

The 2012 Bunbury Jetty Survey

Report prepared for City of Bunbury

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INTRODUCTION

In March 2012 the Department of Maritime Archaeology was contacted by the City of Bunbury advising that the Bunbury Timber Jetty was planned to be deconstructed. In the scope of works, it was suggested that a side scan sonar and magnetometer survey should be included. It was agreed that the Department would conduct a survey to examine what features were significant before the work took place and to support the maritime archaeological watching brief.

On 1 May 2012, a survey was undertaken of the jetty area. The results showed that there was significant geomagnetism in the area that would make a magnetometer survey difficult. The geomagnetic effect is a result of the underlying geology that has some from of residual ferromagnetism which could be due to old geological watercourses or ferromagnetic igneous rock or basalt. In addition, the presence of a large bulk carrier on the adjacent Number One wharf added to the magnetic problems. Thus the magnetometer survey was abandoned. However, the side scan survey was extremely productive and the conditions on the day were perfect, resulting in high resolution images of the jetty structure and surrounding area.

THE SCOPE

Following discussions with the City of Bunbury on the scope of works for the Bunbury Jetty, the Department recommended that pre-disturbance survey be carried out consisting of a surface survey of the seabed to identify any concentrations of artefacts, features, underwater jetty features and any wreck sites. The *Laughing Wave* is recorded to have been wrecked against the jetty in 1903 and this will be protected by the Commonwealth *Historic Shipwrecks Act 1976*.

THE EQUIPMENT

The Department of Maritime Archaeology has a Marine Sonic dual frequency (150/600 KHz) side scan sonar, a Marine Magnetics Explorer magnetometer and an OmniStar satellite-based Differential Global Positioning System (GPS). The electronics for these systems is mounted in a custom-built unit that can be mounted and demounted from the department's work-boat *Seaspray*. In general, the side scan fish is deployed midships on the vessel from a davit and the magnetometer is attached to the side scan a few metres distance behind, thus avoiding any magnetic interference from ferrous material in the side scan fish. Usually, the detector heads lie some distance behind the GPS system on the vessel so that lay-back (the difference in the position of the recording system in relation to the GPS position) has to be taken into account. In the Bunbury Jetty survey, as the water was shallow, the side scan–magnetometer were deployed a few metres below the vessel, so that lay-back was negligible.

The side scan sonar has a resolution which varies with the frequency used. At 150 KHz, the sonar has a range of about 750 m, giving a total swath of 1.5 km on either side of the fish and a resolution of around 200 mm. The 600 KHz frequency gives a range of about 75 m with a resolution of around 20 mm (for example it was just possible to resolve the mooring lines for the surface bund (see Figure 1). The side scan sonar produces a trace of the seabed (referred to as a waterfall display) which is effectively an acoustic map of the sea-bed. Since the display is integrated with the GPS system it is possible to measure items on the trace, and in certain circumstances measure the height of an object on the sea-bed.

The magnetometer, as it turned out, was not practical to use on the Bunbury Jetty Survey. Within the first few minutes of operation it was found that there were large geomagnetic anomalies in and around the jetty. In addition a large bulk carrier, *BBC Zarate*, which was anchored on the modern Berth 1 to the north-west of the jetty that created an additional magnetic signal (Figure 1). Subsequently, the Geoscience Australia website <www.geoscience.gov.au> was consulted and it was found that the region has a considerable amount of geomagnetic variation (Figure 2).

THE SURVEY

It was immediately obvious that the survey was going to be limited by a floating bund (Figure 3), designed to contain any material that became unattached from the jetty, that otherwise would become a navigation hazard. There was a small entrance that allowed access to the area between the bund and the jetty, so it was decided to first carry out a broad survey around the jetty on the outside of the bund and then enter the inside area and carry out a survey closer to the jetty.

The survey started on the west side of the Bunbury Jetty with a test of the operating system. At this point it was realised that the magnetometer was not going to be of any use, due to the geomagnetic anomalies, so it was retrieved and the operation continued using only the side scan sonar.

Features recorded on the survey are related to the bent number starting at the beginning of the jetty (see Figure 3 and Figure 4).

First sonar run (MST 001 and MST003–005, Figure 65 and Figure 56)

With the side scan operating in a dual channel mode 75 m on either side of the towfish, the top half of the west side (Figure 65) and the whole of the east side (Figure 56) of jetty was surveyed with side scan. It should be noted that the side scan image showed a large amount of scouring on the west side of the jetty, possibly due to dredging of the Outer Harbour around Berths 1 and 2.

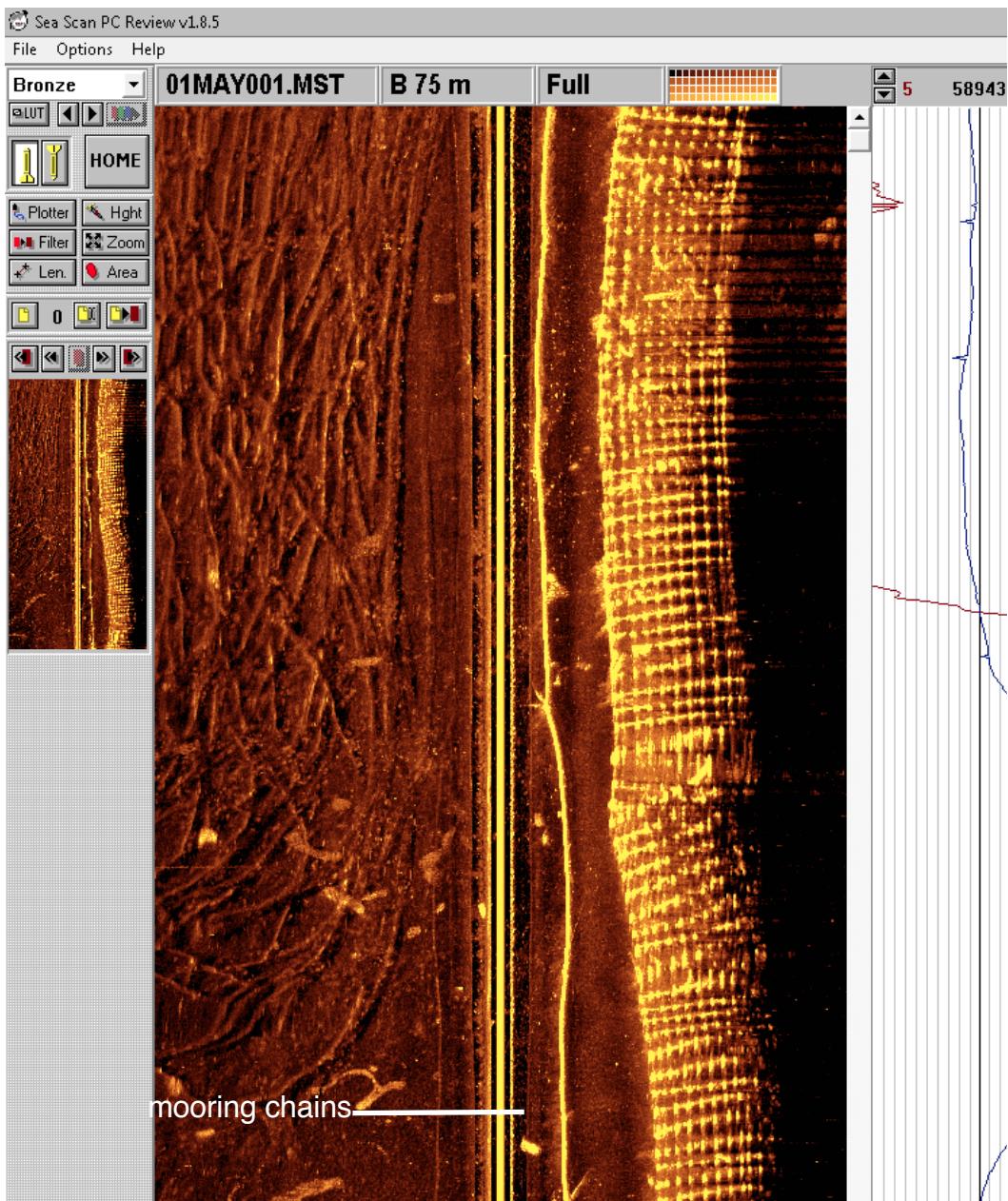


Figure 1. Marine Sonic side scan sonar interface showing sonar waterfall and on the right hand side the magnetometer trace, showing the large magnetic anomalies over large distances.

