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Résumé de l'article

Les abondantes ressources de subsistance maritimes de la Gaspésie telles que les baleines et la morue ont attiré les pêcheurs européens pendant des siècles. L'exploitation de ces riches ressources halieutiques nécessitait des navires bien adaptés à la géographie difficile du golfe du Saint-Laurent. Ces défis ont poussé les constructeurs navals à développer de nouvelles technologies nautiques qui ont été mises en oeuvre dans la construction des navires. Le projet d'archéologie maritime de Gaspé (GMAP) vise à étudier ces technologies en développement à travers les vestiges archéologiques de navires dans les eaux autour de Gaspé. La saison de fouilles 2022 a poursuivi ces recherches par un relevé par télédétection de la baie de Gaspé et de Malbay et par l'étude d'un naufrage sur une plage de Cap-des-Rosiers qui serait un navire océanique du XIX^e siècle.

Note de recherche

Shipwrecked at Land's End: The Gaspé Maritime Archaeology Project 2022 Field Season

Carolyn Kennedy and Christopher Dostal

Gaspé's abundant maritime subsistence resources such as whales and cod drew European fishermen for centuries. Exploiting these rich fishing resources required vessels that were well-suited to the challenging geography. These challenges pushed shipwrights to develop new nautical technologies which were implemented in the ships' construction. The Gaspé Maritime Archaeology Project (GMAP) seeks to study these developing technologies through the archaeological ship remnants in the waters around Gaspé. The 2022 field season pursued this research through a remote-sensing survey of Gaspé Bay and Malbay and by studying a shipwreck on a beach in Cap-des-Rosiers believed to be a 19th-century oceangoing ship.

Les abondantes ressources de subsistance maritimes de la Gaspésie telles que les baleines et la morue ont attiré les pêcheurs européens pendant des siècles. L'exploitation de ces riches ressources halieutiques nécessitait des navires bien adaptés à la géographie difficile du golfe du Saint-Laurent. Ces défis ont poussé les constructeurs navals à développer de nouvelles technologies nautiques qui ont été mises en œuvre dans la construction des navires. Le projet d'archéologie maritime de Gaspé (GMAP) vise à étudier ces technologies en développement à travers les vestiges archéologiques de navires dans les eaux autour de Gaspé. La saison de fouilles 2022 a poursuivi ces recherches par un relevé par télédétection de la baie de Gaspé et de Malbay et par l'étude d'un naufrage sur une plage de Cap-des-Rosiers qui serait un navire océanique du XIX^e siècle.

FOR AS LONG as there has been human occupation of the Gaspé peninsula, there has been an inexorable tie to the sea and inland waterways of the region. Trade, transportation, foodways, and the economy have all been heavily shaped by the proximity of the St. Lawrence River and the Atlantic Ocean. To take advantage of the abundance of maritime resources, people inhabiting Gaspésie relied on nautical technology, specifically watercraft, for their livelihoods. The Gaspé Maritime Archaeology Project (GMAP) is an endeavour seeking to further modern understanding of these historical nautical technologies through archaeological study of the shipwrecks left behind. While human habitation of this region has spanned thousands of years, the likelihood of finding remnants from the Indigenous People of the region's watercraft is less likely due to the biodegradable nature of the materials they used. On the other hand, the European ships that began arriving in the 16th century are more likely to be preserved. By studying the archaeological rem-

nants of the watercraft used around Gaspé the lives of the people who built and lived on board these ships can be better understood than purely through historical records.

The beginning of Gaspé's historical period is generally attributed to Jacques Cartier's 1534 arrival in July of his first exploration voyage (COOK 1993, 24). Though Cartier's voyage was the first to pinpoint Gaspé, many Europeans had preceded him and his crew in arriving in the areas surrounding the Gulf of the St. Lawrence (**fig. 1**). The Basques, Bretons, and Normans had been fishing and whaling around Newfoundland for decades before Cartier's arrival, most likely having visited Gaspé in their navigations around the Gulf (COOK 1993, xxi; POPE 2003, 123-124). Other European nations have also been documented in Terra Nova during the 1500s, including the Portuguese, the Spanish, and the English (PARKHURST 1578, 128-129). Though many nations of Europe continued fishing in these rich waters for centuries, the French began to dominate the scene towards



Figure 1. Map of the Gulf of the St. Lawrence including key locations to Gaspé's history. Gaspé is marked with a red star. (Kennedy, ESRI ArcGIS Pro, 2022)

the end of the 1500s and into the 1600s. In 1565, at least 156 ships from three French ports (Bordeaux, La Rochelle, and Rouen) were outfitted and sent to North America with the express purposes of fishing in the Gulf, far outnumbering any other individual European nation (TURGEON 1998, 590).

Historical evidence of Gaspé's fisheries dates to as early as 1542, according to Jacques Cartier's associate, Jean Alphonse (LEE 1970, 36). As these fisheries developed throughout the 1500s and 1600s, Gaspé curing methods, seasonal operations, and the types and sizes of ships used to take advantage of the natural resources and geography diverged from the rest of the Gulf of the St. Lawrence fisheries. Instead of the green curing method preferred elsewhere in the Gulf, in which the fish were salted on board the ships, French fishermen found that the dry curing method preserved cod for longer periods, making it better suited for the long voyage across the Atlantic back to the south of France. The stone beaches, or

graves, were uniquely suited to this curing method as fish could be laid directly on the smooth stones which provided natural ventilation to cure the cod properly. Unlike the many English fishermen who overwintered on Newfoundland, the French generally made the trans-Atlantic journey every season, which necessitated that their ships were built larger and equipped differently than those of the English (LEE 1970, 37).

With Gaspé's long maritime history, and the abundance of ships and boats that frequented its waters from multiple nations, the potential for the preservation and possible discovery of ship remnants in the bay is high (MACWHIRTER 1919, 5, 7; SAMSON 1980, 101). Not only that, but the prospect of learning a great deal about these less well-known fishing vessels equipped specifically for Gaspé is also high and worthy of investigation. A treatise from 1772 provides some construction details of fishing vessels bound for North America, describing most as having either one deck with

large forecastles, or two decks, ranging in size from 40 to 150 tons. The treatise notes how “it is essential that these vessels be strong in limbs, to be able to resist the heavy seas in which they are exposed,”¹ presenting some clues to the construction of the bottoms of these ships, the parts most likely to be preserved archaeologically. The treatise also notes that the variation between ships used for this trade was such that only very general specifications can be given, indicating the need for archaeological research to learn more about the specific construction details (DUHAMEL DU MONCEAU 1772, 52; MUCKELROY 1978, 233).

Considering the impact French fishing vessels and their crews had on Canadian, North American, and European history, these ships are exceptionally historically important. These ships were built to cross the Atlantic, a treacherous task, and then successfully haul back tons of dried and salted fish, all the while serving not only as transportation and cargo storage but also as housing for crews of approximately 18-75 men (DUHAMEL DU MONCEAU 1772, 52; LEE 1970, 37). These requirements pushed shipwrights to adapt previous ship designs and develop new strategies to maximize the efficiency of these vessels. The construction patterns and details present in these wrecks will therefore undoubtedly represent the highest levels of skill and available nautical technology at the time, and the archaeological record holds the key to learning what those were and, in turn, how they impacted the lives of those in French and other European maritime subcultures (CASTRO *et al.* 2018, 56; MUCKELROY 1978, 230-233).

