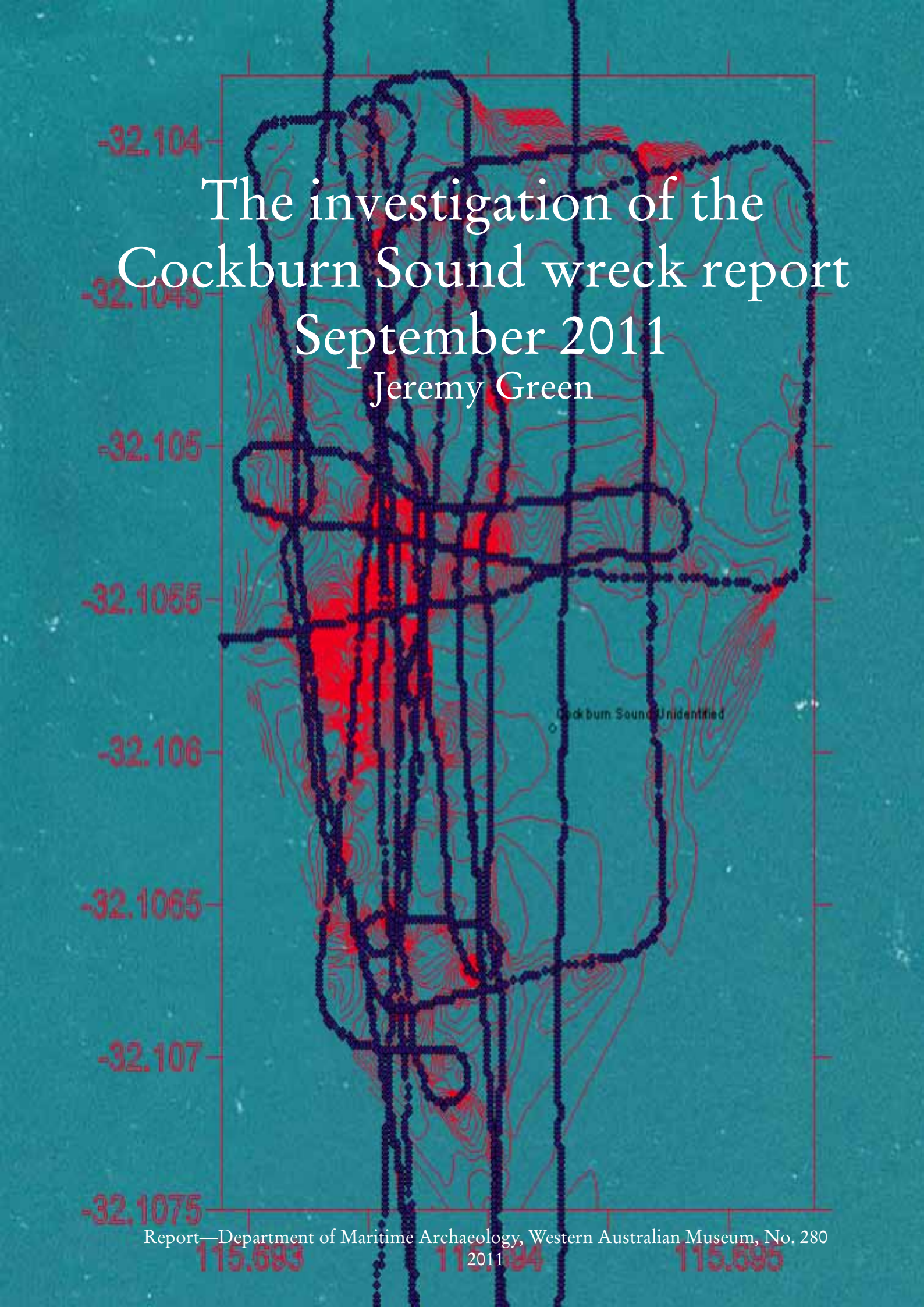

The investigation of the Cockburn Sound wreck report September 2011

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Introduction

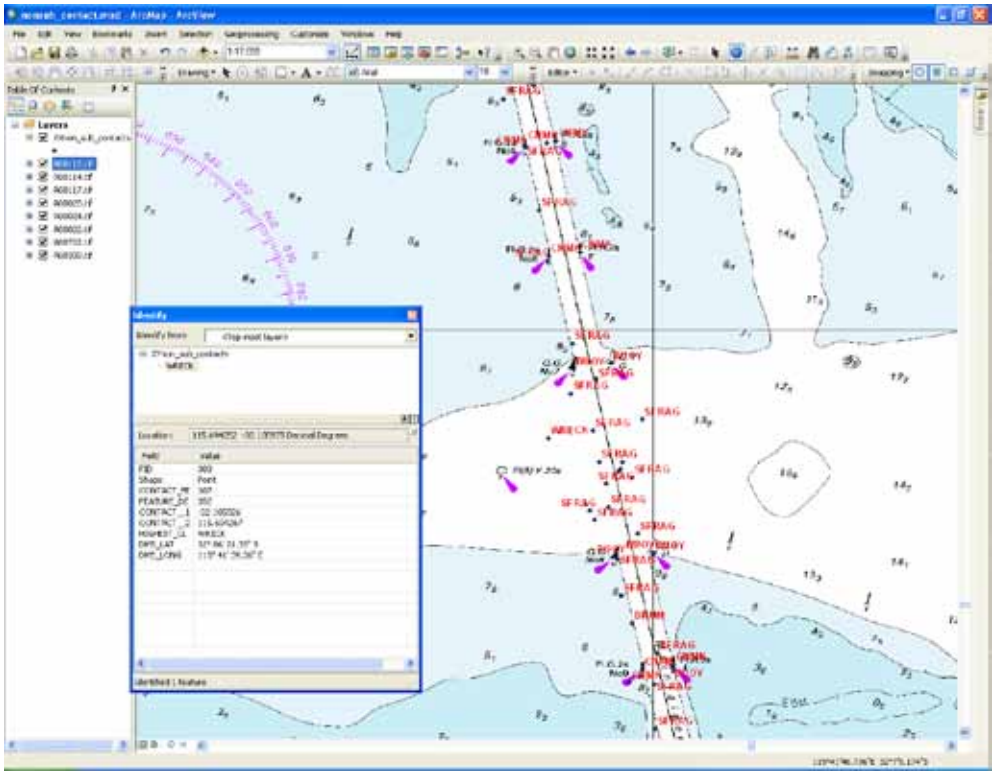

Figure 1. The report from Hydrographic Department showing wreck location.

On 19 August 2011 the Department of Maritime Archaeology received an email from Mrs Anne Hoogvliet from the RAN Hydrographic Department providing information on a possible wreck site in Cockburn Sound. The report was of a Nonsub contact picked up by mine warfare pre 2008 (Figure 1). The site lies about 300 m west the centre of the deep-water channel between Success Bank and Parmelia Bank in about 15 m of water.

September 2011 remote sensing

On 13 September a team (Ross Anderson, Patrick Baker, Csilla Ariese and Jeremy Green) was mobilised to investigate the site using the Department's workboat Seaspray. A side scan sonar (Marine Sonic Technology (MST) dual frequency (600/1200KHz) and a magnetometer (Marine Magnetics Explorer overhauser system) were utilised for the investigation. Initially survey lines were run in a north south direction

using the side scan sonar. No discernable wreck targets were noted, although the side scan sonar indicated a rather broken up ground with sea grass beds to the west of the survey area (Figure 2). As there was no obvious wreck site the magnetometer was deployed in conjunction with the side scan. A number of magnetic anomalies were located in the area. The total survey distance was 4 km.

