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An Overview of Maritime Archaeological Research of the Colonial Period in the French Antilles

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This article provides a summary of the various maritime archaeology projects undertaken in the French Antilles (Guadeloupe and Martinique) since the 1980s that date to the 17th–19th century Colonial period. These projects are presented in the context of the principal maritime archaeological research questions. The results are analysed thematically touching on different aspects of archaeological research in littoral and underwater zones: coastal plantations, ports, and micro-islets. Research carried out on wreck-sites is presented with respect to their maritime use (commercial, naval, and cabotage). The nature and distribution of such sites provides information both on maritime routes and traffic, trade, conflicts, and environmental risks specific to the Antilles in the Colonial period.

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Key words: Historical archaeology, littoral structures, ports, micro islets, wrecks, French Antilles, maritime cultural heritage, extreme climatic events.

The islands of Guadeloupe, Martinique, Saint Berthélémy, and part of Saint Martin are French territories in the archipelago of the Lesser Antilles. Archaeological remains are managed within the French system, with maritime archaeology overseen by the *Département des recherches archéologiques*

subaquatiques et sous-marines (DRASSM) for the Ministry of Culture. The history of the islands is generally divided into two periods: pre-Colombian, from 3000 BC to AD 1493; and the Colonial period from 1493 to the end of the 19th century. The pre-Colombian period is divided into the preceramic and

ceramic periods, each subdivided into a series of phases and cultures (Bérard, 2013; Giraud, 2013). Within the Colonial period, a contact period from the 16th to the start of the 17th century and the period of colonization from 1635 are defined, during which plantations and settlements were developed (Bégot, 2011: 267–337).

The situation and history of these territories makes them exceptional maritime regions. The sea structured their settlement, their organization, and their development in both the pre-Colombian and Colonial periods. Nonetheless, it is only recently that this maritime perspective has been developed as a means of understanding past Antillean societies. In the absence of these perspectives, maritime archaeology and the specific questions raised by these maritime societies have been secondary.

The term maritime archaeology is used here to designate the archaeology of coastal and maritime regions in a global perspective integrating coastal, nautical, and port archaeology (Muckleroy, 1978; Pomey and Rieth, 2005); underwater archaeology being linked rather to the methods used rather than the research questions raised in these different areas.

Research context

In the Antilles, maritime archaeology is not particularly advanced, for a variety of reasons (Leshikar-Denton, 2002; Leshikar-Denton and Erreguenera, 2011). Research is recent and almost exclusively sporadic. Interest in underwater heritage goes back to the mid 1970s and the discovery of the Saint-Pierre wrecks in Martinique, notably by Michel Météry with the support of Jaques-Yves Cousteau's team (Météry, 2002). The first archaeological research carried out in Guadeloupe took place in 1986, 1992, and 1999, led by Jean-Pierre Moreau, and focused on the location of three wrecked ships from a Spanish fleet of 1603, lost in waters around Vieux-Habitants, including Don Juan de Mendoza y Luna, the Marquis of Montesclaros's ship (Moreau, 1999).

Investigations have been relatively rare, only around 30 underwater projects have been authorized since the 1990s and a further 20 terrestrial projects related to Colonial-period coastal structures are listed (Fig. 1, Table 1). They have been carried out by a variety of bodies: independent researchers, societies, universities, and the DRASSM. Among them the role played by the *Groupe de Recherche en Archéologie Navale* (GRAN), in Martinique, should be noted. It was active between 1990 and 2000, and was able to inform local councils about maritime heritage and start a long-term programme to list the island's underwater heritage sites, create a permanent post for an archaeologist, and make the results of their research available to all through a database overseen by the association (<http://archeonavale.org/martinique/>). Some 63 sites were investigated and recorded including 19 possible

wreck-sites, seven of which were located and identified (Guillaume, 1999a; Guérout, 2002: 445–446).

In Guadeloupe, the role of Association Prépasub during the 2000s should be highlighted, followed by the Association Archéologie Petites Antilles (AAPA) in partnership with the University of Antilles in the 2010s (Guibert, 2013a); some 20 wreck-sites have been recorded, five of which have been identified by matching the historical records with the archaeological material (Guibert, 2012). Recently, the University of the Antilles has put in place a research programme dedicated to maritime history and archaeology. In parallel with these local groups, the work of the Arkaéos Association in collaboration with Aix-Marseille University instigated a project in Saint-Pierre. The recent growth of development-led projects, particularly in urban areas, has allowed Inrap, the French national body for development-led archaeology, or private companies to carry out a number of projects on the coast.

The DRASSM has had the role of overseeing these projects both scientifically and technically within the maritime area, as outlined in law, and has provided expert assessment of sites with increasing regularity as interest in the historic period has grown since the 1990s. Its role in the Saint-Pierre projects in Martinique since 2010 is of particular note.

The relatively small number of projects does not compromise this attempt to synthesize knowledge to date: the current move towards the professionalization of underwater archaeology heralds the end of a pioneer period, making this appraisal timely.

Research perspectives

All archaeological research carried out in the islands has contributed to the creation of the *carte archéologique*, the national register of sites maintained by the State (art. L. 522–5 du Code du Patrimoine), which is, for French waters, held by the DRASSM. Previous archaeological projects undertaken in the Antilles can be tied into major research perspectives only retrospectively. Research has been adapted, developed, and refined as sites have been revealed.¹ Beyond issues of evaluation, management, and preservation of archaeological sites, the projects presented here fall into five principal areas of research: 1) the relationship of Antillean society with the sea as evidenced by the distribution of coastal sites, along with their various functions and activities; 2) wreck-sites, which form a record of the different types of maritime activity, commercial and naval, linked to different maritime spaces (the Caribbean, the Americas, or transatlantic), and the battle for control of the Caribbean seas; 3) the analysis of maritime risk through the distribution of wreck-sites, and the presence of coastal structures intended to prevent ships wrecking and reduce losses at sea; 4) information about trade and the extent of cultural influence as provided by the material culture recovered, as well as vestiges

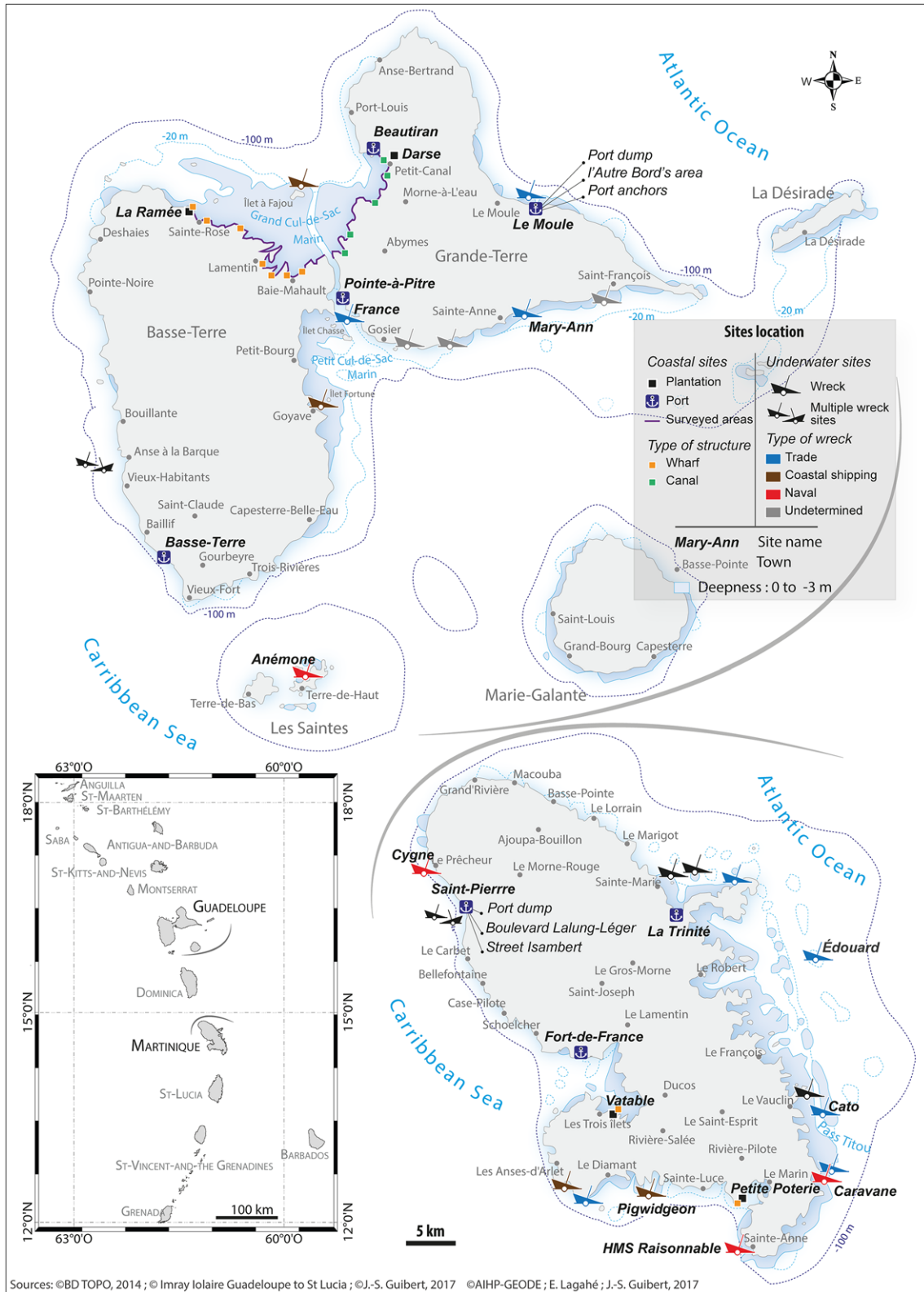


Figure 1. Site locations on Guadeloupe and Martinique (É. Lagahé).

