

The Rising Tide: Submerged Landscape of Orkney

Quarterly Report: June 2009



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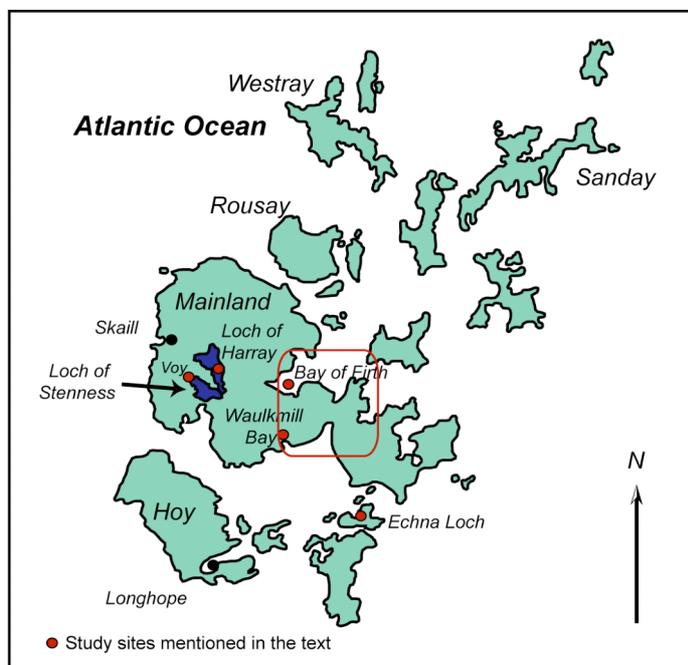
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Project Work

Fieldwork

Damsay, Bay of Firth

Field research took place in the Bay of Firth in June 2009, in liaison with Richard Bates of the University of St Andrews and Paul Byham of SEA survey. Work concentrated on the sea areas around the island of Damsay (below).



Location of Bathymetric survey and diving – June 2009

Methods

- Detailed geophysical survey work using bathymetric side scan sonar.
- Shallow diving.

Aims

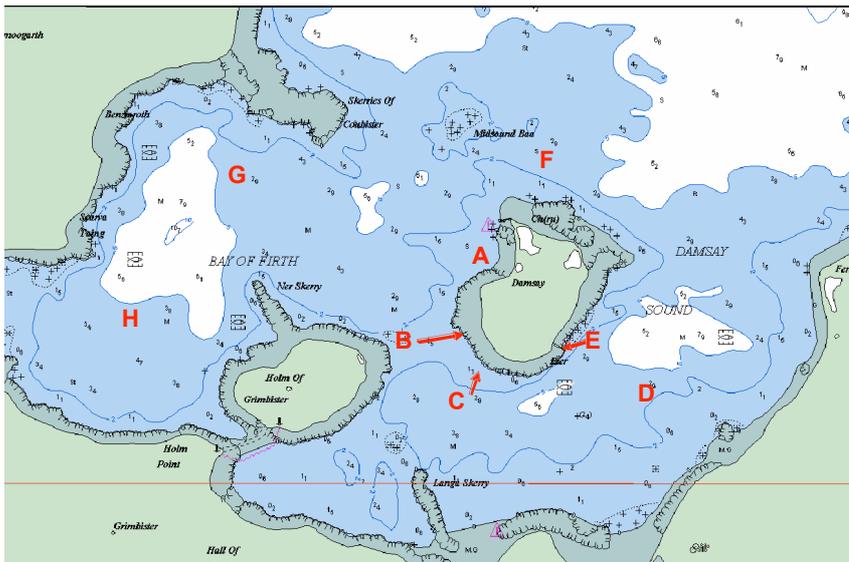
- Elucidation of selected targets identified during the side-scan survey undertaken in September 2008.
- Verification of techniques.



Targets identified during sidescan survey in September 2008 (Fiona Stewart)

Geophysics

Geophysical survey concentrated in the shallow areas immediately offshore the island of Damsay where previous work had identified a number of individual targets. In total eight potential targets were examined, together with five general searches (table 1). Detailed analyses and mosaic results are awaited but preliminary examples of the type of data produced can be given (see below).



Damsay, selected targets



Damsay, looking towards the beach (location A).

