



Geophysical Survey Report No. 34

NIEA License Number AE/15/38

Aghagallon Enclosure,

Co. Antrim

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Contents

List of Figures	1
List of Tables.....	1
Site Specific Information	2
Survey methodology overview.....	3
Introduction	7
Historical & archaeological background	7
Description and interpretation of anomalies.....	8
Discussion.....	10
Recommendations.....	11
Bibliography	12
Acknowledgements	12
Appendix one: Georeferenced geophysical survey grid	13
Appendix two: Processed and raw geophysical survey plots.....	14
Appendix three: Historical mapping	16

List of Figures

Figure 1 Location and landscape setting of the geophysical survey 5

Figure 2 Wider recorded archaeological landscape setting 6

Figure 3 Interpretation diagram with geophysical anomalies 10

Figure 4 Irish National Grid coordinates for geophysical survey grid baseline 13

Figure 5 Greyscale plot of raw data gathered with 0.5m probe spacing..... 14

Figure 6 Greyscale plot of raw data gathered with 1m probe spacing..... 14

Figure 7 Greyscale plot of processed data gathered with 0.5m probe spacing 15

Figure 8 Greyscale plot of processed data gathered with 1m probe spacing. 15

Figure 9 Geophysical survey area in relation to the First Edition Ordnance Survey map series..... 16

Figure 10 Geophysical survey area in relation to the Second Edition Ordnance Survey map series 16

Figure 11 Geophysical survey area in relation to the Fifth Edition Ordnance Survey map series 17

Figure 12 Geophysical survey area in relation to the 2014 ortho-rectified aerial photograph series 17

List of Tables

Table 1 Description and interpretation of archaeological anomalies 8

Summary of results

A characterisation resolution electrical resistance survey was carried out over a total area of 0.24 hectares either side of the south-eastern section of a single banked large, enclosure (ANT 066:001) in the hamlet of Aghgallon. Magnetic gradiometry was trailed across the site but the underlying basalt geology prevented its successful application.

One high resistance feature is of particular significance – r1. Which appears to follow the outer line of the bank to a depth of at least 1m. This may be an external ditch with a stony fill and suggests the monument is not hengeiform in nature and instead may be characterised as a large ditched enclosure.

Site Specific Information

Site Name: Aghgallon Enclosure, Co. Antrim

Townland: Derrynaseer

SMR No: ANT 066:001

Grid Ref: J 10530 63552

County: Antrim

Date of Survey: 18th – 19th February 2015

Surveyors Present: Siobhán McDermott, Stuart Alexander & Grace Macalister Centre for Archaeological Fieldwork, School of Geography, Archaeology and Paleoecology, Queens University, Belfast.

Size of area surveyed: 0.23 hectares

Weather conditions: Mild.

Solid Geology: Lower Basalt Formation: Antrim Lava Group

Drift Geology: Diamicton till

Current Land Use: Playing fields and pasture

Intended Land Use: N/a

Survey methodology overview

*Survey type:*¹

Electrical resistance

Instrumentation:

Geoscan RM85

Probe spacing:

Multiple three probe array (1m + 0.5m x2)

Grid size:

30m x 30m

Traverse interval:

1m/0.5m

Sample Interval:

0.5m

Traverse Pattern:

Zig-zag

Lecia TS06-plus total station

Station setup:

Floating grid tied into ING using best-fit to OSNI basemaps

Survey Internal Accuracy:

Survey grade accuracy (<3cm)

Georeferencing:

The EDM data will be used to georeference the geophysical survey datasets exported from Geoplot v.3 in ArcMap 10.2.

Data processing:

The geophysical data was processed in Geoplot v. 3 software. The primary processes applied were high pass filtering (HPF) to remove geological 'background' noise and low pass filtering (LPF) which helps to eradicate minor spikes in the data. The datasets were also interpolated which creates a smoothing effect.

Visualisations:

The datasets were visualised within Geoplot v.3 using shade, trace, dot density and relief plots. Processed datasets and bitmap graph plots were exported from Geoplot v.3 and imported into ArcGIS 10.2. Once georeferenced statistical analysis were carried out on the rasters within ArcGIS 10.2 and they were interpreted in relation to the First, Third and Fifth Edition Ordnance Survey maps of the area and the 2014 orthorectified aerial photographs.

¹ Magnetic gradiometry survey was also trialled but the underlying Basalt geology prevented the machine being correctly balanced.

Digital archive:

The geophysical datasets were collected, processed and archived in accordance with Archaeological Data Services best practice.²

² Schmidt, A. & E. Ernenwein, 2011, Guide to good practice: Geophysical data in Archaeology [Online]
http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_Toc

