding landscape should be seen as key actors in the development of the settlement and subsistence practices discussed in this volume.

Just under a year later, on April 25th–28th 2019, the Expanding Horizons group met again in Iceland. Forty-one participants gathered in Brjónsstaðir for two more days of talks and discussions. While the first workshop had a main focus on remote wild resources, the second focused on settlement and land-use patterns, agricultural practices, and trade and exchange. Again, the workshop concluded with an excursion to local archaeological sites. Attendees visited the episcopal manor farm and church at Skálholt, the reconstructed Viking Age house at Stöng in Þjórsárdalur, the caves at Ægissíðuhellir, the archaeological site at the manor farm Oddi and the preserved medieval turf-built farm and museum at Keldur. Photographs of the participants of both workshops are presented on the following pages.

Partly due to the ongoing coronavirus pandemic, more time than anticipated has passed between these meetings and the publication of this volume. We thank the authors for their patience, and for their outstanding contributions to the archaeology of western Norway and the Norse North Atlantic diaspora. We are also very grateful to our colleagues who assisted the editors in the peer review of this volume. Lastly, we thank you, the reader, and we hope that you find inspiration in the papers presented here.

Stavanger/Reykjavík/Bergen, Spring 2022

Dawn Elise Mooney, Lísabet Guðmundsdóttir, Barbro Dahl, Howell Roberts and Morten Ramstad



Attendees of the first Expanding Horizons workshop at Mo in Modalen, June 2018.

Back row, left to right: Jennica Einebrant Svensson, Garðar Guðmundsson, Even Bjørdal, Orri Vésteinsson, Morten Ramstad, Jørgen Rosvold, James Barrett, Gísli Pálsson, Michael Nielsen, Christian Koch Madsen, Konrad Smiarowski, Howell Magnus Roberts, Ragnar Orten Lie; Middle row, left to right: Solveig Roti Dahl, Brita Hope, Ragnheiður Gló Gylfadóttir, Kristoffer Dahle, Douglas Bolender, Hákan Petersson; Front row, left to right: Mjöll Snæsadóttir, Birna Lárusdóttir, Lilja Laufey Davíðsdóttir, Irene Baug, Kristin Ilves, Jørn Henriksen, Kathryn Catlin, Lilja Björk Pálsdóttir, Gitte Hansen, Kristborg Þórsdóttir, Élie Pinta, Dawn Elise Mooney, Lisabet Guðmundsdóttir, Sólveig Guðmundsdóttir Beck, Ramona Harrison. *Photo: Kathryn Catlin.*



Attendees of the second Expanding Horizons workshop at Brjánsstaðir, April 2019.

Back row, left to right: Howell Magnus Roberts, Morten Ramstad, Kjetil Loftsgarden, Kristoffer Dahle, Douglas Bolender, Ragnheiður Gló Gylfadóttir, Hildur Gestsdóttir, Michael Nielsen, Orri Vésteinsson, Jennica Einebrant Svensson, Trond Meling, Knut Paasche, Anja Roth Niemi, Knut Andreas Bergsvik, Simun Arge; Middle row, left to right: Guðrún Alda Gísladóttir, Brita Hope, Hákan Petersson, Kathryn Catlin, Even Bjørdal, Ragnheiður Traustadóttir, Élie Pinta, Solveig Roti Dahl, Per Christian Underhaug; Front row, left to right: Kristborg Þórsdóttir, Sólveig Guðmundsdóttir Beck, Guðmundur Ólafsson, Gitte Hansen, Mjöll Snæsadóttir, Lisbeth Prösch-Danielsen, Kari Loe Hjelle, Irene Baug, Christian Koch Madsen, Ramona Harrison, Barbro Dahl, Dawn Elise Mooney, Thomas Birch, Lisabet Guðmundsdóttir, Jørn Henriksen. *Photo: Lisabet Guðmundsdóttir.*



Ramona Harrison and Howell M. Roberts

Skuggi landnám farm and site economy in transition: an assessment of the Structure A and household midden remains from the Viking Age to the Medieval period

This paper provides an initial overview and assessment of the Skuggi Settlement Era farm in Hörgárdalur, Eyjafjörður. Excavations on the marginal site in 2008-09 resulted in organic and inorganic remains collected from a domestic midden infilling a turf and stone building, Structure A, which was fully excavated in 2013-14. Located on land owned by the Staðartunga farm, the site was discovered on a seemingly marginal, north-facing slope. The midden and structural remains inform us about changing farming and thus economic strategies from the Viking period and Middle Ages. Buried contemporary landslides indicate destabilized slope conditions, potentially coinciding with human settlement on this steep mountain slope. Skuggi can be viewed as one small, and early, part of a larger socio-economic network within and beyond Eyjafjörður, based on exchange in luxury goods for export, but also bulk goods such as dried fish, and, in this case, a shift from subsistence agro-pastoralism toward increased sheep wool production. Along with local and overseas politics and religious institutions exerting power on such small-scale farming operations, the changing environment may have also played a role. Research at Skuggi forms a part of the Eyjafjörður Ecodynamics Project (EE) which was developed from the Gásir Hinterlands Project (GHP).

Introduction

This paper provides an initial synthesis of excavation data from the Viking Age farm site of Skuggi in Hörgárdalur, Eyjafjörður. It aims to create a general site narrative through a multi-stranded, proxy data-based view into the past at this Settlement Era site. The dataset consists of both previously published zooarchaeological data from the 2008/2009 investigations (Harrison 2010b, 2014, Smiarowski *et al.* 2017) and new results from the 2013/2014 midden and structural excavations (Harrison and Roberts 2014). The results of the latter investigation allow the authors to present the site chronology in five activity phases, starting in the late 9th century and ending in the early 13th century.

- The paper first presents the research background, then discusses the site chronology and the Structure A remains. It then briefly presents general overviews of results from the artefact, geochemical, and archaeobotanical analysis. The buried landslides from Trench

3 are presented, followed by an overview of the overall finds from the zooarchaeological analysis. The latter forms the greater part of the Skuggi farm site story. A discussion addresses the main questions:

- Can we define changes in site activity and farming economy over time?
- Do the archaeological remains at Skuggi show evidence of environmental impacts that might affect the use and longevity of the site?

Background

Skuggi is located about 200 m southwest of the abandoned farm of Oddstaðir (Harrison 2014), and a little more than 20 km southwest of the Medieval trade site of Gásir which is located on the estuary of the Hörgá, a river which runs through Hörgárdalur (see Figure 1). Skuggi is situated about midway uphill on a north facing slope, below steep rocky outcrops and south of the Hörgá. Positioned on a little plateau at an elevation of about 160-170 m above sea level, Skuggi may be considered a semi-upland site. The Skuggi midden deposits have been radiocarbon dated to between cal. AD 970-1208 (Figure 4); tephrochronology further aids in dating the remains. All midden deposits are sealed by the H1300 tephra (from the volcano Hekla), and most of them also by H1104. A well preserved turf and stone structure under the midden contains tephra layers deposited during the Settlement Era volcanic activity (Landnám Tephra Layer, LTL), now dated to AD 877 ± 1 (Schmid *et al.* 2016).