Table 1. *Index of sites cited in the article*

Site	Town	Island	Type	Date	Reference
La Ramée	Sainte-Rose	Guadeloupe	Wharf of coastal plantation	Mid 18th–19th	Bégot, 1991; Bigot and Guibert, 2011a, 2011b; Guibert and Bigot, 2014
La Darse	Petit-Canal	Guadeloupe	Canal	18th–19th	Bigot and Guibert, 2011a, 2011b
Beautiran	Petit-Canal	Guadeloupe	Quay, multi wreck	19th–20th	Guibert and Bigot, 2014
Charpentier Cove	Sainte-Marie	Martinique	Mooring	19th	Bigot and Guibert, 2011a, 2011b; Barfleur, 2005
Vatable	Les Trois-Îlets	Martinique	Wharf of coastal plantation	19th	Guillaume, 1993
Petite Poterie	Le Marin	Martinique	Wharf of coastal pottery	18th–19th	Jégouzo, 2015
Isambert Street	Saint-Pierre	Martinique	Coastal housing blocks, seawall	19th–20th	Ollivier, 2012, 2014; Serra, 2015
Lalung-Léger Boulevard	Saint-Pierre	Martinique	Seawall, slipway	End 18th–20th	Pignot, 2014
Doban	Saint-Pierre	Martinique	Port dump	End 18th–20th	Bolle, 2013; Martin, 2016; Robert, 2016
Le Moule Port	Le Moule	Guadeloupe	Port dump, anchorage	Mid 18th–19th	Serra <i>et al.</i> , 2010, 2011, 2012
L'Autre Bord	Le Moule	Guadeloupe	Coastal housing blocks	Mid 18th–19th	Bigot Vicens, 2006; Texier <i>et al.</i> , 2010
Colas Islet	Sainte-Rose	Guadeloupe	Micro-islet	End 17th–18th	Demangeot, 2015; Romon, 2016
Chasse Islet	Baie-Mahault	Guadeloupe	Micro-islet	18th–19th*	Guibert <i>et al.</i> , 2013
Anse à la Barque	Bouillante / Vieux Habitants	Guadeloupe	Multiple wrecks, See Figure 7a	18th–19th*	Guibert <i>et al.</i> , 2013
Saint-Pierre Bay	Saint-Pierre	Guadeloupe	Multiple wrecks, See Figure 3	18th–19th	Vicens, 2001, 2003, 2004, 2008, Guibert, 2010b; Villié Vicens, 2013
Sainte-Anne Passe	Saint-Pierre	Martinique	Multiple wrecks, See Figure 3	End 19th–20th	Guérout and Guillaume, 1990; Guillaume <i>et al.</i> , 1994; Guillaume, 1999b; Leroy, 2013, 2016
Pointe-à-Pitre Passe	Sainte-Anne	Guadeloupe	Wreck <i>Mary-Ann</i>	1866	Guibert, 2014b
Macabou Cay	Pointe-à-Pitre	Guadeloupe	Wreck <i>France</i>	1824	Guibert and Bigot, 2013
Pointe Pie	Le Vauclin	Martinique	Wreck <i>Cato</i>	1893	Guillaume, 1992, 1995
	Sainte-Anne	Martinique	Wreck <i>HMS Raisonnable</i>	1761	Guillaume, 1996
Pointe Macré	Sainte-Anne	Martinique	Wreck <i>Caravane</i>	1817	Guillaume, 1992, 1996
Pointe Lamarre	Le Prêcheur	Martinique	Wreck <i>Cygne</i>	1808	Guillaume, 1991
Passe de la Baleine	Terre-de-Haut	Les Saintes	Wreck <i>Anémone</i>	1824	Guibert <i>et al.</i> , 2015, 2016
Pothuau	Le Carbet	Martinique	Cargo	17th	L'Hour, 2010
Fortune Islet	Goyave	Martinique	Wreck	19th	Guibert, 2015
Mocos Cay	Le Diamant	Martinique	Wreck <i>Pigwidgeon</i>	1856	Guillaume, 1996, 1999a

* indicates evidence of precolonial occupation

of living spaces; and 5) questions linked to history of ship construction techniques and the provision of raw materials transcend these axes of research.

These themes fall within research questions that are specific to the Antilles and to the Atlantic world more generally. Research previously carried out by the GRAN in Martinique was primarily concerned with visiting vessels: naval and commercial ships involved in long-distance trade or cabotage, including those linked to the transatlantic slave trade. Research is also linked to the varied areas of historical maritime archaeology

defined for the Atlantic area (Babits and Van Tilburg, 1998; Ruppé and Bastard, 2002; L'Hour and Veyrat, 2005; L'Hour and Bellan, 2011).

While the pre-Colombian periods are of evident interest, it has been necessary here to relegate whole sections of Antillean history to a future report. In fact, coastal villages, subsistence, strategies of procurement and distribution of materials, and the original settlement of the Lesser Antilles could all be researched within the maritime archaeology paradigms outlined above. Nevertheless, we have deliberately

limited this article to the coastal archaeology of the historic period. As defined here, this period is characterized by the common denominators of exchange, conflict, and interaction. Two themes have been excluded: military archaeology, which has already been well researched and published (Verrand, 2004; Vidal, 2008, 2011, 2013), and funerary archaeology, despite both having coastal links.

Methods

The methods used in Guadeloupe and Martinique have generally been those common to historical archaeology, combining archival research with the results of archaeological fieldwork, though some variation is noted between the teams involved. In Martinique, for example, most archival research concerns the 17th and 18th centuries despite the majority of known archaeological remains dating to the 19th century, fault of means for fieldwork and as a result of site formation processes (Guibert, 2013a; Guibert *et al.*, 2017). It should be noted that fieldwork conducted by the GRAN and the AAPA included systematic analysis of the material remains (samples, species analysis, dendrochronology, and conservation treatments). In Martinique the GRAN and the DRASSM have used remote sensing methods that have not yet been used in Guadeloupe. For example, magnetometry surveys have been carried out in Martinique by the GRAN in Saint-Pierre Bay (1990), Robert Bay (1991), Fort-de France (1998) and Trinité Bay (2000); and a sidescan-sonar survey of Saint-Pierre Bay was conducted by the DRASSM in 2013.

Other surveys and excavations have been carried out using standard recording procedures. For the most part test excavations were targeted to limit impact on the archaeology but to establish the extent of remains prior to full and exhaustive excavation, a motif that can be seen in all the work carried out by the GRAN, although this second stage has never been reached—no full excavation of an underwater site has been carried out to date.

The coastal sites investigated, such as those on the shores of Saint-Pierre, have not been fully excavated either, due to the detailed requirements of the excavation permit or the proximity to the sea that limited the depth to which test pits could be dug safely. Excavation or survey licences are granted by the ‘Commission territoriale de la recherche archéologique Outre-Mer’, based on the pertinence of the research questions, the research interests of the team, and the research orientation of the CNRA.

Plantations and production centres

Research into coastal plantations was started in 1980 by D. Bégot and M. Mousnier. A ‘settlement’ is the primary unit of the island’s economic system dedicated initially to tobacco production, then sugar and coffee.

The ‘central factory’ developed from this in the second half of the 19th century. Here we concentrate on the coastal plantations with structures on the shore, the potential of which was first recognized in the 1990s (Bégot, 1991; Mousnier, 1991).

Surveys of coastal structures (quays, piers, embankments, and canals) have allowed investigation of the economy and structures of the coast of the Grand Cul-de-Sac Marin of Guadeloupe, while also enriching the *carte archéologique*. These were carried out in two phases with terrestrial survey between 2010 and January 2011, followed by terrestrial and underwater test excavations in three sites in July 2011 (Bigot and Guibert, 2011a; 2011b; Guibert and Bigot, 2014).

Of the 23 sites recorded, 12 are coastal structures. Archival research allowed potential sites to be located and to place the evidence gathered in the field in its wider historic context. The diversity of structures located, from piers to quays, constructed canal wharves and warehouses, highlights long-term and long-lasting development. It also shows how the use of different structures was adapted to the varying topography: the canal sites are predominantly in the south-west of Grande-Terre, while piers are found more commonly in the north of Basse-Terre (Fig. 1).

The test pits and complementary surveys carried out on three sites allowed more precise data to be obtained and confirm the functions of the sites. The shore site La Ramée, Sainte-Rose, revealed a stone-walled pier (Fig. 2) and the remains of a building identified as a boathouse used for logboats. The site highlights coastal structures linked to a sugar production plantation dated to the 18th century (Bégot, 1991: 181–185).

Darse, Petit-Canal, has a wooden-post revetment along 15m of the canal bank, as well as the remains of post-built piers along the seafront dating to the start of the 19th century. These are the remains of the coastal construction of a canal linked to the Girard plantation.

Beautiran, the port linked to the central factory of Beauport (Petit-Canal), confirmed the strong potential for future investigation of the industrial and maritime heritage previously indicated by historical research (Barfleur, 2005). A quay and a loading gantry built in 1865, along with the remains of eight wrecks dating from the late 19th century to the mid 20th century, including wooden barges, a paddle steamer, and metal barges, have been recorded in the intertidal zone in the area thought to be the shipyard of Beautiran port. This port site is indicative of the shift from the system of sugar plantation to that of the central factory during the 19th century (Schnakenbourg, 1987; 2009).

These three sites represent three relationships between land and sea and have been investigated using an approach that mixes historical evidence and terrestrial, intertidal, and underwater archaeology.

This typology has been complemented by short-term projects on Martinique. The anchorage of Pain du Sucre near Charpentier Cove at Sainte-Marie has a

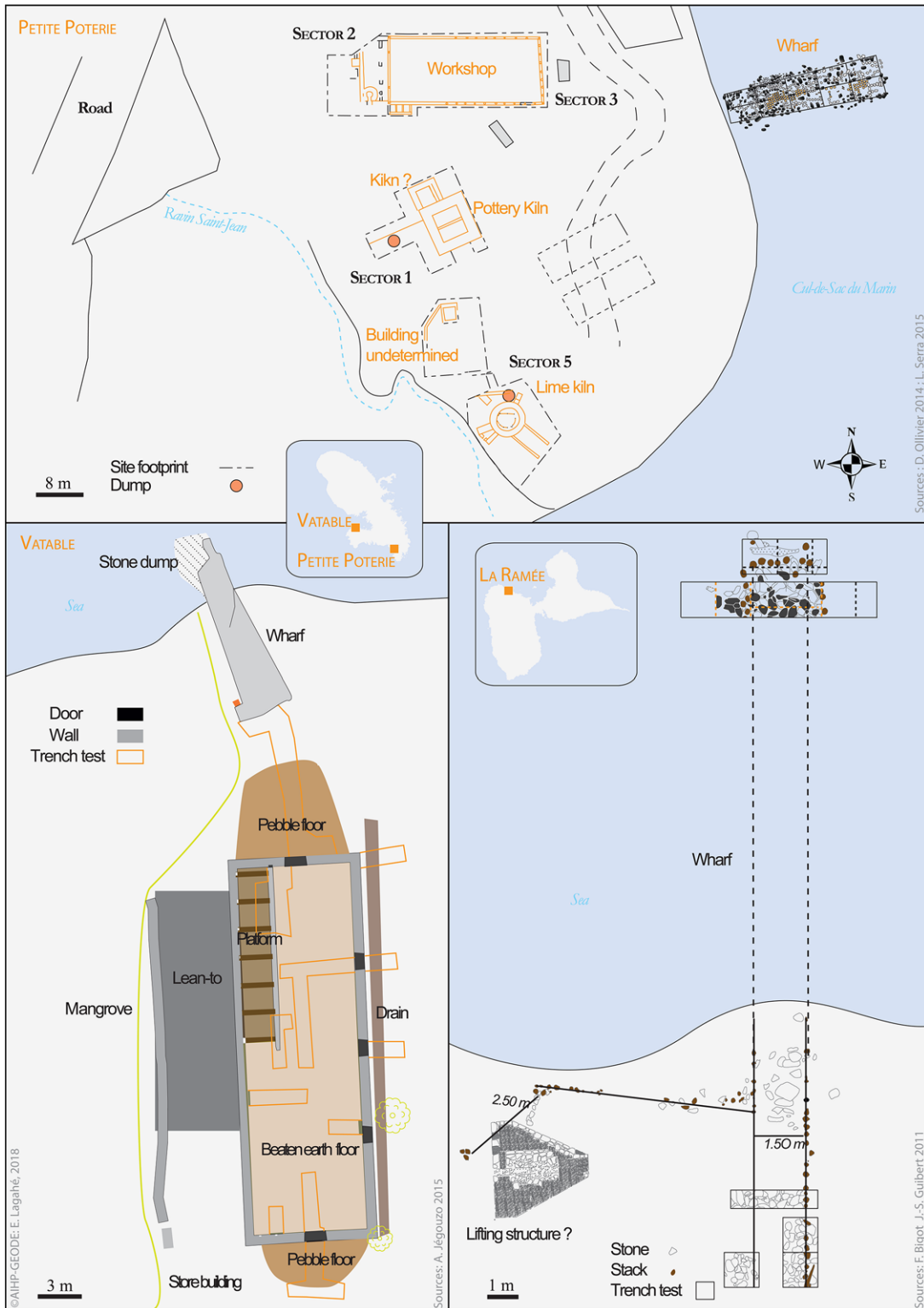


Figure 2. Typology of littoral structures in Guadeloupe and Martinique (É. Lagahé, sources: A. Jégouzo, D. Ollivier, L. Serra, F. Bigot and J.-S. Guibert).