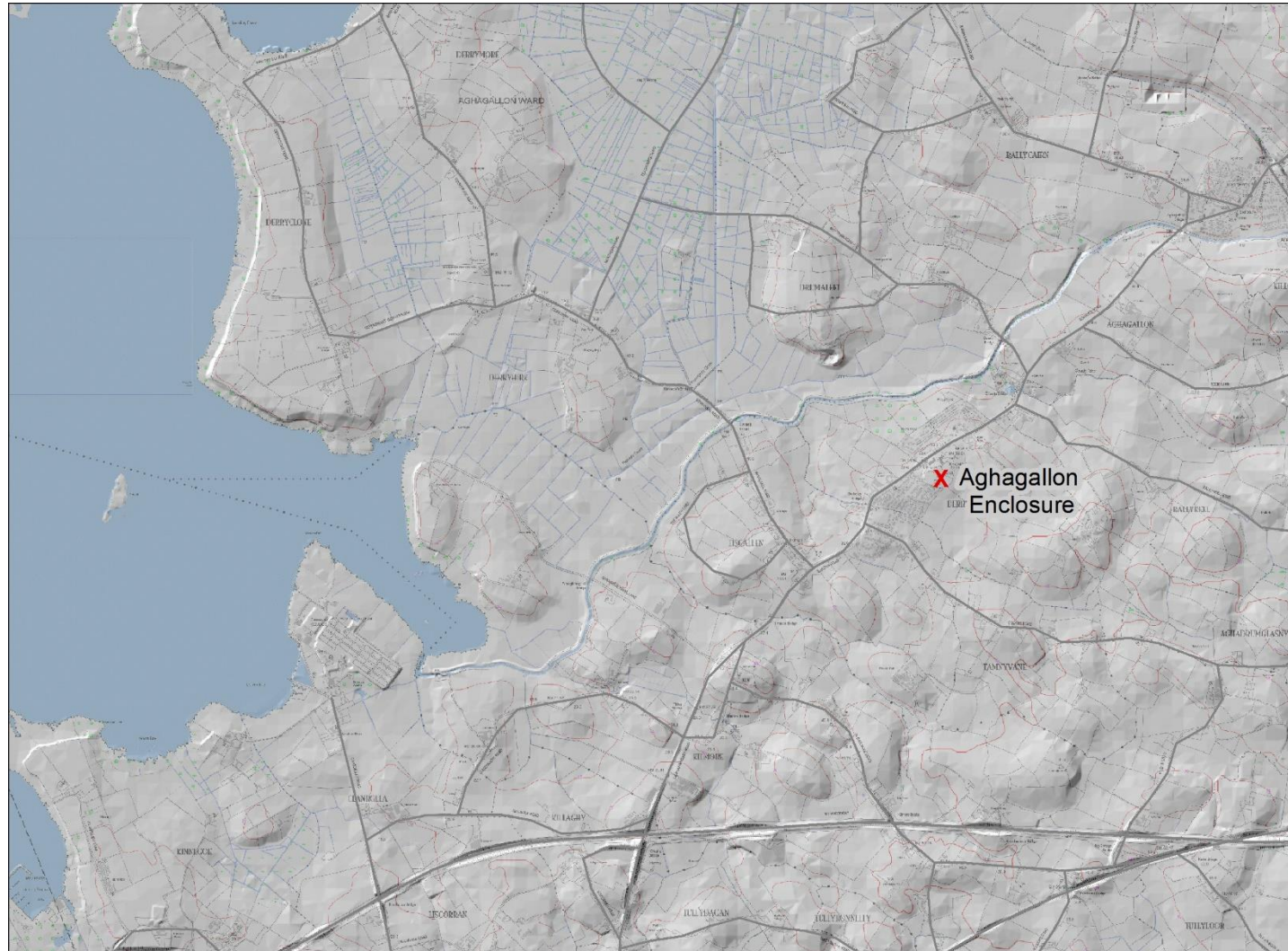
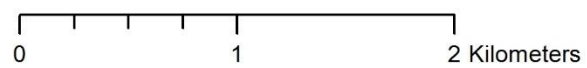


Figure 1 Location and landscape setting of the geophysical survey marked in red (OSNI 10km vector data layered over 5km DEM Hillshade).*