Figure 1. Map of Hörgárdalur, indicating the sites mentioned, as well as others investigated as part of GHP and EE research (Map: Gisli Pálsson, 2013).

Archaeological investigations at this seemingly marginal site originated as part of a study of the larger socio-economic context of the 12-14th century AD trading site of Gásir (e.g. Harrison *et al.* 2008, Roberts 2009, Vésteinsson 2011). Although the Skuggi remains predate those from Gásir, they can be directly compared to archaeological remains from the early occupation periods at neighboring Oddstaðir. Its ruins are located on relatively flat, south facing pastureland at c. 150-160 m above sea level, and it was one of Skuggi's northern neighbors from across the Hörgá (Harrison 2013). The Oddstaðir midden produced stratified deposits that indicate a continuous site occupation from the late 9th/early 10th century to the early 15th century. The animal bone data suggests that Oddstaðir could have started out as an independent farm and thus may have enjoyed a higher social status than Skuggi (Harrison 2014).

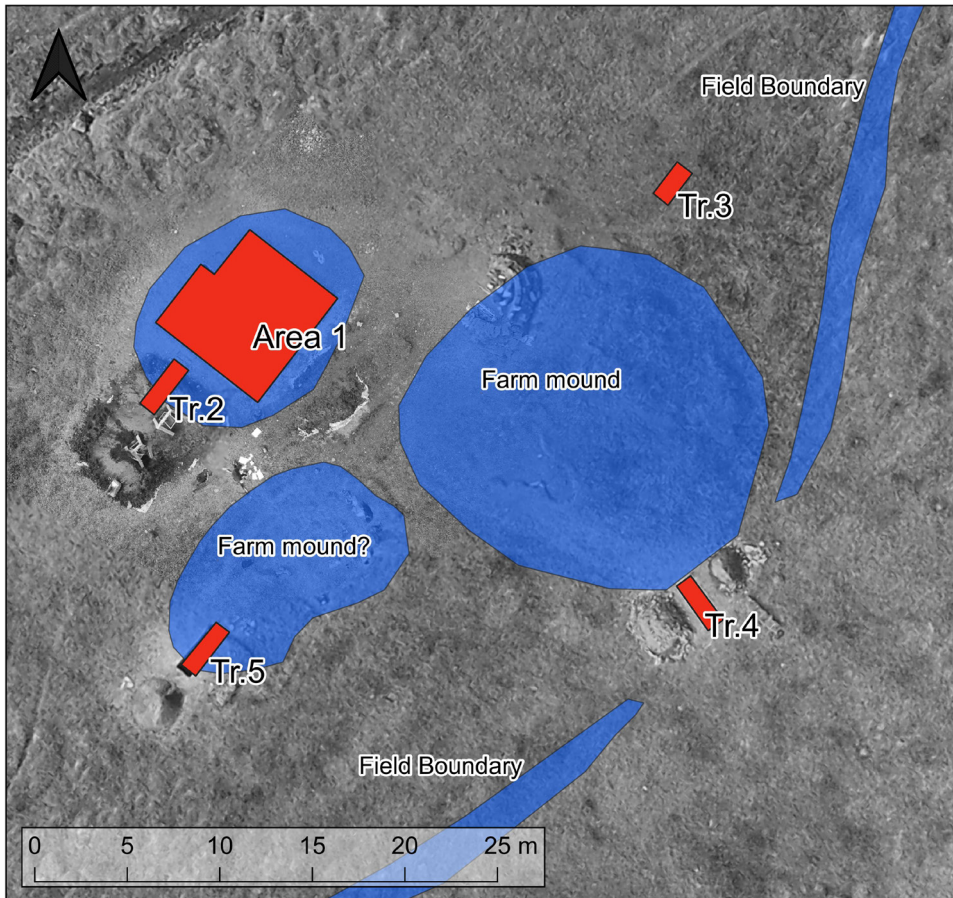


Figure 2. Overview of Skuggi Site elements and excavated areas.

Skuggi may have originally been constructed as a small subsidiary farm and was later incorporated into the larger landholdings of the Staðartunga farm. Staðartunga, at one point a church farm, eventually came under ownership of the Möðruvellir church estate in the mid-15th century (Hreiðarsdóttir and Pétursdóttir 2008, p. 230). Möðruvellir, located close

to the Hörgá delta, developed from a church farm during the 11th century to a parish church in about AD 1150. This large ecclesiastical estate became a House of Canons in 1296 and was under the continuous control of the northern bishopric at Hólar from about the first half of the 13th century onwards (Vésteinsson 2001). Its 13th-20th century archaeofauna postdates the Skuggi archaeological remains (Harrison 2011), with few written records about the Möðruvellir economy available prior to the 15th century (Júlíusson 1996).

Site Chronology

As indicated in Figure 2, Structure A forms only a small part of a much more extensive farm site. The remains/features visible on the surface suggest a farm mound, or mound and outlying buildings, measuring at least 40 m in diameter. This is consistent with other structures on site remaining in use whilst Structure A becomes infilled with domestic waste. The visible remains of the farm mound are further associated with field boundary walls currently visible for a length of approximately 70 m, located upslope of the farm mound. A fan-shaped geological feature renders the extent of the farm boundaries somewhat obscured.



Figure 3. Outline of Skuggi, Structure A.

During the initial excavation project, faunal remains, artefacts, and palaeoecological samples from the well-stratified Skuggi midden were retrieved and analyzed to discuss farming activity and site economy in the 11th-12th centuries (Harrison 2010a, 2010b, 2013). In 2013 and 2014, fieldwork focused on excavating a structure containing the midden materials, and this revealed the remains of a semi-sunken turf and stone outbuilding dating to circa AD 900.

Table 1. Time periods mentioned in the paper.