Second sonar run (MST 006–009 and MST 010–014)

For some reason this particular run contained a high level of noise which could have been acoustic or electromagnetic. These files were therefore not processed as they were virtually useless.

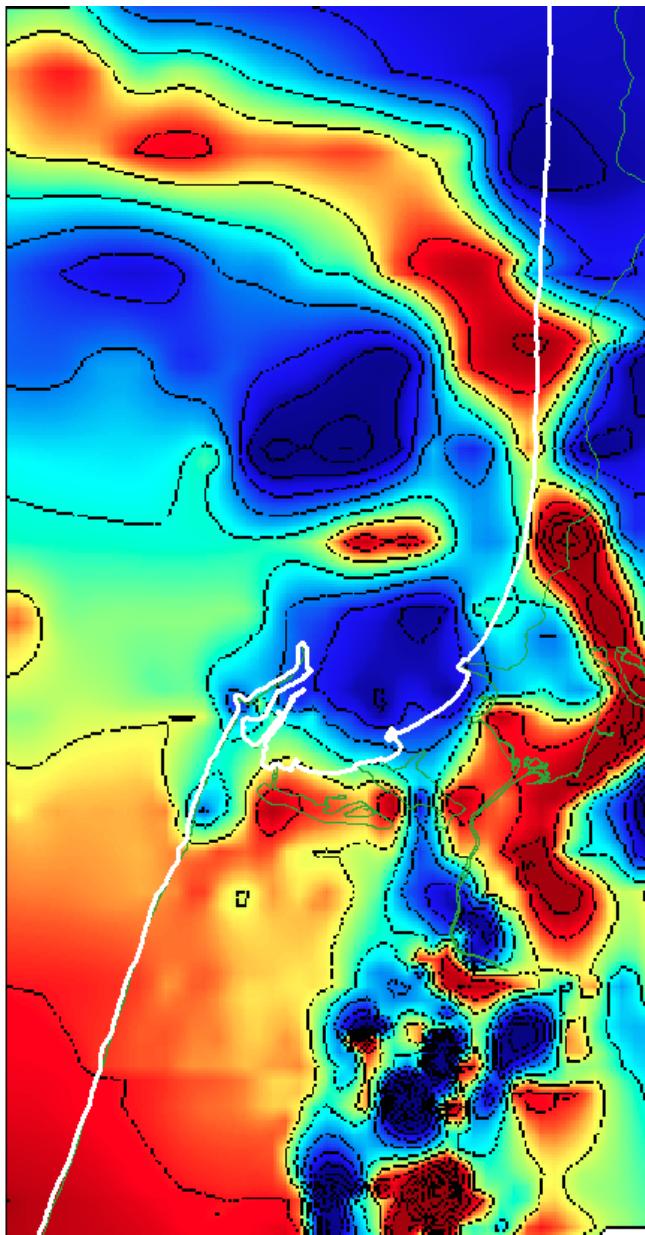


Figure 2. Magnetic field intensity map centred in the Bunbury region (data source Geoscience Australia).

Third sonar run (MST 015–020 and MST 021–024, Figure 7 and Figure 8)

Run MST 015–020 (Figure 7) was a single channel run along the west side of the jetty in a northerly direction, inside the bund. It shows the jetty bents quite clearly and parts of the bund on the east side that have not been shadowed by the jetty bents. At 81 m from the start of the jetty on the west side around bent 21.

The run MST 021–024 (Figure 8) was a single run on the east side of the jetty running south. This trace showed debris lying on the seabed along most of the

east side of the jetty from the start of the jetty up to Bent 90, particularly between Bents 40 and 90.

Fourth sonar run (MST 026–029, Figure 9)

This was a single channel run in a northerly direction on the east side of the Jetty (Figure 9).

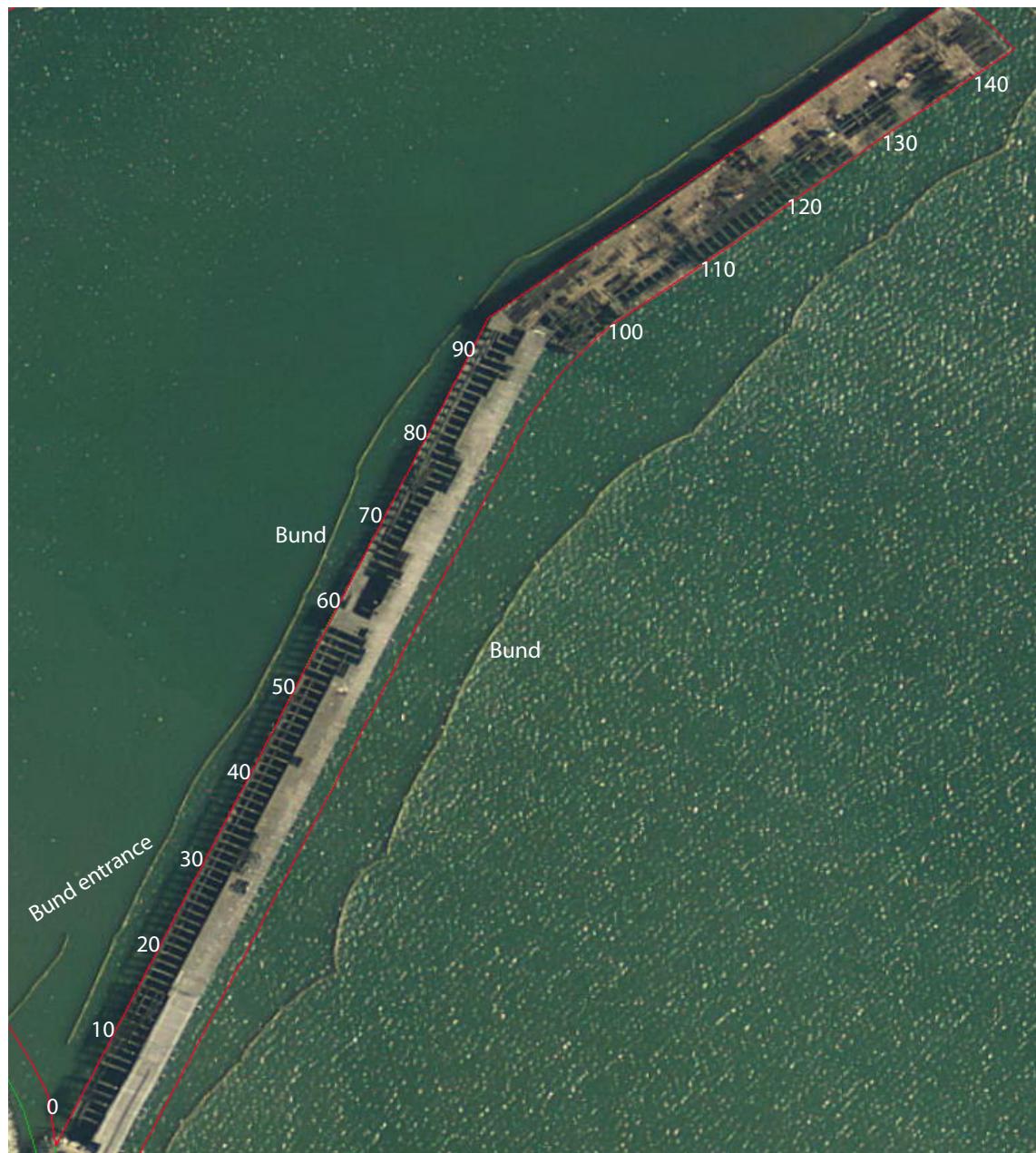


Figure 3. Jetty showing bund and bent numbers used in reference to targets on survey.

