Neolithic crannogs: rethinking settlement, monumentality and deposition in the Outer Hebrides and beyond

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Abstract

This paper outlines work on a group of newly-identified Neolithic crannogs in the Outer Hebrides. Methods employed included underwater/aerial photogrammetry, geophysics, diver surveys and terrestrial excavation. Our results demonstrate conclusively, for the first time, that artificial islets were a widespread feature of the Neolithic in this region; they appear to have been special purpose locations which saw significant deposition of material culture into the water. Our findings challenge current conceptualisations of Neolithic settlement, monumentality and depositional practice more widely. They also suggest the possibility that other 'undated' crannogs across Scotland and Ireland could potentially have Neolithic origins as well.

Introduction

Crannogs – artificial islands constructed in lochs – are a geographically and chronologically widespread category of archaeological site. Over 570 island dwellings, including 'crannogs' and 'island duns', have been recorded in Scotland (Figure 1; see Lenfert 2013, 125-127 for a discussion of why these site types should be considered all together). The Outer Hebrides island chain represents a particular hotspot in their distribution with over 170 known sites (Lenfert 2012). It is estimated that as many as 2000 crannogs were built across Ireland (Fredengren 2002, 6) and a single example is known in Wales (Redknap & Lane 1994). Academic consensus generally considers Scottish crannogs to have been built, used and re-used over a period of 2500 years – from the Iron Age to the post-

medieval period, c. 800 BC to AD 1700 (Crone 2012). It was only during the 1970-90s that, thanks to substantial radiocarbon dating programmes, the later prehistoric elements of many sites were fully recognised (Crone 1993; Henderson 1998). Excavation of Eilean Domhnuill, North Uist in the 1980s revealed this artificial islet site to have been constructed and used in the Neolithic (Armit 2003). Following this discovery, many writers speculated that islets may have been constructed more widely during the Neolithic (e.g. Crone 1993, 248; Henderson 1998, 229; Harding 2000, 301; Cavers 2010, 42). However, until the work outlined here, no further sites of this date were found. This paper presents recent survey and excavation results that demonstrate conclusively, for the first time, the widespread presence of Neolithic crannogs in the Outer Hebrides.

Archaeologists have debated exactly how 'a crannog' should be defined for many years and it has proved difficult to reach consensus (see discussions in, for example, Morrison 1985; Henderson 1998; Dixon 2004; Cavers 2012). As Henderson & Sands point out, 'crannog' is generally used as "a portmanteau term" to refer to all forms of artificial islands found in Scotland and Ireland (2012, 269). Whilst on the one hand this wide applicability is convenient, it should be stressed that their shared characteristics (at a very general level) do not necessarily mean that all crannogs were part of single tradition, or that we should seek the origins of later sites in the earliest examples in a given region (ibid.). This paper focuses on a set of newly-discovered Neolithic crannogs in the Outer Hebrides. These sites may have fulfilled a function quite different to those built in later periods; equally, on present evidence, there appears to have been a significant gap in construction of artificial islands during the Late Neolithic/Bronze Age. Any interpretive links between the sites described here and later crannogs should thus be made with caution. Nevertheless, especially given the very high density of crannogs of all dates in the Outer Hebrides, it is important to build a long-term narrative of islet construction there, exploring their earliest origins and investigating their functions and meanings.

As we outline in detail below, these new sites are important for a number of reasons. The practices in evidence at, and character of, the islets also force us to rethink the nature of settlement and monumentality during the Neolithic much more broadly. Equally, the acts of watery deposition witnessed at them represent a previously unrecognised practice during this period. Towards the end of this paper, we also consider the possibility that Neolithic crannogs might be found beyond the Outer Hebrides as well.

Neolithic crannogs

As mentioned above, the notion that crannogs could date back as far as the Neolithic first arose following Armit's excavations at Eilean Domhnuill, North Uist during the 1980s (Armit 2003; Copper & Armit 2018). Having set out to excavate what was expected to be an Iron Age islet, Armit and his team soon encountered substantial quantities of Neolithic pottery. Several seasons of work revealed eleven phases of Neolithic archaeology, with the site's occupation dated to c. 3720-3510 to c. 2600 cal BC at 95% confidence (the latter phases of the site are not at present well-defined chronologically – Garrow et al. 2017a, 115; see also Copper & Armit 2018). The best-preserved layers contained stone walls, stone-built hearths, post-holes and spreads of occupation debris including 22,000 sherds of pottery.

Following the recognition of Eilean Domhnuill's early origins, numerous writers subsequently suggested that further discoveries of Neolithic crannogs were likely. Nonetheless, despite in some cases sustained surveys (e.g. Dixon & Topping 1986; Lenfert 2012; Henley 2012), none were found. Previously excavated sites which have produced Neolithic material culture such as Eilean an Tighe, North Uist and Pygmie's Isle, Lewis were drawn into discussions, but in both cases doubt remains as to whether they were actually islands during the Neolithic (Scott 1951, 2; Lenfert 2012, 219) and neither is artificial.

The situation with regard to the recognition of Neolithic crannogs changed dramatically in 2012. Chris Murray, a resident of Lewis and former Royal Navy clearance diver, was sufficiently intrigued by one islet, spotted whilst out walking his dog, to take the decision to dive around it. What he found – a series of Early/Middle Neolithic 'Hebridean Neolithic' and 'Unstan' pots lying on the loch bed, all remarkably well-preserved with several in a remarkable state of completeness – was totally unexpected. Following on from this discovery, Murray and Mark Elliott (then conservation officer at Museum nan Eilean, Stornoway) embarked on a sustained search of other accessible islet sites – identified using Google Earth – across Lewis. Notably, in several cases, they found similarly impressive assemblages of Neolithic pottery (Figure 2; Table 1). The presence of Neolithic crannogs beyond Eilean Domhnuill had apparently been confirmed at last (Figure 3; Sheridan et al. 2014). It is worth noting that two of the five Neolithic sites identified were not recorded at all within the NRHE or HER, the other three were assumed to be later in origin; none had previously been radiocarbon dated.