Phase	Period	Description
I	Late 9 th -Mid 10 th century AD	Primary structure
II	Mid 10 th -Early 11 th century AD	Changes to structure/function + midden
III	Early-Mid 11 th century AD	Earlier use as midden, last function of structure
IV	Mid 11 th -Mid 12 th century AD	Later midden, change in animal taxa profile
V	Mid-Later 12 th century AD	Pre-site abandonment to site abandonment

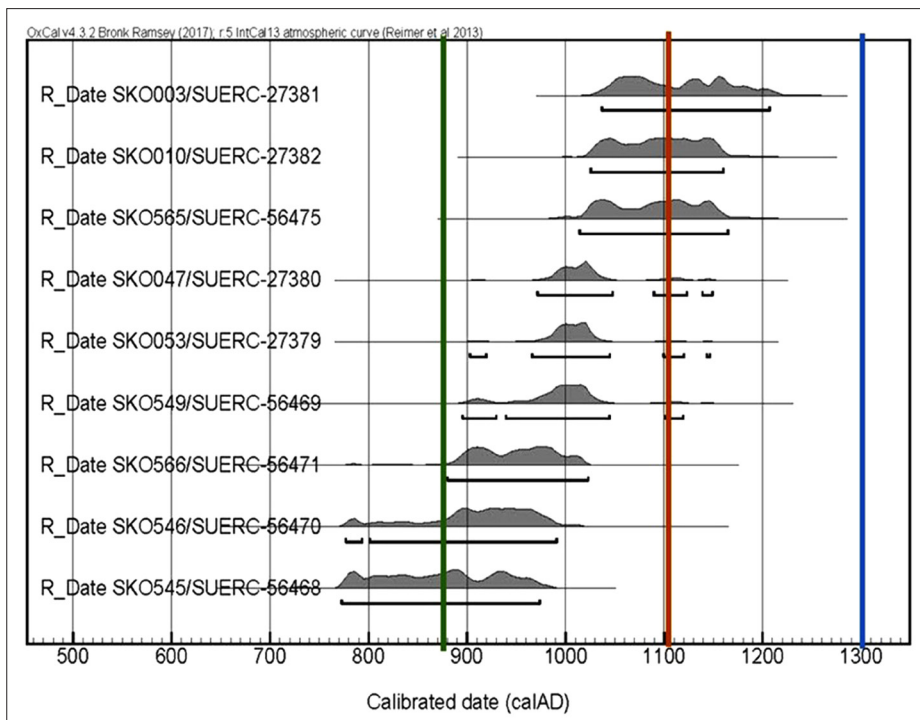


Figure 4. Skuggi calibrated (2 σ) Radiocarbon Dates displayed on multi-plot graph (OxCal program v4.3.2; Bronk Ramsey (2017), Reimer et al. 2013). The coloured lines indicate tephra horizons - green = Veidivötn 877 \pm 1, red = Hekla 1104, and blue = Hekla 1300.

The Skuggi midden and structural remains required careful stratigraphic excavation, with as much focus on single-context excavation as possible to investigate the human and environmental activities involved in site formation processes (detailed excavation and sampling information is available in Harrison 2010a, Harrison and Roberts 2013). The authors located several *in situ* tephra layers as well buried rockslides, possibly connected to human impacts on the steep Staðartunguháls slopes where Skuggi is located (Harrison 2013). Tephrochronology samples were gathered and analyzed by Richard Streeter, University of St. Andrews, with the results demonstrated in the Trench 3 stratigraphy in Figure 7 (see also Streeter and Dugmore 2013).

Based on site stratigraphy, radiocarbon dates from terrestrial mammal bones, tephrochronology, and artefact typology, the authors discerned five activity phases which are presented and described in Table 1.

Phase I activity begins early on during the settlement of Iceland, the *landnám*, in the late 9th century AD. The excavated Phase I structural remains comprise a small, semi-sunken turf and stone house, aligned southwest to northeast (Structure A). The (upslope) south-eastern wall is cut into the natural ground surface, while the (downslope) north-western wall survives to a height of circa 55 cm. Structure A measures 4.9 x 2.7 m internally, and the walls are between 0.85-1.05 m in width. It is broadly rectangular in form, and its south-western gable was at some point used to form part of another building (Structure B), which is yet to be excavated.

The semi-sunken Structure A (Figure 3) has narrow entrances at the southwestern and northwestern corners. Its interior is equipped with a stone-built oven in the south-eastern corner and its thin, laminated floor layers allowed for extensive sampling for geochemical and archaeobotanical studies (Kremkova 2015, Mooney 2020). Excavation of the floor layers also revealed numerous very small stake-holes, typically 1-3 cm in diameter. The area where these stake-holes truncated the floor layer (context 721) was kept clean of other debris and could have been used for wool processing (Kremkova 2015, p. 58).



Figure 5. Picture of context 721 floor layer and stake-holes; southern extent slightly truncated to allow micromorphology sample removal; picture facing north.

Phase II midden remains revealed a large amount of faunal material including extensive numbers of sheep and goat skulls. Structure A itself undergoes an architectural modification at this point, with the northwestern entrance being blocked (Figure 6, below). The main function of Structure A during this phase is unclear.

By Phase III, during the early-mid 11th century, the primary purpose of Structure A had ended, and from that point on it seems to have been used as a site-wide household refuse, or midden, area. The midden material is substantial and especially rich in animal bone remains and provides evidence for barley and other macrobotanical remains, and a moderate artefact assemblage, briefly discussed further below (see also Harrison 2010a, 2010b).



Figure 6. Picture from 2013 season, prior to final excavation of Structure A, with Structure B just emerging in western part. Area A was extended in 2014 to explore the edge of this structure (see Figure 3). Lighter coloured turf layer connecting Structures A and B, thus blocking northwestern entrance to Structure A during Phase II; picture facing north.

Phases IV and V indicate continued use as a household refuse area, with the midden restricted in area and volume during the final phase, which is suggestive of significantly reduced activity prior to the 13th century site abandonment.

The buried landslides

In addition to the excavation of Structure A, the 2013 and 2014 project involved a series of test trenches to investigate structural remains observed on the surface. Trench 2 (Tr. 2) that proved inconclusive, while Trenches 3 and 4 were more productive. Trench 3 (Tr. 3) was dug in 2013 to investigate the area around Structure A (originally Trench 1). The trench was placed at the northeastern limit of the primary farm mound to the southeast of Area 1 (Figure 2). Tr. 3 measured 1 x 3 m and revealed evidence of two landslides (contexts 587 and 585) sealed by tephra deposits (Figure 7). The younger landslide deposit was composed of rubble and gravel (context 585) and occurred between eruptions of the volcano Hekla in AD 1104 and AD 1300 (contexts 586 and 583, respectively). The older landslide (context 587) consisted of much larger boulders and occurred shortly before the H1104 tephra layer. A midden deposit (588) was found beneath the landslide sequence (Harrison and Roberts

2014). One more recent tephra layer (581) was detected in Tr. 3 and was found to be most likely from 1477 according to R. Streeter (personal communication, 2013). Other than the midden deposits underneath the earlier landslide (587), none of the later deposits contained inclusions indicative of anthropogenic activity.

Trenches 4 (Tr. 4) and 5 (Tr. 5) (Figure 2) also revealed sequences of buried landslide deposits that seem to have covered structural remains. The remains of these trenches still need further interpretation, and it is currently not possible to determine that the landslides discovered there were part of the same landslide events as those observed in Tr. 3.