concentration of about 40 anchors, apparently linked to the landing stage suggested by its name. Although exposed to the Atlantic swell and trade winds, the zone was used to unload cargoes linked to sugar production from ships moored in the bay for the Pain de Sucre plantation (Guillaume, 1993: 14–18).

A stone pier was also noted during an archaeological investigation of the Vatable plantation store in the Trois-Îlets parish (Fig. 2) (Jégouzo, 2015: 93). An unusual structure made of a dump of ceramics used in sugar refinery retained by a wall of volcanic stone was recorded in parallel with the study of the Petite Poterie, in Marin (Fig. 2) (Serra, 2015). These remains could date to the late 18th century and are linked to the Dalençon pottery that produced finewares and common wares that are found throughout the south of Martinique and beyond as a result of maritime transport (Ollivier, 2012; 2014; Thiriot *et al.*, 2016).

Port remains

Only a few projects have been undertaken in the ports of Martinique and Guadeloupe, defined in a broad sense as the maritime interface associated with a town, whether with built infrastructure for loading and unloading or not (Guibert, 2013b). These include the study of the material culture, exchange networks, and attempts to make harbours safer. These port spaces can hold concentrations of wrecks. In Martinique the roadstead of Saint-Pierre, principal port of the French Petites Antilles, has been the subject of several archaeological projects, as has the site of Le Moule, Guadeloupe, the second port of Grande-Terre.

The bay of Saint-Pierre is situated on the north-west coast of the island of Martinique and opens on to the Caribbean Sea. The town grew up alongside the roadstead from the beginning of the colonization of the Caribbean in 1635 and became one of the principal port towns of the Lesser Antilles, until the 1902 Mount Pelée eruption (Veuve, 1999). Throughout this period the roadstead of Saint-Pierre saw much varied maritime traffic from the ports of Europe, the Americas, and the Caribbean. The archaeological remains investigated relate to the town and date from the end of the 18th century to 1902.

If the dumps and port structures of the Saint-Pierre roadstead were known, no investigation of these remains was carried out before 1999 (Veuve, 1999). Several projects have been undertaken since the 2010s that have allowed part of the port debris to be recorded (known as Leny, Doban, and Gouyer) and excavations prior to construction of coastal structures to improve maritime security have been conducted (Fig. 3).

The seafront at Saint-Pierre

Structures along the seafront at Saint-Pierre have been recorded as a result of new building in the zone. Work carried out in 2012 (Martin, 2016; Robert, 2016) initiated a series of pre-development excavations (Bolle, 2013; Pignot, 2014). These provided an overview of

constructions on the front to the north of Bertin Place (Fig. 3), the commercial centre of the town (Bolle *et al.*, forthcoming).

Organization of slipways

The slipways are aligned as extensions of the east-west road system: the roads Ursulines and Domaines end in this area at Isambert Street with paved alleys and slipways giving access to the sea, where cargoes could be loaded onto barges (Pignot, 2014). In the area of Lalung-Léger Boulevard, five slipways, four of which are the prolongation of the streets Petit-Versailles, Landais, Marches, and Marotiers, have been brought to light (Bolle, 2013; Robert, 2016). The southernmost slipway extends 14.5m beyond the buildings along the seafront. A fourth structure identified as a jetty forming a rectangular projection into the sea, was located to one side of Bertin Place, opposite the customs house, and was built later than the slipways (Bolle, 2013).

These structures are difficult to date, but some could go back to the end of the 18th century based on the organization of the road layout and thus the means of loading and unloading merchandise in this part of the anchorage near to Bertin Place, the customs house, and the anchorage for foreign vessels in the 19th century.

Protective structures

In general, areas with structures that provide protection from the swell have been noted—although some may have had alternative defensive roles—but have not yet been thoroughly studied: for example, only the interior face and not the exterior face of a structure interpreted as a seawall in the area of the Isambert Street was excavated, as one side lay outside the area defined by the excavation permit. The wall predates the construction of the slipways, and its various sections have similar and imposing characteristics, the wall being 1.8–2m wide on average (Pignot, 2014). In the southern part, it appears to replace an earlier wall, possibly defensive, the remains of which date to the 18th century (Martin, 2016). The earlier wall serves as the foundation for the several different sections of the present wall, now separated by the slipways (Pignot, 2014; Martin, 2016).

This is not the case of the defensive wall seen near to Lalung-Léger Boulevard; in this area no buildings abut the proposed seawall. To the north of Lalung-Léger Boulevard there is a wall along the seafront dated to the 18th century that appears to serve simultaneously as protection against the swell and as a foundation for Bouillé Road (the name is 19th century) (Robert, 2016).

In the area south of Lalung-Léger Boulevard, another stretch of seawall has been noted, 95m long, on the same orientation as the boulevard, which reveals two types of construction. To the south it is built with a battered western face carefully built of volcanic rock, and a vertical eastern face with irregular foundations of stone blocks of difference types. Three phases of construction can be seen, though not dated.

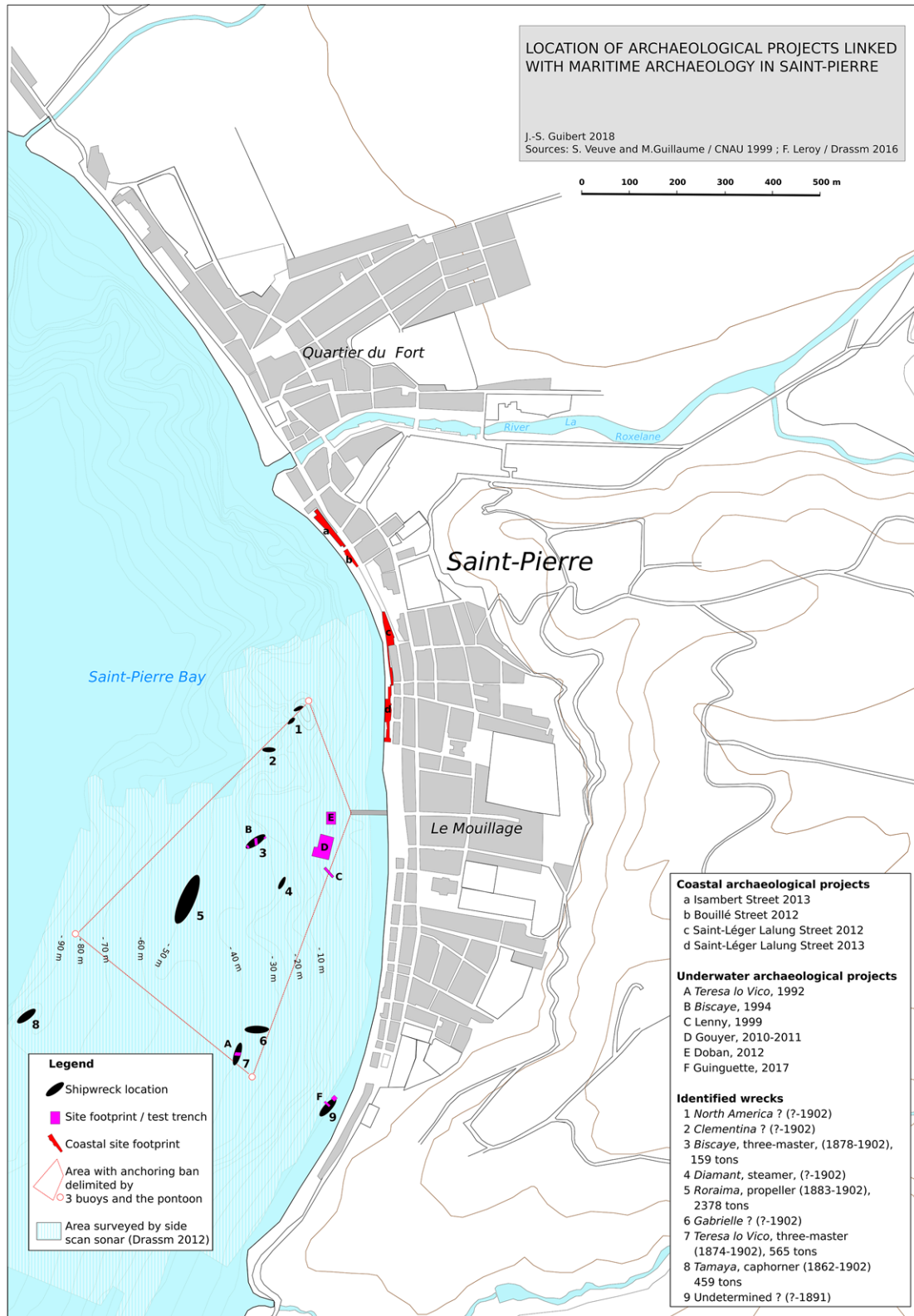


Figure 3. Location of maritime archaeological projects in Saint-Pierre (Martinique) (J.-S. Guibert, Sources: S. Veuve and M. Guillaume, L. Serra, A. Bolle, I. Pignot, C. Martin, G. Robert, F. Leroy).



Figure 4. Seawall structure in Saint-Pierre (Martinique) (A. Bolle).

In the northern part, the structure has a vertical profile and is carefully faced with volcanic stone (Bolle, 2013). This structure, identified as a seawall by its characteristics and location, has at least two phases,

the first isn't dated, the second phase is dated to the second half of the 19th century (Fig. 4). It must have been ineffective in the face of the major climatic events, such as the cyclones recorded in 1822, 1824, and 1891.

In this area a paved zone separates the seafront from the built-up area, providing space to temporarily stock goods and access for transport.