The Neolithic of the Outer Hebrides

The Early/Middle Neolithic of the Outer Hebrides is well-known for both tombs and settlements (Figure 4; see Garrow & Sturt 2017, 19-22 for a recent overview). The tombs found on the islands fall into two main groups – passage graves and Clyde cairns (Henshall 1972). The general lack of modern excavations of tombs and absence of related radiocarbon dates has ensured that neither the chronological relationship between these two different types, nor their position within the span of the Neolithic, are well understood (Armit 1996, 76; Henley 2003, 168; Garrow et al. 2017a). Interestingly, the distribution of tombs across the Outer Hebrides is irregular, with a notably higher density in North Uist (Figure 4), leading some to suggest that there may have been a burst of social competition due to pressure on land (Sharples 1992, 327; Armit 1996, 76). In contrast to tombs, almost all of the settlements were excavated relatively recently. The impressive architecture and material culture assemblages described above at Eilean Domhnuill are echoed to a more limited extent at several other sites. Eilean an Tighe, The Udal, An Doirlinn and Allt Chrisal, for example, have all produced multiple phases of occupation, low stone walls, substantial hearths, post-holes and spreads of occupation debris. Other Neolithic settlement sites are represented by more ephemeral surviving archaeology, such as small-scale middens, pits, post-holes, etc. (see Garrow & Sturt 2017, 19-22 for a more detailed summary and references). Several writers have emphasised the differential distribution of settlements in trying to understand social dynamics at that time. It has been suggested that architectural differences between sites may have been functional, with some occupied all year and others only seasonally (Armit 1996). Equally, Henley (2003, 133) and Copper & Armit (2018) have observed that apparently contemporary sites produce very different ceramic assemblages, suggesting that differences in social status and identity may lie behind these material discrepancies.

On account of their very recent discovery, the unusual crannog sites considered here have not yet been widely incorporated into broader discussions of the region. As we discuss at the end of this paper, these sites have the potential to transform existing narratives.

Exploring Neolithic crannogs on the Isle of Lewis (2016-17)

Following on directly from Murray's discoveries, and working in collaboration with him from the outset, our investigations in 2016-17 were designed to understand the characteristics of the islets, the context of the material found in the lochs around them and the broader topographic and social

landscape within which they were constructed. Given the limited time available, it was not possible to explore further all five sites known to have produced Neolithic material (Table 1). Consequently, our preliminary survey focused on three sites (Arnish, Bhorgastail and Langabhat) and our subsequent, more detailed survey on just two (Bhorgastail and Langabhat); we have excavated only at Langabhat.

The techniques applied over four weeks' work in total included: side-scan sonar, dual frequency single beam echo-sounder, underwater diver surveys, underwater and aerial photogrammetry, real-time kinematic GPS survey, palaeoenvironmental coring and terrestrial excavation. The methods employed and full results are set out within the interim reports published for each season's work (Garrow et al. 2017b; Garrow & Sturt 2018). Our aims were:

- To determine the local topographic context of the islets
- To establish whether the islets were artificially constructed, and to record in detail their architectural form
- To ascertain the presence of any features (or other archaeological evidence) on top of/around, the islets
- To plot the distribution of and recover further material on the loch beds
- To obtain samples suitable for radiocarbon dating

The following sections focus mainly on the two sites we have examined in most detail – Bhorgastail and Langabhat (Figure 5). At Bhorgastail, we carried out vegetation removal across the full width of the islet in a 2m-wide strip. At Langabhat, we were able to conduct more substantial excavations, digging a 2m-wide trench across the islet that was subsequently extended at its NW end in order to explore a small oval structure and other occupation deposits (Figure 9).

Architecture and local topographic context

At both Bhorgastail and Langabhat, bathymetric survey indicates that the islets are located on local rises in the loch bed next to areas of deeper water (Figure 6). Both are clearly human-made, created through piling up boulders on the loch bed to create artificial islands (Figures 7 and 8). Loch levels, on those sites examined, are likely to be similar today to those seen in the Neolithic. The clastic sequences revealed in exposed sections and through coring indicate that these islets are likely to have

been surrounded by shallow water on three 'sides', with deeper water on the fourth, at the time of construction.

At Langabhat, the islet builders had made use of an existing natural crag which sticks up out of the water. Rocks were piled around this, creating a shallow, volcano-like form, the 'crater' of which was infilled further with rocks to create a flattish surface (Figures 7-9). At Bhorgastail, in the absence of a natural crag, the islet had been constructed entirely artificially. It nonetheless had a similar 'volcano'-like form, infilled to create a flattish central space (Figures 7 and 8). Although this site was not excavated, even after limited vegetation clearance, organic rich 'peaty' deposits were observable in the centre, in contrast to Langabhat which was very stony throughout. Notably, at Bhorgastail, numerous worked timbers were observed underwater towards the edges of the islet: posts sunk vertically through the silts and clays of the loch bed, with horizontal timbers between them. These appear to be revetting constructed to stabilise the structure where the natural shelf that it is built on gives way to deeper water.

The two islets represent very substantial constructions. The islet at Bhorgastail measures c. 26 x 22m and Langabhat 19 x 17m (for the whole structure, including below the water). The rocks moved to make both islets measured up to c. 70 x 40 x 30cm in size and thus must weigh up to c. 250kg each. At Bhorgastail, a stone causeway had been constructed leading from the west of the islet towards the closest stretch of shore (Figure 5). At Langabhat, we have not yet detected any evidence of a causeway; it is possible that the islet was accessed by boat or a wooden causeway, although no evidence for these has emerged thus far.

On the islets themselves, no clear evidence of any Neolithic structures has yet been identified. On both sites, the presence of apparently recent, small cairns reminds us that later activity may have disturbed original features. At Langabhat, a small, oval stone structure (3.0 x 1.5m) was identified just west of the island's central point (Figure 9). In places, its dry-stone walling was five courses high. Dark, charcoal-rich occupation deposits were identified within it, in which low quantities of worked lithics and small sherds of Neolithic pottery were found. As we excavated this feature, we assumed that it was indeed Neolithic. However, two radiocarbon dates – from two separate layers, one of which was situated immediately above the stone 'floor' of the structure and so can be considered to be associated with its primary occupation – indicate that it was actually used (and therefore probably constructed) in the Middle Bronze Age, c. 1420-1130 cal BC (Table 3); the few Neolithic finds within these deposits could be residual. This later phase, which relates to a period not usually associated

with crannog occupation (Lenfert 2013, 130-131), was not clearly suggested by any diagnostic material culture and its appearance only as a consequence of radiocarbon dating reminds us that other incidences of re-use at these sites may not have left much, or indeed any, archaeological imprint.

Material recovered from the loch bed

The first recognition that these islets had Neolithic origins came about because multiple pottery vessels were recovered from the loch beds around them. Our work has subsequently confirmed and elucidated further this pattern of substantial deposition into the water. In total, parts of 59 different vessels have been recovered from the loch at Bhorgastail and 73 from Langabhat (Figure 7).