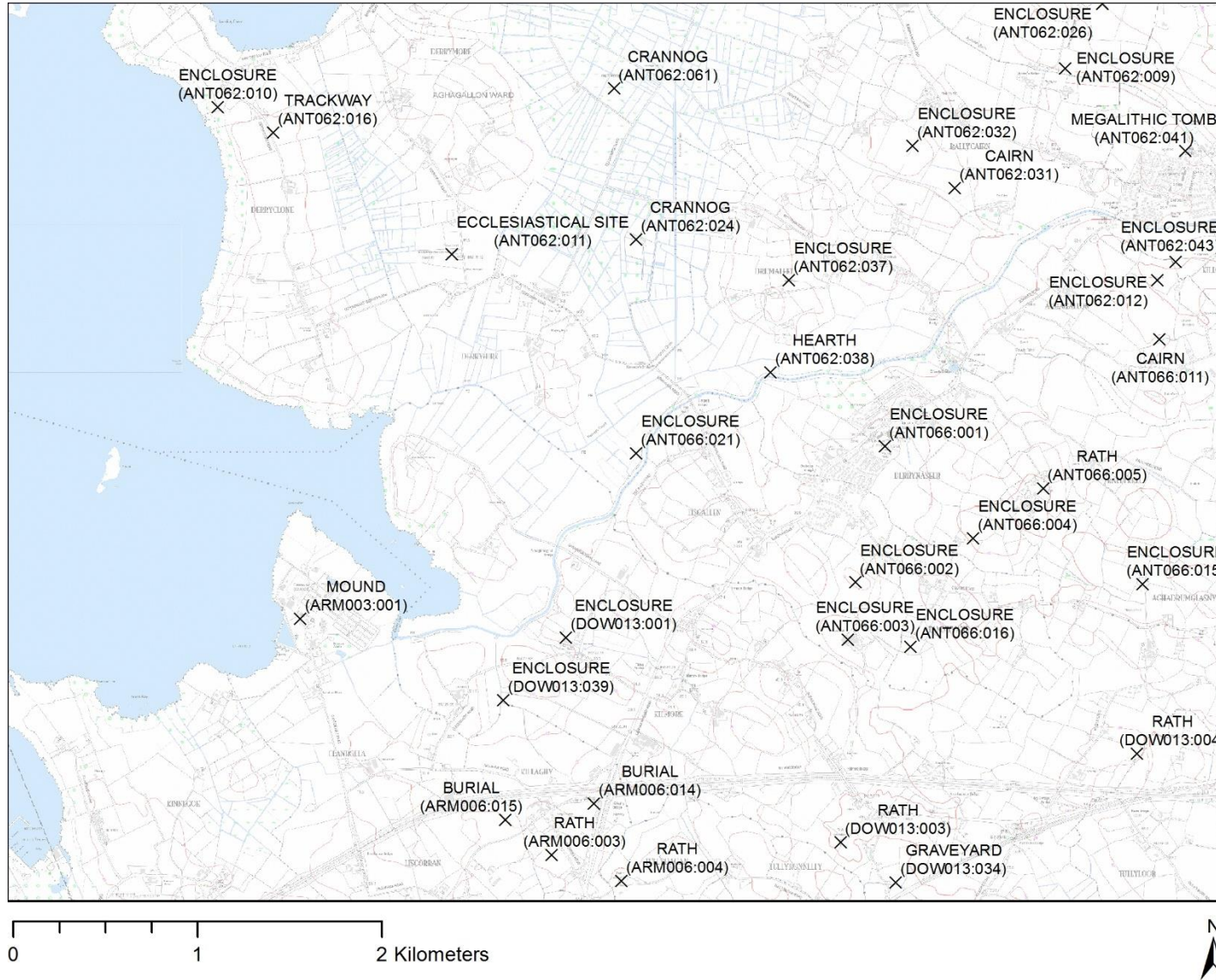


Figure 2 Wider recorded archaeological landscape setting. Geophysical survey area in red with Key NISMR locations noted.**

Introduction

A characterisation resolution electrical resistance survey was carried out over a total area 0.24 hectares over the southern section of a large, single banked enclosure (ANT 066:001). The enclosure has an overall diameter of c. 160m east to west. Electrical resistance data was gathered at 1m and 0.5m probe-spacing to facilitate the interpretation of the depth of the geophysical anomalies recorded.

The hamlet of Aghgallon is situated just under 3km east of the south-eastern shores of Lough Neagh. The surrounding landscape is characterised by low-lying, marshy former wetlands with small protruding drumlins. Numerous drainage channels and the Lagan Canal are indicative of the sustained improvement of these former wetlands which included peat extraction. The extensive nature of this peat extraction has shaped the topography of the landscape with notable changes in surface levels passing from one peat bank to another.

The enclosure is located to the south of Aghgallon Roman Catholic Church. A graveyard and parking lot occupies the north-eastern half of the interior of the enclosure. This appears to have occurred at some stage between the 3rd and 5th (1900 – 37) edition Ordnance Survey mapping of the area. The remaining undeveloped portion of the interior of the enclosure is currently used as a playing field. Modern housing has heavily encroached along the western exterior during the latter half of the 20th century.

Historical & archaeological background

Little is known about the site itself beyond it is a large enclosure (c. 180m diameter). The scale of the structure has drawn comparisons with the Giant's Ring (DOW 009:036), Co. Down, which is a large embanked prehistoric ritual enclosure. With a diameter of 225m and a single earthen bank 4m high and 19m wide the Giant's Ring dwarfs the Aghgallon enclosure (bank measures 1.2m high, 2.8m wide). Limited geophysical survey at two similar large embanked enclosures, Micknanstown & Balrath, both Co. Meath, have revealed the arc of a possible trench or ditch 3–4m wide within the interior of the monuments (Waddell 2010, 116). This is typical of henge-like monuments where the enclosing bank is the outermost element. As with other examples of this site type the Giant's Ring is just one of a series of large ring ditched enclosures and other monuments that occurred over an area of 33 Ha. A wider landscape study of the Aghgallon area could identify monuments which form part of a similar ritual landscape – although the effects of peat extraction on the archaeological archive should be considered.

The geophysical evidence for a possible external ditch, r1, at Aghgallon would question whether it is correct to categorise this monument as a prehistoric embanked enclosure. The wider archaeological landscape setting has been greatly affected by the area's history of peat extraction. Numerous enclosures and crannogs are attested to in the Ordnance Survey memories but are no longer present while other sites, such as a trackway, were unearthed during peat extraction. Of those enclosures that have been archaeologically recorded in some form none of them are near the scale of Aghgallon.

Description and interpretation of anomalies (Figure 4)

Table 1 Description and interpretation of archaeological anomalies.