Despite Gaspe’s rich nautical past, archaeological investigations in the area have focused largely on terrestrial sites. Though excellent archaeological work has explored the land settlements around Gaspe Bay, to date no peer-reviewed research has been published on the underwater archaeology (BENMOUYAL 1981; BLANCHETTE 1975; GAUVIN 1998). Though unpublished, several archaeological reports were made on two known shipwreck sites in Gaspe Bay itself: DdDb-3 and DeDc-6. The shipwreck at site DdDb-3, found near Pointe-Jaune, was investigated by a team of underwater archaeologists headed by André Lépine in 1981, 1982, and 1983. The wreck site consisted of 11 cannon and one large, though degraded, anchor, along with some smaller artifacts like handwrought square-shafted nails (LÉPINE 1984, 14). Lépine narrowed down the identity of the wreck to two possibilities: *Louise* (1690) or *Jean-*

Joseph de St-Malo (1748) (LÉPINE 1981, 50). The wreck is currently believed to belong to the *Jean-Joseph* (LANTEIGNE 2015, 9-11). The second wreck was discovered in 2010 by a resident of Douglstown who observed wooden fragments that appeared to belong to a shipwreck along Douglstown Beach. The site, DeDc-6, was studied in 2011 by Érik Phaneuf with AECOM, who found a shipwreck over 16 m long that showed evidence of steam propulsion (PHANEUF 2011, 11, 29). The DeDc-6 shipwreck is believed to belong to the 1911-built steamboat *Franck C. Batt* (É. Phaneuf, pers. comm., 2021).

There has been some limited investigation of Gaspe’s north shore on the St. Lawrence River by Parks Canada underwater archaeologists, though these investigations were similarly in response to discoveries made by local divers and history enthusiasts. Four shipwrecks were discovered along Gaspe’s St. Lawrence shore: DgDp-b and DgDp-c, DhDf-1, and DhDo-3. DgDp-b and DgDp-c were two iron-hulled ships discovered near Cap-Chat by avocational diver Alain Therrien in 2011. DgDp-b was identified as *Delta*, a steamship built in 1872 by Earle’s Shipbuilding & Engineering Co. (England) (AECOM 2014, 9). DhDf-1 was also discovered by Therrien in 2008, named the “Pointe-à-la-Frégate” shipwreck after its wreck location. The site included cannon balls and cupreous artifacts marked with the British broad arrow. Though no hull remains were found, the assemblage was identified as the remains of *Penelope*, a 1798-built English frigate that sank in the St. Lawrence in 1815 (DESROSIERS 2008). DhDo-3, the “Tourelle” shipwreck, consisted of six cannon, cannon balls, and assorted metal artifacts. Therrien again reported this site to Parks Canada after its discovery in 1999. In 2002, the site was investigated by Parks Canada underwater archaeologists over a one-week period. Though the artifacts were found in a poor state of preservation, nevertheless, the wreck was identified as a Royal Navy ship and posited to be HMS *Viper* (BERNIER & DAGNEAU 2008).

The GMAP began as an initiative by the authors as an exploratory effort to purposely search out and document the maritime archaeology and history of the region of Gaspe in an effort to begin cataloguing not only what cultural materials remain, but also to attempt to catalogue construction features of shipwrecks that frequented this region so that hypotheses about ship construction trends may be attempted based on

archaeological data (Bass 1983, 98). The initial season of fieldwork took place in 2019, with an underwater survey of Gaspé Bay with remote-sensing equipment. This first season included Kennedy and Dostal and a local boat captain, Rocky Annett, who drove his personal watercraft, an eight-meter repurposed lobster boat. The remote sensing equipment was a Geomatics G-882 towfish magnetometer that ran through MaglogLite software, with a Trimble SPS855 differential GPS. This first season located several potential targets, four of which were ground-truthed via scuba, revealing no visible cultural remains.

In addition to remote-sensing, Kennedy and Dostal also staged dive surveys from shore at two high-potential locations. One of these locations, Douglastown Beach, yielded results in the form of a submerged, historic, man-made structure, DeDc-9, measuring 5.2 m by 6.6 m at its largest extents. The wooden structure was fastened with iron fasteners, but due to time restraints the archaeological details of the structure were not fully recorded.

The 2019 fieldwork included public outreach initiatives, including radio and television interviews, both locally and in Quebec City and Montreal, as well as meeting with local informants. One of those informants, a retired scalloper, implied that during his scalloping he had noted anomalies in Malbay, the bay immediately south of Gaspé Bay, that could be cultural in origin. This information prompted the authors to consider expanding their remote-sensing survey to include Malbay in future seasons.

In response to public outreach efforts, in April 2020, Kennedy was contacted by a resident of Cap-des-Rosiers who announced his discovery of ship remains on a small beach adjacent to his property. The resident, Cleo Buttineau, sent photographs of the wreckage along with basic measurements of the timbers indicating a large ship with partial remains measuring approximately 6 m by 10 m and frame timbers measuring 18 cm by 25 cm in section. Following communications with Buttineau, Kennedy and Dostal prioritized the Cap-des-Rosiers shipwreck for study in the following season.

With many insights into and many more questions regarding the maritime archaeology of Gaspé, Kennedy and Dostal resumed fieldwork with a team of six graduate students in 2022 after

a two-year, pandemic-driven hiatus. The goals of the 2022 fieldwork were threefold:

1. to continue the remote-sensing survey of Gaspé Bay and expand the survey to include Malbay;
2. to record the remains of the Cap-des-Rosiers wreck in detail for the purposes of reconstruction in hopes of identifying the type of ship; and
3. to revisit the Douglastown structure for further recording.

REMOTE-SENSING SURVEY

The first goal of GMAP 2022 was to continue the 2019 remote-sensing survey of Gaspé Bay and expand to include Malbay, a smaller, shallower bay immediately south of Gaspé Bay. Based on local information that indicated that larger artifacts of the type often indicative of shipwreck sites, such as cannons and anchors, were in the bay as well, Kennedy and Dostal opted to prioritize Malbay in the remote-sensing survey.

The remote-sensing portion involved towing a magnetometer (the same used in 2019) and a side scan sonar from the stern of the Texas A&M University research vessel, *Lucy*, a 21-foot Boston Whaler. The side scan sonar was a Klein Marine System 3900, loaned to the project by Joshua Daniel, who also joined the team bringing his significant remote-sensing experience to the project. Data from the side scan was processed in SonarWiz and Hypack softwares. Surveys were held on weekdays (except for two weather days) between 5 am and 11 am. The waters in and around the bays tended to be calmest during these hours, with a significant increase in wind and waves occurring daily around noon.

Four targets, three from 2019 and one from 2022, were ground-truthed by divers. Dive operations for these dives involved boating to the precise GPS location of the target and deploying two anchors. With the boat stationary, divers geared up and followed the anchor line to the sea floor where they attached a reel to the two anchor lines. Divers swam circle surveys around the anchor line at approximately 3-5-m intervals (depending on visibility).

The results of the 2022 survey included 11 magnetometer targets and 11 sonar targets. Most of the magnetometer targets were found in Malbay, with one exception near Douglastown in

Gaspé Bay. The target near Douglastown was ground-truthed but revealed no cultural materials. Of the remaining 10 magnetometer targets in Malbay, at least one is worthy of investigation due to its close proximity to one of the 11 sonar targets. The others are considered low potential and will be investigated in future seasons if resources allow. The survey specifically targeted areas of the bay within recreational diving range, up to 30 m in depth, so that scientific (not commercial) divers could later investigate any noted features. Despite this reduction in the total area of the bay to be surveyed, the 2022 survey is very much just a beginning, and there is a sizeable area left to be investigated (**fig. 2**).

Of the 11 sonar targets, eight were found in Malbay with three found along Grande-Grave in Gaspé Bay. The sonar targets were divided into four main categories:

1. Rock scatters;
2. Single small objects;
3. Vessel-shaped anomalies; and
4. Lobster traps.

Two of the targets in Grande-Grave (GGSS-02 and GGSS-03) are now believed to be lobster traps, and so are of extremely low priority. The other three categories are all deemed low-to-medium potential for cultural materials, but worthy of future investigations. There are four rock scatters, all located in Malbay: MBSS-01, MBSS-06, MBSS-07, and MBSS-08. These range in size from 8.19 m long by 3.45 m wide (MBSS-01) to 17.05 m long by 10 m wide (MBSS-07) (**fig. 3**). All of the scatters are surrounded by an otherwise relatively smooth sandy bottom, and therefore appear anomalous. Though very possibly just piles of natural rock, there is a slight chance that these scatters may be ship ballast piles. Their locations have been noted and these targets will be ground-truthed in future seasons to verify whether they indicate the presence of ship remains.

