

# Luray Victory and the SS Ira: Identification and Deterioration of Wrecks on the Goodwin Sands

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*The Goodwin Sands has long been a major navigation hazard. Several previous projects have been undertaken to document the many shipwrecks in the area, and this study furthered this effort by utilizing recent bathymetric surveys to update the wreck database created during the English Heritage AMAP2 project. The bathymetric data was analyzed to independently confirm the presence of known wrecks and locate previously undocumented ones. Two wrecks listed in the AMAP2 database, the SS Ira and the Luray Victory, were flagged as potentially misidentified, and alternate identifications of the related wrecks were discussed. The rapidly changing geomorphology of the Goodwin Sands was also investigated to determine the extent of its effects on wreck sites in the area.*

## Introduction

The Goodwin Sands has long been an important maritime location, and its capacity for preserving shipwrecks has made it a major resource for archaeologists. Understanding the bank's patterns of sediment transport is crucial in predicting threats to sites due to exposure. This project used recent bathymetric and hydrodynamic data combined with previous known wreck databases to assess the vulnerability and archaeological potential of visible wrecks in the area.

## Background

The Goodwin Sands consists of a pair of sandbanks, which combined measure 14 km long and 8 km wide (Figure 1). The formation lies between 4 and 8 km off the coast of Kent (Larn and Larn 1995b) and acts as a breakwater for The Downs, a channel that runs between the Goodwins and the mainland. The Goodwin Sands' bank structure is simpler than most sandbanks in the region, which allowed geologists to begin modeling and predicting its movements as early as the 1950s, when R. L. Cloet (1954) determined that the banks follow a general pattern of counterclockwise rotation, with the northwest arm of the bank moving shoreward and the southern tip of the bank moving eastward. This rotation happens irregularly over centennial timescales, with occasional periods of reversal.

The area has a long history of significance to maritime activity, both good and bad. On the one hand, it acts as a barrier between the North Sea and the Downs, creating a sheltered harbor that has allowed the Thames Estuary and the Deal coast to become thriving regions for international trade (Redknap and Fleming 1985). On the other hand, its ever-changing shape presents a constant navigational challenge, leading to numerous wrecks over the years (Larn and Larn 1995b). Of

particular note is the area along the bend in the eastern margin of the South Goodwin bank, which acquired the nickname "Calamity Corner" in the early 1950s due to the large number of wrecks that occurred there within the span of a few years (Larn and Larn 1995b). Two of these wrecks were analyzed during this project.

The area's 16 ft. average tidal range is one of the

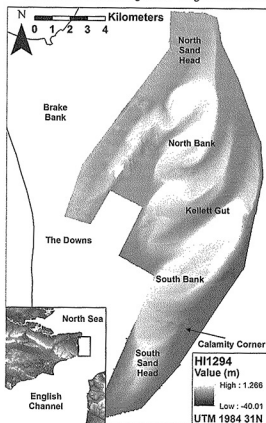


Figure 1. Overview map of the Goodwin Sands, HI1294 (Map by author, 2017; data from UKHO 2017).

largest in the world, and much of the bank uncovers at low spring tide (Larn and Larn 1995b). The large tidal range and strong currents around the Goodwin Sands create an extremely dynamic burial environment, which can be destructive to exposed shipwrecks (Bates et al. 2007). Studying the active site dynamics in the region is useful for prioritizing wreck sites in imminent danger of degradation for additional documentation and study. In addition, areas of erosion can be monitored for the emergence of previously undocumented wrecks.

## **Aims and Objectives**

The main aim of this project was to examine the site dynamics, both locally and regionally, affecting the wrecks on the Goodwin Sands and combine this with prior knowledge of the wreck record to create a comprehensive catalog of the wrecks in the area. In addition, this project aimed to determine whether any wrecks of archaeological significance in the area were in urgent need of archaeological investigation due to natural deterioration or other potential threats.