TARGET	Location	Anomaly	Result
A	59.00.580N 03.04.050W	Bay on W coast of Damsay, clear subsea embayment	Several stone features
B	59.00.3898N 03.04.1596W	Unusual reading on sidescan	Stone feature
C	59.00.2404N 03.04.0032W	Circular feature on sidescan	Stone feature
D	59.00.130N 03.03.300W	Unusual reading on sidescan	Stone feature
E	59.00.339N 03.03.654W	Pier visible at low tide	Pier
F	59.00.720N 03.03.870W	High readings on sidescan	Stone features
G	59.01.2287N 03.04.4063W	Funnel shape on sidescan	Nothing visible, deep sediment
H	59.00.3686N 03.05.5321W	Moorings	Nothing visible, deep sediment
SEARCH AREAS			
	To N of D	Clear Linear features on sidescan	Nothing visible, deep sediment
	Between B – C	Shoreline	Shoreline
	To N of E		Nothing visible
	To E of F		Nothing visible
	In Bay around A		Several stone features

Table 1: Diving targets and brief results

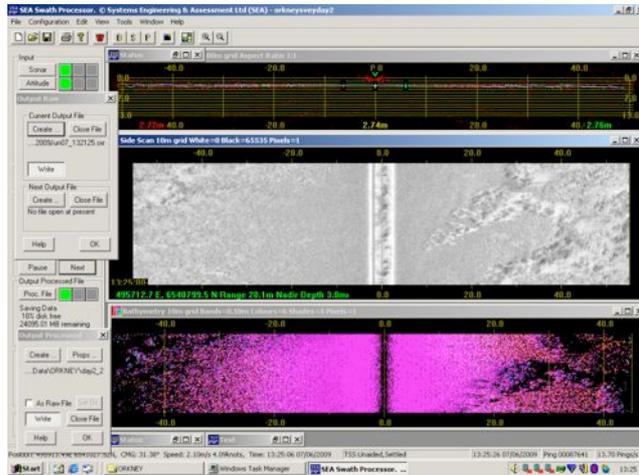
Shallow-Diving

Shallow-dives (less than 10m) were undertaken by SULA Diving on eight targets and five search areas over a three day period. Five main areas of interest were highlighted (A-E above). Video camera and still photography was undertaken.

Diver at work



Results Area A



Example of survey data illustrating clear target area off the west coast of Damsay (area A above). In this case the target may relate to a combination of palaeo-shoreline and archaeological features.

This area located off the modern beach on the west coast of Damsay is today a shallow embayment. Water depths are between 1 and 3 metres. The area was initially considered as a possible palaeo-embayment from the sidescan imagery (below). At least two potential features were recorded: material including upright slabs lay immediately underneath the boat as the divers entered the water; and slightly to the north lay a large feature comprising slabs and collapsed stonework with voids. This measured roughly 8m x 2m. There were, in addition, other features of interest (eg: clip 10.32).



Day 3, untitled1, Area A, clip 10.32: stones with voids



Day 3, Area A, still 164, uprights below boat



Day 3, Area A, still 158, upright below boat (note hand as scale)



Day 3, Area A, still 162, uprights



Day 3 untitled 1, Area A, clip 15.43, stone feature



Day 3, Area A, still 223, general view of sand and sediment on sea bed with sea grass

Area B & C

Area B & C were located on the south-western shore of Damsay. Two targets were located (previously identified by sidescan in 2008) comprising mounded features of angular slabs including apparently coursed stone, collapse, and voids. A sweep was also carried out along the shore at high tide in c 3 m of water depth just outside of the intertidal zone, but yielded nothing.



Day 1, film 2, Area B, clip 2.23 stonework



Day 1, Area B, still 020, stonework



Day 1, film 1, Area C, clip 13.46 stonework



Day 1, Area B, still 021, coursed stonework

Area D

This area lies in c10m of water depth and lies to the east of Damsay between the island and the Rennibister shore. The original target comprised an area of clear linear anomalies identified on the original sidescan survey of September 2008. These anomalies showed clearly in the 2009 survey. In addition the sidescan of 09, suggested an isolated circular feature in this area.

At the drop zone, to the S of this area the divers located a small stone feature in 9m of water (high tide) made up of horizontal flagstones together with small upright slabs. This stood proud of the fine particulate muddy substrate which extended over a wide area to the north.