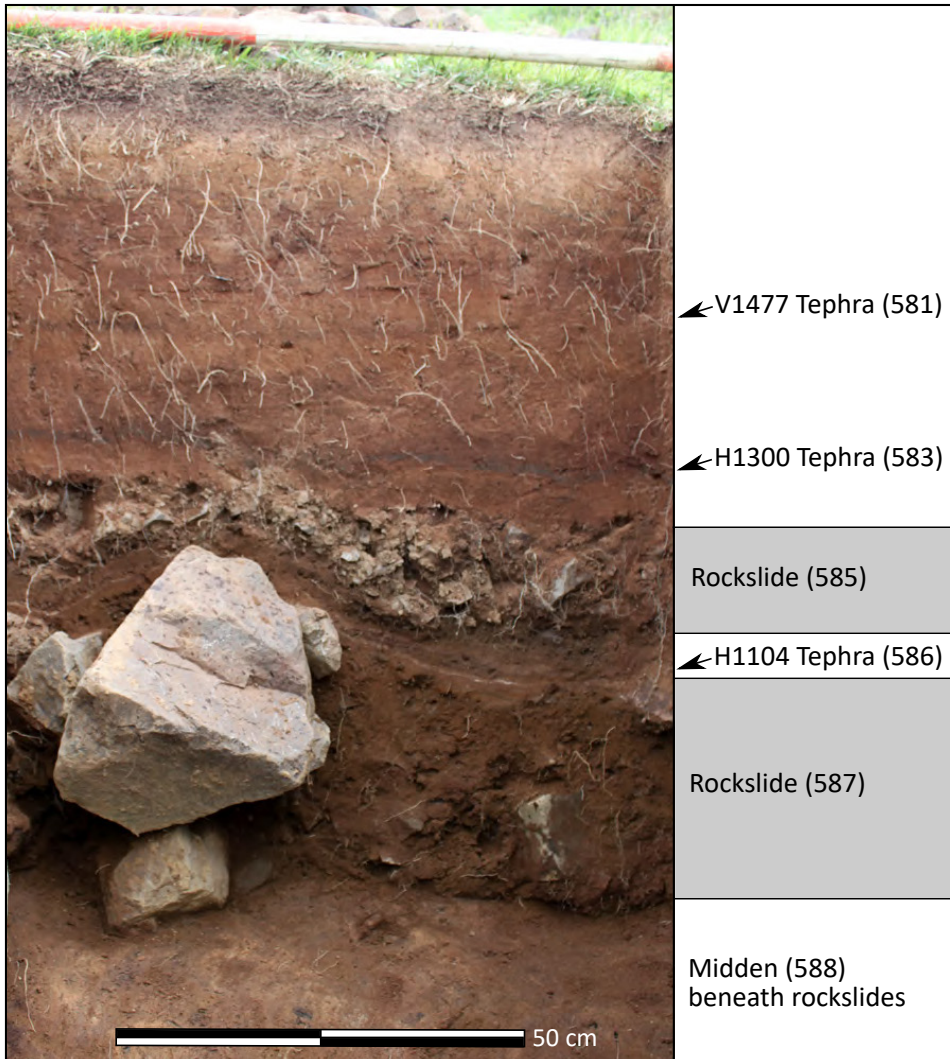


Figure 7. Skuggi, Trench 3. Sequence of landslides and dated tephra layers on top of midden deposit. Tephra layers marked by Harrison for clarity: white = H1104, blue = H1300, grey = most likely AD 1477 eruption (Streeter, personal communication 2014).

Household and Midden Remains

The Skuggi artefacts

Excavations between 2008 and 2014 produced a total of circa 360 artefacts, including a broad range of generally well-preserved objects that cover most material classes. The great majority of the artefactual assemblage was recovered from the post occupational midden infill, and thus generally represents the broader activity taking place at the site, rather than the function of Structure A *per se*. The finds were widely distributed amongst many separate deposits, throughout the depositional sequence. The Skuggi finds await further interpretation, with the 2008 and 2009 artefact results reported previously (Harrison 2010a).

The finds categories with the most objects are iron (96) and stone (162), with copper alloy, glass and worked bone artefacts present in smaller numbers. Finds of particular note include the folding arms of a bronze balance scale from context 546, Phase II (F13-353 - discarded in an external midden dump; see Figure 8), 14 beads (11 of glass, 2 of amber and 1 of stone), 10 gaming pieces (5 of worked fish bone, 5 of sandstone), fragments of 4 bone combs, 1 fragment of stone crucible, 4 bone pins, 1 complete spindle whorl of steatite, 13 whetstones (or fragments), and 20 stone strike-a-lights (15 of jasper). The finds category is completed by a small amount of industrial residue/hearth waste/slag (1.6 kg).



Figure 8. Skuggi find 13-353, context 546, Phase II. Two arms of a copper alloy folding scale. (Photo: Hólfríður Sveinsdóttir/FSÍ).

A small number of the artefacts may be directly associated with the floors and internal occupational features of Structure A. These include 6 of the 14 beads (4 of glass and the 2 of amber), along with a worked stone gaming piece, the steatite spindle whorl, and a small whetstone - pierced for suspension. As such, this small assemblage suggests that textile associated crafts may have been among the potential activities carried out in Structure A (see also results from environmental samples analysis below).

The geoarchaeological samples and analysis to date

During the 2014 excavation the five distinct occupation layers (contexts 710, 718, 721, 725, 726) in Structure A were sampled for flotation/wet sieving and chemical analysis on a 0.5 m grid. Julia Kremkova, under the direction of Karen Milek (University of Durham), analysed the samples as part of her unpublished Master's thesis (Kremkova 2015). Samples for micromorphology analysis were also taken in the field, but still await analysis.

Kremkova's results based on micro-residue analysis, pH and electrical conductivity (EC), magnetic susceptibility, and loss on ignition (LOI) analysis showed that areas with lower pH levels presented higher concentration of burned bones. The LOI values indicated that floor layers seem to have been kept dry and clean by ashes from the corner oven. From the micro-residue analysis, Kremkova found that slag remains were only present from contexts 726 and 725, the earliest occupation layers encountered in Structure A. Charred seeds were recovered from context 710, the latest phase of the floor layer sequence which was well-protected from turf collapse layers of the ceiling. Kremkova further detected burned bone and unburned wood fragments at varying frequencies in each occupational layer (2015, p. 55-56). The charred seeds from context 710 were sub-sampled and analysed by Dawn Elise Mooney, University of Stavanger. The results from her unpublished report will be briefly discussed below (Mooney 2020).