The goals of this project were achieved through examination of recent bathymetric datasets to assess the condition of visible wrecks on the Goodwin Sands, and through comparison of this data with historical information and shipwreck records to determine the historical significance of the located wrecks. Time-lapse analyses of the bathymetric datasets were also used to examine how the condition of the located wrecks have changed in the recent past, and how it may continue to change. This project followed from the recent English Heritage 'AMAP2 - Characterizing the Potential for Wrecks' project (AMAP2), which created a composite wreck database for the southeast coast of England, the most complete wreck record for the region compiled to date (SeaZone Solutions 2011a, 2011b).

## **Methodology**

### ***Data Collection***

This project focused on the use of available digital datasets, relying mainly on the AMAP2 shipwreck database; UKHO bathymetric surveys HI1294, HI1399, and HI1484; and DEFRA bathymetric survey number 235800. All bathymetric surveys were accessed through the United Kingdom Hydrography Office's public online data portal (United Kingdom Hydrography Office 2017). Hydrodynamic modeling analysis of the region output by the Managing Archaeological Cultural Heritage Underwater (MACHU) project was also analyzed. Additional historical information was acquired

from Richard and Bridget Larn's (1995a, 1995b) work cataloging the shipwrecks of the British Isles, as well as the online shipwreck database Wrecksite (2017).

All bathymetric surveys used in this project were collected with multi-beam sonar equipment, and all were originally projected in the WGS 1984 UTM Zone 31 coordinate system, except HI1484, which was originally projected in GCS EPSG 4326 (NATO Military Geodetic Surveying). All surveys used Admiralty Chart Datum for vertical reference. The data for survey HI1294 was collected in 2009, for HI1399 in 2012, and for HI 1484 in 2015. Prior to download, the HI1294 dataset had been binned at 2 m, while HI1399 and HI1484 had been binned with 1 m spacing. The data for the DEFRA survey was collected in 2014 and the dataset accessed for this project had been binned at 2 m.

The hydrodynamic modeling data consulted during this project included several GIS layers detailing bed level change and residual sediment transport vectors for the Goodwin Sands area under various wave and tidal conditions. This model was originally created to better understand of the dynamics affecting underwater archaeological site formation processes (MACHU Project Team 2008a, 2008b; Dix et al. 2008; Carrizales 2010).

### ***Data Processing***

The geographic information systems software ArcMap 10.4.1 was used for all interpretation of environmental datasets. Microsoft Excel for Mac 2011, v14.6.7 was used for accessing and analyzing the data in the AMAP2 shipwreck database.

Before analyzing the various bathymetric datasets, the HI1484 survey was reprojected from GCS EPSG 4326 into the WGS1984 coordinate system using the ArcMap Project Raster tool. Copies of the HI1399 and HI1484 surveys were resampled at a bin size of 2 m for more direct comparison to the other two surveys, but both 1 m- and 2 m-binned versions were considered during visual interpretation of the datasets. Where relevant, the finer-grained versions were used for locating and analyzing shipwrecks, as the increased level of detail allowed for more accurate assessment of the size, shape, and condition of the observed wrecks. The versions with a larger bin size were used for time-lapse comparison with the earlier surveys in order to avoid any bias that may have resulted from differing bin sizes.

### ***Bathymetric Interpretation***

Slope, curvature, and hillshade maps were created for each of the bathymetric datasets. These, along with the initial bathymetry maps, were visually examined to

locate possible wreck sites. Basic information about each of the located wrecks was recorded, including the water depth, the length, beam, height, and orientation of the wreck, and also the length, depth, and orientation of any scour trails present. This information was combined into a visible wrecks database, which is included in full in the original project report (Krueger 2016).

The individual values of the various bathymetry datasets were subtracted from one another to create difference maps showing the change in the seabed level between time-steps in order to analyze the changing shape of both the bank as a whole and individual wreck sites. Due to limited overlap between the surveys, not all areas of the sandbank could be analyzed this way, however several key areas of change were identified from the available data.