Code	Description	Interpretation
r1	<p>High resistance curvilinear anomaly which runs, c. 3m to the south, along a portion of the southern section of the enclosure's bank. The anomaly is traceable for a distance of c. 23m running south-west to north-east. It is captured in both datasets (0.5m & 1m probe spacing) with a maximum width of c. 3m. The anomaly is still distinct at the greater depth (1m probe spacing) although it tapers out to its northern limits.</p>	<p>The anomaly is best defined in the western corner of the field. It loses definition at its northern limits notably in the data gathered with the wider probe spacing and thus at a greater depth. The anomaly is positioned c. 3m to the south of the enclosing bank and is not traceable for its full length. It has a maximum width of 3m.</p> <p>The First Edition Ordnance Survey of the area mapped a pathway (Figure 9) leading from the school house in Aghgallon to a small dwelling c. 700 south-east of the enclosure. The pathway runs diagonally from the north-west to the south-east through the centre of the enclosure before veering sharply to the south-west, apparently following part of the path of the enclosing bank, before sharply veering again and running to the south-east. There are historical issues which effect the usefulness of the oldest Ordnance Survey map source for close georeferencing. With the consequence that because the position of r1 does not closely match the location of the pathway mapped in the 1830s it should not be dismissed that r1 is the geophysical expression of the pathway. The relationship between the pathway and the enclosing bank is not clearly evident in the First Edition map but it appears to run along or very closely to the bank. By the Second Edition (Figure 10) it would appear that part of the pathway has been incorporated into the western field boundary of the survey area.</p> <p>It is possible that r1 represents the remnants of feature associated with the enclosure – better preserved in the corner of the field where modern heavy agricultural machinery can't access. Such an explanation would suggest that r1 is a cut feature with a higher resistance fill than the surrounding soils. This would radically change the interpretation of the site from that of a possible henge monument to a large enclosure.</p>
r2	<p>A cluster of higher resistance readings, c. 2m east – west, c. 1m north – south. Situated c. 15m south-east of the enclosing bank. Clearly evident in the</p>	<p>The anomaly is less evident at the greater depth suggesting that it is a near-surface feature and not of archaeological significance.</p>

	0.5m probe spacing data but less so on the 1m probe spacing dataset.	
r3	A cluster of higher resistance readings, c. 2m east – west, c. 2m north – south. Situated 5m west-south-west of r2 to the south of the enclosing bank. Clearly evident in the 0.5m probe spacing data but less so on the 1m probe spacing dataset.	The anomaly is less evident at the greater depth suggesting that it is a near-surface feature and not of archaeological significance.
r4	A cluster of higher resistance readings, c. 2m east – west, c. 2.5m north – south.	The anomaly is less evident at the greater depth suggesting that it is a near-surface feature and not of archaeological significance.



Figure 3 Interpretation diagram with geophysical anomalies identified

Discussion

The high resistance linear anomaly, r1, recorded running externally to the monuments bank could radically change the current interpretation of the site. The geophysical survey did not capture any evidence for an internal ditch. The anomaly is best defined in the western corner of the field. It loses definition at its northern limits notably in the data gathered with the wider probe spacing and thus at a greater depth. Indicating that it becomes shallower. It is possible that r1 represents the remnants of feature associated with the enclosure – better preserved in the corner of the field where modern heavy agricultural machinery can't access. Such an explanation would suggest that r1 is a cut feature with a higher resistance fill than the surrounding soils. This would radically change the interpretation of the site from that of a possible henge monument to a large enclosure – perhaps medieval.

The anomaly r1 cannot be conclusively interpreted as a ditch feature. There is a good possibility that it is the rammed surface of a 19th-century pathway. The First Edition Ordnance Survey of the area mapped a pathway (Figure 9) leading from the school house in Aghgallon to a small dwelling south-east of the enclosure. There are historical issues which effect the usefulness of the oldest Ordnance Survey map source for close

georeferencing. With the consequence that because the position of r1 does not closely match the location of the pathway it should not be dismissed that r1 is not its geophysical expression.

Recommendations

The anomaly r1 identified by this geophysical survey has the potential to change the interpretation of the monument. If it is the remnants of an enclosing ditch associated with the bank then it no longer conforms to a henge-like monument type. It is recommended that the anomaly r1 be targeted for archaeological investigation.

It is also recommended the rest of the interior of the monument be surveyed using electrical resistance geophysical survey.

Bibliography

Waddell, J., 2010 *The prehistoric archaeology of Ireland*. Wordwell Press: Dublin.

Acknowledgements

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Appendix one: Georeferenced geophysical survey grid