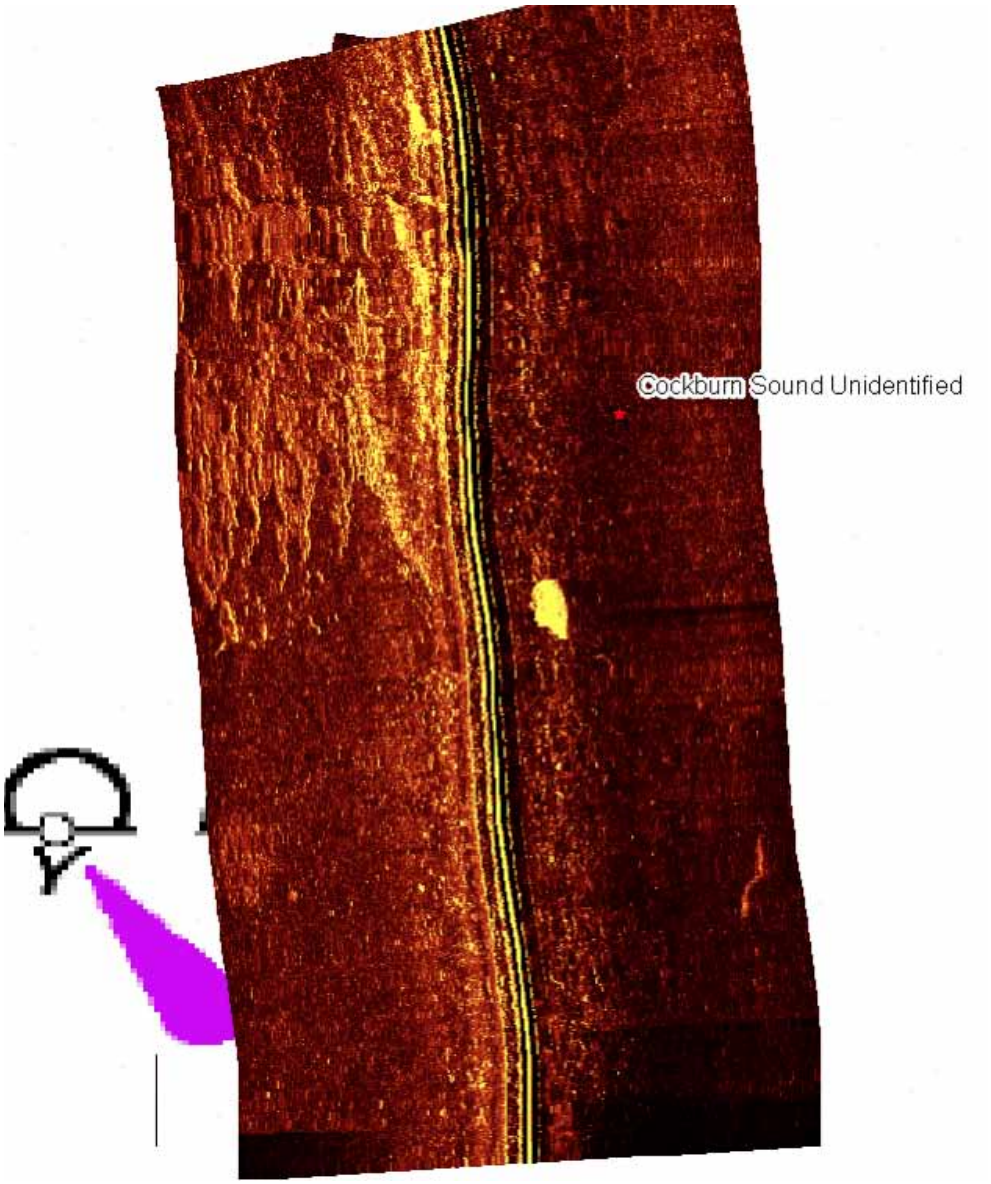

Figure 2. Side scan sonar image showing position of site, sea grass beds to west or reported position. The bright yellow target in centre of image is a school of fish. The centre line is the track of the vessel.