Day 2, Area D, still 66, stonework on seabed



Day 2 untitled 2, Area D, clip 05.34 upright slabs



Day 2, Area D, still 77, horizontal slab



Day 2 untitled 2, Area D, clip 00.50 horizontal slab at angle

A search across the zone to the north failed to locate material that might explain the linear anomalies; this was felt to be due to the depth of soft sediment.



Day 2, diver with jellyfish

Area E

Area E was centred round the remains of a former pier visible at low tide on the east coast of Damsay. The pier was located, and no other features were recorded. A coastal sweep to the north of pier did not yield any further results.



Day 3, Area E, still 251, pier structure with mussels

Area F

Area F lay off the N shore of Damsay, to the N of the mounded location known as St Mary's Chapel. The sidescan revealed some strong anomalies in this area. A feature comprising flat slabs with some semi uprights, and coursed stonework were located at the drop zone. Nearby, lay a large feature comprised of massive blocks. A sweep to the east along the shore yielded nothing.



Day 3, Area F, still 229, upright and slabbing



Day 3, Area F, still 211, : coursed stonework



Day 3, Area F, still 225, upright slabs



Day 3, Area F, still 217: massive blocks

Area G

Area G lay to the west towards the Rendal shore and was investigated to locate a funnel shaped feature that showed clearly on the sidescan. The seabed comprised soft muddy substrate and no feature was located.

Area H

Area H was chosen to investigate a linear series of anomalies towards the mouth of the Finstown harbour. The seabed comprised soft muddy substrate and no features were located, but the presence of a single mooring supported the original identification that these anomalies represent moorings.

Conclusions

The survey demonstrates the survival of stone built structures in at least five locations on the seabed. Thick kelp hindered identification of the size and shape of the features, and at this stage it is not possible to determine their age or nature.

The seabed around Damsay is relatively uniform with shallow angles from the present shoreline into the subtidal area and deeper. In general it is free from large stones, covered in many areas by sediment of differing types and small stones. Whilst many of the smaller stones may relate to erosion of beach material in the intertidal zone, both vertical slabs and apparent traces of coursed and collapsed stonework are unlikely to be natural. The features identified were clearly visible, and all differ markedly from the seabed around them. Where it is visible, the sandstone geology of the area lies in parallel beds, dipping to seaward. Many of the uprights lay at right angles to this natural bedding, also ruling out a natural origin.

The variation in features observed suggests that a variety of structural remains survive on the seabed of the Bay of Firth. The material comprises local flagstones, the native building material of Orkney from the Neolithic onwards.



Implications

- The survival of archaeological material on the seabed confirms the growing impression that the record of sites on land is not complete.
- In order to understand Prehistoric Orkney properly it is necessary to understand the submerged landscape of Orkney and the sites that have survived here.
- Current research suggests that the sea around Orkney only reached its present position some 4000 years ago; it is therefore possible that some seabed sites may date back to the Neolithic period and beyond.
- Current understanding of seabed archaeology is poor, further survey work is needed. To date this is the only work of its kind in Scotland.
- The management of the seabed must now include measures for the study, management (and, where appropriate, conservation) of surviving submerged archaeological sites and landscapes.
- Further study of the Bay of Firth is needed in order to categorise and date the identified sites and to assess their preservation.
- The present study examined only a fraction of the potential targets identified in 2008, further work is necessary to look for other sites and to provide an overall geographical context for the ancient landscape here.
- The visibility of the features suggests that there is potential to extend the recreational dive interest of Orkney with the addition of a submerged prehistory dive trail.



Further Work in the Bay of Firth

1. Photogrammetry/planning to obtain an accurate record of the configuration, shape and size of individual features
2. ROV footage to clarify the visual record
3. Inter-tidal examination of the island of Damsay for visible archaeological remains
4. Detailed bathymetry of the Bay of Firth to assist in the identification of palaeo-landscape and archaeological features
5. Sub-bottom profile work in order to examine the linear anomalies in Area D which seem to lie below a capping of soft sediment
6. Further shallow diving on other targets in the Bay
7. Inshore and coastal coring:
 - a. sediment analysis related to former sea-levels
 - b. dates related to former sea-levels
 - c. environmental analysis related to the palaeo-landscape
8. Academic interpretation and Reporting
9. Public interpretation and Access



Developments and Liaison

British Geological Survey

Discussions continue with BGS relating to their offer to carry out a high-resolution multibeam survey of the southern entrance to Scapa Flow.