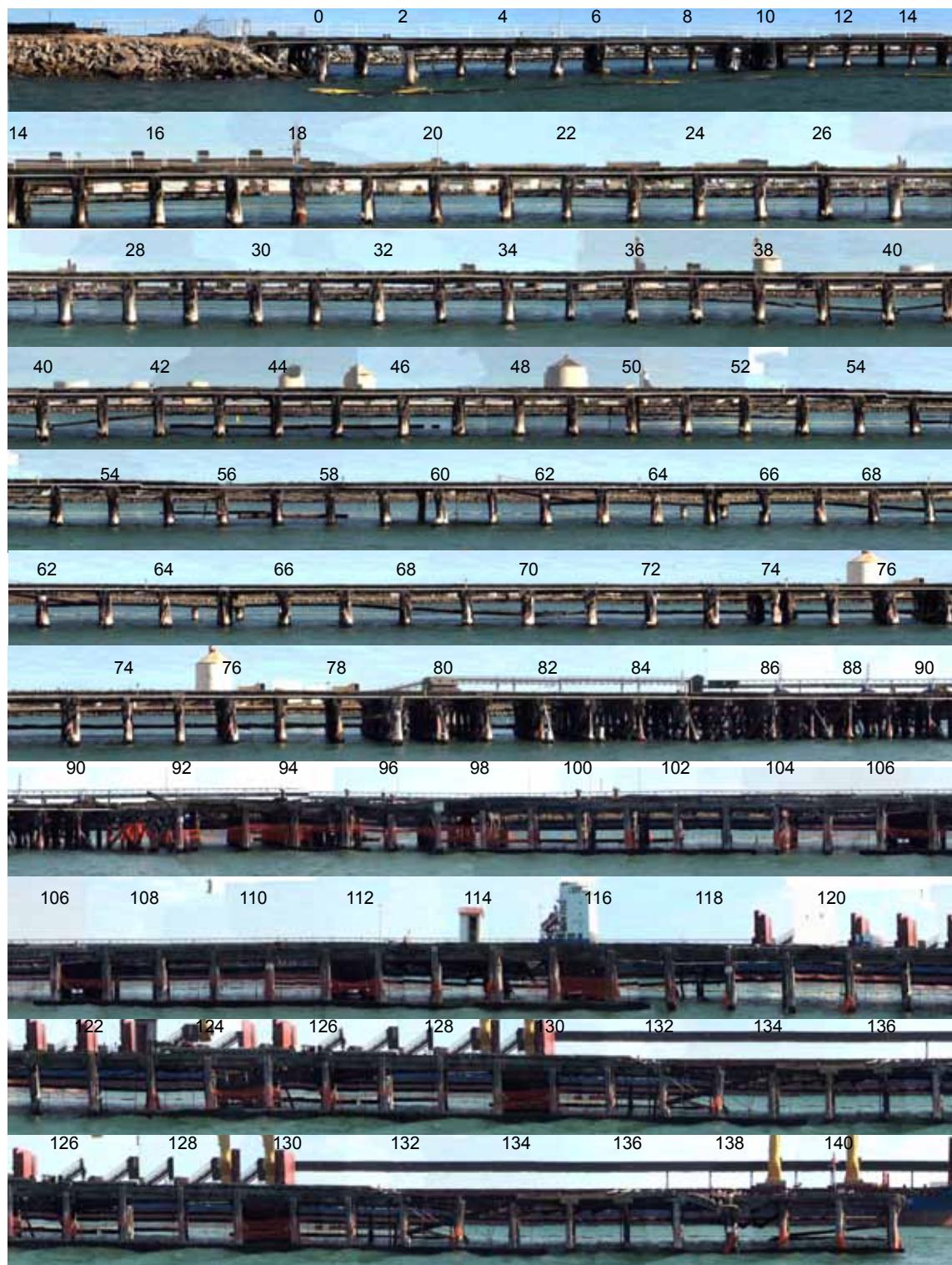


Figure 4. Ortho photograph of the east side of jetty with bent numbers.



Figure 5. Second part of first survey of the east side of the jetty (MST 003–005).

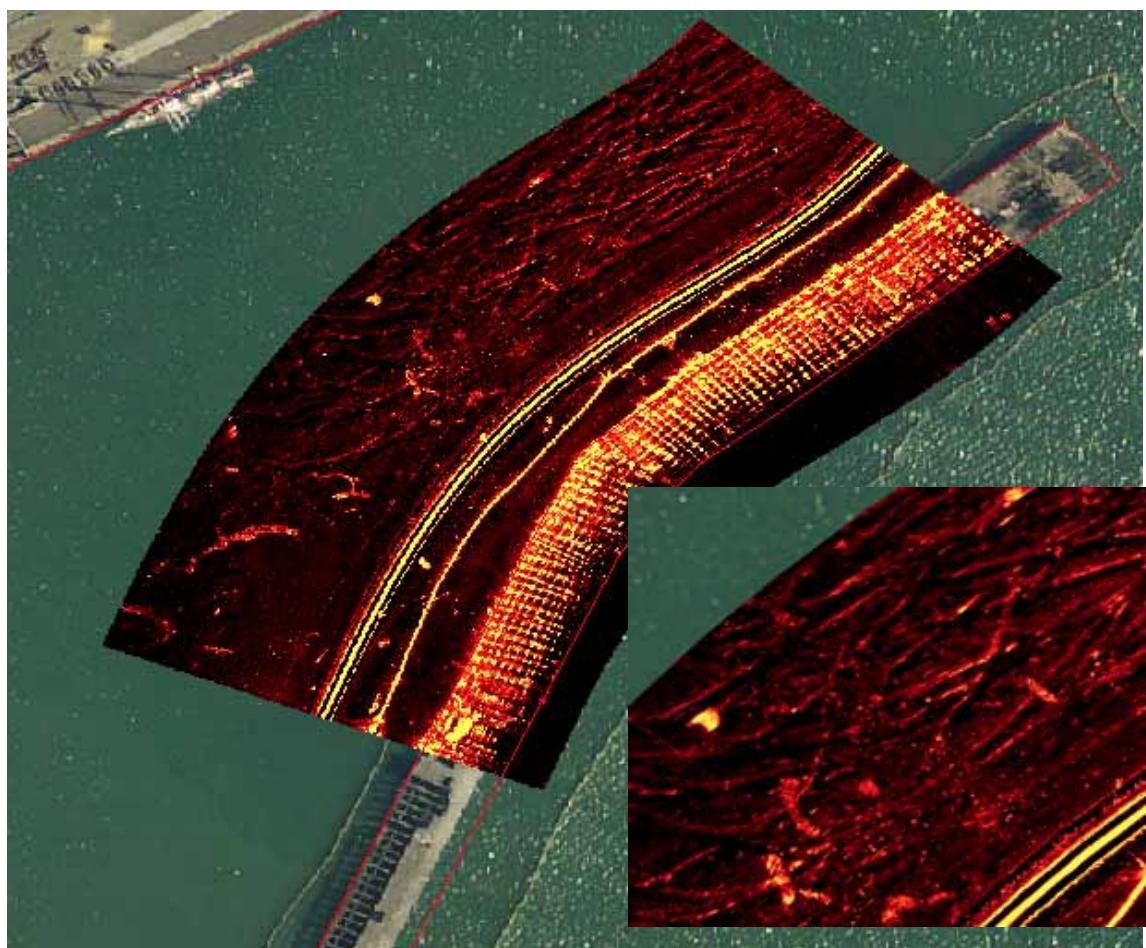


Figure 6. First part of survey 1, the top half of the west side of the jetty, showing the bund and the jetty bents (MST 001) together with the scouring possibly due to dredging. (Insert show an enlargement of the scouring).