The quantities and condition of ceramics recovered from the loch and from excavations on the surface of the islet at Langabhat are completely different. Whilst some pottery clearly was deposited on the islet during its Neolithic occupation and use, the vast majority ended up in the water around it (Figures 7 and 10). The material recovered from the islet was generally speaking abraded and relatively fragmentary, that from the loch in very good condition and substantially more complete (Table 2). Given the low energy nature of the loch sediments revealed by the cores and diver survey, supported by the slow rates of sedimentation identified in lochs across the region (Lomax 1997, 144; Edwards and Whittington 2001, 163), the pots found on the loch bed are unlikely to have been transported over any significant distance and thus were almost certainly deposited directly into the water.

Overall, the quantities of material now identified around several sites, and the position of those vessels in relation to the islets, suggests that pots were being deposited intentionally into the water. Many vessels had substantial sooting on their external surfaces and some had internal charred residues – they had clearly been used first. The large fragment sizes of these vessels – some of them almost complete – suggests that at least some, and possibly all, were complete when they entered the water.

Radiocarbon dating

In total, eight radiocarbon determinations have been obtained from four islet sites across Lewis (Table 3). The six that fall within the Neolithic are fairly closely grouped, ranging from c. 3640-3360 cal BC. The fact that the dates were obtained from worked structural timbers probably associated with

one site's construction (Bhorgastail) and from pots associated with three sites' subsequent use potentially suggests a narrow window of occupation/use for them all. Further dating is required to refine this picture.

Summary

It is now clear that these sites were artificially constructed Neolithic islets – crannogs. They were created by piling up rocks on the loch bed, sometimes focused on existing natural features. The overall architecture of the islets examined in detail was designed to 'ring' off a flattish central area approximately 10m across. Thus far, no structures dating to the Neolithic have been identified, although with only a single site excavated, further work is needed to confirm this pattern conclusively. Whatever activities took place at these sites, the most obvious resulting archaeological evidence was the presence of large numbers of pots deposited into the water around the islets.

Discussion

Settlement, monumentality and deposition in the Neolithic

It is now apparent that islet construction was a widespread practice in the Outer Hebrides during the Neolithic. The possibilities that the excavation of Eilean Domhnuill first raised have been realised, in Lewis at least. Nonetheless, despite this confirmation of previous suspicions, there are already clear differences between that site and those we have investigated. Eilean Domhnuill was a much larger island than either Bhorgastail or Langabhat. It also produced clear evidence for stone structures right from the uppermost levels; no such evidence has been forthcoming from our sites. It produced an assemblage of 22,000 sherds of pottery from the island; by contrast, our site at Langabhat produced 12 sherds from the islet, but – like the other Lewis sites – many substantial fragments from the loch around it, a pattern of deposition not as yet recognised at Eilean Domhnuill (although the loch bed there was not investigated in substantial detail (Dixon 1989)). We are not talking about directly comparable sites: Neolithic artificial islets in the Outer Hebrides do not appear to have been used or perceived in a uniform way.

In order to approach a broadly contextualised interpretation of our sites, it is helpful to revisit some earlier discussions of Eilean Domhnuill. Armit suggested, for example, that it may have been a place

of special significance in the landscape, albeit one that was occupied impermanently: "its permanence, its monumentality, its peculiar location, and the repeated renewal of its buildings, combine to suggest that it played a pivotal role in the cultural landscape of Neolithic North Uist comparable with the role played by the better known funerary monuments" (2003, 99). Cummings & Richards compared the journey to it across water on a causeway with the journey along the tunnel-like passageways of contemporary passage grave tombs (2013, 198-200), and others have picked up on the site's isolation (Henley 2003, 137) and 'liminal' location (Cummings & Richards 2013). Most recently, Copper & Armit – now aware of the new Lewis islet sites – have suggested that they could have been special places associated with social gatherings, ritualised feasting and commensality (2018).

The Lewis islet sites certainly have a monumentality of their own that is comparable with contemporary passage graves. They would have required a huge investment of labour to build and are likely to have remained significant for a long time. Islets may well have represented substantial symbols for, and of, the communities that constructed them. Equally, they could have been perceived as special places, their watery surroundings creating separation from everyday life. The process of crossing over to the island may have emphasised this separation, and the practices which took place on the islets do appear to have been very different from 'normal' life. These might well have included feasting, involving the pots that were subsequently deposited into the surrounding water. The activities that occurred on islets could well have been similar to those occurring at tombs elsewhere across the Outer Hebrides. It is even conceivable that the islets were themselves associated with mortuary practices, rendered invisible (so far) through watery deposition and the acidic local soils.

The Lewis islets might therefore be viewed as falling somewhere in between 'tombs' and 'settlements' – in relation both to their architecture and to the practices associated with them. The position of the islets within their broader contemporary landscape has implications for the overarching narratives we currently construct about the Neolithic – both in the Outer Hebrides and more widely across Britain and beyond. Perhaps most notably, these sites remind us to question the sometimes binary opposition set up between 'settlement' and 'monuments' at that time. In the Outer Hebridean Neolithic, 'settlements' were not a uniform category of site, being composed of different architectures, situated in variable landscape locations, associated with sometimes extremely different assemblages and no doubt different practices. It is quite possible that tombs were equally varied in their composition. Indeed many writers have commented on the variable architectures of monuments in the region (Henshall 1972; Armit 1996; Cummings & Richards 2013), but unfortunately too few

have been excavated for anyone to gauge how they were used. Similarly, very little work has been conducted in the landscapes around them – it is possible that comparable acts of deposition to those we have described at islets also occurred at tombs, but at present we simply cannot tell. Categories of site are useful, of course, in framing our discussions, yet we must also be mindful of the fact that they can also be blurred, internally variable and confusing.

Neolithic crannogs beyond the Outer Hebrides?

As discussed at the start of this paper, while the Outer Hebrides represent a particularly dense hotspot, crannogs are widespread across the rest of Scotland and Ireland. Despite recent dating programmes which have improved the situation dramatically (Crone 2012), only a small proportion of these have any dating evidence associated with them. Cavers reported 44 radiocarbon dated sites in Scotland (2010, 26), while Crone's more recent survey listed 52, three also dated using dendrochronology (2012, 140). Cavers noted an additional 60 datable through material culture or literary references (2010, 26). Estimates as to the total number of crannog sites in Scotland vary, depending on exactly which site types are included, and most would agree that many as yet unrecorded sites remain absent from our lists (as Murray's work in Lewis clearly demonstrated). Lenfert's total of 571 'island dwellings' (2013, 123) is the most inclusive in terms of the site types incorporated; for this reason, it is arguably the most accurate estimate of site numbers, but also consequently sits at the higher end of the spectrum. Using all of these figures together, we can ascertain that approximately 10% of known sites have been radiocarbon dated, with diagnostic material culture recovered from a further 10%. We thus have chronological information – which, it should be noted, often dates only a single phase of the site's construction or use – for approximately 20% of known crannogs.