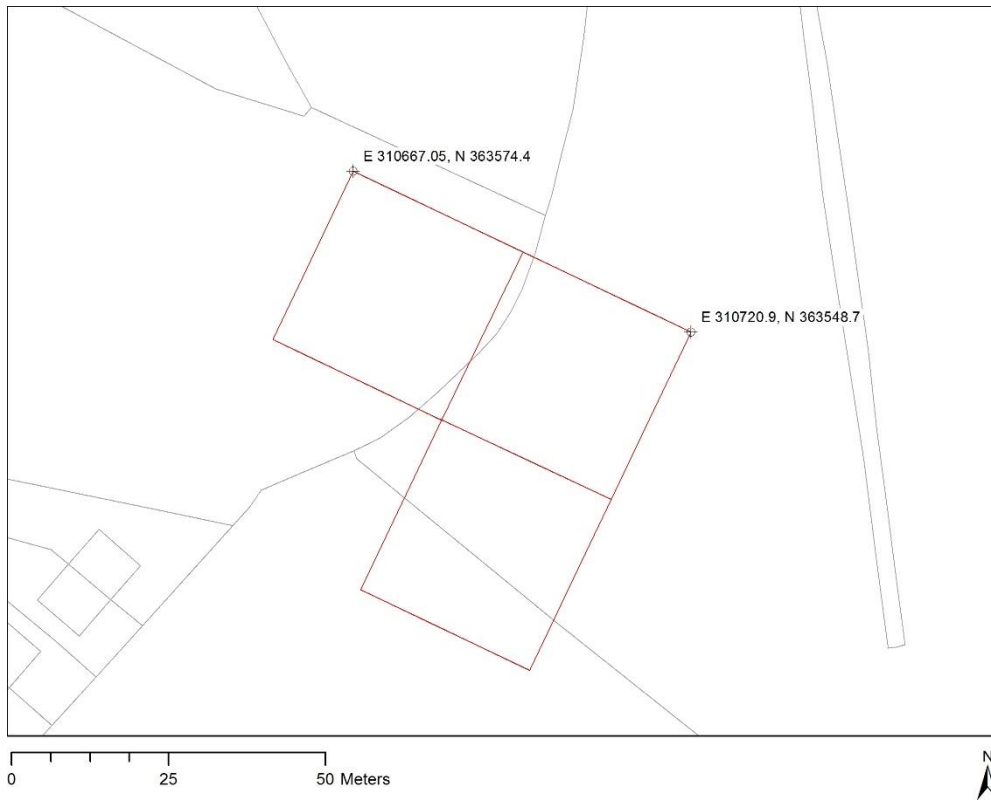


Figure 4 Irish National Grid coordinates for geophysical survey grid baseline.*

Appendix two: Processed and raw geophysical survey plots

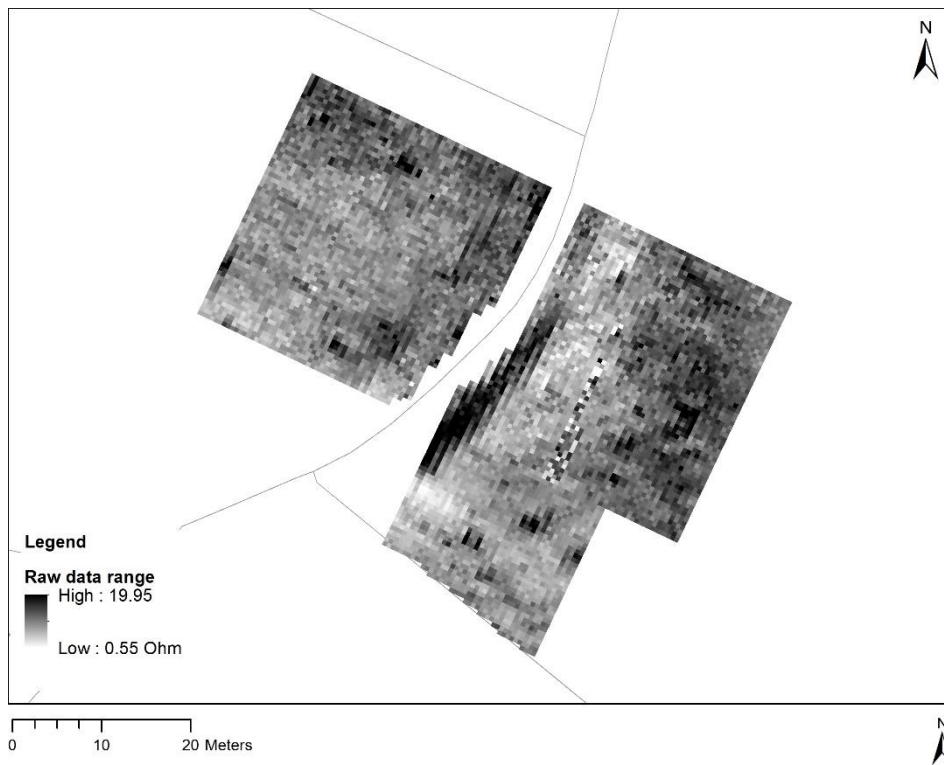


Figure 5 Greyscale plot of raw data gathered with 0.5m probe spacing. Data clipped ± 3 Std Dev. Statistics: Mean: 11.7 Ohm, Std Dev.: 1.57.*