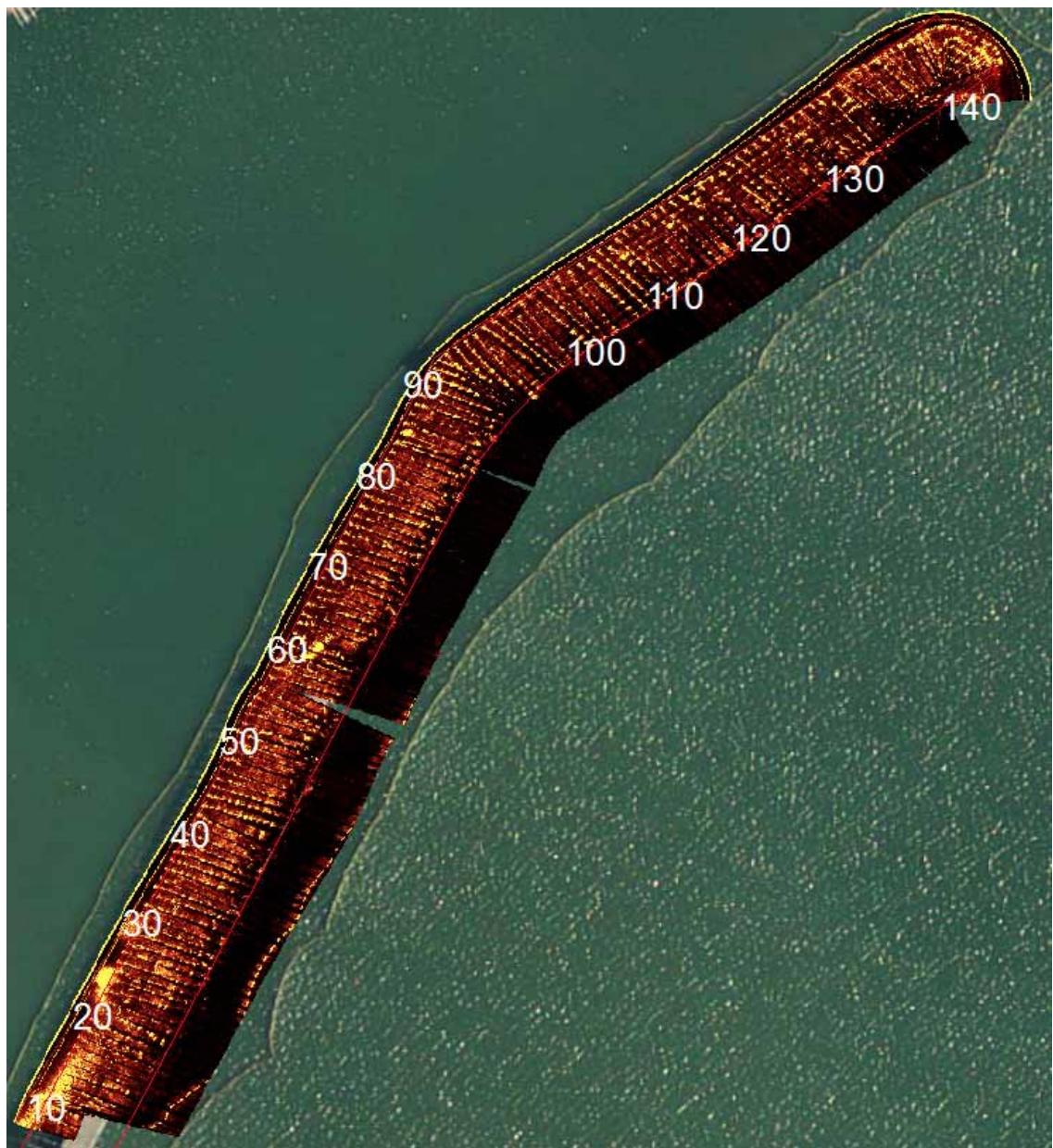


Figure 7. Third sonar survey run MST 015–020.

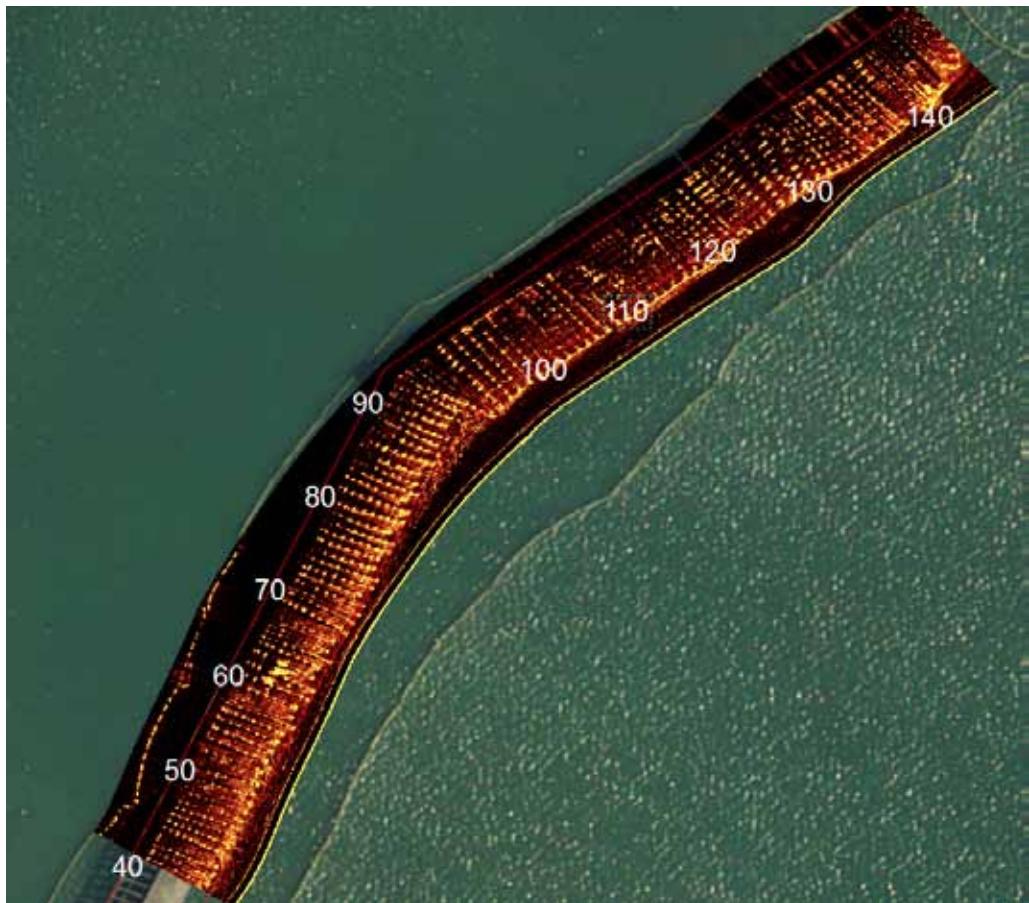


Figure 8. Third sonar survey run MST 021–024.