Based on the single spindle whorl retrieved from the site (Find 542 from context 675) and the potential presence of staffs connected to spinning (as indicated by the small holes in floor layer 721), Kremkova (2015) concludes that the semi-sunken structure could at least at one point have been a place for wool processing and textile production. However, she does not claim to demonstrate that this was Structure A's main purpose, but rather refers to other Viking Age sunken featured buildings (pit-houses) where there was stronger evidence for such activity, based on artefact and geochemical analysis (e.g. Milek 2012). Neither the artefact assemblage, nor the structural components themselves are conclusive enough to claim a single-purpose use of this structure. During her analysis of the Skuggi occupation layers, Kremkova (2015, p. 65) detected small beads and the presence of minute remains of slag, possibly indicative of iron-working activities. The geochemical analysis concluded that peat and wood ash was distributed across the house floor, likely to keep it dry and smooth, and to cover odours (cf. Milek 2012).

The archaeobotanical samples and analysis to date

The materials from soil bulk samples collected from the 2008/09 seasons were sorted after initial flotation and the archaeobotanical remains were communicated by Mike Church, University of Durham (personal communication, 2013). So far, 7 samples from the 2009 excavation season have been analysed, with the results as yet unpublished. The samples contained fragments of birch (*Betula sp.*) and willow (*Salix sp.*) charcoal, charred seeds of wild species, and four charred grains of hulled barley (*Hordeum vulgare*) from sample 20 (context 022). This context belongs to Phase III and can be dated to the early-mid 11th century.

It is not clear whether the barley grains recovered from Skuggi were indigenous or imported. It is possible the cereals were locally grown more frequently and were potentially less of an elite-site arable undertaking than previously assumed (Catlin 2019). A thorough study of Settlement Era midden remains from marginal sites from the Hegrans area in neighbouring Skagafjörður demonstrated that nearly every soil sample taken contained barley seeds,

presumably locally/regionally grown (Catlin 2019, p. 40). Macrobotanical collections from various regions in Iceland that date from the late 9th and early 10th centuries demonstrate fairly common cereal consumption. Cereal production on the other hand, was not easily done in sub-arctic Iceland, declined by the 12th century, and disappeared around AD 1500 (Trigg *et al.* 2009, Catlin and Bolender 2018, p. 123).

In addition to the archaeobotanical analysis of the above-mentioned midden samples, an initial analysis was conducted of sub-sampled remains of charred seeds recovered in 2014 as part of the geochemical sampling of the Structure A floor layers. These charred seeds were identified by Dawn Elise Mooney, who identified the presence of seeds of at least four different sedges (*Carex sp.*), along with bulbils of alpine bistort (*Bistorta vivipara*) and one buttercup (*Ranunculus sp.*) seed (Mooney 2020, p. 1). These plant remains were also identified from the midden samples. The identified plant remains are common in Icelandic hay meadows or damp grassland. Mooney suggests that the fact that the seeds were found in an occupational deposit (context 710) rather than a primary burning context, may represent secondary deposition of burnt material, probably in the form of ash spread on the floors for moisture and odour control. This seconds Kremkova's (2015) interpretation of the geochemical results. Mooney (2020, p. 2) suggests further that the sedge seeds may reflect the use of these plants in bedding or flooring, with the charring either due to waste burning, or accidental burning.

Zooarchaeological materials and methods

All the Skuggi midden materials were dry-sieved through 4 mm mesh size and where applicable materials were targeted for bulk sampling for post-excavation analysis (see section on archaeobotanical samples), in accordance with North Atlantic Biocultural Organisation (NABO) recommendations. Faunal analysis followed practices and standards developed at the Northern Science and Education Center (NORSEC), located at CUNY, New York. Recording and data curation followed the NABONE protocols (NABONE 2009). Following widespread North Atlantic tradition, bone fragment quantification utilizes the Number of Identified Specimens (NISP) method (Grayson 1984). Mammal identifications follow Hillson (1992), fish identifications follow Canon (1987), bird identifications follow Cohen and Serjeantson (1996) and Serjeantson (2009), and sheep/goat distinctions follow Boessneck (1969), Mainland and Halstead (2005), and Zeder and Pilaar (2010).

General patterning of the archaeofauna

Weighing a total of 100 kg, the retrieved Skuggi animal bone collection is substantial, and the ongoing analysis has to date resulted in a Number of Identified Specimens (NISP) of 3 622 and a Total Fragment Count (TNF) of 11 629 (see Harrison 2010b for an extensive discussion of the 2008-2009 archaeofauna). The animal bone collection from the 2013-2014 excavation seasons resulted in an increased data set from the basal midden layers that helped improve the site's chronological resolution and resulted in a much more clearly defined Phase III period (early to mid-11th century). Therefore, intra-site comparison of midden materials from four different activity periods (Phases II-V) is possible. Comparing faunal data from these four activity periods allows for a better insight into the farming strategy on the site and indicates how the focus on certain animal taxa and species as well as the nature of site activity might have changed over time. A discussion of those results will follow a general overview of the Skuggi archaeofauna.

The Overall Major Animal Taxa

Midden deposits from phases II, III, IV and V contained animal remains that were deposited in the same area once structure A was no longer used for its original purposes. Instead, this ruin seems to have been used as a receptacle for several centuries of household refuse deposits which, upon stratigraphic excavation, revealed well-preserved faunal remains.

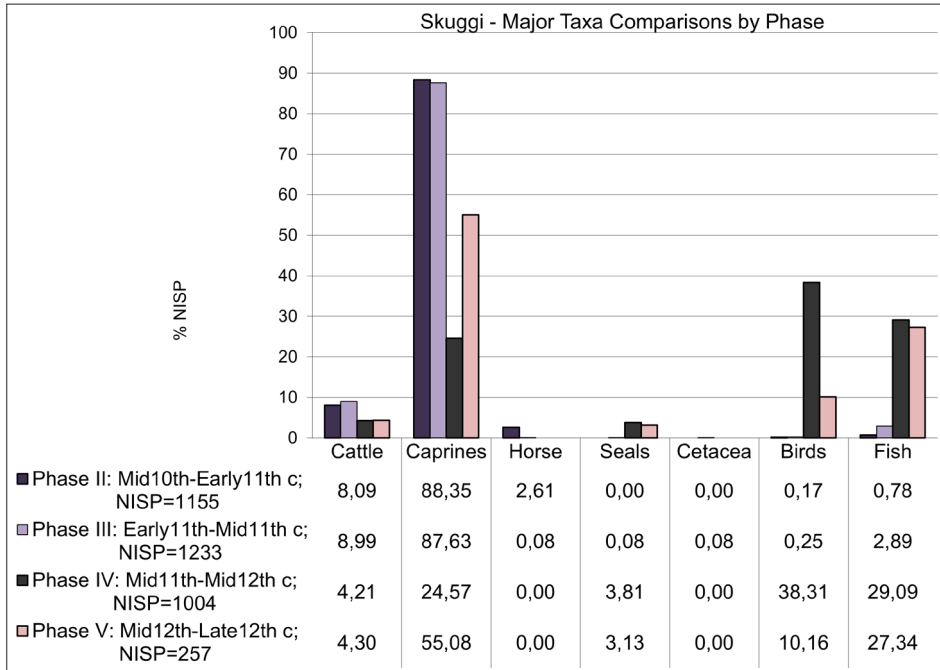


Figure 9. Skuggi major taxa comparisons (NISP %). Phase II-V intra site comparisons.