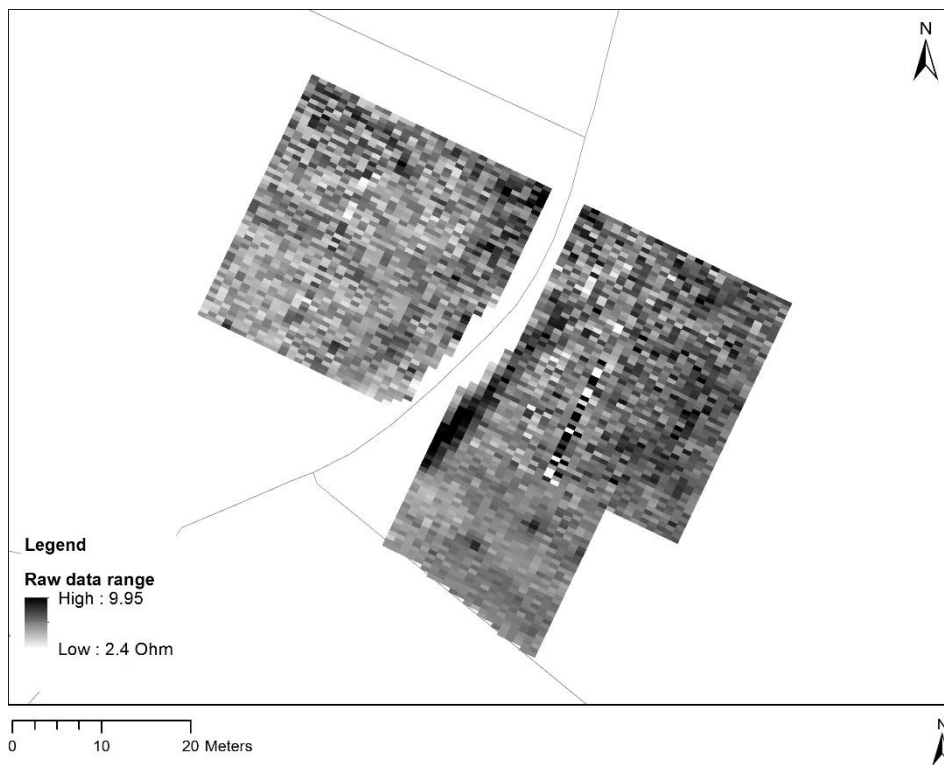


Figure 6 Greyscale plot of raw data gathered with 1m probe spacing.* Data clipped ± 3 Std Dev. Statistics: Mean: 5.07 Ohm, Std Dev.: 0.74.*

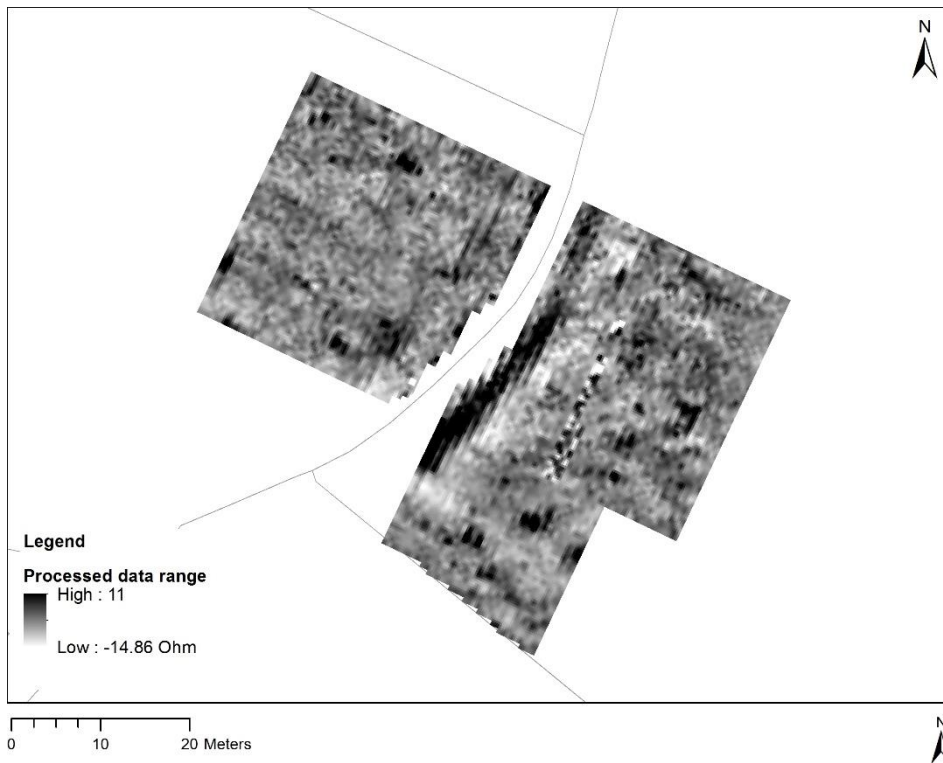


Figure 7 Greyscale plot of processed data gathered with 0.5m probe spacing. HPF (Uniform weighting applied $X = 10$, $Y = 10$), LPF (Gaussian weighting applied $x1$ on x-axis, $x1$ on y-axis), and $\sin(x)/x$ interpolation on x- and y-axis. Statistics: Mean: 0.03 Ohm, Std Dev: 1.75.*