Finally, it is noted that in the area around Isambert Street the street system and blocks of buildings post date the construction of the seafront wall (Pignot, 2014; Martin, 2016), while in the area of Lalung-Léger Boulevard the road system predates the seawall (Bolle, 2013). This suggests the walls had different functions: the first could represent defensive structures designed at the end of the 17th century and built at the start of the 18th century; the second appears to be a port structure that functions to protect buildings from the assault of the sea and to allow ships to moor.

Mooring structures

Different mooring points have been recorded in the area of Lalung-Léger Boulevard, in part linked to the location of the slipways and the seawall (Bolle, 2013). Mooring rings are placed regularly every 8m along the different walls that form the seafront (Fig. 4), attached to reinforcements on either side of the wall. A wooden stock anchor has also been used for tying-up at some point, possibly earlier, in the southern part of the excavated area, as have several cannon built into the structure (Bolle, 2013; Robert, 2016). These indicate both the defence of the settlement but also the organization of the anchorage. Ships could moor with their bows out to the sea on a mooring buoy, or on their own anchors, with the stern to land facilitating loading, as suggested by the map of Saint-Pierre dated 1819 made by Dufaut (ANOM, 13 DFC 550A). These structures limit risks of ships damaging each other or foundering as a result of high swells. However, in a major cyclone, such as that of 1824, they would be ineffective.

Living and workshop quarters

Unlike the excavations on Lalung-Léger Boulevard, the investigation of Isambert Street allowed the occupation of several blocks of buildings to be studied. Spaces were defined as interior or exterior courtyards linked to housing or artisan's workshops with a high density of buildings and many phases of rebuilding. These activities and the constructions linked to warehouses located on the opposite side of the road have not been dated with any certainty (Pignot, 2014), but it is suggested they were installed in the 19th century (Martin, 2016). The finds recovered during these excavations are largely dated to the 18th and 19th century but do not provide precise dating because of mixing caused by continual rebuilding of this zone between land and sea.

The port dump in the Saint-Pierre Bay

An area near to the modern pontoon, opposite Bertin Place, within an anchorage has been investigated (Fig. 3). Excavations in 2010, 2011, and 2012 followed an evaluation carried out by the DRASSM in 2009

on a vast layer of sherds found on the surface of the seafloor. The project is part of the PCRI 'Poterie des îles françaises d'Amérique' research programme started by Aix Marseille University (La3m)/CNRS (Serra et al., 2010, 2011, 2012).

The area is known to local divers as the 'Doban wreck', named after an anchor and an accumulation of glazed ceramics from Aubagne was revealed following hurricane Lenny in 1999 and identified by the GRAN. After three years of fieldwork it has been shown instead to be the northern limit of a vast port deposit, formed by the accumulation of rubbish from merchant ships that anchored in the deep water while being loaded and unloaded to lighters, as seen in some late 19th-century postcards and engravings.

The aim of this project was twofold: firstly, to identify and date a large assemblage likely to prove useful to other material culture research and, secondly, attempt through the form of the deposited layers to understand the bottom dynamics of this anchorage since the 17th century.

Sedimentary sequence

Test pits were opened in the middle part of the bay, at a depth of 8m. Five 2 × 2m pits in a chequerboard pattern were opened along an east-west transect (C1 to C5) and excavated to a depth of about 1.8m. The aim was to obtain 10m of continuous section through the layers. A dozen stratigraphic units were recorded (Fig. 5). Three types of layers form the stratigraphic sequence: sandy, stony, and anthropogenic. The latter layers exist throughout the depth of the section and alternate with sand layers in the lower levels and stony layers in the higher layers. Apart from C1, the layers in test pits C2 to C5 can be grouped and associated with three types of deposits (Fig. 5). The top layers are an accumulation of cargo mixed with ballast up to 0.6m thick. The archaeological finds are varied and abundant (glazed and unglazed ceramics, white earthenware, glass bottles, bone, leather, lead, coins, and fruit stones). The deposit is characterized by a layer containing a majority of bricks/tiles in the highest part of the four recorded sections, followed by a layer of glass bottles and glazed ceramics from a single production centre. The organic materials composed of wooden crates—probably containing mangoes, madder, hazlenuts, peanuts, maize, or salted eels—are seen in the following layer. The material has been dated between 1830 and 1870. It includes coins with the effigy of Napoleon III and Louis-Philippe, lead customs seals relating to the system of legal payments under Louis-Philippe, a perfume bottle found in C5 dated to before 1862, and a white faience pot from Creil was stamped 1844. A blue decorated faience is dated to between 1834 and 1845, and the glazed ceramics are dated pre-1860 (Serra et al., 2012: 17–41; 79–80).

The intermediate layers alternate fine sterile sand, gravels, and rare anthropogenic layers. These layers together are 0.6m thick and are generally separated

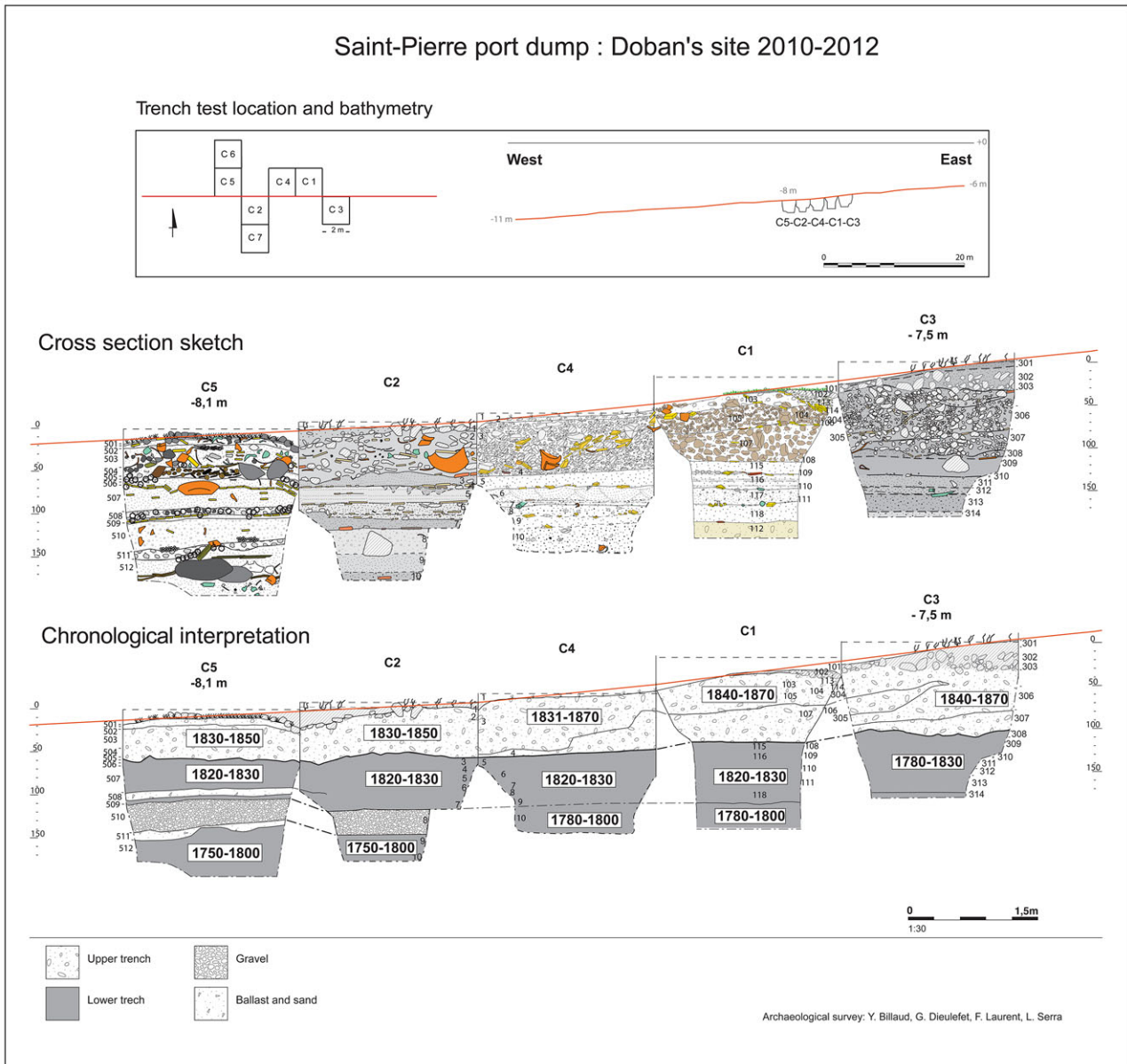


Figure 5. Doban’s port dump in Saint-Pierre (Martinique) (G. Dieulefet, Y. Billaud, L. Serra).

from the top group by a layer of yellow tiles and cooking vessels, composed of fine sand and flint nodules and containing very few artefacts. It appears to correspond to episodes of dumping ballast. The second layer is dated by developments in glass bottle manufacture to between 1820 and 1830. This date relates to the first event of rapid accumulation as 1.2m was deposited in no more than 30 to 40 years (Serra *et al.*, 2012: 17–41; 79–80).

The lowest group is made up of a layer with a denser and more diverse (bone, coins, glass, and fineware ceramics) layer of archaeological remains than that above it. The sequence starts with a very dark medium-grained more-or-less hardened sand

layer with numerous signs of bioturbation, which might signal the relative stability of the area. The diversity of provenance of the finds (Holland, England, and the French Atlantic coast) suggests varied transatlantic trade. The assemblage is dated to the second half of the 18th century by a number of elements: square-based bluish bottle glass, originally from Haut-Languedoc, is dated to around 1750, the gin bottles and faience bottles are English and dated 1770–1780, and an English coin minted in 1800 was found (Serra *et al.*, 2012: 17–41; 79–80).

A larger scale project is necessary to thoroughly understand the formation of this sedimentary sequence. Moreover, erosion, particularly during cyclonic swells,

which first drew the divers attention to the site, must be considered. Such conditions cause erosion rather than the deposition of sediment on the site.

Context and formation processes

Saint-Pierre Bay forms a curved bay more than 2km long. The north-west side of the island is termed 'accore' (Saffache and Desse, 1999), that is a rugged relief with little if any accessible shore. During a visual survey the team noted that the coastal zone north of Bertin Place (opposite the old warehouses) has a regular slope to a depth of 15m over 150–200m. Beyond this point, a break in the slope is followed by a cliff falling to a depth of 60–70m.

Unlike areas such as Fort-de-France Bay or Marin that are characterized by heavy siltation (Saffache and Desse, 1999), the north-west coast is subject to heavy erosion. This is, to a great extent, linked to the lack of rocks that could break the force of the waves. During the passage of waves only the fine sediment is remobilized. It is in part evacuated from the foreshore and trapped in deeper areas, leaving heavier archaeological material more-or-less in place. The site is therefore made up of condensed layers that can then be sealed by new deposits. Interfaces of flat-lying elements were formed in this way (Fig. 5, interfaces 7/8, 5/6).