Three single small objects were found in Malbay, two (MBSS-04 and MBSS-05) appearing to stick up from the seafloor at a maximum estimated height of 2.34 m (**fig. 4**). One of the small objects (MBSS-02) is linear in form and measures 5.27 m long by 1.2 m wide (**fig. 5**). One possible interpretation of MBSS-04 and MBSS-05 are anchors. Another possible interpretation are lobster traps or other modern features. MBSS-02 may be a natural feature as well, or perhaps a

waterlogged tree trunk, but its linear form is of minor interest and may be cultural in nature.

Finally, the third category worthy of investigation involves vessel-shaped anomalies that are very possibly simply vessel-shaped rocky outcrops, but until they are ground-truthed this remains unknown. The first, GGSS-01, was found in Grande-Grave, and measures 16.47 m long by 4.84 m wide (**fig. 6**). The second, MBSS-03, was found in Malbay, and measures 7.74 m long by 1.8 m wide (**fig. 7**).

The preliminary interpretations of MBSS-06, MBSS-07, and MBSS-08 are fairly promising. All three rock scatters were surrounded by smooth, flat sand, and appear to be anomalies on the sea floor. The most promising of the three, MBSS-08, is also in close proximity to one of the magnetic anomalies picked up by the magnetometer. Though GGSS-01 and MBSS-03 are visually compelling and vessel-shaped, it is vital to note that Gaspé Bay and Malbay are riddled with large rocky outcrops that are generally linear and could very easily take the shape of a ship. These two were marked due to the absence of obvious adjacent rocks, though either could simply be a rise of rocks existing underneath the sandy sea floor. All remotely-sensed targets are considered low-to-medium potential (Daniel, pers. comm., 2022).

Though the four ground-truthing efforts of the 2022 season did not discover any cultural heritage materials, there is certainly room for further exploration of these targets. In two cases, before divers could reach the seafloor, the anchor appeared to have been dragged, meaning the location of the dive was off. To overcome this, dive operations in future seasons will transition to using buoy-based down lines instead of anchor-based down lines.

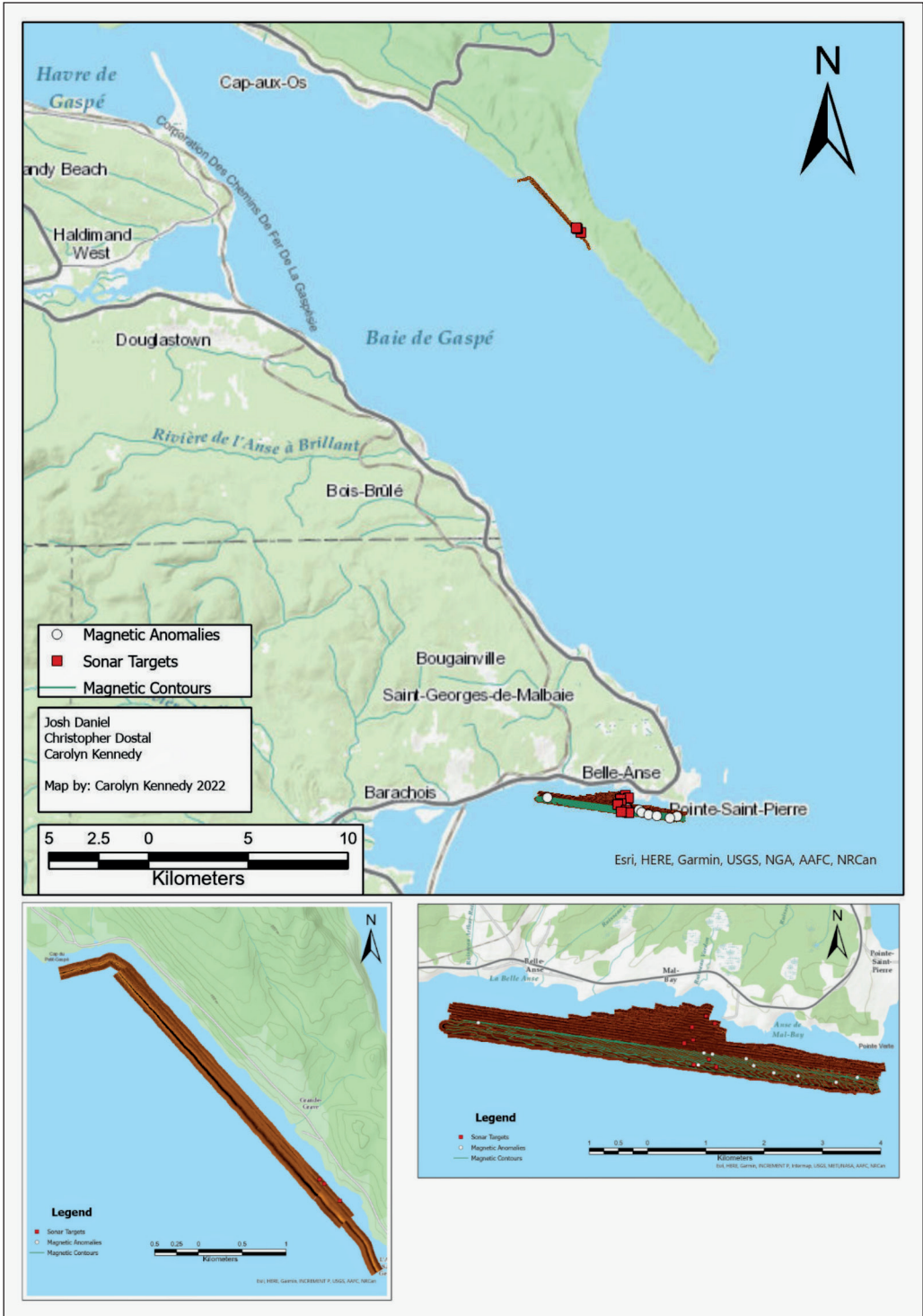


Figure 2. Total areas surveyed in 2022, noting locations of magnetic anomalies, sonar targets, and magnetic contours. Zoomed-in images of surveyed areas of Grande-Grave (bottom left) and Malbay (bottom right) are shown for greater detail. (Kennedy, ESRI ArcGIS Pro, 2022)

