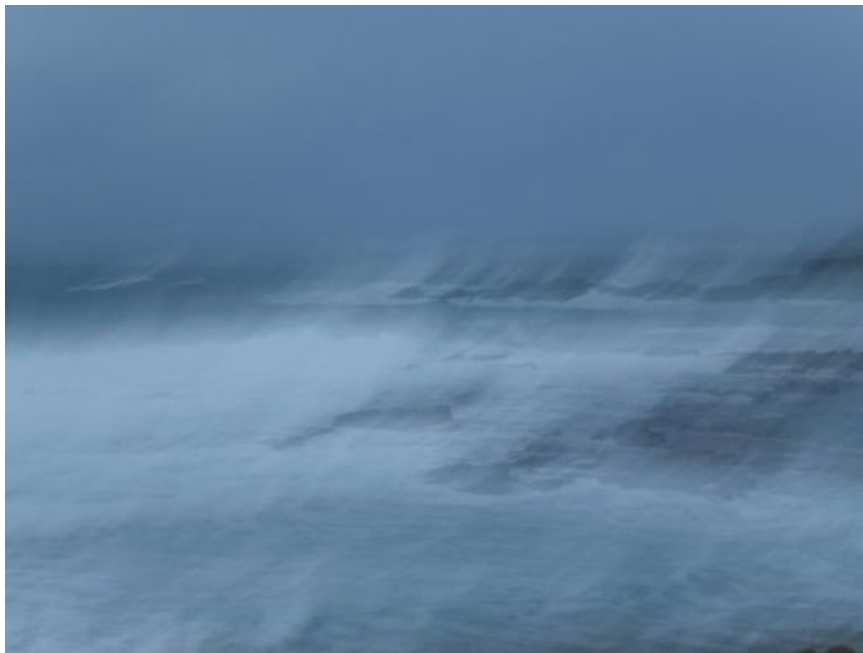


# The Rising Tide: Submerged Landscape of Orkney

*Annual Interim Report March 2009*



*S Dawson<sup>i</sup> & CR Wickham-Jones<sup>ii</sup>*

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## Project Work

### *Fieldwork*

Two fieldwork sessions took place in 2008-9:

- **Lochs of Harray and Stenness**  
Stratigraphic work and coring has been undertaken on the Lochs of Harray and Stenness. In Stenness further coring was undertaken in the sheltered zone of the Seatter embayment towards the mouth of the loch, where a stratigraphic transect from east to west confirms the sedimentary units identified during previous field work. On the Loch of Harray over three metres of sediment were recovered from a sheltered, shallow embayment located close to the eastern shore, at Stoneyhill, Harray.