The results, obtained in collaboration with the *Observatoire volcanologique et sismologique de la Martinique/Institut de Physique du globe de Paris (OVSM/IPGP)*, have allowed the nature and date of the site to be described. It is a port deposit situated in an early anchorage notable for dumped ballast material. The ballast is made up of granite blocks and flint nodules; even the gravel layers interpreted in 2011 as linked to river deposits, are finer flint ballast. These ballast deposits have created layers of human origin dated between 1770 and 1860 up to 2m thick (Fig. 5). The top third is essentially formed of anthropogenic material of unknown origin: wreck, ballast, or a clumsy loss of cargo.

Cultural material from a port deposit

During, this project, the team noted that in the higher layers (US 2, 3, and 4), dated to the middle of the 19th century (prior to 1870), the archaeological material lies under a homogenous layer and includes complete artefacts. Whole cooking pots and bottles were recorded in contrast to the heterogeneous layers of increasingly rare broken sherds in the lower layers.

In the higher third, the great majority of ceramics and glass were found upside down (with the base raised), which might at first sight suggest a lost cargo. In fact, the team noted an inverted organization of the piles of containers. The demi-johns in US 2 are above the more fragile bottles in US 3. This is contrary to general methods of packing cargo observed in other bottle wrecks (Serra, 2008: 17–28). This analysis is supported by the presence of piles of ceramics and the location of

items used in daily life onboard ship characterized by traces of use.

Southern French imports, represented by both Vallauris and Aubagne-Saint-Zacharie wares, dominate the ceramics assemblage. The latter are characterized by three big homogenous series of cooking pots, pans, and chamber pots, for cooking and hygiene. There are also some ceramics from northern production centres, notably porcelaine and fine faïence from France, but also from England, and Westerwald ware. The white clay bowls and tubes of smoking pipes from the north of France or Holland are a constant in the maritime context of the Caribbean. Finally, the assemblage includes local ceramics, probably from one of the nine potteries established on the west coast from the end of the 18th century (Amouric *et al.*, 2009), or imported from another Caribbean island.

Glass is the second most frequent find in the deposit. Black glass bottles dominate the container assemblage. The most remarkable contained English beer, Bordeaux wine, Provençales oil, with demi-johns stamped 'Saint-Omer'. These containers are associated with wine, olive oil, sauces, liquor, and perfumes, all high-quality imported trade goods, and are probably related to the luxurious lifestyle of the prosperous colony.

By contrast, salted cod and customs seals are evidence of the importation of food for slaves or plantation workers. Linked to the transportation of cod, the lead seals appear to be evidence of the protectionist policy that replaced the continental system, but equally to Louis-Philippe's policy of reinvigorating trade with rewards for the export of French goods in the face of foreign competition (Serra, 2006: 68–74). The signs and inscriptions engraved provide indications of the date of the stratigraphy and the provenance of the vessel that transported them. Inscriptions such as 'douanes françaises', 'Marseille', 'Bayonne', 'Le Havre', 'primes' and 'ordonnance de 1817' give insight into the exchange mechanisms linked to the port of Saint-Pierre in a period when fraud was rampant.

Both anthropogenic (abandoned ballast and trade goods) and natural (siltation and wave-carried sediment) give the sections the aspect of port dumping. The excavated zone is so situated as to reveal the relationship between the north and the south of the anchorage, as well as the Bertin Place anchorage. In fact, a very precise picture of the organization of the Saint-Pierre anchorage was provided in 1828 by the hydrographic engineer Paul Monnier:

The best anchorage in the Saint-Pierre roadstead extends from Sainte-Marthe Point to the southern limit of the Thurin inlet; as frequented by the State's ships [...]. Commercial ships anchor stretches from Sainte-Marthe Point up to the the 'Père's' river that borders the town to the north; French vessels occupy the space to the south of Bertin Place, and foreign vessels that to the north. (Monnier, 1828: 139–145)

Near to the custom's house, Bertin Place received all the merchandise that arrived at the anchorage. The area known as Doban has provided a concentration of artefacts related to activities connected to ships anchoring (abandoned ballast) and the economic activities of Bertin Place (finds).

The study of the finds from the port deposit informs us about the daily habits of the inhabitants of the island as consumers, where previously they were known only from pioneer's accounts, port authority's statistics, or terrestrial excavations. To date, the site's chronology stretches from 1680 to 1870. Earlier periods by default lie outside the objectives of this study that aimed to record the deposits in the anchorage from the second half of the 17th century. The excavation team planned to return to take core samples to assess the presence of earlier periods of use. This goal was not reached in 2012 and should be the next step for future projects on this site.

Le Moule : port deposits and structures

In Guadeloupe, Le Moule Port has attracted researchers' attention, alongside Petit-Canal as mentioned. A port dump/deposit contains artefacts dating to the 18th and 19th centuries and has been studied by F. Bigot and B. Vicens (Bigot and Vicens, 2006). Test pits excavated in 2004 were set out in the anchorage zone between two rocky outcrops to the south of Hasting Pass (Fig. 6). The methods used allowed only an approximate record of the stratigraphy to be made with one layer of sterile sand (0.08m), a layer containing abundant 19th-century material (0.8m), an 18th-century layer (0.2m), and a coral substratum (Bigot and Vicens, 2006: 19–26). The range of finds recovered allowed the physical remains of trade in Le Moule Port to be explored (ceramics including table- and kitchenwares, shipboard equipment, and smoking pipes; glass bottles and tableware; wooden tools and arms) but also to assess the importance of Anglo-American imports alongside those from France. Whether the sample is truly representative can be questioned, however. Moreover, should the ceramic finds retrieved be related to life on board or imported trade goods? Can the Anglo-American finds be seen as evidence of illegal trade or rather that means of access to foreign trade were numerous from the 18th century? Another question remains: the lack of pottery used in the sugar refinery process somewhat undermines Bigot and Vicens' suggestion that this was the first sugar port, which is also contested from a historical point of view (Pérotin-Dumon, 2000; Guibert, 2013a: 371–375).

The excavations carried out in the Autre Bord quarter of Le Moule (Fig. 6) revealed remains of the first location of the town to the south of the current port built at the end of the 17th and start of the 18th centuries. It appears to have been occupied until 1738, when a cyclone destroyed this quarter and encouraged the occupants to move to the current site of the town, relegating this quarter to a suburb (Demangeot,

2015; Romon, 2016). The results of the project have enabled the impact of random climatic events on urban development to be recorded and thus a form of adaptation to maritime risk. Means of reducing risk in Le Moule Port is a subject of research in its own right. The anchors found on the rocky outcrop of the port have been recorded and mapped. On both sides of the passage and within the anchorage 54 anchorage points have been noted and 26 mooring anchors of two types (single and double arm), 22 anchors with mobile stocks, 14 unidentified anchors, 4 anchors with wooden arms, and 2 cannon (Figs 6 and 7) have been located. Their types and archival documents suggest they were put in place as part of a project to secure the anchorage between 1825 and 1840 and to facilitate departing the port that is subject to the Atlantic swell (Texier *et al.*, 2010). They were placed following the abandonment of a project proposed in 1825 to build a jetty over the rocks that was judged too costly. These works should be seen in parallel with both an increased frequentation of Le Moule Port but also the high number of ship losses that occurred there (Guibert, 2013a).

Research started in Martinique and Guadeloupe is preliminary; nevertheless, the methods used for the study of the port deposits would be improved by extensive and systematic core sampling to develop comparative data across the sites of a significant size and other areas that await investigation. This could be focused on the principal ports of Guadeloupe, Basse-Terre and Pointe-à-Pitre, and also Fort-de-France and La Trinité on Martinique.

Micro-islands

To complete this first section, a study of two micro-islands in Guadeloupe are included: Colas Islet in the Grand Cul-de-Sac Marin and Chasse Islet. Micro islets are very numerous in Guadeloupe and Martinique. This research has enabled a very interesting archaeological phenomenon to be recorded in the Antilles: by examining the material culture and fauna in the shallows around the islets, their pre-Columbian frequentation can be assessed, particularly by examining the changes in the coastline in these zones that are particularly subject to erosion (Guibert *et al.*, 2013). Detailed topographical mapping, surface samples, test pits excavated using dredges set up along predefined axes, and coring are the various methods that have been used.

Combining analysis of the material remains and documentary evidence indicates the islets were frequented during the Colonial period and at least from the 18th century. For Colas Islet, this was doubtless related to fishing activities mentioned in archival documents and with lime production and hunting on Fajou Islet, a larger island nearby. In test pits A 31 and Z 40 located on the south of Colas Islet at depths of 3m and 1.25m, several layers of detritus of conque shells (*Lobatus Gigas*) and the remains of

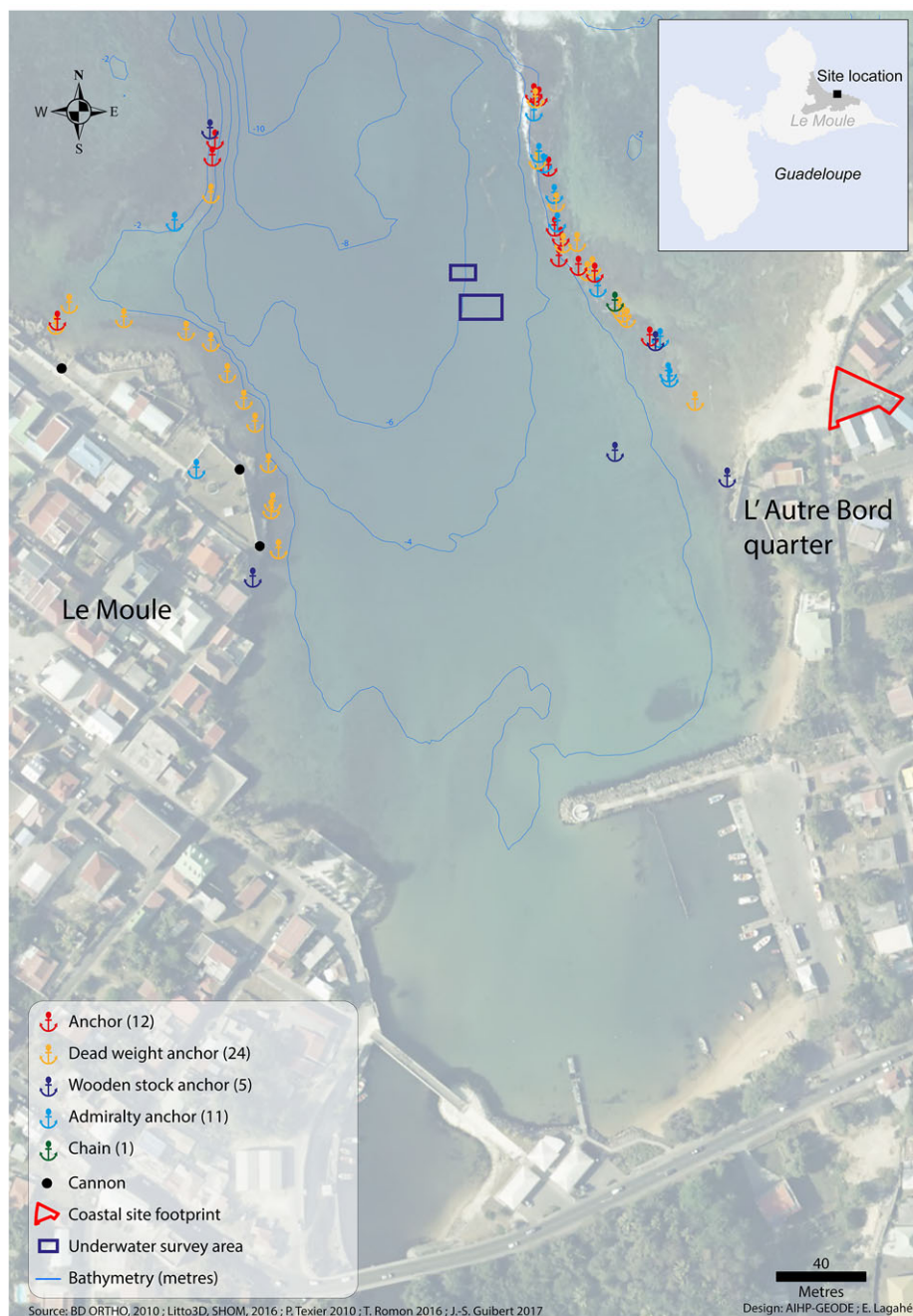


Figure 6. Location of maritime archaeological projects in Le Moule Harbour (Guadeloupe) (É. Lagahé; Sources: P. Texier, T. Romon, J.-S. Guibert).