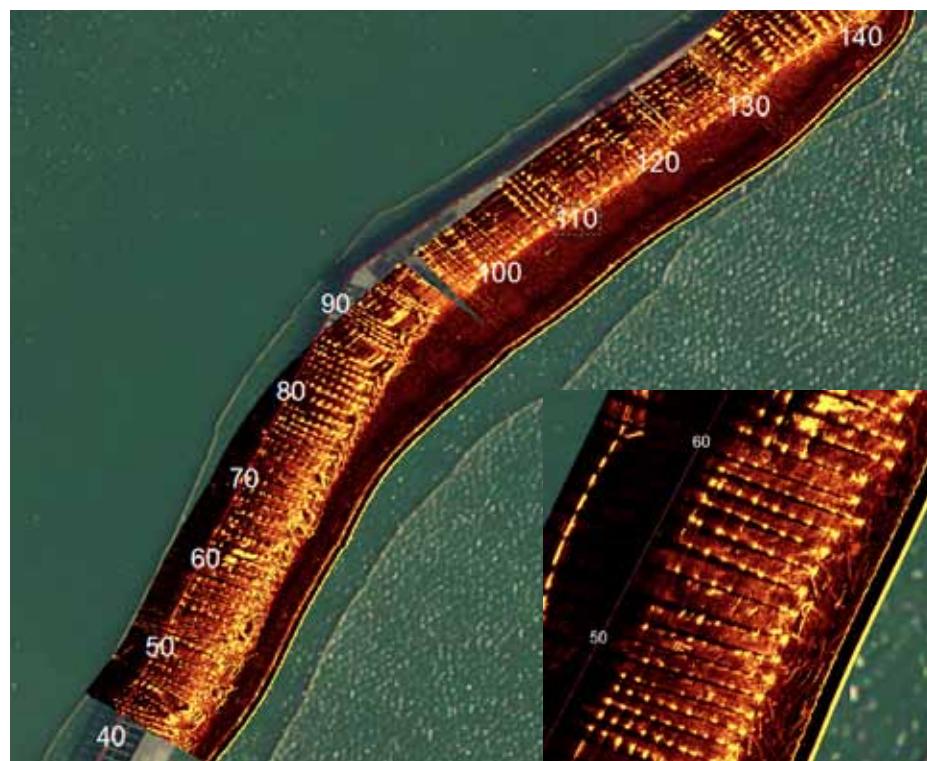


Figure 9. Fourth sonar run (MST 026–029), insert shows details of debris.

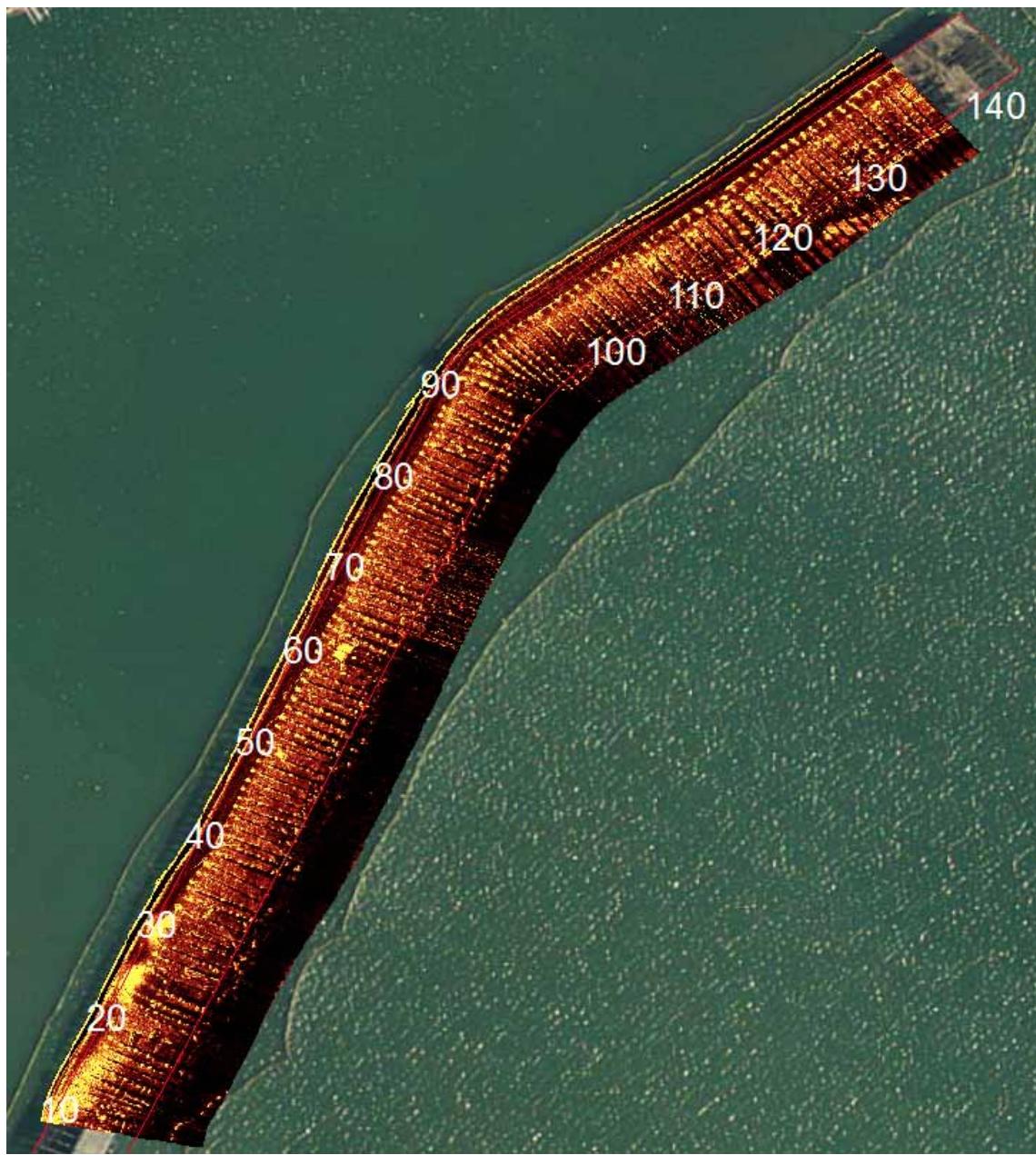


Figure 10. Fifth sonar run (MST 031–035).