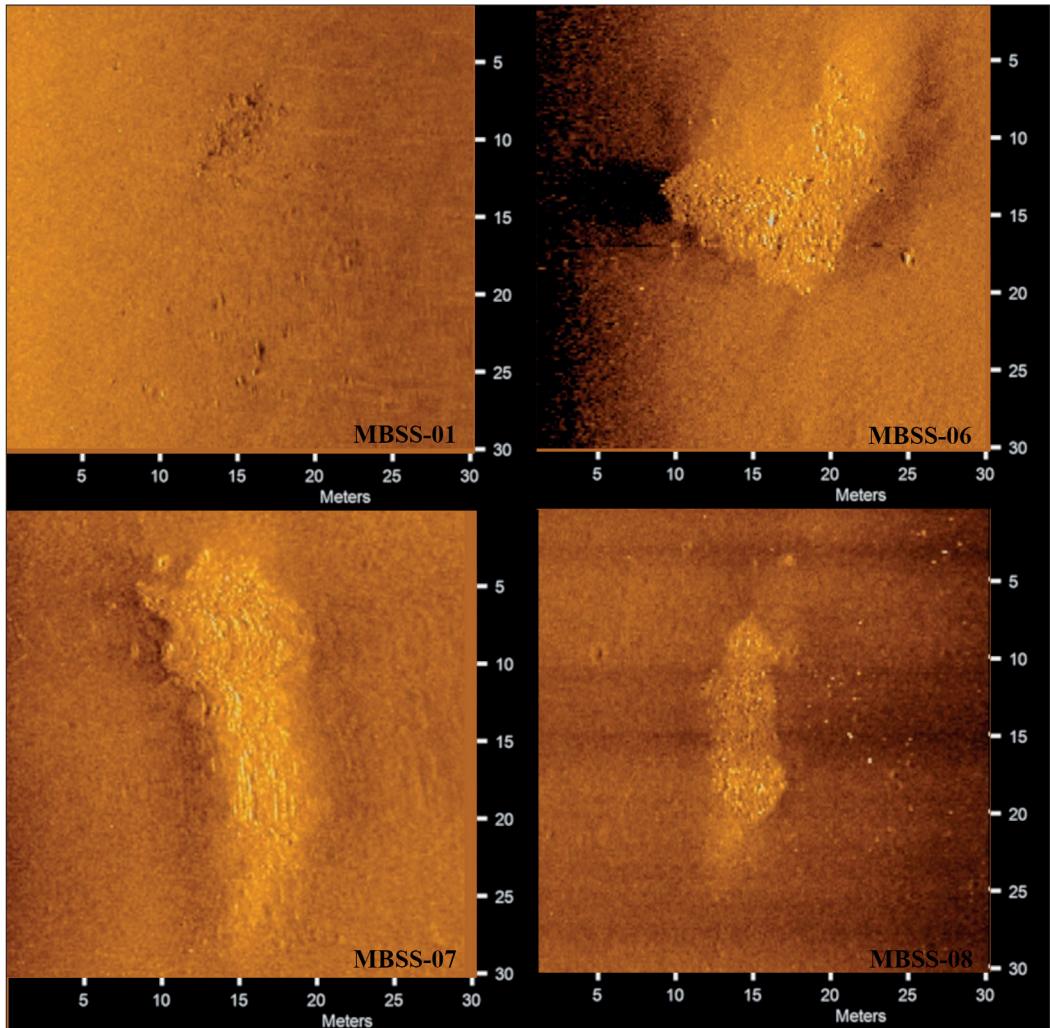


Figure 3. Four sonar targets show rock scatters amidst otherwise flat sandy bay bottom. These rock scatters are most likely naturally occurring, but there is a slight chance they are in fact ballast piles indicating the presence of ship remains. (Daniel, SonarWiz, 2022)

THE CAP-DES-ROSIERS WRECK

The second objective of GMAP 2022 was to document the wreck at Cap-des-Rosiers, DfDb-4. The wreck's presence only became known in the spring of 2020 when resident Cleo Buttineau discovered it. In correspondence from May 2020, Cleo and his wife, Lyn, Buttineau sent pictures of the wreck recently exposed on the beach by a small runoff stream draining into the ocean (**fig. 8**). Most of the year, this stream is small, approximately 1 m wide and 20 cm deep. In the spring, as the ice melts and large storm systems are driven into the

Gaspié region, it swells into a raging torrent several meters across and up to one meter deep. The wreck was only uncovered one other time since, in the spring of 2022. In both instances, the exposed wreck was reburied by more than 1 m of sand deposited by the ocean within days of being uncovered.

The Cap-des-Rosiers wreck site is easily one of the most technically challenging wreck sites encountered by the authors. The beach upon which it is located is on the northeast tip of the Gaspié peninsula and faces almost directly east, with a slightly north angle, towards Anticosti

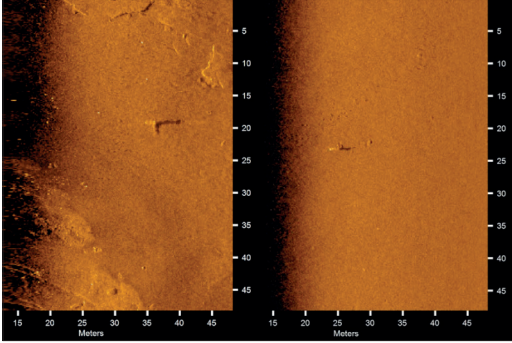


Figure 4. MBSS-04 and MBSS-05, two sonar targets that appear as objects emerging upward from the sandy bay bottom. (Daniel, SonarWiz, 2022)

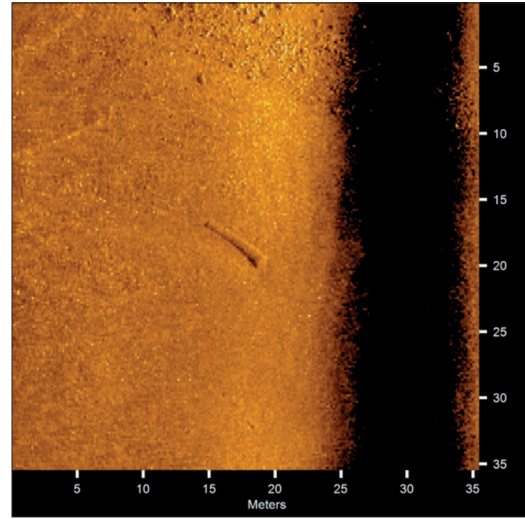


Figure 5. MBSS-02 was identified as an anomalous linear object. (Daniel, SonarWiz, 2022)

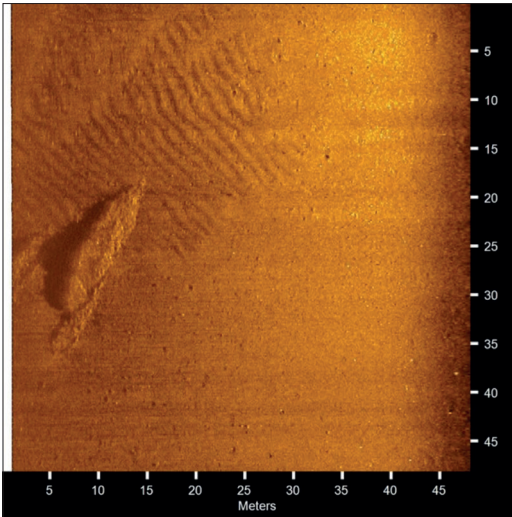


Figure 6. GGSS-01 is a vessel-shaped anomaly worthy of investigation, though it may easily be a rocky outcrop. (Daniel, SonarWiz, 2022)

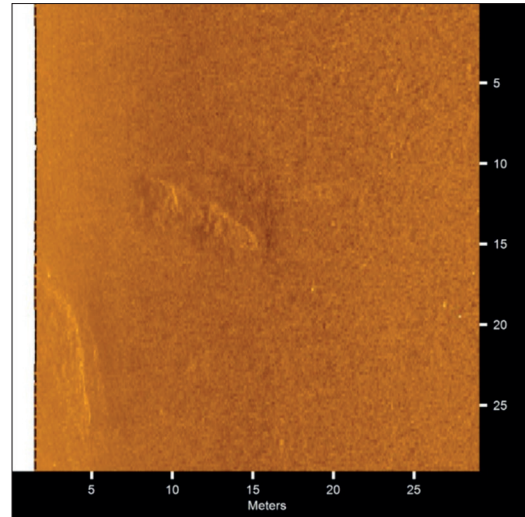


Figure 7. MBSS-03 is another vessel-shaped anomaly worthy of investigation, though it might simply be a rocky outcrop. (Daniel, SonarWiz, 2022)



Figure 8. The Cap-des-Rosiers wreck exposed by the flooded drain off stream in Spring 2022. (Cleo Buttineau, 2020)

Island, approximately 1.2 km northwest of the Cap-des-Rosiers lighthouse (**fig. 9** and **10**). This area is where the Gulf of St. Lawrence begins to narrow into what becomes an estuary, and then a river, further west. The beach is small, approximately 600 m long and 30 m wide, bookended by large cliffs that drop straight into the gulf. The beach is down from a short cliff that ranges from approximately 3 to 10 m high along its 600-m length. The beach itself is made up of mostly coarse, rocky sand, with medium-to-large rocks scattered throughout.