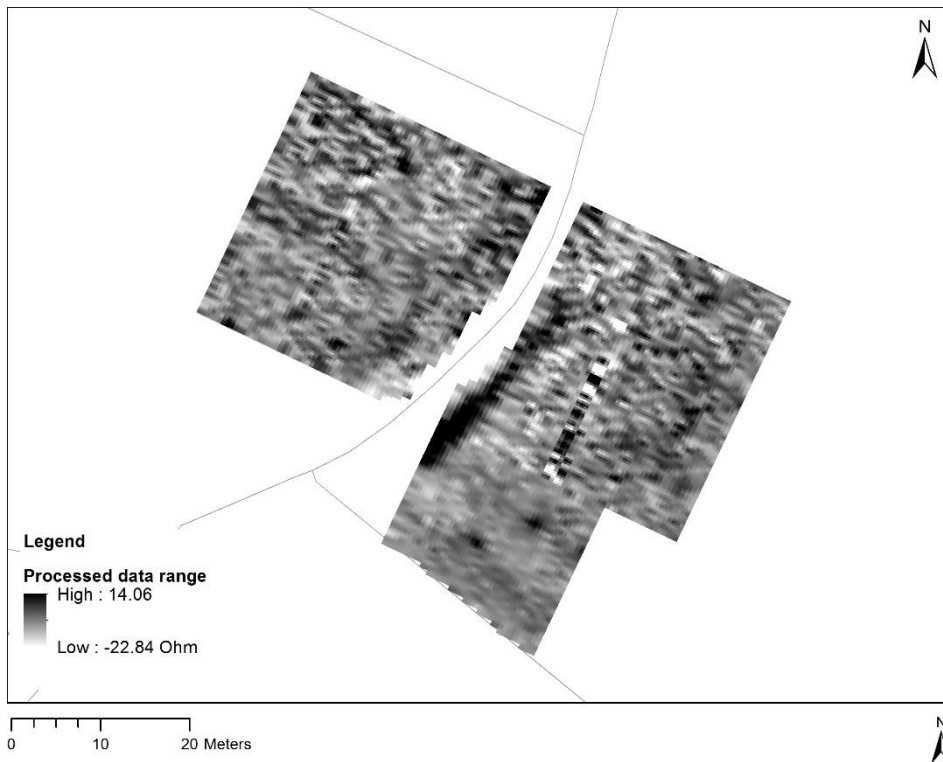


Figure 8 Greyscale plot of processed data gathered with 1m probe spacing. HPF (Uniform weighting applied $X = 10$, $Y = 10$), LPF (Gaussian weighting applied $x1$ on x-axis, $x1$ on y-axis), and $\sin(x)/x$ interpolation on x- and y-axis. Statistics: Mean: 0.01 Ohm, Std Dev: 1.74.*

Appendix three: Historical mapping

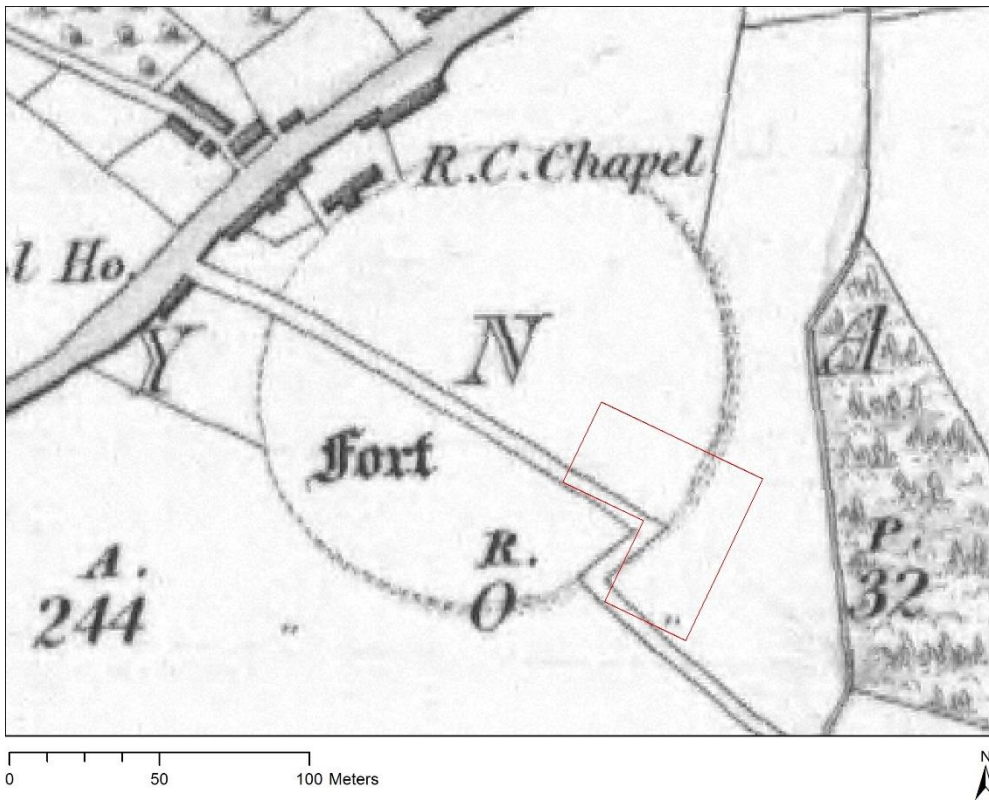


Figure 9 Geophysical survey area in relation to the First Edition Ordnance Survey map series, c. 1831-3.*