### *Wreck Analysis*

The shipwreck database output by the AMAP2 project was the first point of reference for historical data about the shipwrecks visible on the bathymetry datasets. The location data provided in the AMAP2 database was used to match records from the database with anomalies located during the bathymetry analysis stage of the project. The HOID designation for the AMAP2 record matched to each located wreck was included in the visible wreck database created for this project in order to allow cross-examination of the two databases for future research.

Eleven wrecks were chosen for in-depth individual analysis based on quality of bathymetric signature and availability of historical information about the corresponding vessel in the AMAP2 database. Additional visual examination was performed on the bathymetric data available for each of these wrecks, and detailed descriptions of the bathymetric signatures were created. The aforementioned historical sources were consulted for each identified vessel to gain a more complete understanding of the vessel, the circumstances of its loss, and its potential archaeological significance. The historical information was then compared to the bathymetry to assess the validity of the identification, and future plans for documentation and monitoring were recommended. The full results of this analysis were detailed in the original project report (dissertation). Three of the located bathymetric anomalies, corresponding to two entries in the AMAP2 database, were discussed here due to the potential significance of the findings.

## **Results**

### *Bathymetric Analysis*

Figure 1 shows a bathymetric map of the Goodwin Sands with relevant features labeled. The HI1294 survey was used for the overview map, as it was the most extensive of the surveys used in this study. Both banks showed significant motion over the period between the surveys.

### *South Bank*

Overall, the south bank (Figure 2) narrowed during the time between surveys, but the exact change could not be accurately measured due to the differing extents of the surveys. The central ridge running longitudinally along the bank shifted an average of 200 m west between the 2009 and 2015 surveys, with approximately three quarters of that shift occurring between 2009 and 2012. The movement of individual areas varied, with the largest change of around 400-500 m occurring near the

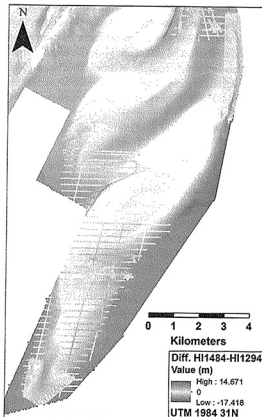


Figure 2. Change in recorded depth between the HI1294 and HI1484, South Goodwin sandbank, overlaid on the HI1294 bathymetry for reference (Map by author, 2017; data from UKHO 2017).

South Sand Head. On the northeast side of the southern bank, the sand migrated on average 50-100 m west between the 2009 and 2012 surveys, but has since begun to reverse direction, showing a small amount of eastward movement between 2012 and 2015.

The average water depth in some areas changed by as much as 10 m between 2009 and 2015, with around two thirds of this change occurring between 2009 and 2012. Over the surveyed period, the central ridge became less pronounced, and the line of the ridge changed from having a noticeable reverse S-curve to being approximately linear, though due to the wide spacing of the survey lines on the later surveys, the exact extent of the straightening was difficult to determine.

### **North Bank**

The western arm of the North Goodwin bank (Figure 3) was one of the few areas completely surveyed at all three time-steps. It migrated westward by 100-200 m over the span of the surveys, with fairly steady movement across the observed time period. Several smaller sand waves southwest of the tip of the bank showed similar movement patterns, migrating about the same distance and direction, with the southernmost waves curling northward over time. The North Sand Head migrated eastward by an average of 60 m between 2009 and 2015, with no intermediate time-step due to a lack of survey coverage.

The southeastern edge of the northern bank migrated eastwards, though only a small section of the bank margin was captured in the later survey, preventing exact measurement of the bank's movement. Only the 2009 and 2015 surveys covered this area, again preventing analysis of whether the bank's movement patterns were steady or changing.

### **Wreck Analysis**

During the course of this work, 68 anomalies were located on the bathymetric datasets. Of these, 29 were visibly exposed and at least partially intact. Nineteen of the bathymetric signatures were oblong mounds likely to be buried wrecks, 8 were debris scatters, and 12 were visible anomalies that were small enough or had poor enough data quality that they could not be classified.