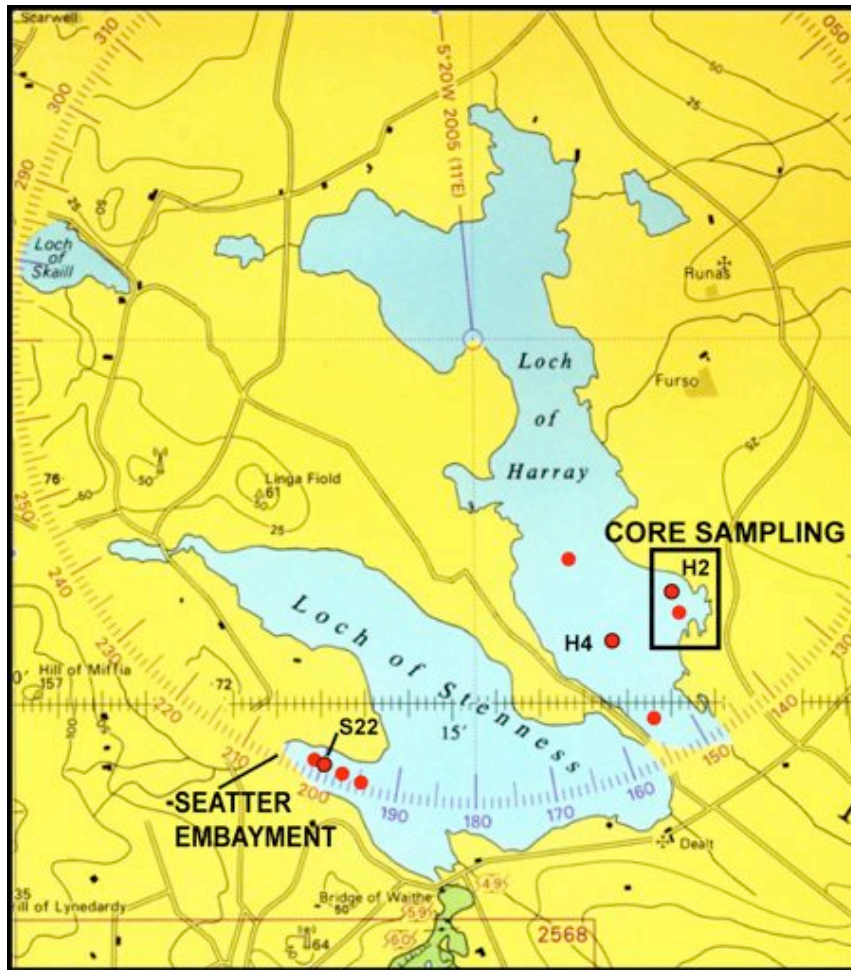


The Lochs of Stenness (foreground) and Harray (background), showing Seatter embayment in the foreground.

- **Bay of Firth**  
Hydrographic survey work was carried out in the Bay of Firth using side scan sonar operated by Fiona Stewart of **HighResolution** Geoservices and the *Charles-Ann* skippered by Harvey Groat from Stronsay. This survey revealed features likely to be related to the submergence of the landscape as well as several positive anomalies which will be investigated in the summer of 2009 using a camera, ROV and shallow diver work. Most of these anomalies are likely to relate to recent cultural heritage, but at least one clear reading came from the area of interest indicated by local informants. The existence of a submerged prehistoric structure in the Bay has not been ruled out.



Damsay in the Bay of Firth



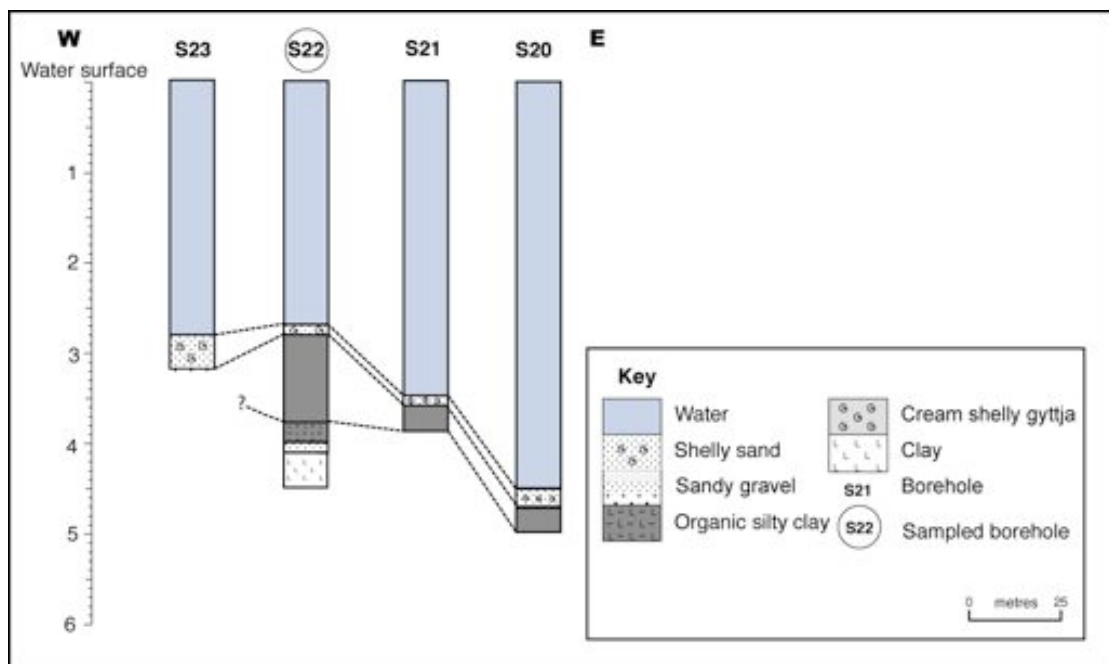
Core locations within the Lochs of Stenness and Harray.