several species of turtle (*Cheloniidae*, *Caretta caretta* et *Eretmochelys imbricata*) were recorded. A radiocarbon date of AD 1591–1806 from a breastbone from a turtle (*Caretta caretta*) from a stratigraphic layer in test pit A 31 indicates anthropogenic resource gathering either before the European colonial occupation and thus *a priori* Amerindian, or after and related to the Colonial occupation. Either way, this can be linked to the fishing activities practised on the islets.

For Chasse Islet, near to Pointe-à-Pitre, the archaeological finds, the remains of a levee, and archival documents, suggest a more stable occupation accompanied by the development of fishing and lime production at the end of the 18th and 19th centuries (Yvon, 2012). As part of the Chasse Islet project, a coastal levee constructed of stakes filled with worked stone recouped from a monumental limestone structure was recorded 25m from the present coastline,



Figure 7. Anchors in Le Moule pass (Guadeloupe) (P. Texier, 2011).

raising questions of coastal erosion and sea-level change.

Wrecks-sites

Wreck-sites are defined as the association of elements including cargoes, rigging, artillery, or ballast with wooden or metal vessel remains. Contemporary wrecks, dated after 1902, are not considered here. Although they could indicate the presence of a wreck, single objects are not considered here either. Sites with multiple wrecks or ship graveyards at Saint-Pierre, Martinique and at the Anse à la Barque (Bouillante), Guadeloupe have been the first to draw the attention of researchers.

Multiple wreck-sites

Anse à la Barque

The site of Anse à la Barque has a concentration of eight wrecks dating from the end of the 18th to the beginning of the 19th centuries, including two Napoleonic flutes scuttled in 1809.

Three distinct areas can be discerned in the bay (Fig. 8). The first with one wreck is situated near to a pontoon at a depth of 6–7m. The second is on the shore below the lighthouse, where the presence of a wreck was recorded in 2009. Neither of these has been the subject of further research nor recorded in detail. In the north of the bay near to the current shore lie five wrecks, one on another, in a depth of 4–5m. This last area has been the subject of several archaeological campaigns.

The first campaigns, authorized in 2001 and 2003, were intended to verify the presence of the *Seine* and the *Loire*, ships mentioned by Jean-Pierre Moreau (Moreau, 1988: 136–137), and to establish the extent and structure of the site (Vicens, 2001: 88). If the presence of five ships is attested by archaeological finds and ship timbers dating to the First Empire, the precise layout of the wrecks cannot be given because of the dispersed nature of the remains. An evaluation led by the DRASSM in 2002 highlighted remains along two axes (L'Hour and Massy, 2002: 82). These two wrecks

have not been identified (Vicens, 2004). In 2003, only the stern of wreck AB 1, originally interpreted as the bow and main mast-step of wreck AB 2, were excavated (Fig. 8). At the time it was considered to be a single wreck (Vicens, 2003: 104). Fieldwork continued in 2006 and 2007 on specific areas of wrecks AB 1 and AB 2 including the stern and central axis of wreck AB 1 and the main mast-step and the hull of AB 2 (Fig. 9). This enabled a third wreck to be recognized, AB 3, as well as two other wrecks lying over AB 1: AB 4 and AB 5. A site plan was drawn up but the wrecks of the flutes could only be confirmed by combining the site evidence with archival research (Vicens, 2008; Guibert, 2010a).

In 2013, following further work, an alternative hypothesis was put forward for AB 2 being a lugger dating to the beginning of the 19th century (Villié and Vicens, 2013). This theory is built on the analysis of the construction features of the vessel, however the archaeological finds recovered in the earlier fieldwork campaigns date to the end of the 18th century. At the same time, another wreck was listed south of AB 2 and possibly identified as another Napoleonic flute.

Study of this group of wrecks highlights important lacunae: the archaeological recording of the ship structures, study of the artefacts, and the analysis of the different materials present should have enabled the different wrecks present to be distinguished more precisely. The site remains one of the most interesting for understanding maritime traffic in Guadeloupe in the 18th and 19th centuries through the wrecks present. Nevertheless, Anse à la Barque is now listed as an archaeological reserve by the Ministry of Culture in collaboration with scientific specialists and the maritime authorities.

Baie de Saint-Pierre: 1902 wrecks

A number of wrecks in Saint-Pierre Bay that are linked to the eruption of Mount Pelée in 1902 have been investigated since 1976, notably by M. Météry (Fig. 3, Table 2). Several campaigns followed: a magnetometer survey (Guérout and Guillaume, 1990), as well as test pits with a view to gaining protected status for the

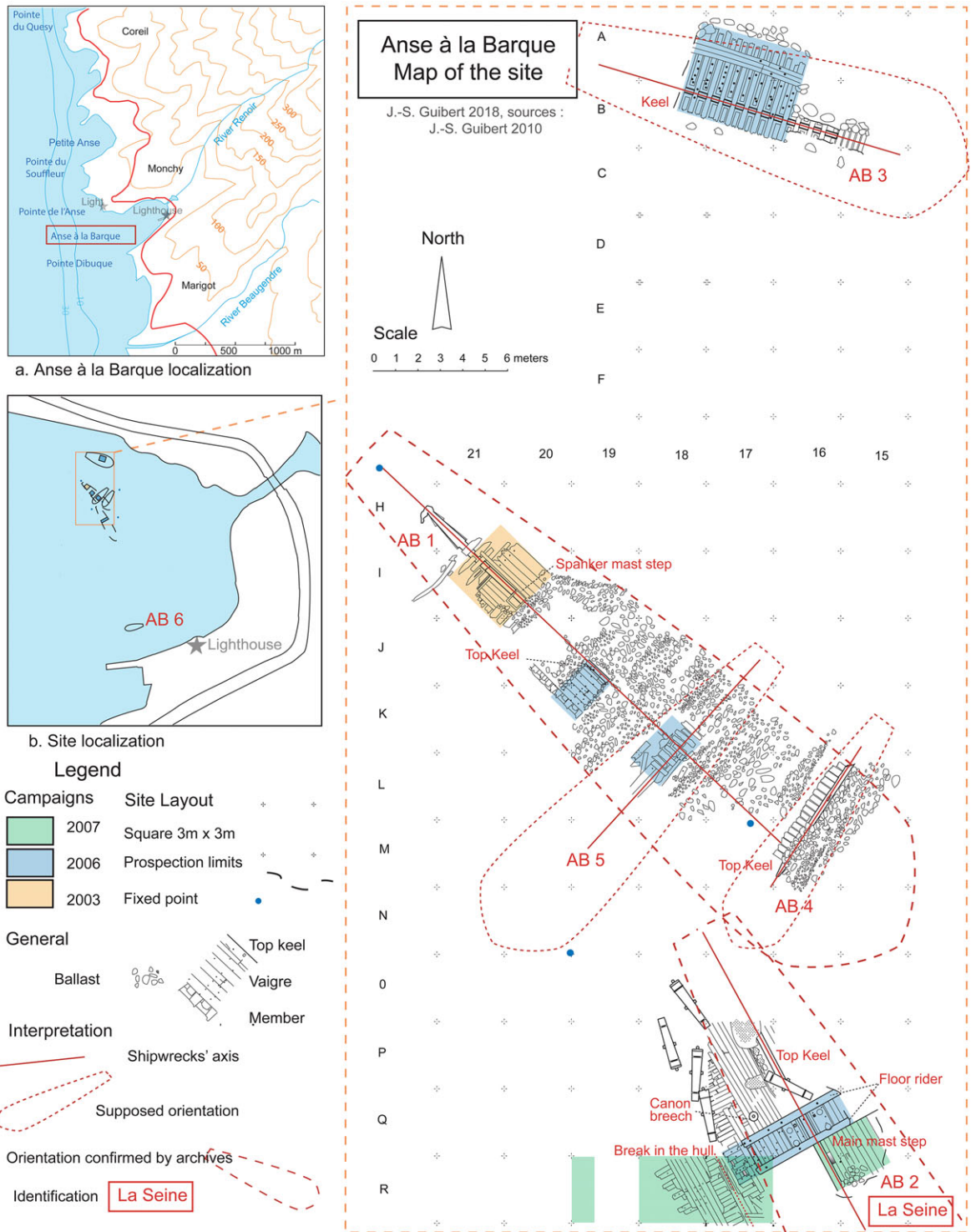


Figure 8. Anse à la Barque plan site, Vieux-Habitants Bouillante (Guadeloupe), (J.-S. Guibert).

wrecks in 1994–1995 (Guillaume *et al.*, 1994); however, their status as maritime heritage fell outside of legal classification in French law at that time.