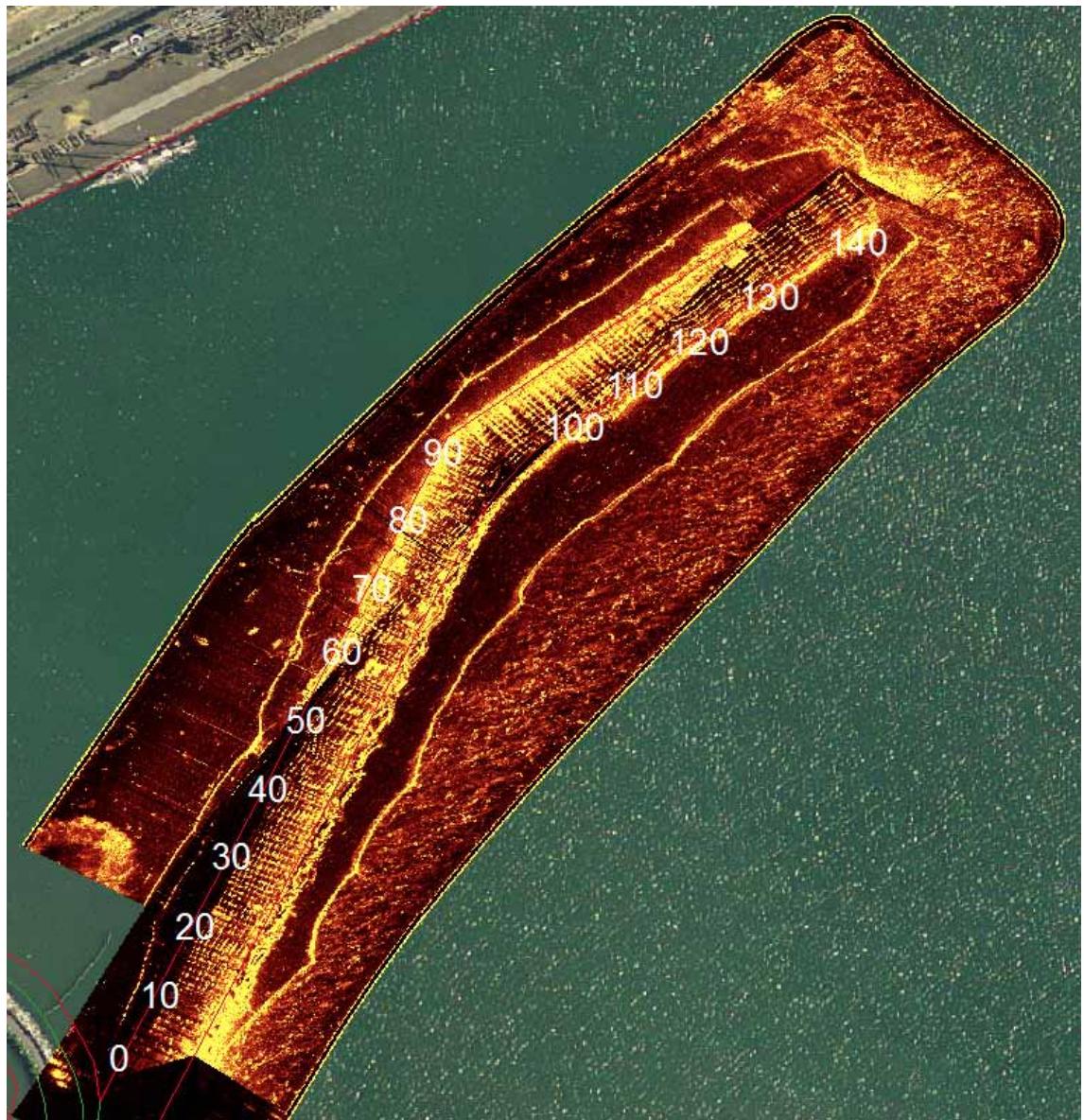


Figure 11. Sixth sonar run (MST 037–043).

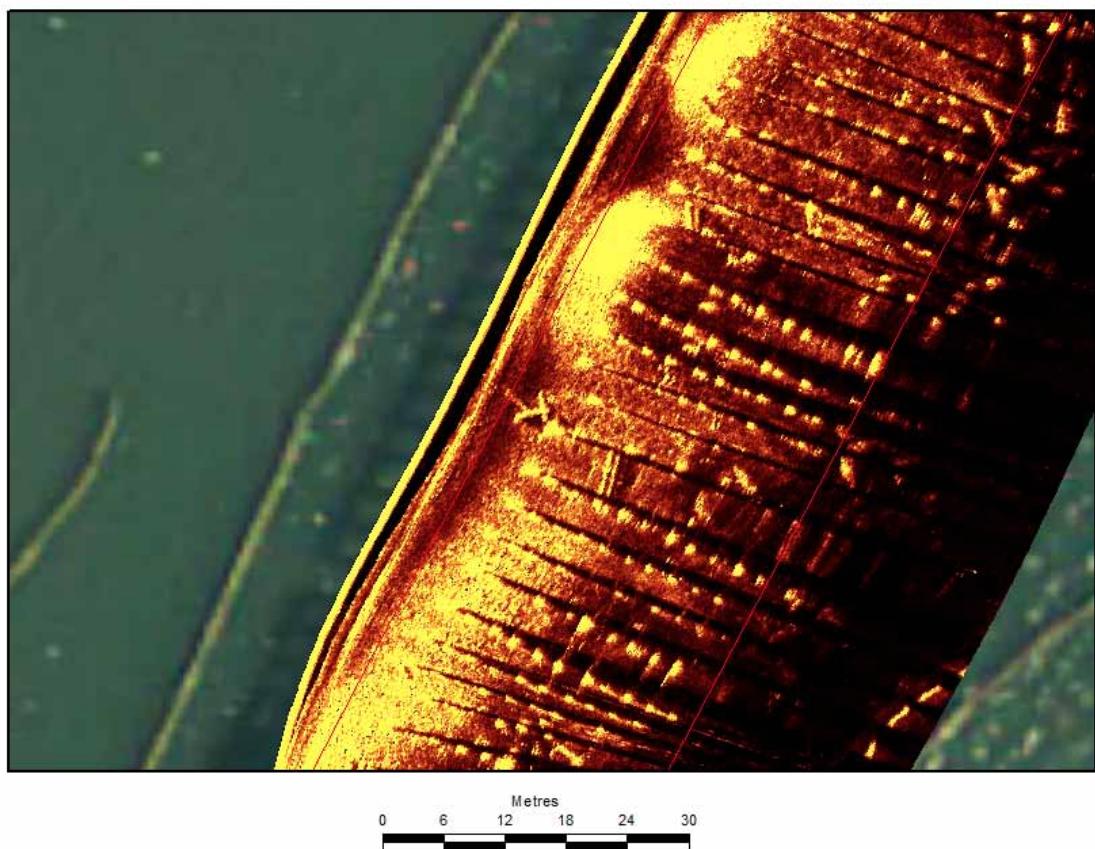


Figure 12. Unusual feature at Bent 22, possibly dolphins.

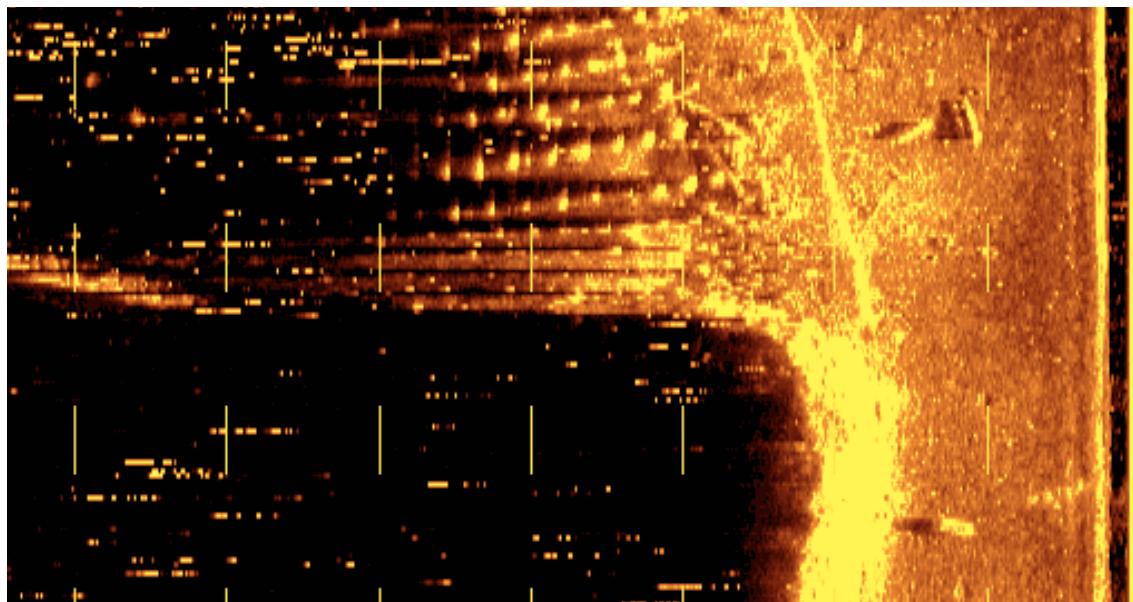


Figure 13. Probably 3 dolphins, these could be the same seen later in the survey (see Figure 12). These features are clearly something swimming in the water column because the acoustic shadows are separated from object this indicating they are not features on the seabed.