Good arguments can be made both against and in favour of the *possibility* that Neolithic crannogs may exist beyond the Outer Hebrides. First, arguing against this suggestion, it must be noted that none of the radiocarbon dates (Crone 2012) and none of the material culture (Cavers 2010) so far recovered from crannog sites elsewhere in Scotland have been Neolithic. However, counter to this, it should equally be noted that 80% of all known sites have no associated dating evidence at all. It is also worth bearing in mind that prior to Armit's work in the 1980s and then Murray's work in 2012-14 no convincing Neolithic crannogs had been identified in the Outer Hebrides either; now, six sites are known. Equally, before our in-depth work, the Neolithic origins of the five Lewis sites had been indicated only through material culture recovered from the loch beds around them, a context that will

have been investigated systematically on only a few other sites. In Ireland, the single Late Mesolithic/Early Neolithic radiocarbon date on a timber from the crannog at Inch Island (Fredengren 2002, 120) and the sometimes very substantial quantities of Neolithic material culture recorded from some 'later' sites (O'Sullivan 1998, 59-68) suggest that we should not too readily dismiss the possibility of Neolithic crannogs there. As O'Sullivan put it, "it could be that the basal deposits on many Early Historic crannog sites provide an insight into the true extent of Neolithic lakeside settlement" (1998, 62). Bearing in mind the complexities of establishing an accurate date for the earliest phases of (mostly unexcavated and often multi-phase) crannogs across Scotland (see Crone 2012), it is difficult to say much more. The Outer Hebrides, as a region, undeniably could have had a coherent and strong internal dynamic during the Neolithic (as seen in its very regionally-specific 'Hebridean' pottery for example) which led to a localised tradition of artificial islet construction. Yet, at the same time, the region clearly was connected to mainland Scotland, Ireland and Orkney as well (as shared tomb types, imported axes and the supra-regional 'Unstan' pottery style demonstrate). We should therefore perhaps simply keep an open mind to the possibility that islet sites dating to the Neolithic could in future be identified elsewhere.

Summary

Overall, we hope that the significance of our findings – building on Murray's initial work – has been made clear. We have been able to demonstrate the widespread presence of Neolithic crannogs in the Outer Hebrides, finally confirming previous speculation that they must exist (beyond Eilean Domhnuill). We have also ascertained in some detail the characteristics of two of these new sites. Our results suggest that crannogs of this date were not necessarily used in a uniform way across the region. The practices in evidence at, and character of, the islets also force us to rethink the nature of settlement, monumentality and deposition during the Neolithic much more broadly – this is essentially a new kind of site for the period, which breaks down its traditional categories and sheds new light on depositional practice at that time. It is exciting to anticipate what further survey and excavation on other Neolithic crannogs across the Outer Hebrides (and possibly beyond) might reveal.