These projects culminated in a synthetic publication and a plan of the wrecks of Saint-Pierre Bay

(Guillaume, 1999b: 145–150). More recently a sidescan-sonar survey was carried out by the DRASSM in 2013 (Leroy, 2014; 2016), providing an objective and detailed view of anomalies on the seafloor. The DRASSM, within the framework of the State’s actions in the

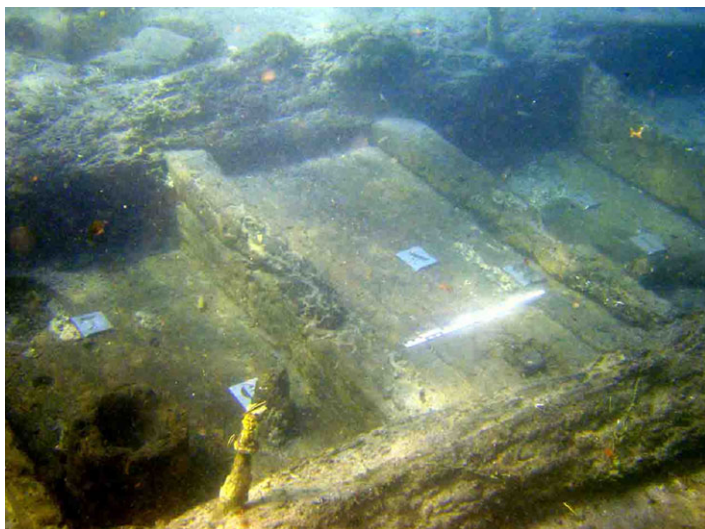


Figure 9. AB 2 main mast foot step (P. Villé, 2006), and wooden pipe and its lead sieve from the bilge pump, Anse à la Barque (Guadeloupe) (J.-S. Guibert, 2007)

Antilles Sea, could extract precise coordinates. As well as obtaining precise locations for the 1902 wrecks, this has enabled 50 anthropogenic anomalies to be recorded in the area at depths of between 4 and 30m, some of which may be earlier. Several areas of the roadstead were surveyed up to a depth of 80m during this field campaign (Fig. 3). Having located these anomalies, ground truthing of each is now necessary to characterize, record, study, and where possible, identify each of these maritime heritage remains, though not all are wrecks. An increased appreciation of maritime heritage in the Antilles would necessarily accompany such a project.

The primary aim of the fieldwork carried out at Saint-Pierre and Anse à la Barque, was to identify the ship remains. Among the wrecks identified at Saint-Pierre are *Biscaye*, a three-masted, 159-ton ship built in 1878; *Diamant*, a steamship that ensured communications with Fort-de-France, *Roraima* a steam tramp (with a screw propeller) of 2738 tons built in Scotland in 1883 and bought by the Quebec Steamship Company in 1889, of which the wreck measures 110m long and 15 in depth; and, lastly, *Tamaya* a Cape Horn of 459 tons built in 1862 identified by its bell retrieved in 1985. Four other wooden sailing vessels sheathed in metal are referred to as *Teresa Lo Vico*, a three-masted, 565-ton ship built in 1874 in North America; ‘Yacht Italien’; *Clementina*; and *Gabrielle*, without having been formally identified (Guillaume, 1999b). The possible identifications are given here along with the ships’ principal characteristics (Fig. 3).

The roadstead has a concentration of shipwrecks of very different types but all built in the years 1860–1880 making it a unique ships’ graveyard representative of the maritime traffic at the end of the 19th century.

Isolated wrecks: trade

Wrecks are primarily of interest for the information they can furnish about maritime traffic to the Antilles within the different categories previously mentioned: merchant, naval, and local trade. It was trade, and particularly the transatlantic slave trade, that first ignited the interest of the GRAN in Martinique, with activities linked to the UNESCO Slave Route programme (UNESCO, 1993; 2004). Research into this type of transport has its own methodological and ethical problems, but in this case the results of the research were disappointing. An elephant tusk found on Loup Garou reef island is the only indication of a possible wreck-site linked to the slave trade (Guillaume, 1997: 67). Research into wrecks of other merchant ships have, however, provided information about cargoes and specific routes in the 19th century. To these merchant vessels studied in Martinique, which also provide evidence of the development of ship construction in the 19th century, must be added the probable *Mary-Ann*, an English brig sunk at Sainte-Anne in 1866 (Guibert, 2014b), which is not detailed here.

France : *Passe de Pointe-à-Pitre*

The site of the wreck at the Pointe-à-Pitre pass (PP1) was found by chance in December 2011. The archaeological potential of the area had been previously suggested by Guibert (2010a, 2013a). Initial investigation of the site and archival research led to the hypothesis that PP1 is the merchant ship *France* sunk in June 1824 (Guibert, 2013a: 526–527). This suggestion is based on a cargo manifest that lists ‘150 fathoms of Barsac stone, 7000 floor tiles and spare parts and provisions’ (ANOM, SG/GEN 340/2135). These details matched initial descriptions of the site. Fieldwork was carried out in July 2013. The site consists of a cargo of worked stones and clay floor tiles, as well as the

Table 2. List of wooden shipwrecks in Saint-Pierre Bay

Name	Wreck number (Fig. 3)	Shipyard	Length (m)	Beam (m)	Depth-in-hold (m)	Tons	Wood	Nails	Sheathing
<i>Gabrielle</i>	6?	Liverpool	23.18	6.61	2.47	60	Oak/Pitch pine	Galvanized iron	-
<i>Biscaye</i>	3	Bibao	31.66	6.35	3.70	159	Oak/Pitch pine	Copper	Yellow metal
<i>North-America</i>	1?	Buccari	43.40	9	5.98	532	Oak/Beech	Copper and iron	-
<i>Sacro Cuore</i>	?	?	?	?	-	558	?	?	-
<i>Teresa Lo Vico</i>	7	?	?	?	-	565	?	?	-

eroded remains of part of the ship's hull. The stone blocks vary greatly in size from 0.28 × 0.38m to 0.35 × 0.80m. The clay tiles are 0.20 × 0.20m. The cargo is not from the Antilles, and could have come from the Bordeaux region. The mineralogical analysis of the stones sampled, suggests, if not Barsac stone from the Coutet estate, then it is from one of a number of Astéries limestones from the Bordeaux hinterland, possibly from the Langon quarry. 'Barsac' stone is a generic term for stone from the Bordeaux region (Déroin *et al.*, 2005: 83). The stones could have served as ballast and are commonly used in buildings in the Antilles, particularly for courtyard paving.

The pottery assemblage is too small to provide a precise date. It does, however, include an inkwell that is similar to those found on the 'slate wreck' of Kerjouano (L'Hour and Veyrat, 2005: 182–183), which suggests a date at the beginning of the 19th century. The ship structure and wood analysis have not provided more precise dating evidence. The fasteners (nails, spikes, and clamps) suggest a date after 1820 (McCarthy, 2005: 90, 186). Three lead sounding weights were recovered from the wreck. The site is in a highly dynamic zone that has allowed only heavy objects to be preserved, but other indicative finds may still be found on the site. Meanwhile, the site is threatened by a vast construction project and no global archaeological survey has been carried out.

The identification of the PP1 wreck rests on the cargo, its location, and components of the hull construction; it cannot be excluded, however, that another ship of similar date sank in the same zone with a similar cargo.

Caye Macabou, Cato (1869–1893)

The wreck was first investigated in 1992, followed by a test excavation the following year conducted by the GRAN (Guillaume, 1992b). The wreck lies on Macabou Cay, at Passe Titou (Le Vauclin), orientated NNW-SSE in 7–11m of water. A heap of coal, about 30m long, lies at the foot of a coral mass in front of the Titou pass. A number of metal objects have been located around the site: windlass, anchor, cables and so on, and to the south of the site a sheathing plate was found.

Two contiguous test pits were excavated in 1993 to the south of the site, on the edge of the coal mound, covering an area 4.5 × 1.5m and to a depth of 0.80m. The structures observed relate to a nearly horizontal section of the hull (5° list approximately). Planking (0.1m thick), a wale (0.14 × 0.15m in section), ceiling (0.1m thick), and a waterway (0.37 × 0.22m in section) were recorded as well as the end of the transversal timbers at the level of the deck: floor-timbers (0.14 × 0.14m in section), deck-beams (0.11m thick), deck-beam knees (about 0.22 × 0.22m in section), and a hawse-hole (Fig. 10). The majority of timber used is pine, with the exception of the futtocks (0.20 × 0.20m), which are oak. There could also be stanchions intended to support a bulwark, or the aft poop.

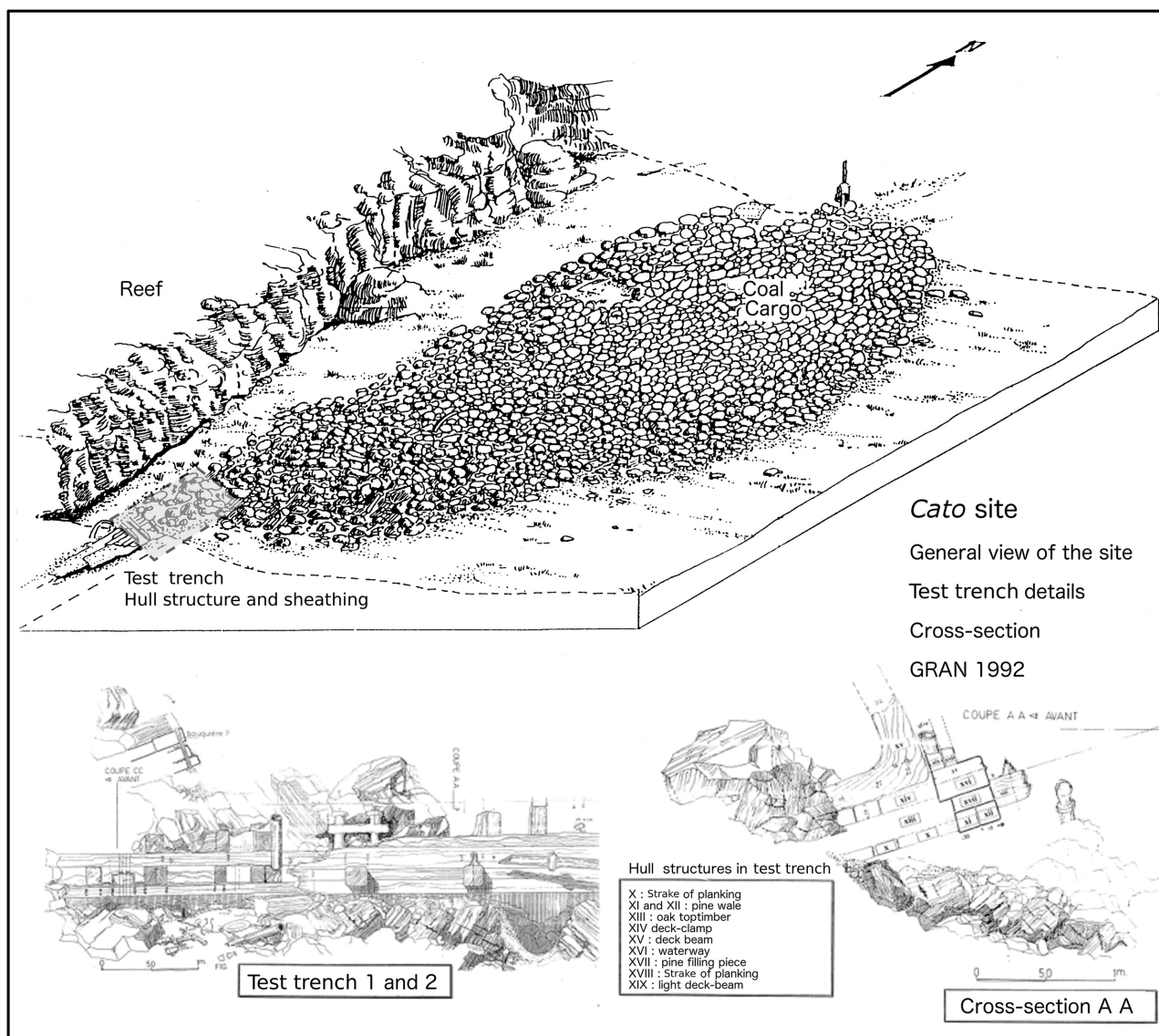


Figure 10. *Cato* shipwreck site, Le Vauclin (Martinique) (M. Guérout, GRAN 1992).