This small beach also experiences extreme tidal surges regularly; the tide change in the area is typically around 1 m, but occasionally the ocean surges, bringing water crashing into, and in rare, reported cases, over the 3-10 m tall cliffs.² The Cap-des-Rosiers wreck, approximately halfway from the waterline to the cliffs (about 15 m from the water at low tide) is often subject to sand and rocks being deposited on it by the ocean surges. The constantly shifting sands greatly hindered the GMAP crew's recording efforts, and therefore the site mapping process was slow and is still incomplete.

The challenging nature of the site was extremely underestimated before arrival in the field. The GMAP crew spent nine workdays on the turbulent site recording what timbers they could,

but because of the shifting sands, each day the accessible parts of the wreck changed so that one day's work might not line up with the following day's work. This puzzle-piece method of documentation was frustrating, but nevertheless fruitful, generating a total of 27 pages of field notes which were later pieced together into a preliminary scaled site plan of the wreck remains.

The wreck's location was recorded with trilateration to datum points on the cliff face as well as with a precise GPS. The site was photographed, though unfortunately the nature of the site, being accessed on land but with the wreck lying just beneath the water table, did not lend itself to photogrammetric recording.³ The exposed portions of the frames and planks were mapped. Several frames were uncovered from end to end, providing the opportunity to take cross-sectional curve measurements on one of the frame timbers using a goniometer. The timbers and hull structure were recorded using traditional methods: sketching on mylar with measurements taken using measuring tapes.

The documented section of the Cap-des-Rosiers wreck measures 4.52 m long by 5.73 m wide, with its central axis running perpendicular to the frames in an 18° NNE – 198° SSW direction. The documented remains consist of 17 frames, one internal longitudinal timber, and three hull

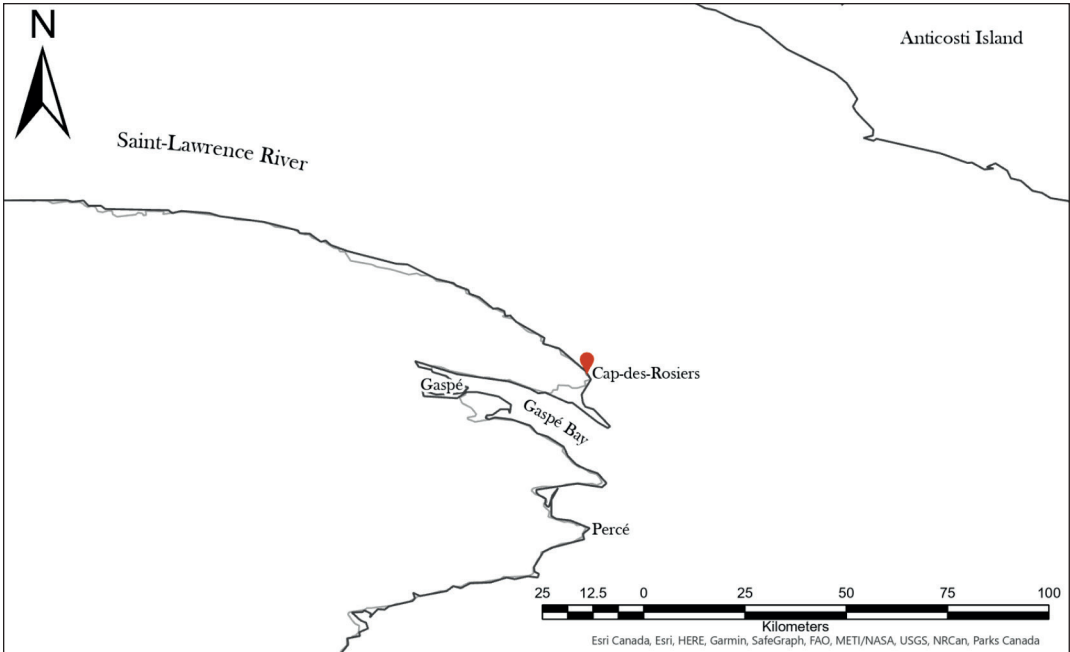


Figure 9. Map with a red pin showing the location of the Cap-des-Rosiers wreck (DfDb-4) with relevant nearby geographical elements labelled. (Kennedy, ESRI ArcGIS Pro, 2023)

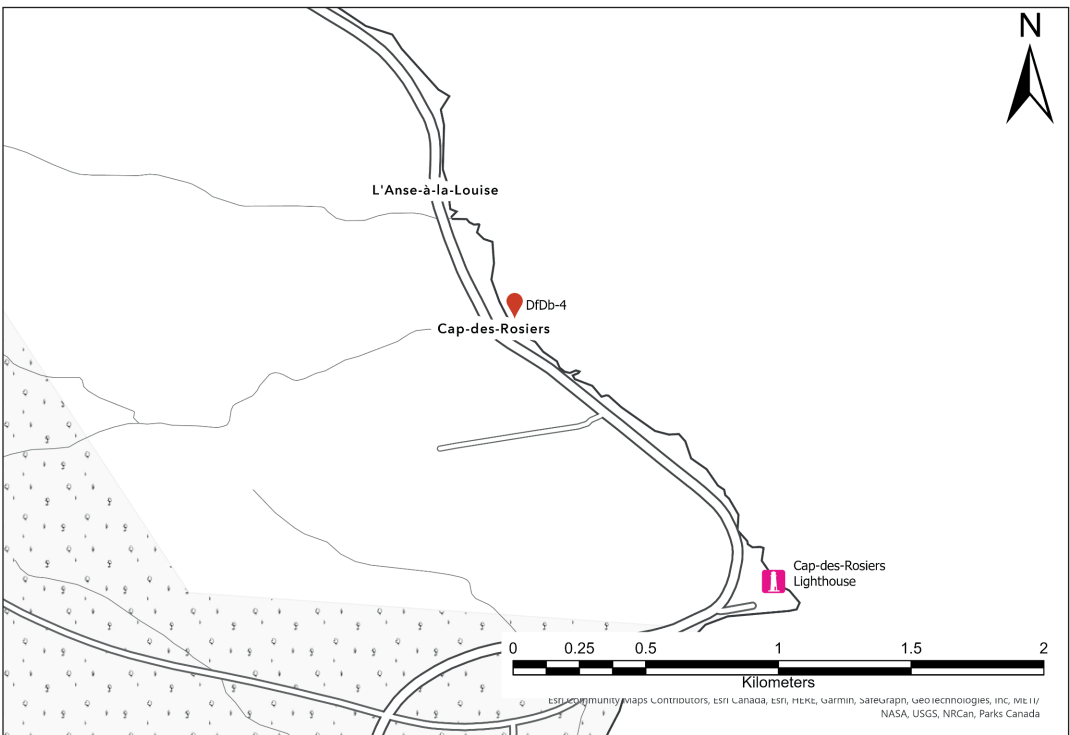


Figure 10. Location of the Cap-des-Rosiers wreck, DfDb-4 (red pin), with reference to the Cap-des-Rosiers Lighthouse. (Kennedy, ESRI ArcGIS Pro, 2023)

planks. No centerline timbers, keel, or keelson were located, nor has it yet been possible to determine which end was the bow or the stern (fig. 11).⁴