#### *Sediment Analysis (Seatter, Stenness)*

Core analyses from the Seatter embayment in Stenness are being assessed for microfossil (diatom) preservation. The stratigraphic survey shows an extensive thickness of deposits under 2-3 metres water depth. At the surface of the sediment sequence lies brackish and marine shelly sands overlying the freshwater cream gyttjas which are extensive across the basin. A radiocarbon date across this change will allow comparison with the date obtained for Voy (Stenness), detailed above. Towards the base of the gyttja a unit of grey medium to coarse sand and gravel is present (see fig below). This reflects higher energy deposition into the Loch and samples have been submitted for radiocarbon dating. Light grey smooth clays make up the remainder of the core stratigraphy. These samples are being analysed for tephra (volcanic ash) content to provide a known marker horizon from which to cross-correlate the cores within the loch.



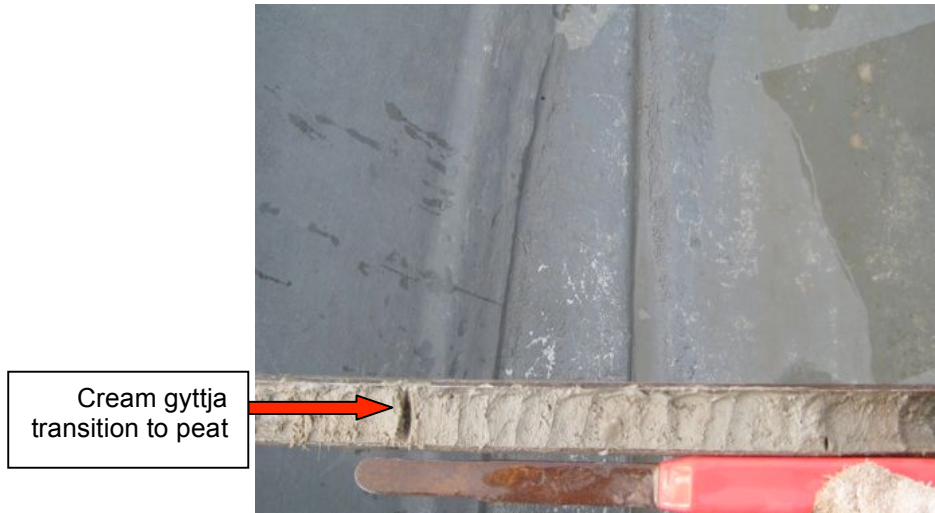
Seatter core 22 detailing the sand unit and associated upper organic unit and lower silty clays.



Stratigraphic transect within the Seatter embayment in the Loch of Stenness.

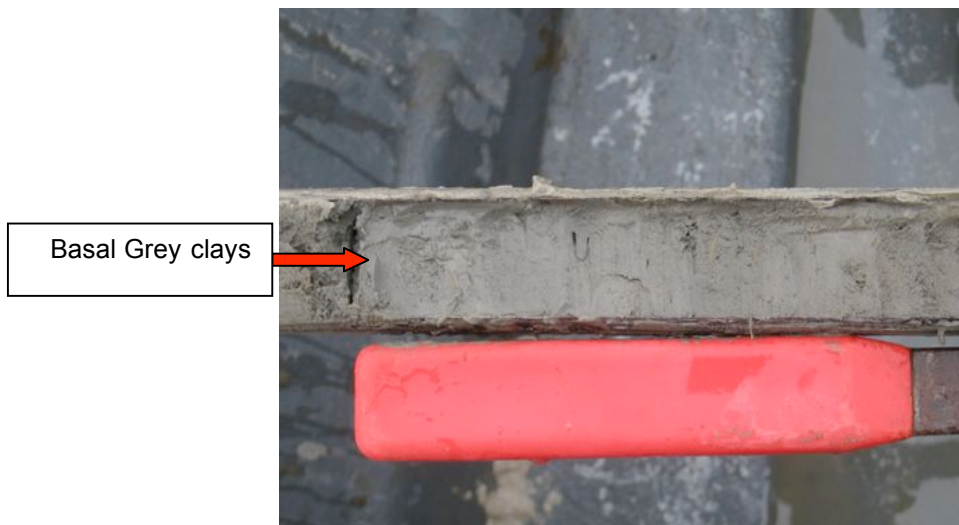
*Stratigraphic Survey, Stoneyhill, Loch of Harray*

A sediment sequence of over 3 metres was recovered in the sheltered embayment to the east of the loch at Stoneyhill. This comprised silty sands overlying a sequence of gyttjas. Below these lay more organic peats suggestive of a more terrestrial locality. Underlying the organic peats lay a smooth light grey clay.