The visible wrecks tended to cluster along the slopes at the margins of the sandbank and on areas of bare chalk shelf. There were particularly high numbers of wrecks near the South Sand Head, the northwest margin of the northern bank's western arm, the northern end of Kellett Gut, and the area of the eastern margin of the southern bank known as 'Calamity Corner'. Of these areas, the most visibly intact wrecks were found near

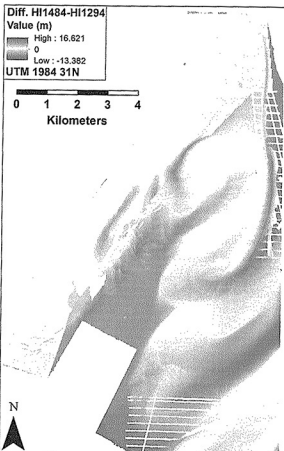


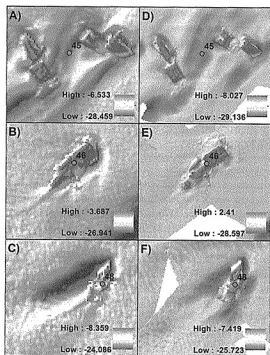
Figure 3. Change in recorded depth between the HI1294 and HI1484, North Goodwin sandbank, overlaid on the HI1294 bathymetry for reference (Map by author, 2017; data from UKHO 2017).

### **Calamity Corner.**

Three of the anomalies located near Calamity Corner were discussed here (Figure 4). Two of these wrecks – labeled here as Wreck 46 and Wreck 48 – matched the locations of two wrecks listed in the AMAP2 database, named *Luray Victory* and the *SS Ira*, respectively. The last of these anomalies, Wreck 45, did not have a clearly associated AMAP2 entry.

### **Wreck 45**

Wreck 45 was located on the eastern margin of the South Goodwin sandbank and appeared on both the HI1294 and HI1484 surveys. The wreck rested at the base of the eastern margin of the South Goodwin sandbank, near the bottom of the slope. The water depth as of the 2009 survey varied across the length of the wreck between 20 and 23 m, sloping downwards to the southeast. By the 2015 survey, the margin of



A-C: HI1294, D-F: HI1484  
Value (m)

UTM 1984 31N

0 50 100 150 200

Meters



Figure 4. Bathymetric images of wrecks 45, 46, and 48, shown at two time-steps. A), B), and C) show HI1294, while D), E), and F) show HI1484 (Map by author, 2017; data from UKHO 2017).

the sandbank had migrated 600 m westward, leaving the wreck slightly deeper at 25 m with a flat seabed surrounding it.

The wreck was found in 4 pieces with lengths of 40 m, 30 m, 30 m, and 35 m, ordered from west to east, giving a total length of 135 m. The maximum width of the wreck was 17 m. The eastern half of the wreck rested 60 m northeast of the western half. Piecewise, the wreck appeared structurally intact. Both end pieces had tilted over to the northeast, the western one having settled at a diagonal, while the deck of the eastern one was close to vertical. The central pieces were approximately upright. The western end of the vessel narrowed significantly towards the lower half of the hull, while the eastern end narrowed gradually towards the keel.

The wreck had a maximum height of 16m above the seabed, which was achieved at the uppermost points of the diagonally tilted end pieces. Most of the wreck

averaged 10 m high. There was a thin protrusion to the northeast of the westernmost piece of the wreck that was visible at all time-steps. It extended 14 m out from the wreck and was less than 4m wide. A similar protrusion was seen in the 2009 bathymetry extending 15 m out to the northeast from the wreck on the easternmost piece of the wreck, but it was not visible as of the most recent survey. As of the 2015 survey, a gap had appeared in the western end of the eastern midsection fragment, apparently having collapsed in on itself.

### Wreck 46

Wreck 46 was found partway down the slope of the South Goodwin sandbank's eastern margin. It was located 135 m away from Wreck 45 at an azimuth of 294. The bathymetric signature was 87 m long and 21 m wide at its widest. The wreck had a pointed end to the southwest and a flat end to the northeast, and was mostly intact, though visibly degraded between the two surveys.