Though samples were not taken for analysis, the frames were visually observed to be cut from dense, hardwood, that maintained a good level of preservation despite the constantly shifting sands and rocks. The longest frame recorded (F0) was 5.73 m long, with indications of breakage on one end and a butt joint between two timbers 1.62 m from its west end. Several of the frame remains were composed of two timbers laid end to end with only a small gap between the butt ends. Frame sections (table 1) ranged in size from 6 to 25 cm sided with molded dimensions averaging 22 cm. The sided dimensions appear to vary in a pattern of three. Starting with F0, which has a large sided dimension of 25 cm, moving to the next frame southward (F1), and the next frame southward after that (F2), the sided dimensions decrease to a maximum of 20 cm sided for F1, and a maximum of 18 cm sided for F2. Moving to the next three frames southward, F3, F4, and F5, the same pattern of three decreasing sided dimensions was observed, with maximum sided dimensions of 22 cm, 20 cm, and 14 cm respectively. The following three frames' maximum sided dimensions are: F6, 25 cm; F7, 20 cm; and F8, 6 cm. Additionally, frames F1, F4, and F7 all have butt ends between framing timbers (along the run of the frame) at approximately the same distance from the western extremity of the remains: with F1's butt joint at 3.75 m, F4's at 3.65 m, and F7's at 3.575 m. This pattern also indicates a pattern of three framing timbers laid side by side, rather than the typical two. Unfortunately, with no centerline discovered, which timbers are floors and which are futtocks is still unknown.

The constant shifting of rocks around the site and between the narrowly-spaced frame timbers made it impossible to acquire goniometer measurements of the outside of the frame timber, therefore a curve was taken from the inside, or upper face, of the timber. The goniometer curve angles and the timber's molded dimensions were taken every 25 cm, then extrapolated to provide a full section view of F-2 (fig. 12). F-2 proved a good candidate for a section recording as both ends were intact, and the preservation of the recorded surface was good.

The section shows a moderately curved timber with an average and consistent molded dimension

Table 1. Maximum sided and molded dimensions of recorded frames given in centimeters. Only three frames, F-2, F0, and F1, were cleared enough to record their molded dimensions

Frame Number	Sided (cm)	Molded (cm)
F-6	15	
F-5	15	
F-4	8	
F-3	27	
F-2	16	22
F-1	13	
F0	25	22
F1	20	21
F2	18	
F3	22	
F4	20	
F5	14	
F6	25	
F7	20	
F8	6	
F9	20	
F10	15	

of 22 cm. Three features are visible on the molded face: one lateral fastener head made of iron, and two unknown features, possibly lateral fasteners made of an unidentified material. A discussion of these can be found in the next section.

Frames were fastened to planking with both iron fasteners and trenails. Iron fasteners were generally 1.27 cm (0.5 inch) square cut nails. Many of these protruded above the timbers, indicating the former presence of ceiling timbers or stringers. The maximum height nails protruded above the surface of framing timbers was 15 cm. The two tallest nails (14 cm and 15 cm above the frame timber) were found on F0 and F1, parallel to one another 195 cm from the western extent. The following two tallest nails, both protruding 13 cm above the top of the frame, were also found nearly parallel on F3 and F4 at 316 cm and 322 cm from the western extent respectively. Since all other nails protruded no more than 11 cm, these four longer nails may indicate the locations of stringers.

Trenails were also noted throughout the wreck, measuring 2.54 cm (1 inch) in diameter. Though the iron fasteners appeared to function to hold the ceiling planking in place, the trenails

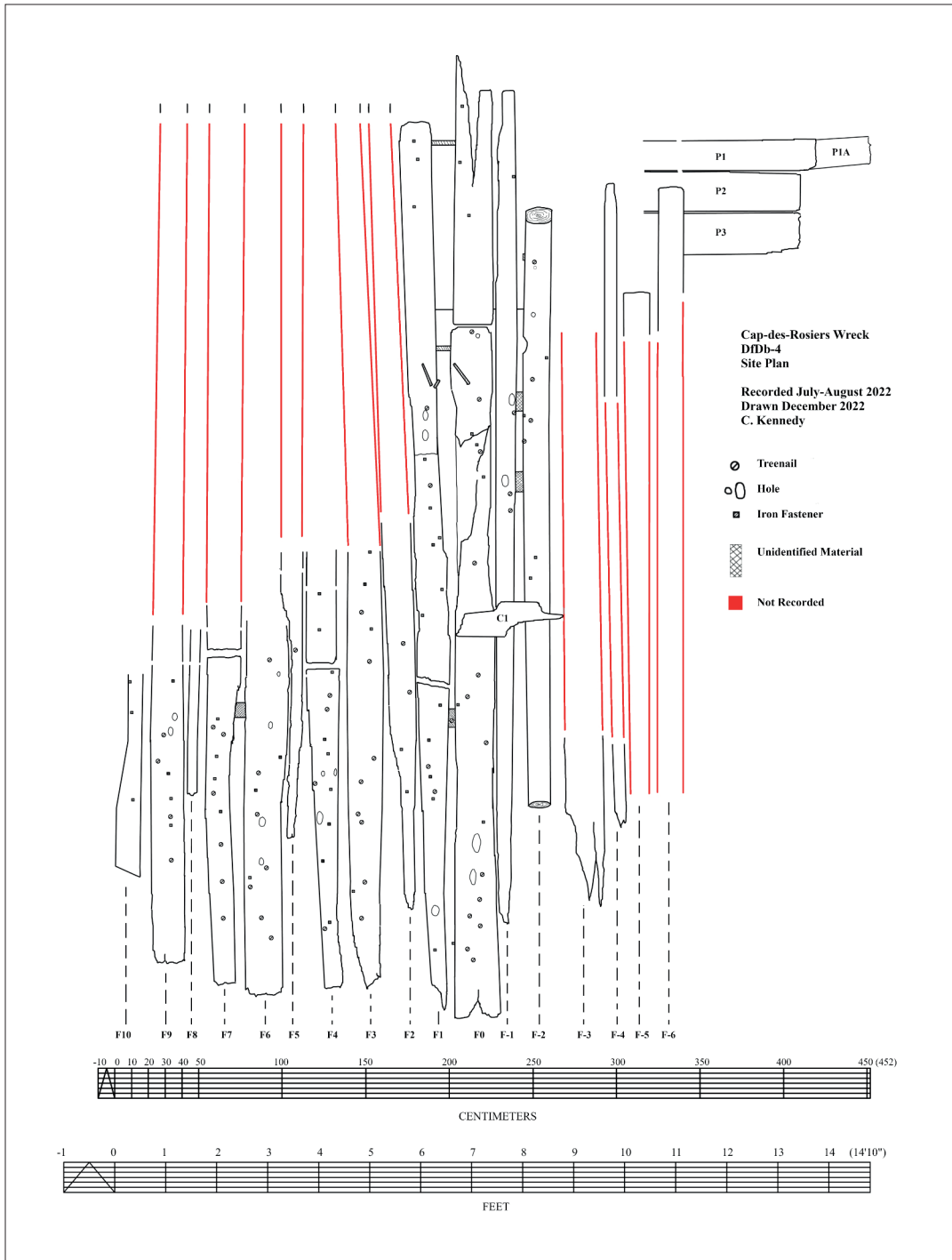


Figure 11. Site plan of the recorded sections of the Cap-des-Rosiers wreck. Features in black were documented, and features in red were estimated. (Kennedy, 2022)