Figure 9 presents Skuggi Major Taxa NISP comparisons by phase. Caprines (sheep/goats) clearly dominate the phase II and III fauna, with a strong shift to a more varied overall taxa profile in phases IV and V (although Phase V has a low count of identifiable elements). NISP numbers of phases II through IV are large enough to discuss the herd strategy management as well as the clear change in animal taxa distribution after the mid-11th century; that is, from phase III to IV. There is a very clear shift from predominantly domesticated mammals to a more broad-spectrum resource management at Skuggi. This signature is not uncommon in other Icelandic farm midden excavations (e.g. McGovern *et al.* 2007, Smiarowski *et al.* 2017).

The bird category shows a marked increase in Phase IV, and so does the presence of marine fish which ends up comprising nearly 30 % of the major taxa proportion in Phase IV and Phase V, a pattern which has been observed elsewhere in contemporary Icelandic farming contexts (McGovern *et al.* 2007, Harrison 2010a, Smiarowski *et al.* 2017). The presence of raven (*Corvus corax*) in Phase IV and V contexts are of particular interest as these birds are not regularly found in Icelandic midden deposits (for more detailed reporting on the Skuggi animal bone remains, see Harrison 2010b and 2013).

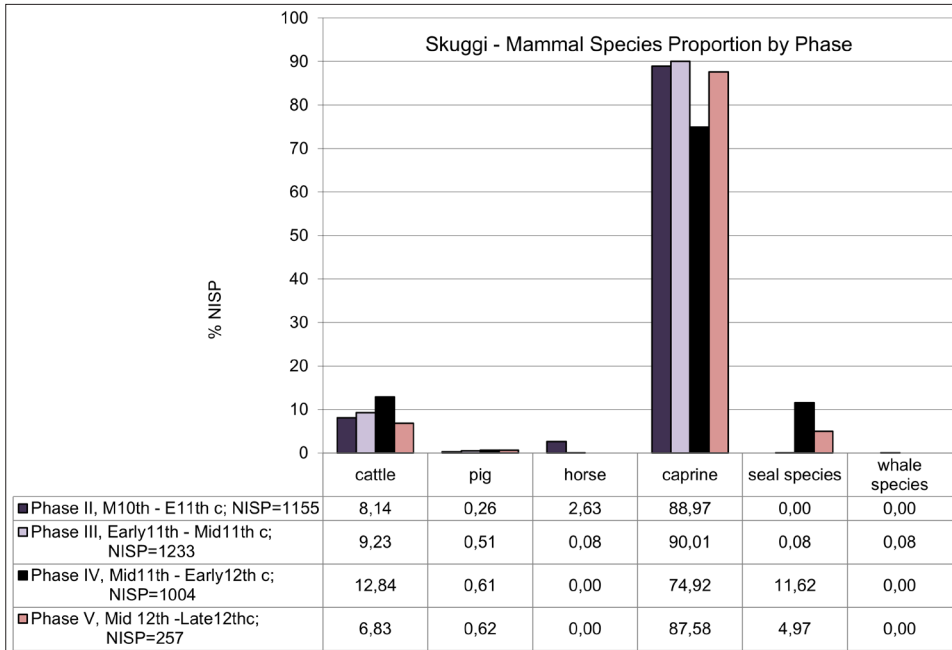


Figure 10. Skuggi domesticate species distribution, Phase II-V intra site comparisons.

The Skuggi Mammals

Figure 10 displays the domestic and wild mammal species proportion divided into phases. Except for a very small fraction of seal and whale (0.8 % each), the earlier two phases, dated to the late Viking Age and the transition to the Middle Ages, display a mammal assemblage where domestic mammals, and especially caprines (sheep and goats) and cattle, dominate. In phase II, the total caprine category comprises 89 %, the cattle category 8 %, and the horse category close to 3 %. The proportions in phase III are nearly the same for the caprines and cattle categories. Horse, pig, seal, and whale elements are present in this period, but at below 1 % of the total mammal assemblage. The Medieval period assemblages in phases IV and V display a continuation in an overall caprine bone predominance at 75 and 88 %, respectively. The phase IV and V cattle percentages are markedly different from each other, with a respective decline from 13 % to 7 %. The pig proportion at 0.6 % remains stable, but the phase IV seal proportion of 12 % declines to 5 % in phase V. There are no horse or whale remains analyzed in these two phases.

Major domesticates ratios

Caprines clearly dominate the Skuggi domesticate fauna. The goat vs sheep ratios in table 2 indicate that goats were present in all periods except phase V. In phases II through IV, there were about three sheep per every goat present.

Table 2. Sheep versus goat ratios by phase.

Phase	Goat : Sheep ratio	Cattle : Caprine ratio
II	1 : 2.48	1 : 10.92
III	1 : 3.40	1 : 9.75
IV	1 : 2.67	1 : 5.83
V	N/A	1 : 12.82

Table 2 also displays how the phase II, III, and V cattle to caprine bone ratios range from about 10 to 13 caprines per one cattle bone, while the phase IV cattle caprine ratio shows six caprines per one cattle bone.

As mentioned above, the cattle to caprine ratios are relatively consistent for Phases II and III, but phase IV has a low cattle to caprine ratio in comparison. The total NISP count of the animal bones collected from the phase V deposits was low, and therefore the ratio for that period might be somewhat skewed in favor of the cattle remains.

Brief Faunal Data Discussion

Early on, the small amount of marine fish bone attests to the site’s inland location, although it rises in the medieval deposits, and together with the seal elements indicates an outside supply with marine species. Similar to the Sveigakot and Hrísheimar archaeofauna from Mývatnssveit, there seems to be a clear indication of provisioning of even smaller inland farms with marine fish and sea mammals (McGovern *et al.* 2007, Smiarowski *et al.* 2017). There were no dog elements in the archaeofauna, but gnawing marks left on many faunal elements are associated with presence of the species. One long bone element shows potential rodent gnawing, but no physical remains of rodents have been found.

The Skuggi farm depended on mostly sheep/goats during the Later Viking Age and the transitional phase III, dated to the early to mid-11th century, with a shift from predominantly domesticate utilization to a broader animal resource strategy during the early Medieval deposits in Phase IV. Besides the usual domesticates, the site occupants now increased their reliance on birds, fish, and marine mammals. Changes in the site taxa profile can be observed in Phase IV and are detectable for most of the animal categories presented here. This change in the animal bone data in the mid-11th to early 12th century could represent a re-organisation of the site provisioning strategy, or even the site’s economic organisation itself.