The wreck was covered by the HI1294 and HI1484 surveys. The water depth increased by 5 m between surveys as the sandbank retreated westward. In 2009, the water level ranged from 19 to 20 m across the wreck, sloping down to the southeast. In 2015, the water level was 24-25 m, but with the wreck lying at the base of the slope, the area to the southeast of the wreck flattened out rather than continuing to slope downwards as in the earlier survey.

As of the 2009 survey, the maximum height of the wreck was 14m above the seabed, increasing to 18 m by the 2015 survey. The north end of the wreck had two distinct levels, with the northwest side raised by 2 m in comparison with the southeast side, which averaged 11 m high as of 2009. The south end of the wreck measured 8-10 m off the seabed at that time-step. As of 2015, the northern end of the wreck measured 12 and 8 m high for the upper and lower portions respectively, while the southern end measured 8-9 m high with a maximum height of 12 m. There was a thin protrusion extending 16 m to the southeast of the vessel, which was visible on both the 2009 and 2015 surveys.

The southern end of the wreck was fairly intact in the 2009 survey, but appeared to be in the process of breaking apart, as there was visible deterioration of the wreck's structural integrity between the two surveys. A small section of the northern end's lower portion was no longer visible on the 2015 survey, and a section of the northwest side of the vessel appeared to be separating from the rest of the wreck. In addition, the southern tip of the vessel was blunter in the 2015 survey, appearing to

have collapsed between the two time-steps.

### ***Wreck 48***

Wreck 48 was found on the upper slope of the eastern margin of the South Goodwin sandbank and lay exposed on the surface of the bank. The wreck had dimensions of 62 × 24 m and had one pointed end and one blunt end, with the pointed end oriented at an azimuth of 20°. At the time of the 2009 survey, the wreck rested on top of the sandbank, with the water depth a flat 16 m across the site. By 2015, the sandbank had migrated far enough west that the wreck was on the eastern slope of the bank margin, and the water depth varied across the site from 20 to 22 m, sloping down to the southeast.

In 2009, the maximum height of the wreck was 8 m above the seabed, which occurred on a raised section at the northern end of the wreck. As of the 2015 survey, maximum height had increased to 13 m due to the sandbank's retreat. Another raised section at the southern end of the wreck rose to a maximum of 11 m above the seabed, with the remainder of the wreck averaging 4–5 m high. These measurements did not change between surveys. There was a deep scour pit seen along the west side and northern end of the wreck in the 2009 survey, which migrated to surround the entire wreck in the 2015 survey. A section of the hull near the western corner of the vessel fell outward between 2009 and 2015.

## **Discussion**

### ***Sandbank Geomorphology***

The South Goodwin sandbank showed a pattern of clockwise rotation across the time period studied here, suggesting that the Goodwin Sands was in a period of reversal, as described in Cloet's work (1954). The bank's movement was significantly slower between 2012 and 2015 than during the earlier time-step, suggesting that this reversal period may have been nearing its end, and some areas of the southern bank were already beginning to reverse their movement.

Most of the North Goodwin sandbank was not covered by the 2012 survey, so it was not possible to directly confirm whether it was undergoing similar rotational slowing to that seen on the South Goodwin bank. However, given the results of previous study of the geomorphology of the Goodwin Sands, it seems unlikely that the northern bank would move independently of the southern bank, since the two are part of the same hydrodynamic system.

The conclusions laid out in Cloet's work (1961) suggest that the western arm of the North Goodwin

sandbank is likely to continue its current westward trajectory and eventually separate from the main bank to migrate shoreward, replacing Brake Bank as it merges with the shoreline.

### ***Wreck Deterioration***

The three wrecks considered here provide clear examples of the movement of the Goodwin Sands causing deterioration of shipwrecks due to increased exposure.