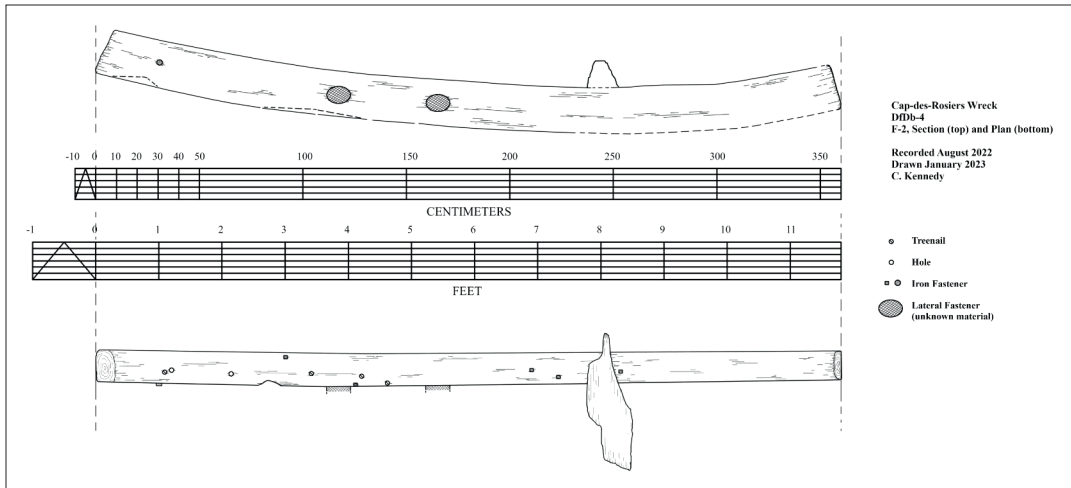


Figure 12. Cross-sectional view of Cap-des-Rosiers wreck F-2 facing north. One iron lateral fastener head and two unidentified features can be seen along the molded face of the cross section. (Kennedy, 2023)

were used to fasten the hull planking and were driven in from outside the hull. Despite this directionality, a couple of irregularly placed treenails did reveal triangular wedges, and therefore it is assumed that all the treenails were likely wedged. Figure 11 does not show any treenails present on the hull planking as the limited time these outer planks were accessible prevented detailed recording.

Lateral fasteners were noted between several frames, including F-1 and F-2, F0 and F1, and F6 and F7. Though three of the lateral fasteners were easily identified as iron bolts, four elements currently classified as lateral fasteners present a mystery. The best recorded of these was found between frames F0 and F1, from 391 to 401 cm from the western extent of F0. It is 10 cm long along the length of the frames and fills the 3 cm gap between the frames. When examined closely, the material was black in color and crumbly in texture when touched. The one between F0 and F1 was the only one that had a treenail driven into it, wedged with a triangular wedge. Two more of these were found between F-1 and F-2, and one other between F6 and F7, though treenails were not observed on either of these. The estimated section view of the two between F-1 and F-2 can be seen in figure 12. The exact purpose and material of these elements are unknown, though they are found between frames where lateral fasteners would typically be located. It is possible these were some form of fastener that has since corroded or degraded in some way to make the

material unrecognizable. Another explanation is that they could be spacers, designed to keep the frames from sloping into each other.

Three hull planks were documented towards the northwest of the assemblage. Each was approximately 10 cm thick and measured 17 cm, 24 cm, and 25 cm wide from west to east. The westernmost strake, P1, emerged from the sand enough to reveal the hull planking was reinforced with thinner (estimated 2 cm thick) sacrificial wooden planking that was a visibly different color than the main hull planking, indicating two different wood species (likely oak hull planking with sacrificial pine planks).

Only one severely fragmented internal plank was found (C1). At first, this was thought to be a part of the keelson, but despite the severe erosion of the plank, parts of its upper face were preserved, and its maximum thickness was measured at 13 cm, much too small for a keelson. Based on the nails protruding from the upper surfaces of the frames surrounding C1, it appears that at least several strakes would have been as thick. The fragmented plank measured 64 cm long, though it was broken on both ends, and 21 cm wide, with some erosion on both sides.

A preliminary analysis of the wreck remains indicates that the portion discovered may not be the bottom of the vessel. With the constant refilling of sand towards the lowest, central part of the wreck, and the rock-sand combination nature of the beach sediment, it was impossible to see or probe in any attempt to discover a keel.

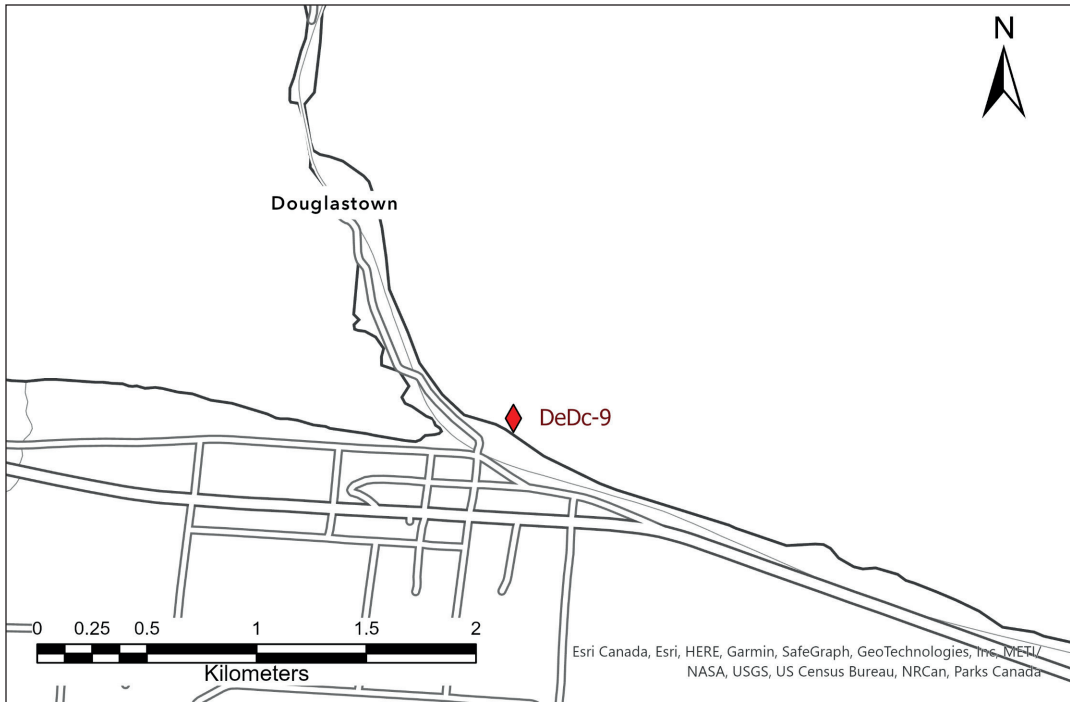


Figure 13. Location of the Douglastown structure, DeDc-9, based on 2019 survey. (Kennedy, ESRI ArcGIS Pro, 2023)

C1 does not provide enough data to give an idea of its location in relation to the centerline, even when interpreted with the patterns of protruding nails. Framing timbers included both broken ends and cut ends, providing no indication of what section of the ship's cross section they originated from or if they are a mixture of floors and futtocks, or even all futtocks.

Examining the cross section of Frame 2, it might be possible to interpret the slightly sharper curve on the east side as nearing a turn of the bilge, in which case the true centerline of the vessel would have been on the ocean, or east side, originally, and we are left with only one disarticulated side. While the rest of the ship is in the vicinity of these remains, the dynamic shoreline here and the extremely turbulent St. Lawrence make it unlikely those will be easily located.

Preliminary observations of the recorded timbers point to a substantially sized ship most likely dating to the 19th century, though more research is necessary to confirm this date. The substantial main hull planks and the addition of sacrificial planking imply this was a ship purposefully built for hard ocean sailing, implicating a transatlantic navigator. It is premature to attempt to identify

what function the Cap-des-Rosiers wreck served, whether it was a fishing vessel, a merchant vessel of some other kind, an immigrant ship, a naval ship, or if it served some other unidentified purpose, much less its identity. The data derived from the wreck remains are currently under analysis, and more insights into this wreck's origins will be revealed through thorough study.