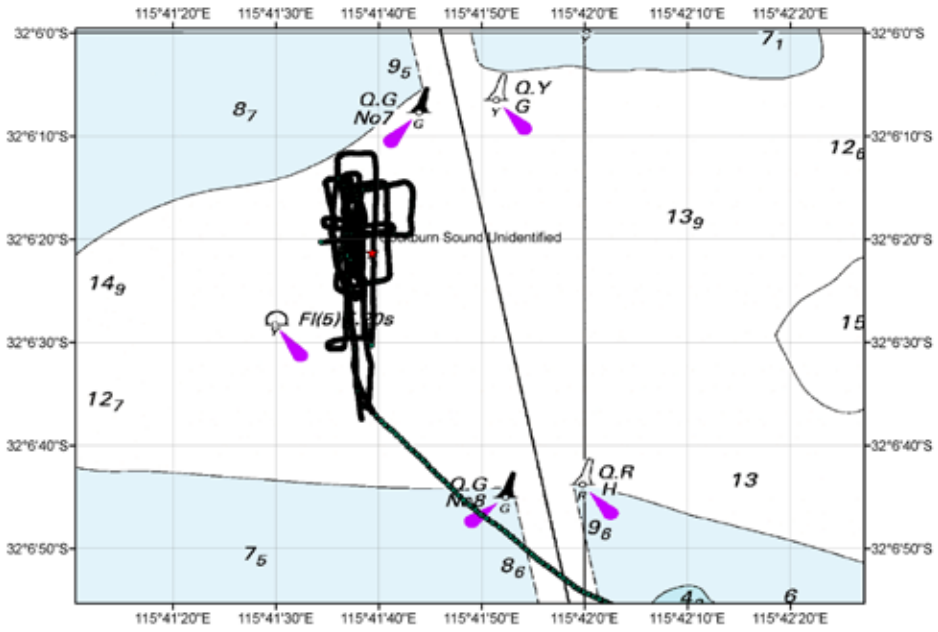

Figure 3. Track of survey.

Post Processing

Three sets of data were collected using the SeaScan software: vessel track; sidescan images and magnetometer data.

Track

The track of the survey was extracted from the MST survey file in an Excel spread sheet. Incoming data to the MST SeaScan software includes GPS position, magnetic data from the Marine Magnetics magnetometer and the side scan images. The magnetic and GPS data is incorporated in the survey file, so that the Latitude and Longitude together with the absolute magnetic field strength is captured. Since the latitude and longitude data is recorded as DDMM.SSSSSS it is necessary to recalculate this to DD.DDDDDDDD, which is a simple Excel calculation. This data is the saved as a .dbf file and the track recorded on the GIS (See Figure 3).

Side Scan

The MST sidescan image files were converted to geotiffs using the Group. exe program. This converts the .mst files into georeferenced images that

can then be layered on a GIS. A total of 22 usable files were georeferenced (see Appendix). These were then placed on the Department's GIS so that the area covered using the side scan could be seen (Figure 4).