Wreck 45 maintained a consistent absolute height between the surveyed years while increasing the height difference between the wreck and the seabed, suggesting that the wreck was resting directly on the chalk shelf that underlies the Goodwin Sands. Several protrusions from the northeastern side of the wreck visible on the 2009 survey were absent or degraded as of the 2015 survey, suggesting that the less structural parts of the wreck were being degraded over time as the sandbank retreated and the wreck settled onto the chalk shelf.

The multi-level appearance of wreck 46 could be indicative of the two sides of the hull, with the wreck having tilted partially onto its side to the southeast. If this was the case, the sharp split between the two sections could mean that the deck had collapsed or was otherwise missing. In addition, the pointed bow of the vessel seen in the 2009 bathymetry appeared noticeably blunted in the 2015 survey, likely due to the collapse of the structure. A small scour pit appeared around the bow of the vessel in the later survey, which was not present in the earlier one, though it was unclear whether the increased scour caused the bow to collapse or if the collapse of the bow initiated the hydrodynamic change that created the scour pit.

Wreck 48 appeared to be collapsing in on itself as the sandbank shifted westward, though the structure of the northern end appeared to still be fairly intact as of the 2015 survey. Over the surveyed period, a section of the hull on the southern side of the vessel near the stern fell outwards, potentially exposing the interior of the ship to future deterioration. As a whole, the wreck appeared to be uncovering and deteriorating as the sediment around it receded.

## **Identification of the SS Ira**

### ***Historical Documentation***

The AMAP2 database identified Wreck 46 as the *Luray Victory*, an American Victory VC2-S-AP3 class steamship with dimensions of 138.7 × 18.9 × 11.6 m, weighing 7618 gross tons. The vessel was equipped with a 127 mm stern gun, a bow-mounted 76 mm

anti-aircraft gun, and eight 20 mm anti-aircraft cannons when it was stranded on the Goodwin Sands and broke in two on January 30, 1946. The wreck was noted as almost entirely buried as of a survey in 1997 (SeaZone Solutions 2011b; Wrecksite 2016).

Wreck 48 was identified as the SS Ira by the AMAP2 project. The SS Ira was a steel, Greek cargo ship with dimensions of 134.7 × 17.4 × 8.2 m and weighing 7176 tons. The AMAP2 database lists the vessel as an American ship, likely due to her origin as the Harry Percy, a Liberty EC2-S-C1 class steamship owned by the US Maritime Commission War Shipping Administration. Notable features of the vessel class included a pilothouse amidships and cargo winches midway between the pilothouse and the bow and stern of the ship. The SS Ira was additionally outfitted with a stern-mounted 102mm deck gun (SeaZone Solutions 2011b; Wrecksite 2016).

The SS Ira was reported to have run aground on the Goodwin Sands and broken in two on 7 March, 1947. The coxswain of the Walmer lifeboat, which was launched to rescue the vessel and its crew, reported witnessing an explosion that split the ship down the middle. Accounts of the sinking noted that the ship sunk midway between two sections of the Luray Victory, which had sunk just over a year prior (Larn and Larn 1995b). The wreck was listed as "dead (not found)" by the Wrecksite (2016) database, and the AMAP2 database labeled the data entry as "Ira (possibly)", suggesting that previous attempts at identification had not provided a definitive identification.

## Data Comparison

The wreck labeled by the AMAP project as the Luray Victory was about 80 m in length, which falls significantly short of the historically documented vessel length 138.7 m. However, assuming the wreck identified as the Ira by the AMAP2 project was actually the other half of the Luray Victory wreck, the combined length of the two pieces would add to 140 m, which is within reasonable error of the Luray Victory's historically recorded vessel length, and the beam measurement was similarly accurate. The shape of the two anomalies also supported this idea, as both had abrupt blunt ends, which do not match historical descriptions of either ship but would make sense if the two wrecks were originally one vessel. Historical accounts of the SS Ira's sinking also corroborated this theory, describing the location of the Ira's sinking to be between the two halves of the Luray Victory, implying that the latter was in two distinct pieces far enough apart from each other that such a

description would be reasonable.