RELOCATION OF THE DOUGLASTOWN STRUCTURE

The third goal of GMAP 2022 was to relocate and continue documenting the man-made historic structure, DeDc-9, discovered during an offset reciprocal survey staged from shore at Douglastown Beach in 2019 (fig. 13). Kennedy led a search effort with several members of the GMAP 2022 crew, but unfortunately the structure was not relocated. Kennedy and Dostal considered returning to the site several times, but ultimately deemed the remote-sensing survey and Cap-des-Rosiers wreck documentation of higher priority and therefore chose not to allocate more resources to rediscovering the Douglastown structure for the remainder of the 2022 season.

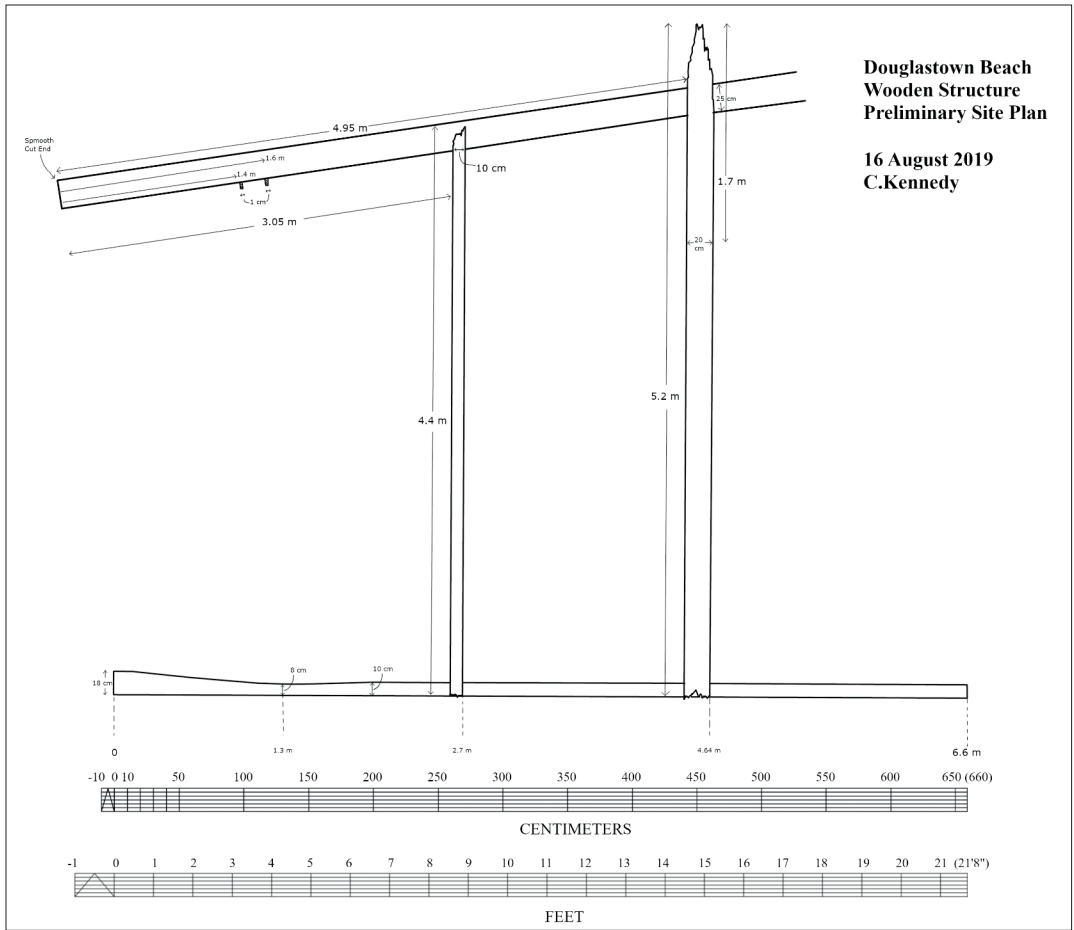


Figure 14. Preliminary site plan of the Douglastown Beach submerged structure. Time constraints limited the recording of this feature, so only the largest timbers were recorded. The plan accurately shows the outer extent of the structure, but is missing many internal details. (Kennedy, 2019)

As the wreck was not relocated during this field season, the results remain the same as from 2019, summarized here. Two dives were made on the wreck in 2019 due to time constraints, allowing for only basic details about the structure to be recorded. The data from those two dives showed a man-made wooden structure with iron fasteners. The maximum extents of the structure measured 5.2 m by 6.6 m (fig. 14).

The structure, originally believed to be a shipwreck, was drawn to scale with the minimal measurements taken in 2019. The structure's overall shape was rectangular, rather than curved, indicating it may have been part of a pier rather than a ship hull. In fact, a map of the area shows that a historic pier dating to the 1920s did exist near this location (MINISTÈRE DES TERRES ET

FORÊTS, QUÉBEC 1928). However, no other structure was located near the site, which seems at odds with the finding of a historic pier that would presumably lead to the shore (and be longer than 6.6 m).

CONCLUSION

The results of the 2022 field season show that Gaspé is an extremely promising region for discovering shipwrecks that will add to our understanding of the dramatic changes in nautical technologies that began during the Age of Discovery and continued throughout the historic period. Of the 11 sonar targets found, at least six might be remnants of historic vessels and are worth further investigation. An additional 11 magnetometer

targets may also reveal diagnostic submerged cultural heritage materials. The 2022 survey of Gaspé Bay and Malbay has only just scratched the surface, and there is much more surveying to do in future field seasons to inventory the submerged cultural heritage remains of these historically significant bays.

The Cap-des-Rosiers wreck was undoubtedly an ocean-going vessel from the 19th century or earlier, and its construction has already provided evidence of the need for extremely durable ships for navigating the turbulent Gulf of the St. Lawrence. Its large size points to something other than a personal watercraft, but it is too early to make assumptions about its original use. Further study of the hull is necessary to learn the original function of this ship, and additional archival research may lead to the identification of the actual ship itself. The Douglstown structure additionally awaits future study to determine whether it was indeed part of the historic pier or perhaps a barge-type shipwreck. Though the structure was not relocated in 2022, its discovery following a single shore-staged dive survey in 2019 also points to the vast potential for discovering shipwrecks in Gaspé Bay.

Future field seasons will continue the search for and documentation of shipwrecks in Gaspé Bay and Malbay and resume the documentation of the Cap-des-Rosiers wreck. Methodical documentation of ship hull remains from the Gaspé region will help archaeologists and historians alike understand how shipwrights of Europe and North America were adapting their nautical technologies for this remote area's new and challenging geography. From the 1500s on, the lure of rich maritime resources such as cod, and to a lesser extent whales, created a need for vessels equipped to weather transatlantic voyages to a remote and somewhat inhospitable region, where the ships themselves acted not only as transportation but also as housing and cargo storage for hundreds of fishermen. These ships were therefore continuously modified to address the needs of the men who made their livelihoods on board, and these modifications can be directly studied through archaeological and historical investigation. On a wider scale, documented ship construction details will lend to our understanding of life on board these historic vessels and provide a deeper comprehension of the lives of European and North American fishermen.

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Notes

1. Translated from original: «il est essentiel que ces bâtiments soient forts de membres, pour être en état de résister aux grosses mers où ils s'exposent» (DUHAMEL DU MONCEAU 1772, 52).

2. This happened in 2019, completely flooding the basement of a building located just above and east of the wreck location. The building, which can be seen on Google Maps (currently 2018) at 1241 Rte 132/Cap-des-Rosiers Blvd., was previously abandoned for this reason and after the 2019 flood was demolished. The cliff where it used to be is the lowest along the length of the beach, approximately 3 m higher than the gulf.

3. The wreck being only partially uncovered of rocks and sand at any given time, and those uncovered timbers lying under a very shallow (5-10 cm) covering of water (as the wreck is just below the water table), means a comprehensive photo set for photogrammetric modeling could not be generated.

4. For an illustrated glossary of the naval architecture terms presented in this section, see STEFFY 1994, 266-298.

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