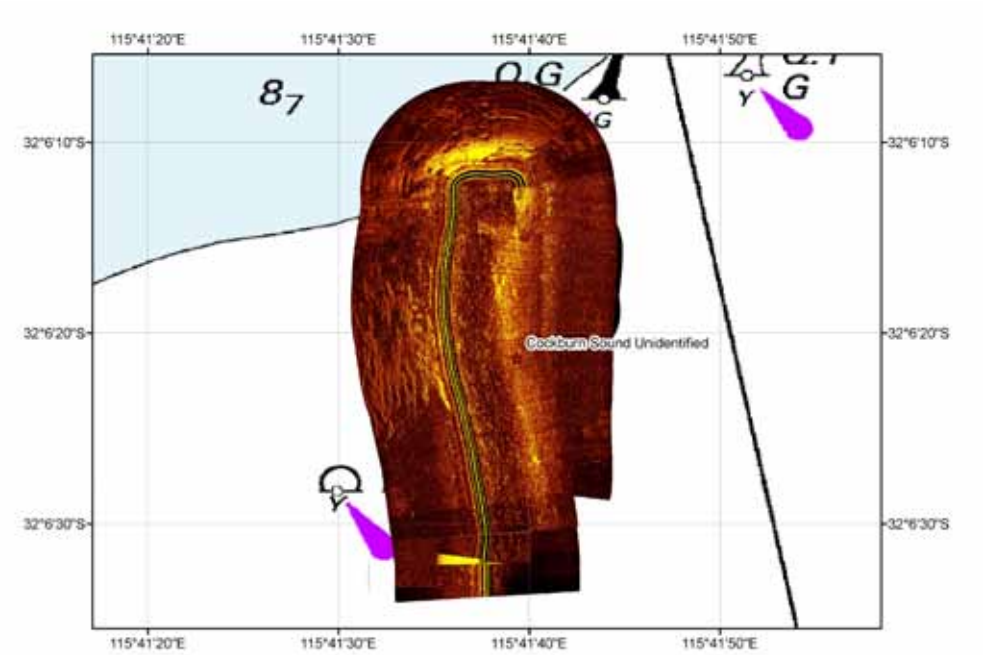

Figure 4. Showing the area covered by the side scan survey.

Magnetic data

The magnetic data was included in the survey file. However there are number of problems with working on the data. Although the SeaScan software provides location it is not the location of the detector but the location of the GPS antenna. The layback of the detector head therefore has to be calculated from the information provided by the track plot. With the coordinates shown in Figure 5 the position of the detector head is:

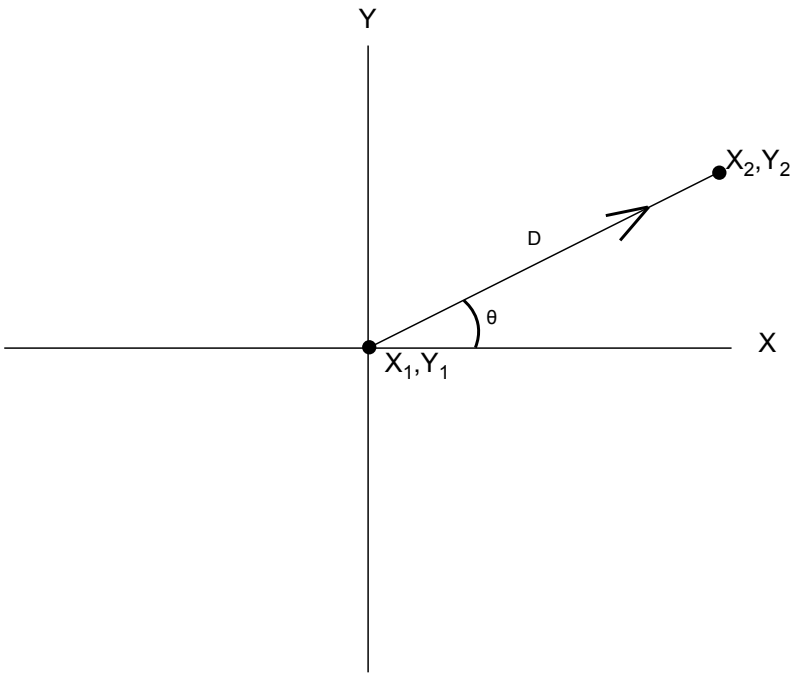

Figure 5. Coordinate system showing the positions, coordinates and angle discussed below.

Where X_1 and Y_1 are the starting coordinates, X_2 and Y_2 are the end coordinates, D is the distance travelled, θ is the Cartesian angle (θ =90– Course Angle) and d is the estimated lay back. All distances are measured in decimal degrees.

$$X_2 = X_1 + (D - d) * Cos(\theta)$$

$$Y_2 = Y_1 + (D - d) * Sin(\theta)$$

where $\theta = \tan^{-1} \dfrac{(Y_2 - Y_1)}{(X_2 - X_1)}$

and $D = \sqrt{(X_2 - X_1)^2 + (Y_2 - Y_1)^2}$

Using this equation, it is possible to calculate the position of the towed detector head.

The resulting table of points, with the associated magnetic field intensity is then processed to produce a contour plot of magnetic field intensity (see Figure 6).