The dimension measurements for Wreck 45 matched closely to those of the SS Ira, and the shape of the wreck bore several similarities to schematics of the Liberty EC2-S-C1 class, namely the location and size of the pilothouse and the existence of the two northeastern protrusions, which could be the remains of cargo winches. The pieces of the wreck had a combined length of 135 m, which fit closely with the 134.7 m length listed in the AMAP2 database for the SS Ira. Between the accurate length measurement and descriptions of the wrecking suggesting that the ship was violently split in half by a boiler explosion, it seemed reasonably likely that Wreck 45 was in fact the SS Ira.

## Significance and Recommendations

Both the Luray Victory and the SS Ira were lost to mundane causes during routine non-war-time shipping activities, and neither vessel was unique, as both were from classes of ships that were mass-produced during WWII. However, both vessel classes have very few surviving examples, which makes any remaining ones more important than they might be otherwise. In addition, both vessels were lost in the Calamity Corner area during the period when it earned the moniker, and both wrecks were significant events in the history of the Deal coast lifeboats.

Both wrecks showed deterioration between 2009 and 2015, and given that the current movement of the sandbank will uncover them further, it is likely that their states of preservation will continue to worsen. Given the imminent danger to the wrecks, further monitoring to check for deterioration is highly recommended, and if any site work is to be done to record the wrecks, it should be done sooner rather than later. It would also likely prove useful to analyze the original Generic Sensor Format (GSF) data from the relevant surveys in order to assess finer details of the wrecks not visible on the binned data, both for the purpose of verifying the identifications proposed here and for more accurate analysis of the wrecks' deterioration.

## Conclusion

This project was undertaken with the goal of better understanding the site dynamics affecting the wrecks on the Goodwin Sands in the hopes of using this knowledge to better monitor and protect them. Understanding how the sandbanks interact with shipwrecks, both on a local and regional scale, will allow archaeologists to make better predictions as to which wrecks might soon be buried or destroyed and suggest appropriate

recommendations for future archaeological study. Wrecks that are buried will likely be preserved, but will be lost to study unless they resurface, while wrecks that become exposed are susceptible to increased degradation as they are subjected to the strong tidal forces that affect the Goodwin Sands.

Of the wrecks both listed in the AMAP2 database and visible on the analyzed bathymetric surveys, few had sufficient historical detail to attempt to confirm the identity of the wreck. Of the identifiable wrecks, the majority appeared to be correctly labeled in the AMAP2 database. However, the cluster of wrecks consisting of The SS Ira and the two halves of the Luray Victory were likely misidentified, and an alternate interpretation was presented here that alleviated several discrepancies between previous identifications and evidence from recent bathymetry data.

One potential direction for future work would be to acquire and examine the raw GSF data files for the surveys analyzed here. With GSF point cloud data rather than meter-scale binned rasters, a much more detailed examination of the wrecks would be possible. This could allow for more confident identification of the located wrecks, and would also provide more detailed data for analyzing and monitoring changes to both the sandbank and the wrecks themselves. Further research into the geomorphology of the Goodwin Sands via computer modeling and analysis of bathymetric surveys of the area would also be useful to provide a better understanding of sandbank's movement patterns. Such analysis could assist in predicting where and when known, buried wrecks might become unburied, which would be of immense use for monitoring known wrecks in the area.

This project has advanced the effort to document and protect the wrecks of the Goodwin Sands by synthesizing recent bathymetric surveys with previously compiled wreck databases to assess the continually changing state of the sandbank and the wrecks buried there. It has laid the groundwork for future research into both geomorphological and wreck record patterns as well as furthered the state of knowledge about specific known wrecks in the area.

The Goodwin Sands has great potential for future archaeological investigation. The constant shifting of the sandbank presents both an opportunity and a challenge by both protecting the wrecks buried within the bank and making archaeological documentation and monitoring difficult. This project was but one small part of the continuing effort to protect and preserve the wrecks buried beneath the Goodwin Sands.

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