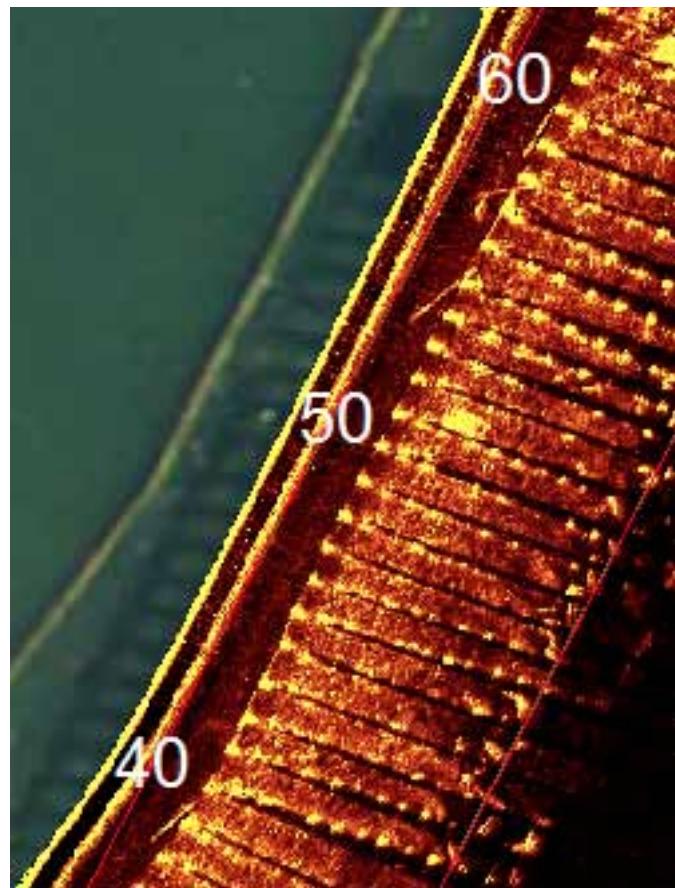


Figure 14. Submerged bents at Bent 39, 54 and 57. Piles are about 5 m long.

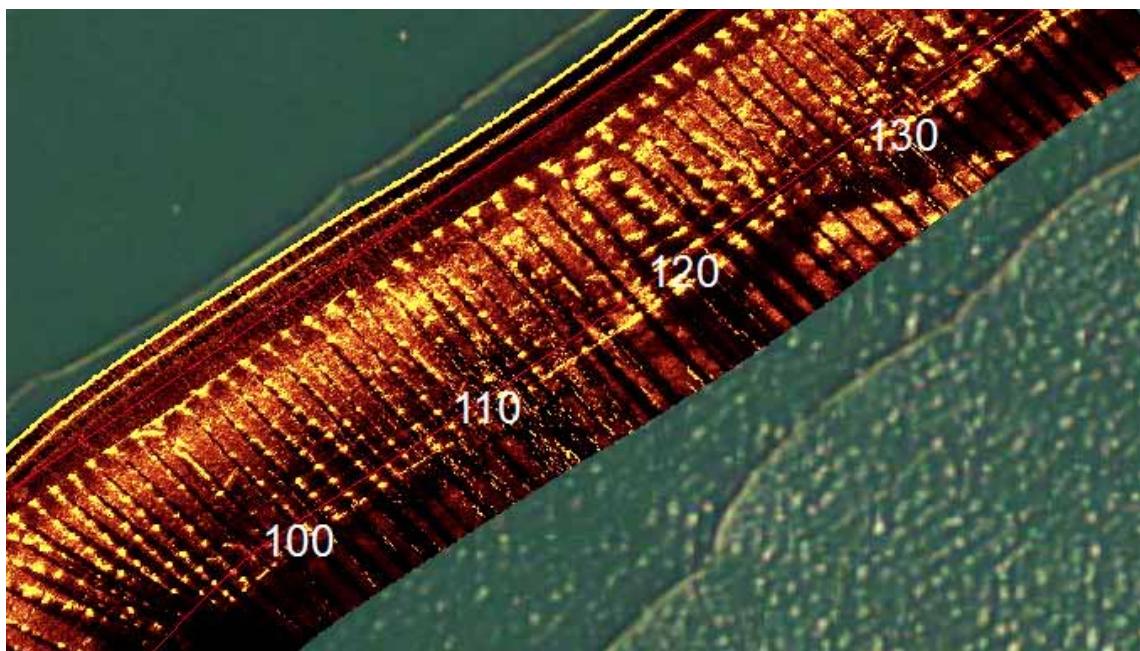


Figure 15. Submerged piles at Bent 99, 110, 125 and 134.

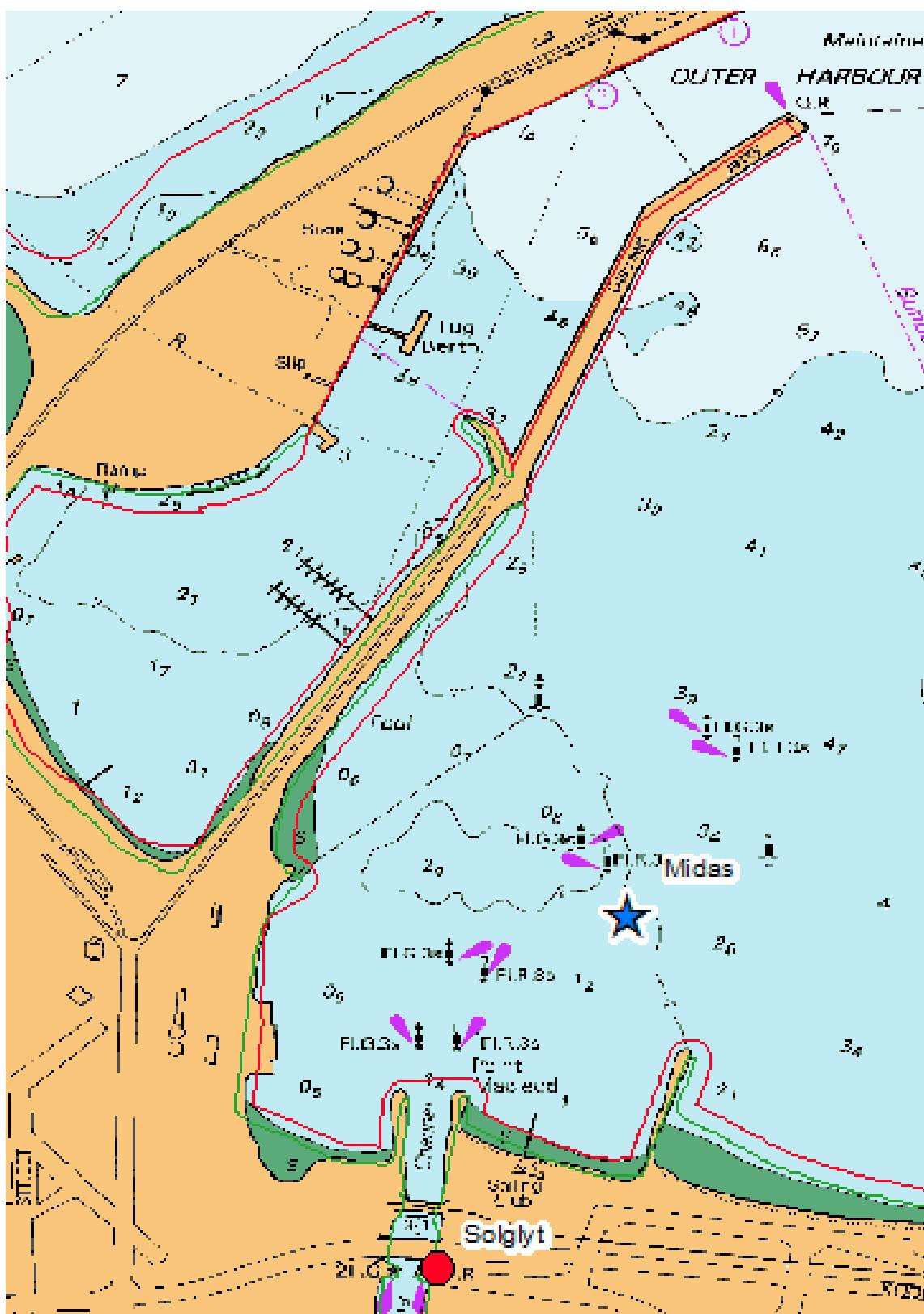


Figure 16. Chart showing position of the wreck of the *Solglyt* in relation to the jetty.