Discussion

As indicated by the title, this paper is meant to be an assessment of the combined analysis of Structure A and the household midden remains excavated at Skuggi. Whereas much more extensive discussions of the 2008-2009 midden remains have been provided elsewhere (Harrison 2010b, 2010c, 2013, McGovern *et al.* 2014, Smiarowski *et al.* 2017), the results from the 2013-2014 excavation project have yielded archaeological and environmental evidence that allow for a more refined site activity chronology, which especially applies to Phases I-III. It has also provided an insight into the landscape and environmental story at Skuggi, particularly based on the landslides, but also the archaeobotanical evidence.

Based on its structural features, the nature of the artefact assemblage, and the results of geochemical analysis, it seems Structure A could have been used for different purposes, among

them textile working, smithing, and possibly personal hygiene if it was also used as a bathing hut and/or sauna. Continuing archaeobotanical and micromorphological analysis is expected to add to our understanding of Structure A's purpose, and perhaps the site's use over time. More detailed archaeofaunal analysis from the 2013-2014 seasons is currently underway and will add to our understanding of local and regional faunal resource utilization practices and, together with a detailed analysis of the artefact assemblage, can potentially provide us with indicators for status, as well as craft and exchange activity. To date, we have learned enough about the archaeology of Skuggi to address the questions we stated above.

Can we define changes in site activity and farming economy over time?

The archaeological investigations indicate establishment around AD 900. The marginal location of a seemingly full-fledged farm operation, of which the excavated Structure A was a part, contributes to the idea of an early, extensive, and rapid settlement process as seems to have happened elsewhere in Iceland (Vésteinsson & McGovern 2012, Steinberg *et al.* 2016, Catlin 2019). Though not indicative of site status, the artefact material suggests a diverse range of actions took place on site which were of a domestic and personal nature on the one hand, but also clearly connected to craft working and possibly trade-related activities. The latter can be inferred from the find of the remains of the copper-alloy folding scales as seen in Figure 8. This is also suggested by the overall change in Structure A's function and the animal bone patterns that suggest a different occupation activity in the later phases, with a more and more scaled down activity at the site itself. Upon abandonment, it could be feasible that the Skuggi pasturages were incorporated into the larger Staðartunga or Möðruvellir landholdings to increase the number of sheep for an increased regional wool production focus.

With Phase I as the Structure A building and occupation phase, changes between Phase II and Phase III that suggest a change in building, and potentially farm activity are observed from the structural remains. These are the blocking off of the Structure A northwestern entrance, and the change in purpose from household to household midden site. The mid-10th to early 11th century midden contents from Phase II have yielded faunal remains suggestive of a significant number of the sheep and goat herds slaughtered within a fairly short period of time, which could be connected with this change in purpose in Phase III.

One reason for this change in Structure A's utilization is that the site was expanded, potentially because a larger group of people lived there by some point in Phase II. It has been suggested elsewhere that sunken-featured buildings were often the earliest structures on Icelandic farm sites, for example at Sveigakot and Hofstaðir in Mývatnssveit (Lucas 2009). A larger household might have made the upkeep of the relatively small structure with room for only a few at one time inefficient, and might have required focus on larger structures to carry out the activities previously associated with Structure A. Even though the buried landslides were not obviously from this period and can likely be more directly associated with Phase IV and V site activities, it is possible that earlier landslides could have forced a farm reorganization. Another reason could be that the site itself underwent reorganization due to a changed political/economic situation, with more significant changes observed in Phases IV and V.

The archaeofaunal record suggests that Skuggi started out as a farming operation focused almost entirely on domesticates. This strategy was changed in Phase IV, indicated by a higher reliance on wild resources. The mentioned change in site economy together with the

domesticate ratios suggests that Skuggi may have started out as a dependent farm or sub-farm specializing in sheep/goat herding. The change in use of Structure A, the enormous midden deposits accumulated, and the archaeofaunal profile drastically changing in Phase IV could be interpreted as a larger household in need of wild species to supplement its own supply of domesticates. A second explanation accounting for the increase in marine species could be a stronger connection to the larger region and profiting from an exchange network; i.e., supplying meat, dairy, or wool in exchange for fish and seal and potentially other goods moved from the coast or other farms to this inland site. The Skuggi marine fish collection includes Atlantic cod and (especially) haddock, but also a mix of other cod-family species and halibut (Harrison 2010b). This broad species diversity is similar to Viking Age and early medieval patterns in Mývatnssveit and fits the current model for an Icelandic Viking Age/early medieval artisanal fishery profile. It does not reflect the strong focus on cod seen in the late medieval and early modern export-oriented archaeofauna (Smiarowski *et al.* 2017).

Thus, driven by as yet unknown factors, the site function during phases III-V in the 11th and 12th centuries AD is either changed and/or farming activity reduced. This could have been in the form of either multi- to single-site consolidation or a single animal species site focus, likely toward a certain sheep/goat product (e.g., Harrison 2013). As mentioned earlier, the church farm at Möðruvellir became a parish church in the mid-12th century, which could have resulted in an economic reorganization of the pasturages and contributing farms as part of its landholdings. It does not necessarily mean that this new, powerful landholder was Möðruvellir, but the site is one reasonable contestant.

Do the archaeological remains at Skuggi show evidence of environmental impacts that might affect the use and longevity of the site?

As discussed in detail elsewhere (Harrison 2013), available climate data for Eyjafjörður suggest that the transition from a relatively stable Viking Age and early Medieval pattern, which was favourable to home field pasture productivity and use of upland pasturages, was followed by a cold and variable climate pattern in the 13th century, with a period of marked cooling in temperatures and increase in weather instability in the 14th century. However, based on multi-proxy climate data reconstructions, a significant period of cooling temperatures has been identified for the period between AD 1118 and AD 1127 (Ingram 2012, see also Harrison 2013, p.127). Climate seems to be a major driver of Hörgárdalur landscape instability, but deforestation of the landscape immediately after Settlement may have also contributed to an increased instability of the steep valley slopes (Streeter and Dugmore 2009, p. 16). Landslides seem to have occurred during times of high precipitation fluctuations, especially when coupled with temperature fluctuations around freezing point (A. Dugmore, personal communication, October 2012). Besides being possible factors triggering the landslides, the precipitation fluctuations themselves could have also affected the local farming strategy and might be among the reasons behind the changed Skuggi livestock proportions observed in the later phases.

Structure A, established in Phase I and still used as outbuilding in Phase II, gives us an idea of the beginning of the initial Skuggi settlement. Many more structures, most prominently the primary farm mound, remain unexcavated, and our picture of the whole site is thus incomplete. What can be garnered from the excavated areas, however, is that Skuggi site abandonment seems to coincide with a severely destabilized mountain slope environment in

the 12th century, as demonstrated by the buried landslides in Tr. 3 (Figure 6), and possibly Tr. 4 and Tr. 5 (Figure 2). The datable series of landslides from Tr. 3, with the more recent of the two occurring between eruptions of the volcano Hekla in AD 1104 and AD 1300, and the older one shortly before the H1104 tephra layer was deposited, give insight into the change of the Skuggi landscape during that time. Though not yet dated, the uncovered Tr. 4 and Tr. 5 landslides can potentially add to our understanding of how extensive these landslides might have been.