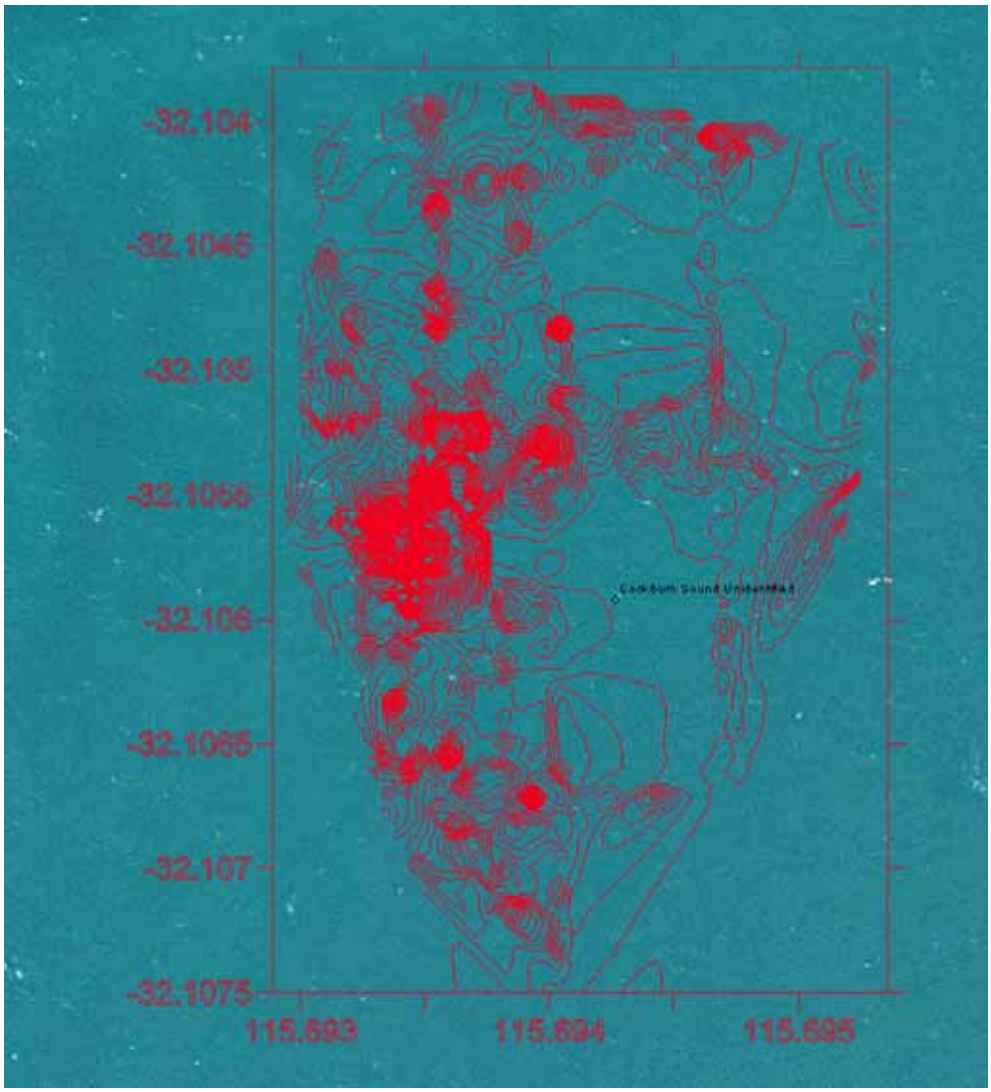

Figure 6. Magnetic field intensity plot of the area, showing a large and scattered array of magnetic anomalies.

Conclusions

It can be seen that the area is a complex magnetic target. The centre of the area is some distance away from the Hydrographic Department report. It is unlikely to be a wreck because the area of the main magnetic target is too large. It is possible that it is a dump site of some sort, either chain or other material related to the buoying of the navigation channel, or, possibly, part of the old Second World War anti-submarine net (Carter and Anderson, 2010). Further investigation is required.

References

Carter, M. and Anderson, R., 2010, Cockburn Sound's World War II anti-submarine boom net. Historical background and site inspections. Report—Department of Maritime Archaeology, Western Australian Museum No. 252.

Appendix: Side scan GeoTiffs