Figure 17. Aerial photograph taken in 2004 showing the location of the *Midas* wreck site, the anchor scours from yacht moorings and the old Bunbury Jetty. (Image courtesy of Landgate).

Fifth sonar run (MST 031–035, Figure 10)

This was a single channel run in a southerly direction on the west side of the jetty (Figure 10). This showed a number of unusual features including one at Bent 22 (Figure 12), possibly dolphins seen in Run 1, MST 003–005 (Figure 5). In addition, submerged bents, about 5 m long were noted at Bents 39, 54, 57, 99, 110, 125 and 134 (Figure 14 and Figure 15).

Sixth sonar run (MST 037–043, Figure 11)

This was a single channel run in a clockwise direction around the jetty (Figure 11), the three objects could possibly be dolphins that were observed earlier on the east side of the jetty near the junction with the solid rock groyne (MST 003–005).

ARCHIVAL INFORMATION RELATING TO THE *LAUGHING WAVE*

The *Laughing Wave* was reported to have foundered on the Bunbury Jetty after it broke adrift from the south berth and drifted onto the wreck of the *Solglyt*. The *Solglyt* had been lost in 1901 and was uncovered in 1973 during dredging operations for a southern cut near Point MacLeod, now Koombana Channel (McCarthy, 1982).

It has been suggested by Henderson (quoted in McCarthy, 1982: 60) that: 'Six months after the *Solglyt* was wrecked the purchasers of the wreck were ordered to remove the wreck or it would be blown up. It seems likely that the site found had been removed from elsewhere, as there is no sign of the other side of the vessel, or of the superstructure, or even the keel. Possibly a lighter towed one side of the *Solglyt* inside the estuary to be beached (as a local resident, Mr Smithall, was told by his father).'

It seems therefore that the site shown in Figure 16, is not the site of the wreck of the *Solglyt*.

The West Australian Monday 31 August 1903

SHIPPING CASUALTY AT BUNBURY FOUNDERING OF *LAUGHING WAVE*.

Disastrous effects have long been predicted as the result of the unprotected state of the jetty and the climax has at last arrived in the foundering of the schooner *Laughing Wave*, which occurred early this morning. The schooner arrived from Fremantle on Thursday and was placed in the south berth. During the heavy weather which prevailed that night, she parted with her port cable, drifting on to the *Solglyt* wreck, she lost her rudder. She was brought back to her berth again; and the whole of yesterday she appeared to be fairly snug. Last night, however; she bumped heavily against the jetty, and, about 3 o'clock this morning, it was found that she was leaking badly. All hands were called to man the pumps, but, notwithstanding the most strenuous efforts made to keep the water under, she was seen to be rapidly foundering. About 6 o'clock the steam pump of the tug *Dunkskey* was called into requisition, but any assistance which might otherwise have been, rendered from this source was by that time too late, as she had then completely foundered, and was resting on a rough rocky bottom. The actual amount of the damage to the vessel is as yet unknown, seeing that she is almost completely under water, but it is supposed that in bumping against the jetty she sprung her butts.

All was excitement on the jetty this morning. A large crowd of spectators stood watching the operations of the men on board who were working like Trojans to relieve the vessel of weight, hoisting out large tanks of malt and other heavy substances. The work was of anything but a pleasant nature, some of the men being over their waists in water. The vessel rolling heavily all the time, it was not an easy matter for them to retain foothold; in fact; one man received a couple of immersions through losing his balance and falling over the side. The *Laughing Wave* is a very old wooden schooner, and was brought here for the purpose of loading timber for Geraldton. In consequence of the rough state of the rock on which she is resting, it is doubtful whether it

will be possible to raise her successfully, as there is a danger of the bottom of the vessel being too seriously damaged.

The West Australian Tuesday 1 September 1903

THE FOUNDERING OF THE *LAUGHING WAVE*. SALVAGE OPERATIONS. Bunbury, August 31. Capt. Arundel, of Fremantle, representing Lloyds' underwriters, arrived in Bunbury last Saturday night to inspect the submerged schooner *Laughing Wave*. He made an inspection of the vessel early yesterday morning, and decided to get a diver to work, so as to save as much of the cargo as possible. After that has been done, an attempt will be made to raise the schooner. A diver started work this afternoon. The chances of saving the vessel appear doubtful, as heavy seas washed over her all last night. It is feared that the knocking about that she received on the rocky bottom has sealed her fate. She had on board 29 tons of mixed cargo for this port, but, fortunately only a small portion of it is of a perishable nature. The *Laughing Wave* was owned by Messrs. Davis, Hankinson and Co., of Perth. She was valued at £750, and insured with the Australian Alliance Insurance Co. for £300. The cargo, which was shipped by Messrs. Denny Bros. and Lynn, of Fremantle, to various consignees at Bunbury, was valued at £1,000, and the whole of it was insured.

Western Mail Saturday 5 December 1903

THE SCHOONER *LAUGHING WAVE*.

Bunbury, November 30.

A start was made yesterday to raise the submerged schooner *Laughing Wave*, which, during the past three months, has blocked the south berth at the local jetty. With the aid of three donkey-engines on the jetty, the vessel was raised, and efforts were made to pump her out. Two pumps from the Government steamer *Penguin* and the local fire-engine were engaged in the work, but they were unable to keep pace with the inrush of water. The Chief Harbourmaster (Captain Irvine) has decided to skid the vessel off the rocky bottom on which she lies, and then to tow her out to sea and sink her.

SURVEY CONCLUSIONS

The survey showed that there was considerable jetty debris on the east side of the jetty and it is difficult to determine why this should be. On the west side of the jetty some individual large piles were seen on the seabed. The sonar survey showed that the resolution was acceptable, given it was possible to see the mooring lines for the floating bund. No evidence was seen of the *Laughing Wave*, although a brief archival research in the newspaper records of the time suggested that the

vessel was refloated and towed away from the jetty and disposed of. There was no other evidence of shipwrecks in and around the jetty, an unlikely event under the circumstances as any wreckage would interrupt the operations, which in its day was a busy jetty.

During the survey a brief sonar survey was undertaken to see if there was any evidence of the *Midas* lost in 1872 (Henderson, G. & K. 1988; Worsley, J. & P & Green, 2012). Unfortunately, the site (see Figure 16 and Figure 17) was in the middle of the yacht mooring area and the moorings and chains, together with the scouring of the sea grass by the scope of the chain made it extremely unlikely to show any evidence of the site.

RECOMMENDATIONS

1. It is suggested that on completion of the removal of the jetty bents a sonar survey be undertaken to determine if there is any further evidence of wreck sites or artefacts.
2. It is extremely likely that there will be a variety of artefacts jettisoned from vessels tied up at the jetty and items lost by the public. This has been the case with the old Fremantle Long Jetty and any future work should take this into consideration.
3. In addition, the old first Bunbury Jetty should also be surveyed. Its presence can be seen on aerial photographs (Figure 17).

REFERENCES

- Duivenvoorde, W. van, (ed.) 2011, *The 2009 WA Museum ALA Fellowship Placement: an archaeological survey and corrosion study in Geographe Bay*. Report—Department of Maritime Archaeology, Western Australian Museum, No. 250.
- Henderson, G. & K., 1988, *Unfinished voyages: Western Australian shipwrecks 1851–1880*. University of Western Australia Press, Nedlands.
- McCarthy, M., 1982, Koombanah Bay shipwrecks. Report—Department of Maritime Archaeology, Western Australian Museum, No. 19.
- Worsley, P. & J., 2012, *Capes of Sunset, Western Australia's maritime heritage between Peel Inlet & Flinders Bay*. Australian National Centre of Excellence for Maritime Archaeology, special publication No. 15.