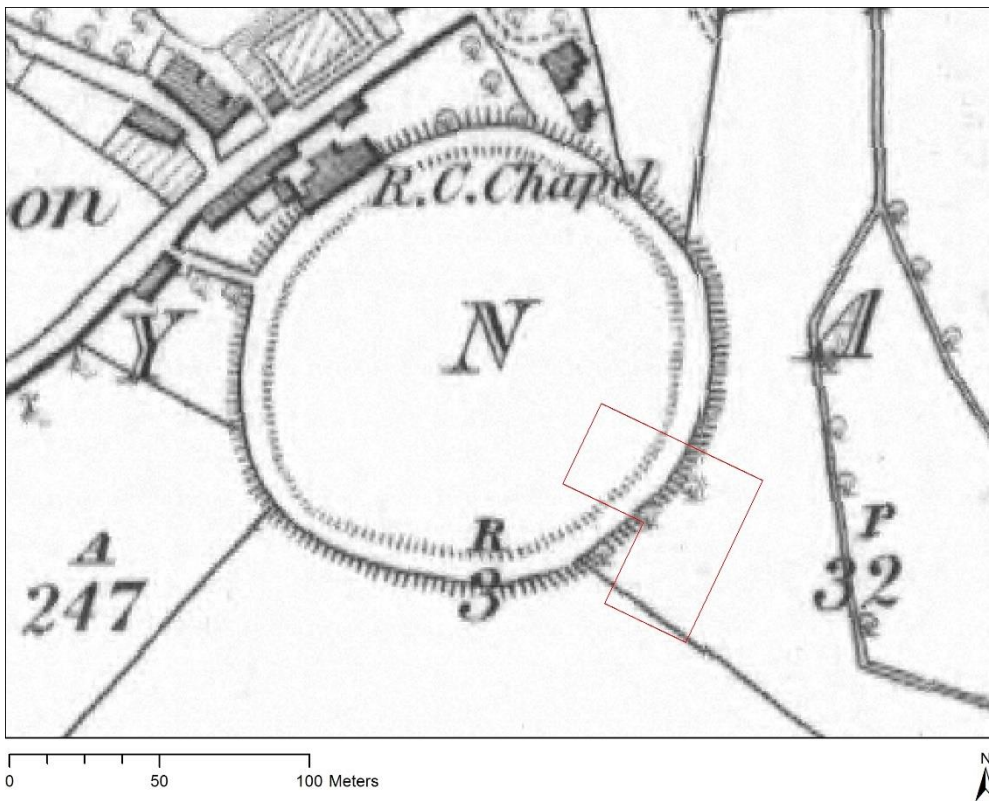


Figure 10 Geophysical survey area in relation to the Second Edition Ordnance Survey map series, c. 1853-58.*

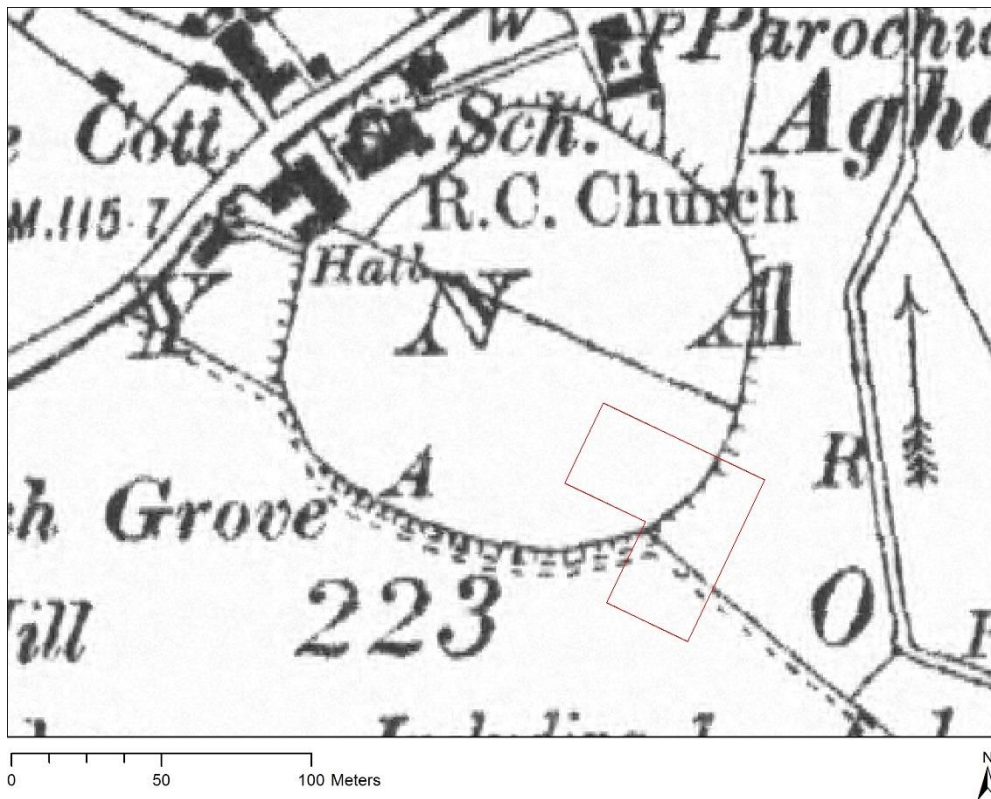


Figure 11 Geophysical survey area in relation to the Fifth Edition Ordnance Survey map series, c. 1931 – 7.*



Figure 12 Geophysical survey area in relation to the 2014 ortho-rectified aerial photograph series.*