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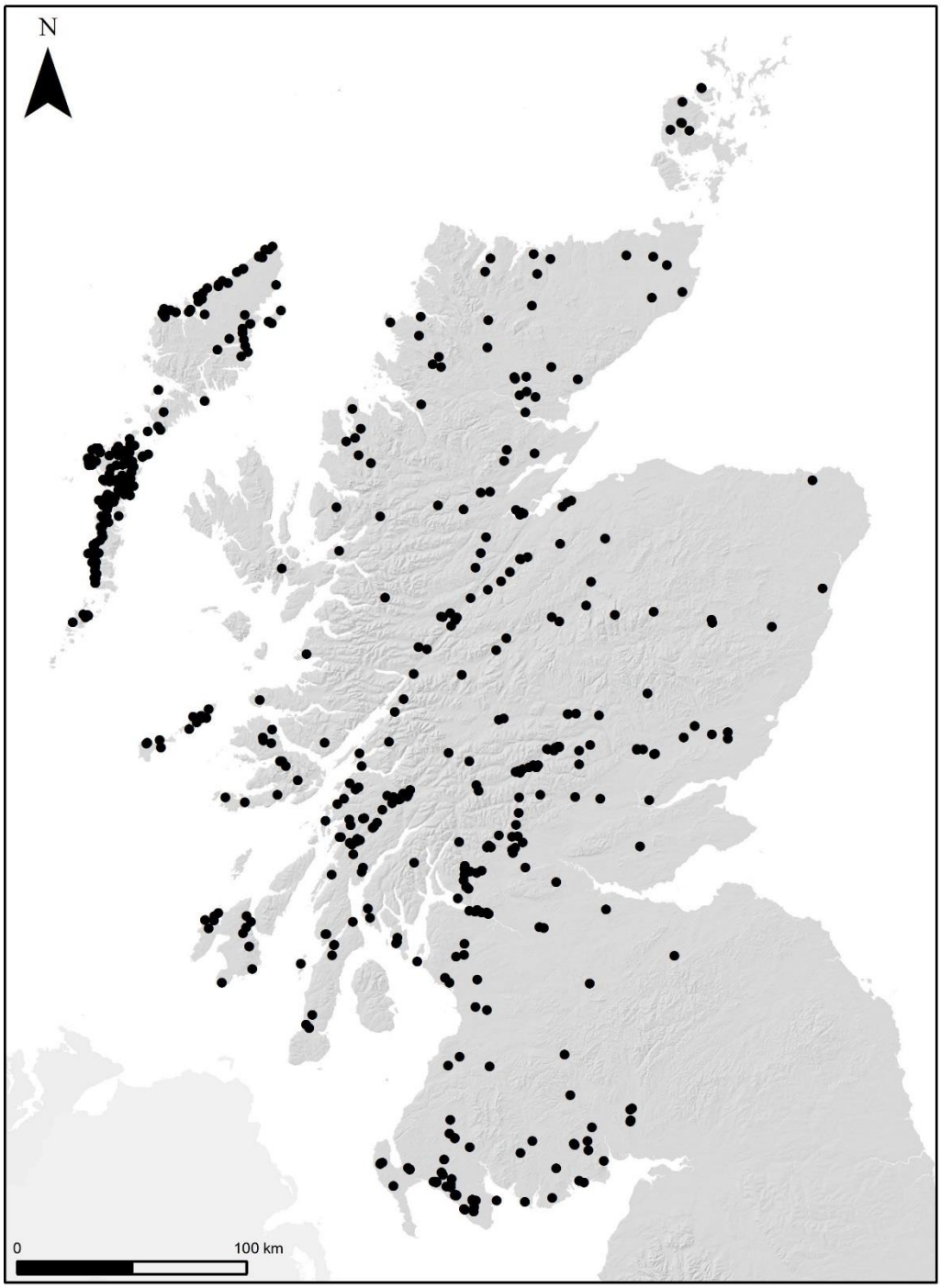
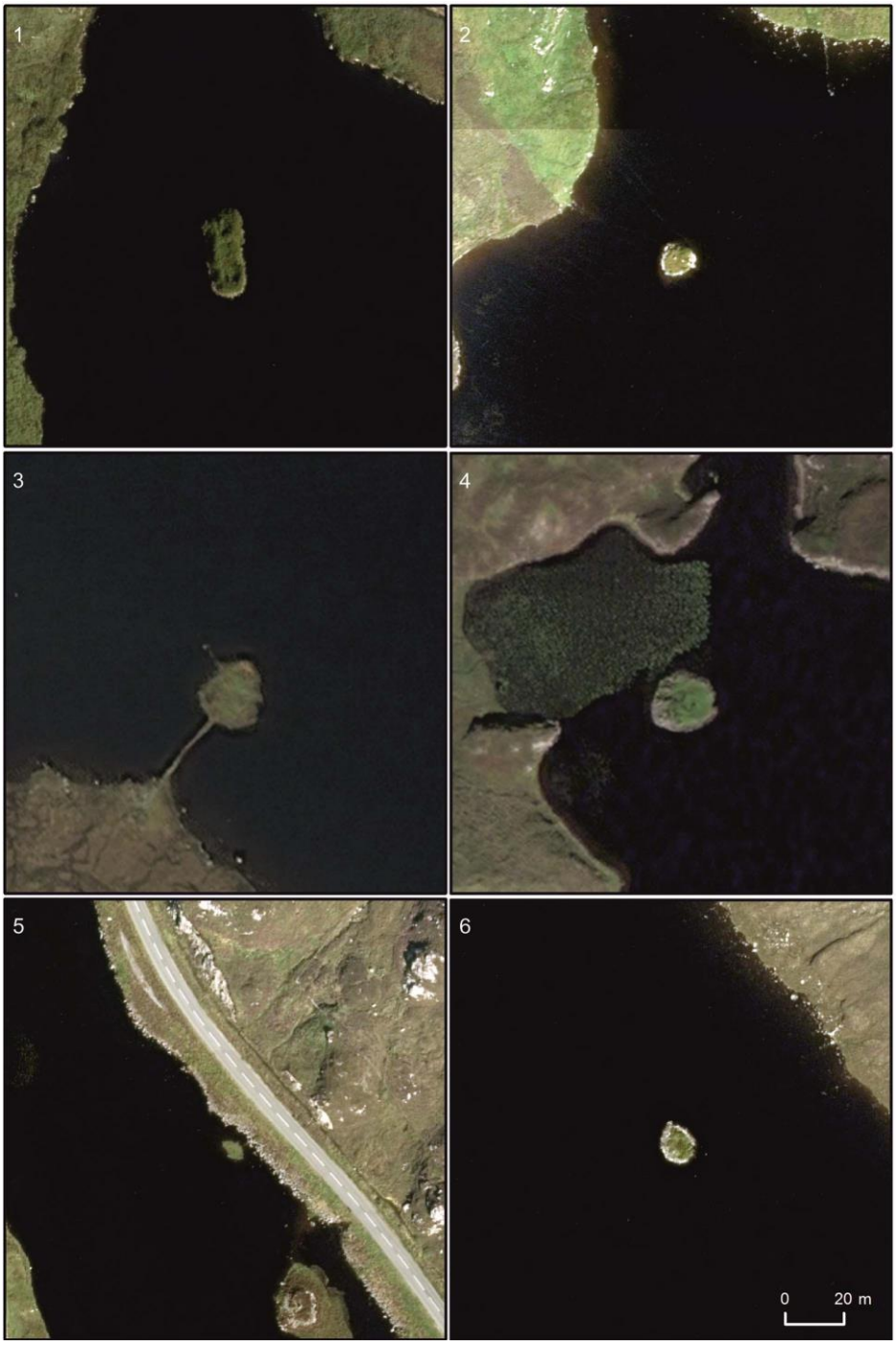
Figures