Continued instability moving and depositing large stones and sediment on the mountain slopes where Skuggi lies may be linked with the abandonment of the site, either because it destroyed large parts of the grazing land, or because it damaged living quarters, or even potentially killed livestock and humans. It could have further coincided with factors such as downsized livestock numbers due to unfavourable climate and environmental conditions, or due to a changed regional livestock focus. These hypotheses need to be tested more thoroughly through further analysis, but they provide a scenario of what might have happened at this site that caused changes in farming strategy in the 11th century and abandonment in the 12th century.

Conclusion

At Skuggi, the excavation of the upstanding structures has provided us with a broader idea of very early site activity and the settlement and landscape changes in the late Viking Age/early Medieval periods. These may be associated with changes in the regional economy and the foci of local versus international exchange.

Rather than relying on merely the midden remains as proxies for site, and perhaps even valley-wide, economic strategy, the Skuggi project allows us to investigate the Structure A activities and explore reasons behind site re-organization and abandonment. It also increases our understanding of a change in the Skuggi livestock management strategy during the 11th and 12th centuries AD. For this paper, the focus was placed predominantly on the Skuggi excavations, to allow for a site-scale analysis, and to provide a solid assessment of the results from the two different excavations there.

In comparison with the data sets produced from the Oddstaðir midden excavations and when placed into an even larger context provided by the long-term focus on Eyjafjörður archaeology by the authors and their colleagues, it becomes clear that there was, in fact, an observable shift in the socio-economic organization of the valley system (Harrison 2013). The Skuggi archaeological and environmental record is thus valuable to our understanding of the early Hörgárdalur settlement dynamics, as well as providing an early part of the story of Viking Age to Medieval socio-economic transitions in Eyjafjörður.

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Full list of participants at the workshops (alphabetical by first name)

Anja Roth Niemi *The Arctic University Museum of Norway*
Barbro Dahl *Museum of Archaeology, University of Stavanger*
Birna Lárusdóttir *Institute of Archaeology, Iceland*
Brita Hope *Department of Cultural History, University Museum of Bergen*
Christian Koch Madsen *Greenland National Museum and Archives*
Dawn Elise Mooney *Museum of Archaeology, University of Stavanger*
Élie Pinta *University of Paris 1 Panthéon-Sorbonne / UMR 8096*
Even Bjørdal *Museum of Archaeology, University of Stavanger*
Douglas Bolender *Fiske Center for Archaeological Research, University of Massachusetts Boston*
Garðar Guðmundsson *Institute of Archaeology, Iceland*
Gísli Pálsson *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*
Gitte Hansen *Department of Cultural History, University Museum of Bergen*
Guðmundur Ólafsson *National Museum of Iceland*
Guðrún Alda Gísladóttir *Institute of Archaeology, Iceland*
Hildur Gestsdóttir *Institute of Archaeology, Iceland*
Howell Roberts *Institute of Archaeology, Iceland*
Håkan Petersson *Museum of Archaeology, University of Stavanger*
Irene Baug *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*
James Barrett *McDonald Institute for Archaeological Research, University of Cambridge*
Jennica Einebrant Svensson *Section for Cultural Heritage, Rogaland Fylkeskommune*
Jørgen Rosvold *Norwegian Institute for Nature Research*
Jørn Erik Henriksen *The Arctic University Museum of Norway*
Kari Loe Hjelle *Department of Natural History, University Museum of Bergen*
Kathryn Catlin *Department of Chemistry and Geosciences, Jacksonville State University*
Kathrine Stene *Department of Archaeology, Museum of Cultural History, Oslo*
Kjetil Loftsgarden *Department of Archaeology, Museum of Cultural History, Oslo*
Knut Andreas Bergsvik *Department of Cultural History, University Museum of Bergen*
Knut Paasche *Norwegian Institute for Cultural Heritage Research (NIKU)*
Konrad Smiarowski *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*
Kristborg Þórsdóttir *Institute of Archaeology, Iceland*
Kristin Ilves *Department of Cultures, University of Helsinki*
Kristoffer Dahle *Section for Cultural Heritage, Møre og Romsdal Fylkeskommune*
Lilja Björk Pálsdóttir *Institute of Archaeology, Iceland*
Lilja Laufey Davíðsdóttir *Institute of Archaeology, Iceland*
Lísabet Guðmundsdóttir *Department of Archaeology, University of Iceland*
Lisbeth Prösch-Danielsen *Museum of Archaeology, University of Stavanger*
Michael Nielsen *Greenland National Museum and Archives*
Mjöll Snæsdóttir *Institute of Archaeology, Iceland*
Morten Ramstad *Department of Cultural History, University Museum of Bergen*
Orri Vésteinsson *Department of Archaeology, University of Iceland*
Per Christian Underhaug *Norwegian Institute for Cultural Heritage Research (NIKU)*

Full list of participants at the workshops

Ragnar Orten Lie *Section for Cultural Heritage, Vestfold og Telemark Fylkeskommune*

Ragnheiður Gló Gylfadóttir *Institute of Archaeology, Iceland*

Ragnheiður Traustadóttir *Antikva ehf., Iceland*

Ramona Harrison *Department of Archaeology, History, Cultural Studies and Religion, University of Bergen*

Símun V. Arge *Department of Archaeology, Faroe Islands National Museum*

Sólveig Guðmundsdóttir Beck *Department of Archaeology, University of Iceland*

Solveig Roti Dahl *Section for Cultural Heritage, Rogaland Fylkeskommune*

Susanne Iren Busengdal *Section for Cultural Heritage, Møre og Romsdal Fylkeskommune*

Therese Nasset *University Museum of Bergen*

Thomas Birch *Department of Conservation and Natural Science, Moesgaard Museum*

Trond Meling *Museum of Archaeology, University of Stavanger*

From the 9th century AD onwards, Norse migration resulted in the spread across the North Atlantic of cultural traits originating in Norway. The challenging landscapes of this region rewarded resilience and adaptability, evidenced by complex subsistence strategies incorporating the exploitation of a variety of outfield resources. However, differing methodologies and approaches across the region have limited the extent to which the connections between western Norway and the North Atlantic have been explored in archaeological research. The Expanding Horizons project brought together junior and senior practitioners in archaeology and related fields, from both within and outside of academia, to address this. The papers in this volume present case studies of outfield resource use and its impact on settlement patterns, placed in the wider context of Norse settlement and subsistence across the North Atlantic.