Cream gyttja  
transition to peat

*Loch of Harray sediment – cream gyttjas to peat at the base*



Basal Grey clays

*Loch of Harray: basal clays*

*Dating*

Two AMS radiometric dates have been obtained from gyttja associated with gradual changes in diatom assemblages:

- Echna Loch: 3950±40BP (Beta 242126) 2340 – 2570 cal BC  
This relates to a change to freshwater conditions from marine with the closure of the marine embayment after the emplacement of the barrier (a storm beach) along which the present day road runs.
- Voy, Stenness: 3090±40BP (Beta 242127) 1440 – 1270 cal BC  
Voy lies at the inland extremity of the Loch of Stenness and the date relates to a change to marine and brackish conditions from freshwater/lagoonal.



Echna Loch, Burray



Voy, at the head of the Loch of Stenness

These dates give an initial idea of the age range when sea level reached present levels around mainland Orkney.

Three more dates have been submitted from the sediment cores taken in the Seatter embayment on the Loch of Stenness and other dates will be obtained from the Loch of Harray.

### **Bay of Skail**

The opportunity was taken to visit the Bay of Skail during work to strengthen the sea wall at Skara Brae with a view to examining the stratigraphy below the site. In the event the existing sea wall is founded directly on to bedrock so there was no opportunity to take samples, but the visit was well worthwhile.

### **Developments and Liaison**

#### *Project Deukalion, FP7*

Project Deukalion is a multi-national European collaboration to research the submerged prehistory and environment of the continental shelf under the Environment and Cultural Heritage themes of the European Framework -7 research programme. This project is slowly taking shape; the Rising Tide is included in the Scottish involvement which takes place under the leadership of CWJ at Aberdeen University.

#### *British Geological Survey*

BGS have offered to provide a high resolution multibeam survey of the southern entrance to Scapa Flow.

#### *University of Hull*

Dr Jane Bunting and Michelle Farrell, palaeo-environmental specialists at the University of Hull, are working with us on a variety of collaborations, in which they use our samples for additional analysis or provide supplementary material from their own projects.

#### *Orkney College*

On-going liaison with the Archaeology Department at Orkney College includes discussion of issues related to submerged archaeology around Orkney. In addition they have applied for a NERC grant to do a LIDAR survey of Orkney and this would include coverage of areas of interest such as the lochs of Stenness and Harray, and the Bay of Firth.

## Outreach

### Lectures

- SD and CWJ joint presentation at a seminar on past sea level change in Orkney organised by Orkney College/Durham University, April 2008.
- CWJ lecture to Historic Scotland Rangers in Orkney on the project and its relevance to the World Heritage Sites, May 2008.
- CWJ attended a Scapa Flow Landscape Partnership meeting in Flotta to present the project, June 2008
- CWJ lecture at the *World Archaeology Congress* in Dublin, July 2008, to present a joint paper outlining the project.
- SD (panel Member) presentation at the inaugural meeting of the Marine and Maritime Panel of ScARF (Scottish Archaeological Research Framework), Society of Antiquaries, November 2008.
- CWJ presentation to the European Marine Energy Centre, Jan 2009.
- CWJ public lecture on the project for Marischall College, Aberdeen, Feb 2009.
- SD lecture to International Geological Correlation Programme, June 2009
- CWJ to deliver a public lecture on the project to Orkney Archaeology Society in June 2009

### Publications

Wickham-Jones CR & Dawson S 2008 The Rising Tide Project of Orkney, *Orkney Archaeology Society Newsletter*, Nov 2008 (1), 18-20.

Wickham-Jones CR & Dawson S 2008 The Rising Tide Project of Orkney, *Archaeology Scotland*, (2) Autumn 2008, 6.

Wickham-Jones CR, Dawson S & Dawson A forthcoming, Rising Tide, Orkney, submitted to *Discovery and Excavation in Scotland 2008*.

Wickham-Jones CR & Dawson S forthcoming The Rising Tide Project of Orkney: ongoing research, submitted to the *Nautical Archaeology Society Newsletter*.