Outreach

Lectures

- SD (panel Member) presentation at the second meeting of the Marine and Maritime Panel of ScARF (Scottish Archaeological Research Framework), Society of Antiquaries, April 2009.
- CWJ forthcoming lecture on the project in general to UHI (invited) seminar on the study of the Archaeological Landscapes of Highland Scotland, July 2009.
- CWJ forthcoming lecture on Orkney project to Orkney Archaeological Society as part of the Orkney Science Festival in September 2009.

Publications

- Report on sediment analysis of core material from the Lochs of Stenness, Harray and Echnaloch to be prepared for publication by end March 2010.
- Preliminary report on Bay of Firth to be prepared for submission to *Antiquity*, winter 2009/10.

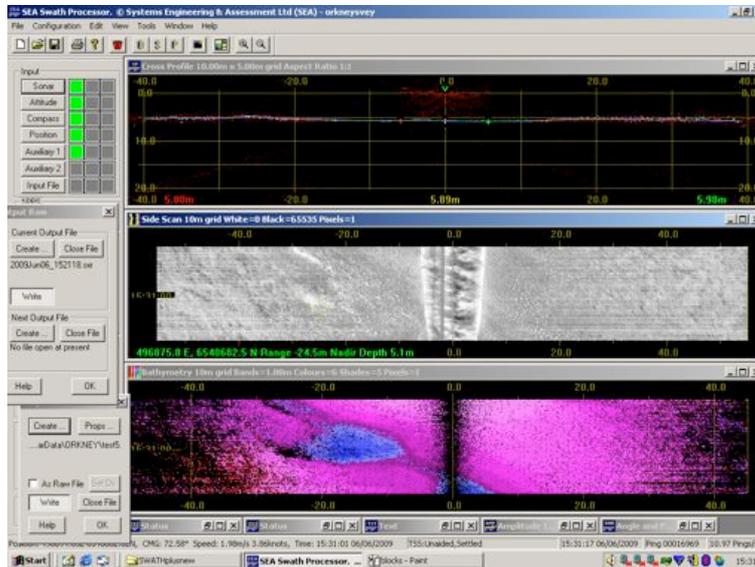
Media coverage

In compliance with the wishes of the funders, National Geographic Society, there has been no publicity related to the work in the Bay of Firth. This would, in any case, be more appropriate once further work has been undertaken.

Website

A background PDF file setting out the work of the project to April 2009 has been produced and placed on the Department of Archaeology website at the University of Aberdeen. All interim reports are also downloadable from this website.

<http://www.abdn.ac.uk/archaeology/staff/staff.php?id=c.wickham-jones>



Typical sidescan data showing rounded anomaly

Further Work 2009-10

Scapa Flow Landscape Partnership

As part of the Scapa Flow Landscape Partnership, the project plans to investigate the submerged landscape of Longhope and Flotta. This work will take place over the next three years with fieldwork, including coring in Longhope Bay and South Ronaldsay, to take place in year 1, analysis in year 2, and interpretation in year 3. SFLP funds have been approved by HLF and SFLP staff are now in place. Preliminary prospection for project core sites will take place at the end of August 2009.

Bay of Firth

- Elements 1 – 2 above (planning, photography, and ROV work) are best carried out in February when the kelp is down and visibility at its best. If funds can be obtained this work is planned for February 2010.
- Element 3 (inter-tidal work on Damsay) is planned as part of the present round of work in August 2009 (weather and permissions permitting).
- Elements 4 – 7 require increased access to funds, and work is underway to facilitate this.

Sediment Analysis and Dating

Final analysis and further dating of cores from Stenness, Harray, and Waulkmill Bay is to take place in 2009.

Report writing

- Preparation of a report on sediment analysis to date to be prepared for publication by end March 2010
- Preparation of a preliminary report on work in the Bay of Firth to take place over the winter 2009-10.

Funding 2009-10

- Historic Scotland - sediment analysis.
- National Geographic Society – initial work in the Bay of Firth.
- Orkney Islands Council – initial work in the Bay of Firth.
- Heritage Lottery Fund - SFLP funding for work on Hoy and South Ronaldsay.

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Photography

Clips from SULA Diving video
Stills from SULA Diving
All other photos SD, CWJ and
GLopez.