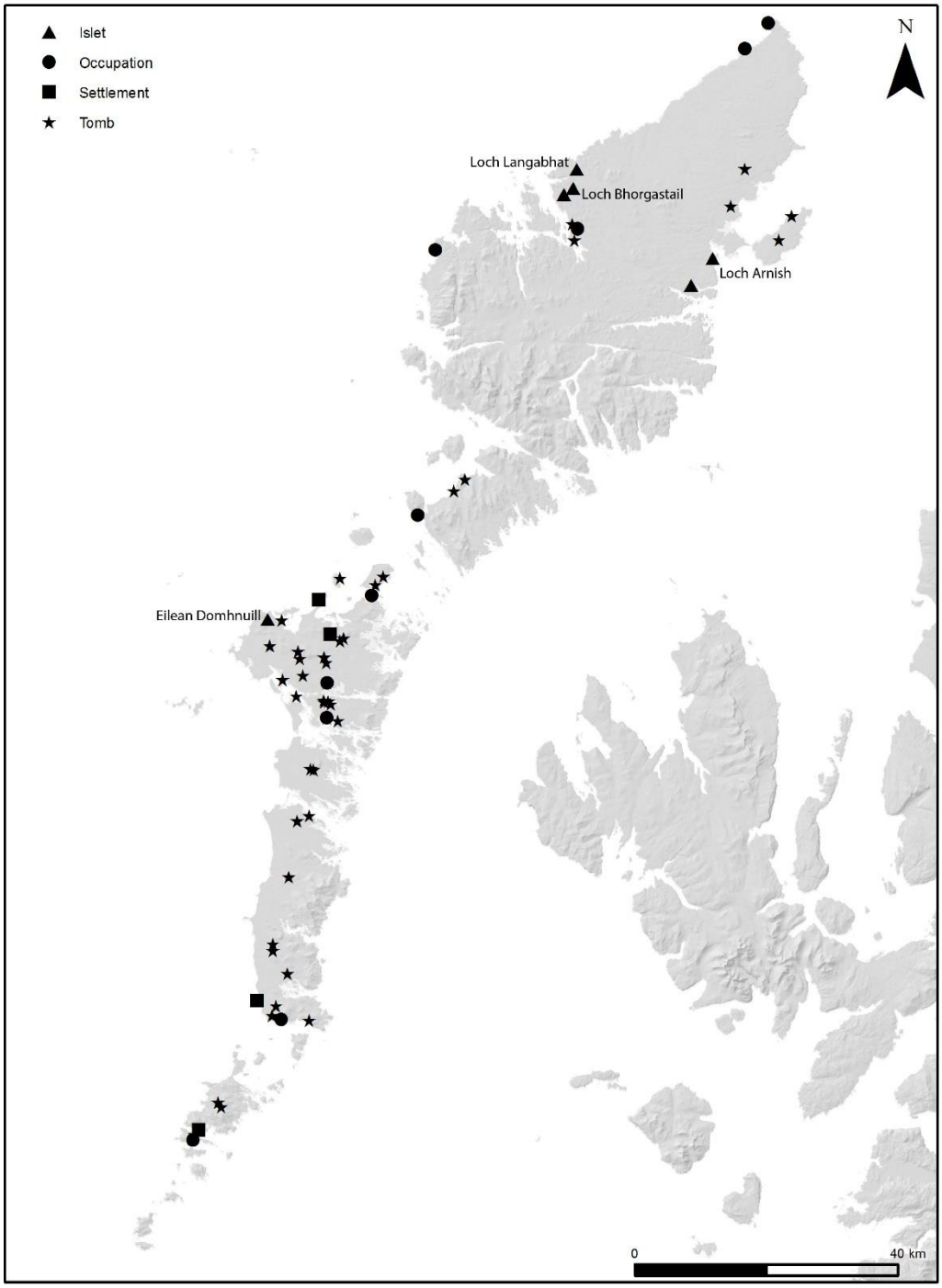


1. Distribution of island dwellings (including ‘crannogs’, ‘island duns’, etc.) in Scotland. Data from Lenfert 2012, Appendix 1.

2. Chris Murray recovering an Unstan vessel at Loch Arnish in 2012. Photo: C. Murray.

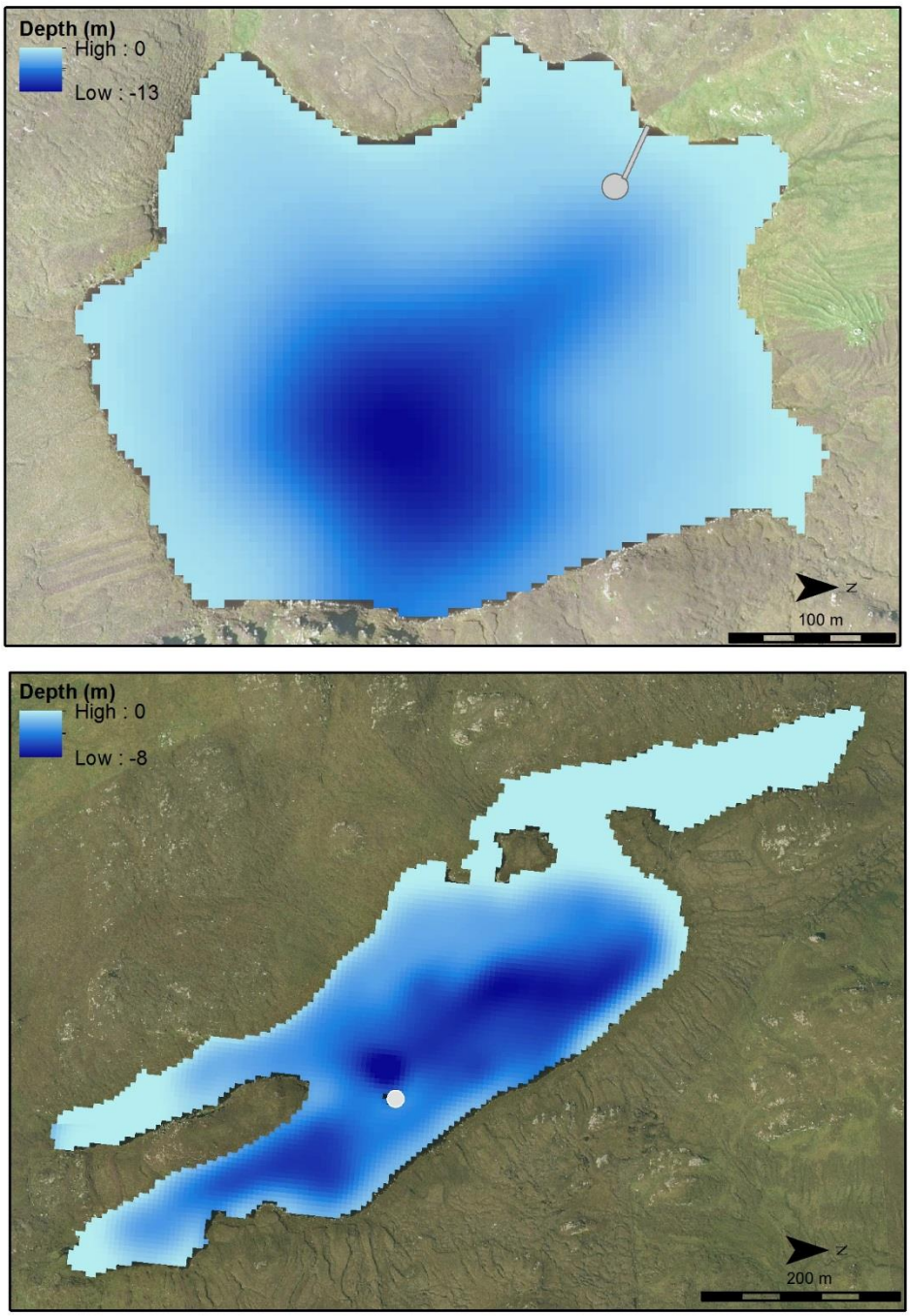


3. Aerial photographic comparison of the six islet sites known to have produced Neolithic material (all shown at same scale). 1 – Arnish; 2 – Bhorgastail; 3 – Eilean Domhnuill; 4 – Lochan Duna (Ranish); 5 – Loch an Dunain (Carloway); 6 – Langabhat. © Getmapping plc.