### Media coverage

- Orcadian
- Orkney Today
- BBC Radio Orkney – 28<sup>th</sup> August 2008
- STV – North Tonight September 2008
- EMEC website – January 2009,  
<http://www.emec.org.uk/view.asp?newsID=130>
- BBC Radio 4 – Britain's Lost Atlantis, February 2009
- *Current Archaeology* - August 2008

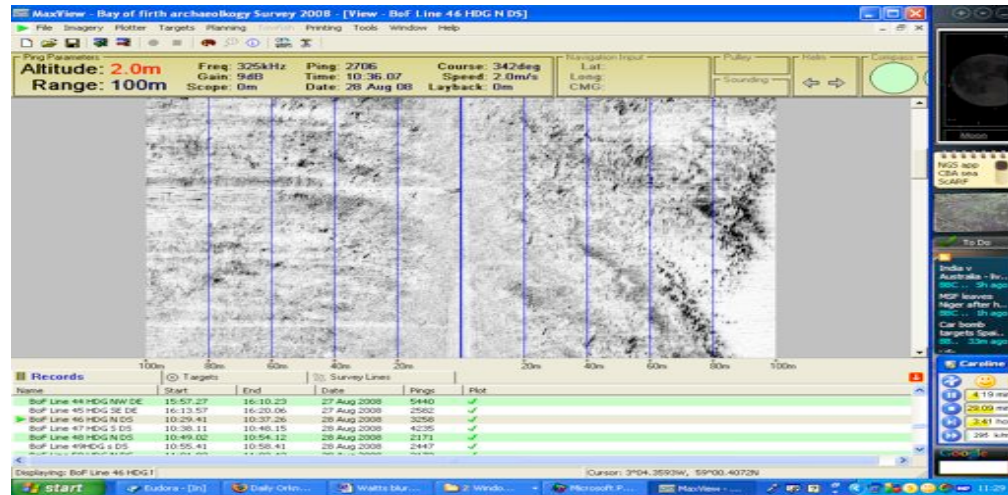
### Website

Website text produced and submitted to Aberdeen University for inclusion on the Department of Archaeology website. Liaison continuing.

## Work 2009-10

### *Bay of Firth*

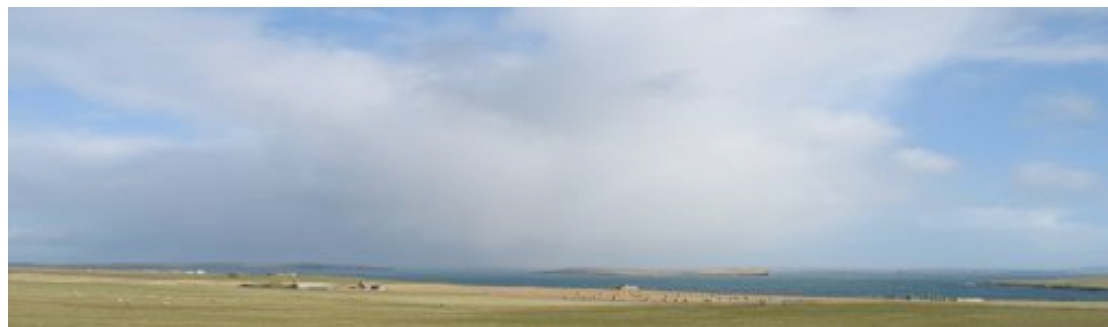
More detailed survey, ROV work and diving will take place to investigate the anomalies in the Bay of Firth. This work will take place in June 2009 and is to be funded by the National Geographic Society and Orkney Islands Council. This will be undertaken in liaison with Dr Richard Bates of the University of St Andrews. Local team SULA Diving, lead by Bobby Forbes will carry out the diving.



CMax screen during Bay of Firth survey 2008, showing anomaly on right hand side.

### *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 one, analysis in year 2, and interpretation in year 3. SFLP have submitted their overall application to HLF, and a positive decision was announced as this report was being written in March 2009. Work should start in May 2009.



View from South Ronaldsay across to South Walls

### *Sediment Analysis and Dating*

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





Taking cores at Waulkmill Bay

### *Hydrographic Survey*

British Geological Survey to provide a multibeam survey between Hoy and Hoxa, summer 2009

### *Report writing*

Preparation of a report on sediment analysis to date to be prepared for publication by end March 2010

### **Funding 2009-10**

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

### **Acknowledgements**

#### *Funding 2008-9*

The Crown Estate  
Historic Scotland

#### *Assistance*

Brian the Merkister Ghillie  
Richard Bates  
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Captain Billy Sclater  
Scottish Natural Heritage  
Fiona Stewart  
Stephen Watt of Historic Scotland