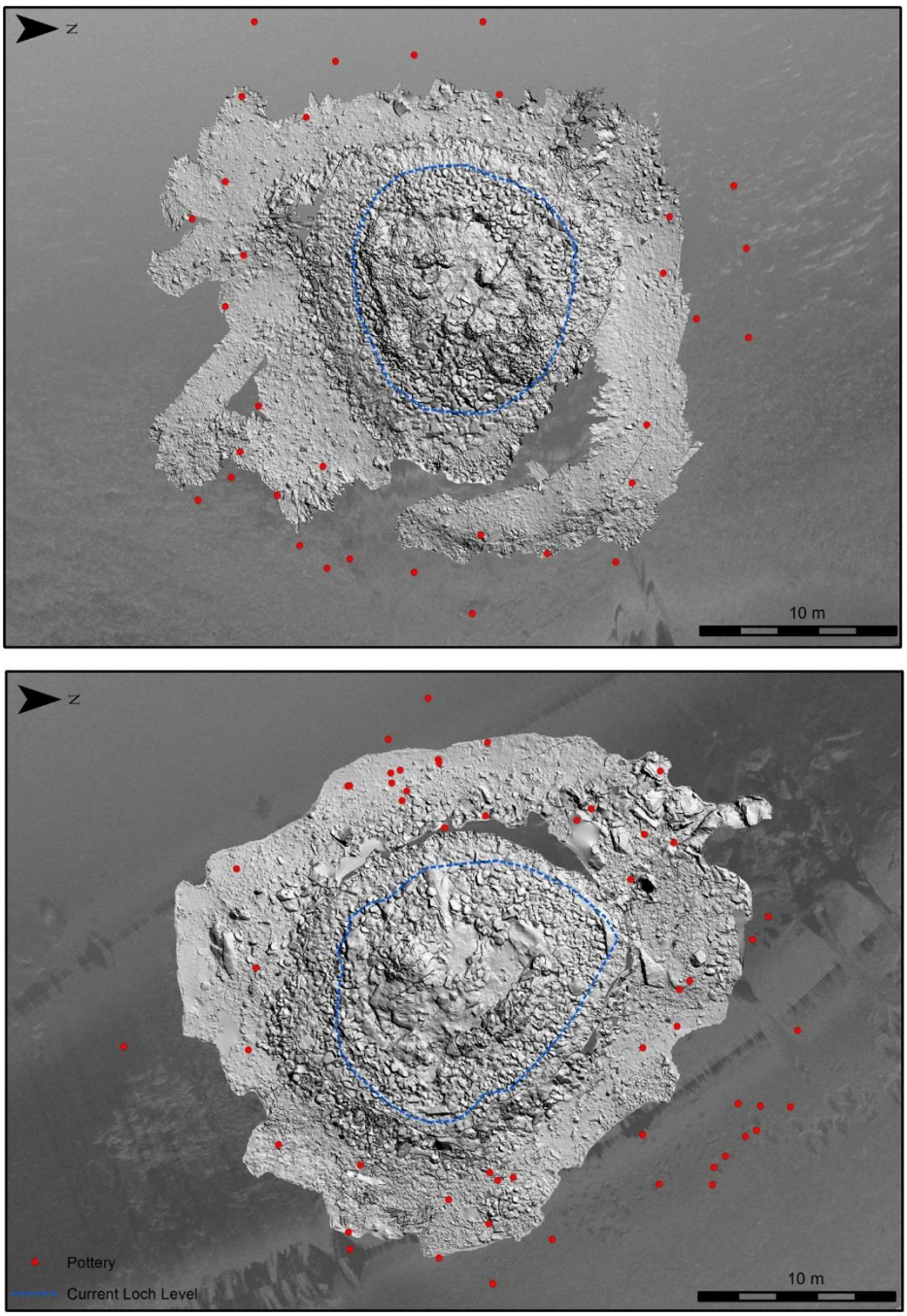


4. Distribution of known Early/Middle Neolithic tombs, ‘settlements’ (with buildings), ‘occupation sites’ (more ephemeral traces of settlement) and islet sites in the Outer Hebrides, with key sites labelled

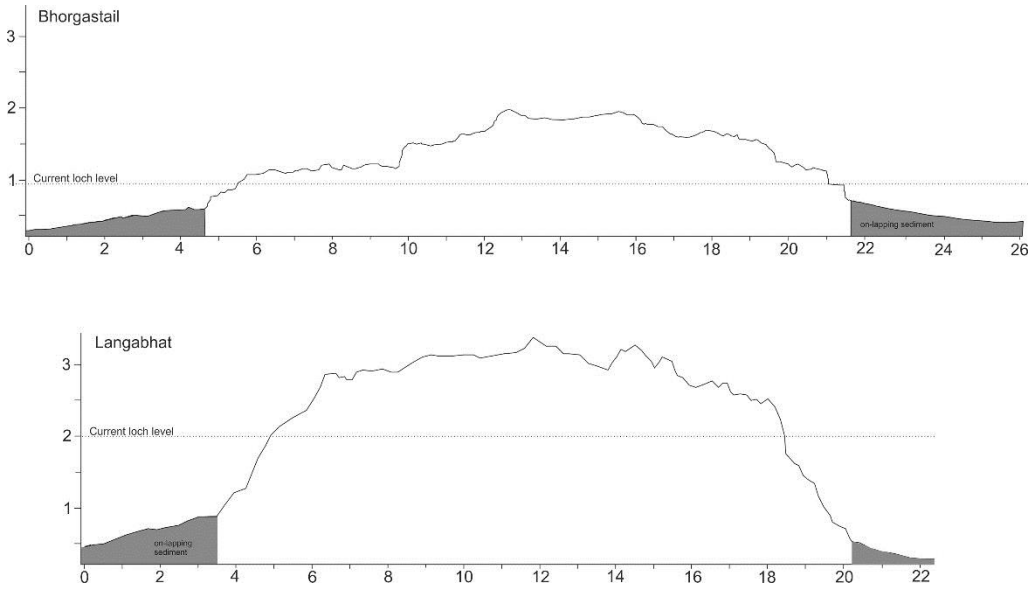
5. Aerial views of the islets in Loch Bhorgastail (top) and Loch Langabhat (bottom)



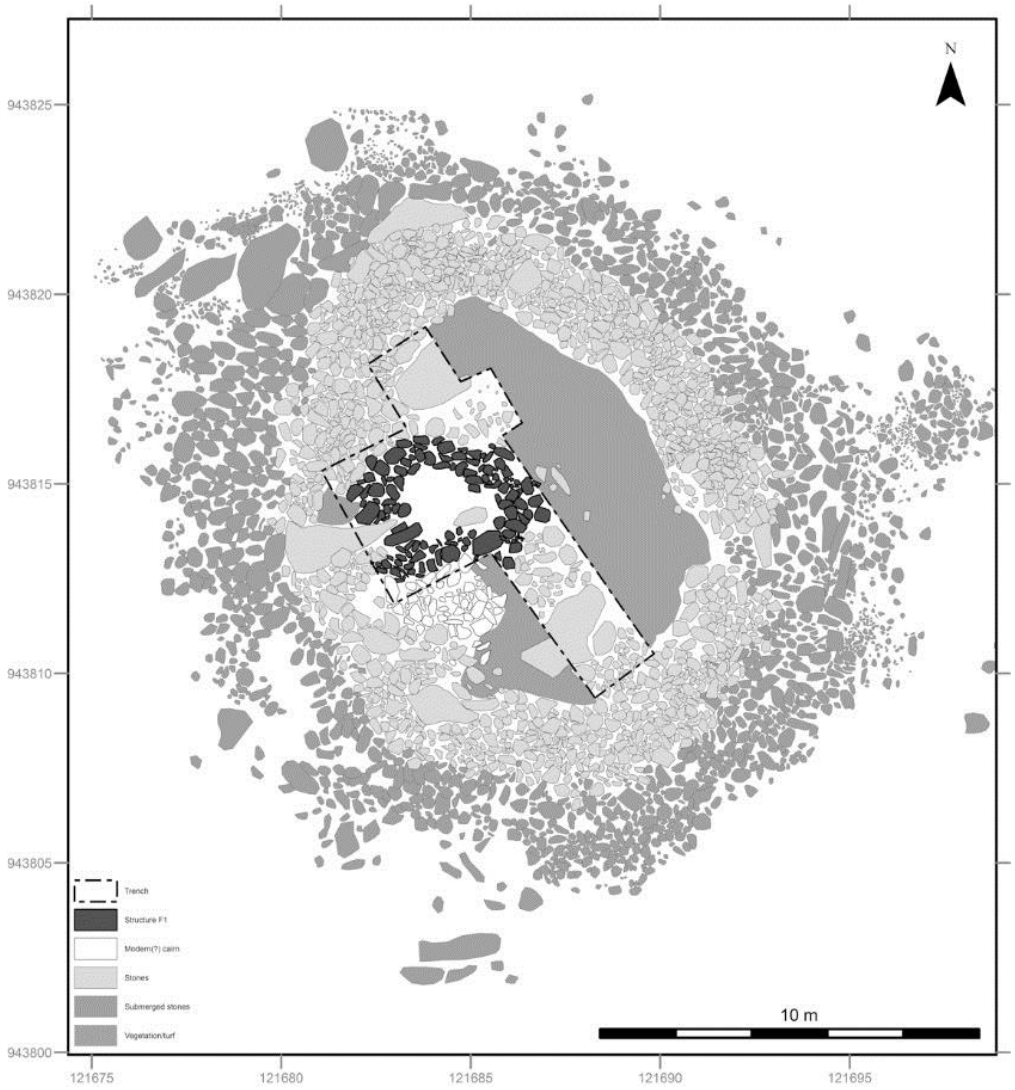
6. Bathymetric models for Loch Bhorgastail (top) and Loch Langabhat (bottom)



7. The islets at Loch Bhorgastail (top) and Loch Langabhat (bottom), with pottery findspots and current loch levels indicated: multi-directional hillshade of digital elevation model from photogrammetry (3mm resolution) overlying side scan sonar (10mm resolution)



8. Profiles of the islets at Loch Bhorgastail and Loch Langabhat (scale: metres)



9. Plan of 2017 excavations at Loch Langabhat

10. Bob Mackintosh and Felix Pedrotti recovering a substantial fragment of a 'Hebridean Neolithic' vessel at Loch Langabhat in 2017

Tables

Site	Vessels (no.)
Loch Arnish	58
Loch Bhorgastail	59
Lochan Duna (Ranish)	23
Loch an Dunain (Carloway)	1
Loch Langabhat	83

Table 1. Neolithic vessels recovered from islet sites on the Isle of Lewis since 2012.

	Sherds (no.)	Weight (g)	No. vessels (estimated)	Mean sherd weight (g)
Islet surface	12	234	10	19.5
Loch bed	97	8430	73	86.9

Table 2. Comparison of pottery assemblages recovered from the surface of the islet and the loch bed at Langabhat

Lab code	Site name	Material	Species/type	Context	Radiocarbon age	δ13C (‰) (error ± 0.2 per mille)	Calibrated date ra (cal BC) at 95% confidence
OxA-28953	Loch Arnish	Charred residue	Internal food residue on 'Hebridean' vessel	Unstratified - loch bed	4620±30	-26.3	3510-3350
OxA-28955	Lochan Duna (Ranish)	Charred residue	Internal food residue on 'Hebridean' vessel	Unstratified - loch bed	4658±30	-26.3	3520-3370
OxA-28954	Loch Bhorgastail	Charred residue	Internal food residue on 'Hebridean' vessel	Unstratified - loch bed	4749±30	-21.6	3640-3380
SUERC-77427	Loch Bhorgastail	Wood	Salix sp. - outer rings	[30] - worked timbers east of islet	4737±24	-27.3	3630-3380

SUERC-77428	Loch Bhorgastail	Wood	Salix sp. - outer rings	[31] - worked timbers east of islet	4629±23	-27.4	3500-3360
SUERC-77434	Loch Langabhat	Charred residue	Internal food residue on 'Hebridean' vessel	Unstratified - loch bed, findspot [8]	4708±25	-26.4	3630-3380
SUERC-77432	Loch Langabhat	Wood charcoal	Alnus cf glut - small-medium branch	[52] - occupation deposits inside structure F1	3089±24	-25.4	1420-1290
SUERC-77433	Loch Langabhat	Wood charcoal	Alnus cf glut - medium branch	[57] - occupation deposits inside structure F1	2996±24	-26.2	1370-1130

Table 3. Radiocarbon dates from Neolithic islet sites in Lewis. Radiocarbon ages calibrated to the calendar timescale using OxCal 4.3.2 (Bronk Ramsey 2017). Date ranges calibrated using the IntCal13 atmospheric calibration curve (Reimer et al. 2013). Note that OxA-coded dates were previously published in Garrow et al. 2017a.