A total of about 40 objects were recovered from the two test excavations beneath the timber elements, between lumps of coal, or on the sand. It is the largest collection of on-board objects found in Martinique to date. One corked bottle containing 98 pieces of chewing tobacco reveals a little-known aspect of life aboard. Remains of musical instruments include a flute in four pieces, a violin tailpiece, and a fragment of a music stand. These suggest this area of the vessel was the officers' accommodation at the rear of the ship.

Glass and pottery sherds are numerous, and suggest a north European provenance: including Russia (porcelain marked 'Kouwnetsov'), and vessels from Dresden, Cardiff, and Newport, the latter indicating *Cato's* last port of call.

A telescope is remarkable for its state of preservation and for an inscription that was found during

conservation that has provided an identification for the wreck, it reads 'Bark *Cato* of Arendal'. The maritime museum of Bergen was able to link this to the three-masted bark *Cato*.

Analysis of the wood showed pine (*Pinus sylvestris*) was used for the longitudinal timbers and oak (*Quercus* sp.) for the framing, which supports the identification, as does the presence of copper sheathing (Guillaume, 1995: 23–26).

The ship was built in 1869 in Grimstad, Norway, in the Salve Johnsens shipyard. It was 110 feet (33.35m) long, 27 feet (8.23m) wide, and 14.9 feet (4.54m) deep, with 14.5 foot (4.42m) displacement, and a tonnage of 342 tons.

Built of oak and Norwegian pine, treenailed, and sheathed in yellow metal, *Cato* was classed 'A1' and insured by Agders Assuranceforening (Grimstad). At

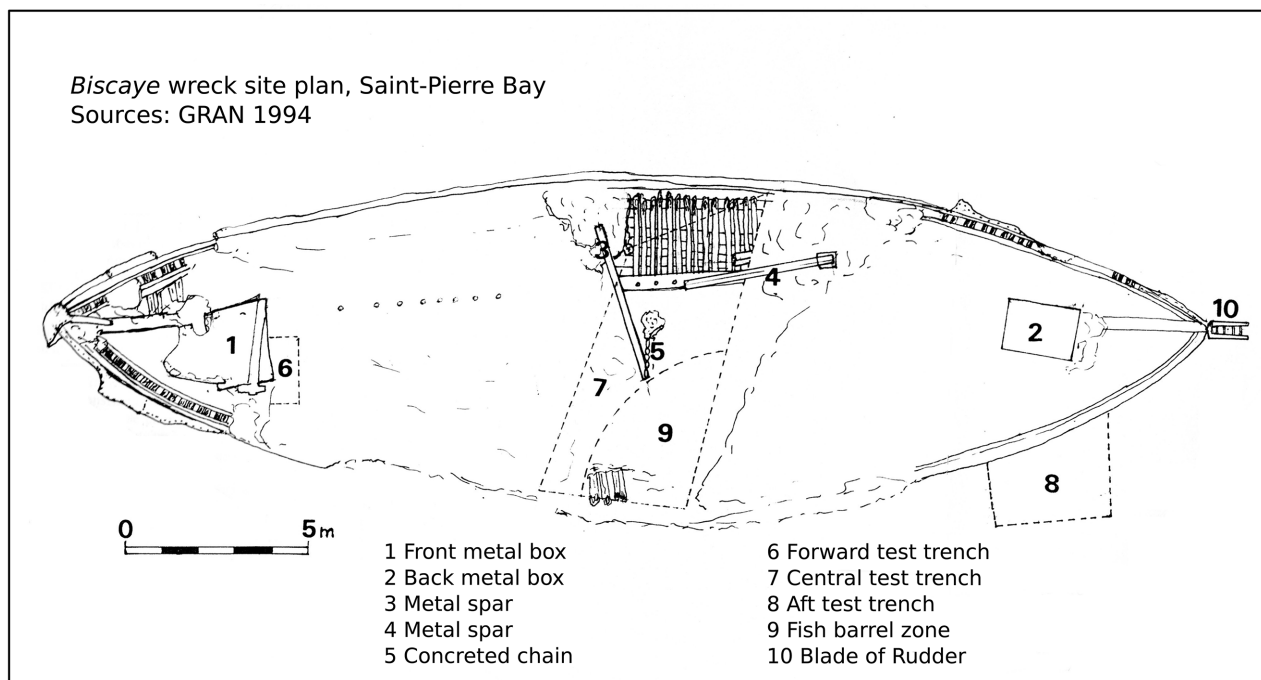


Figure 11. *Biscaye* shipwreck site, Saint-Pierre (Martinique) (M. Guillaume, GRAN 1994).

the time of its last voyage the ship was owned by C.H. Johnsen of Arendal, and captained by J. Johannesen. It departed Arendal for Newport (Wales) 27 July 1893, where it arrived 16 August. It likely loaded its coal cargo there. A telegram dated 2 October 1893 describes the wrecking: 'Martinique, 3-masted bark *Cato* sunk. Crew saved'. It was struck from the insurer's list in November 1893. Research in Norway has produced the construction plan and a painting of *Cato* (Guillaume, 1995: 14–15).

This wreck illustrates how coal was transported to allow steam vessels that had crossed the Atlantic to refuel as there was a coal depot at Fort-de-France. *Cato's* story touches on the bitter irony of sailing ships transporting the fuel that would lead to their demise.

Biscaye 1878–1902

A test excavation on the site was undertaken in 1994 by the GRAN for the Ministry of Culture with the goal of locating, recording and evaluating the wrecks of Saint-Pierre, Martinique that sunk when Mount Pelée erupted, 8 May 1902, in order to provide adequate protection (Guillaume *et al.*, 1994).

The wreck is orientated east-west. The bow is to the east in 29m of water, the stern is at 39m. The wreck lies on its port side at about 45°. The starboard frames are clearly visible, as are planking and sheathing. The starboard is preserved up to the fifth or sixth plank above the keel. A site plan was drawn; the total length of the wreck is between 30.6 and 32.2m.

Three test pits, one at each end and one amidships were dug. Only the midships excavation was fruitful.

The starboard timbers were revealed at the keel. A cargo of casks was recorded, which survives on at least two layers. Three casks of the upper layer were damaged, they held fish. The base of the casks measured 0.72m, which would correspond to a size '2' container (484 litres) (Guillaume *et al.*, 1994: 17). The fish were packed headless, with articulated vertebrae, and arranged head to tail (Fig. 11).

The hull bottom was recorded on the starboard, it consists of a keel (dimensions not recorded), a false keel (0.30m in depth and 0.40m wide), a keelson (0.41m deep), above the keelson a damaged timber (0.28 × 0.28m) could be the main mast-step. The floor-timbers (0.12m wide and 0.28m in depth) are notched over the keelson with 0.16m joggles. The limber holes are 60mm in diameter (Guillaume *et al.*, 1994: 17–18).

The futtocks are approximately 0.13m sided and 0.17m moulded, assembled to form pairs 0.325m wide spaced between 0.125 and 0.14m.

The sheathing is a yellow-coloured copper alloy that is relatively rigid; it is probably yellow metal or Muntz metal, an alloy invented by G.F. Muntz in 1830, composed of 60% copper and 40% zinc (Bingeman, 2018: 466). Sheathing sheets measure 1.15 × 0.34m, attached with 30mm-long sheathing tacks; 26 on the long sides and ten on the narrow side of each sheet.

The sparse finds include a small number of pottery sherds, two complete bottles and a few glass sherds, and a small number of rigging elements and chandlery. None of the finds can provide a precise date or suggest an identification for the wreck.

Seven fish vertebrae were sampled and sent for identification to the Museum of Natural History in Paris. A single species was identified, Gadides, of which cod, haddock, whiting, and hake are members. Four were certainly *Gadusmorhua*, cod, the three others could not be identified with certainty. The size of the vertebrae allows the size of the cod to be estimated at 1m long and weighing 10kg, which matches standard sizes for conserved cod, whether salted or dried (Guillaume, 1995: 13).

Three elements led to the identification of *Biscaye*: the length recorded and the type of sheathing. The cargo of fish identified as cod matches archival data and confirms the identification.

The three-masted schooner was built in 1878 at the Domingo Mendiguren shipyard in Bilbao, Spain, under the name *Gurruchagahijos*. It was registered in Bayonne, France, 7 July 1895, named *Biscaye*, and acquired by Vidart and Legasse, merchants of Bayonne. The ship was 31.66m long, 6.35m in the beam, 3.70m in depth, with a displacement of 3.70m, and brut tonnage of 194 tons. When registered in France the displacement was modified and the tonnage recorded as 112 tons 43/100. The hull is constructed of oak and pitch pine, copper nailed, and sheathed with felt and copper according to the archives (Lloyd's Register of Shipping, 1901).

The ship was armed in Nantes, 10 June 1901, and was listed by the *Bureau Veritas* at Bordeaux in January 1902. It appears for the last time in Lloyd's Register in 1901 as No. 113 (and with an alternative name recorded with the initials J.U.A.). The last inspection took place in Bordeaux in 1902. *Biscaye* departed Bordeaux on its last voyage 17 February 1902, headed for Saint-Pierre and Miquelon, where they loaded 700 casks of salt cod (SHD Rochefort, 13 P940; Bureau Veritas 1901; Lloyd's Register of shipping 1901).

This summary of the wrecks linked to transatlantic maritime trade highlights the merchant ships dated to the end of the 19th century (three-masted barks and brigs) that are found both in Martinique and Guadeloupe.

Isolated wrecks: naval vessels

Naval vessels have been documented in the French Antilles at Pointe Pie at Sainte-Anne (Martinique) where the remains of HMS *Raisonnable* (1761) have been recorded (Guérout and Guillaume, 1990: 77–79; Guillaume, 1996: 6), and at Anse à la Barque (Guadeloupe) where the remains of *Seine* and *Loire* (1809) have been identified (Vicens, 2004, 2008; Guibert, 2010b, 2013a, 2014), and at Prêcheur (Martinique) where *Cygne* (1808) has been found (Guillaume, 1991), at Pointe Macré (Martinique) where *Caravane* (1817) has been located and identified (Guillaume, 1992: 10–13). The first sites are related to sea battles, the last to the 1817 hurricane. Finally, in Guadeloupe the remains of *Anémone*, a schooner lost in 1824 in a hurricane is currently being studied (Guibert *et al.*, 2015; 2016).

Prêcheur, le Cygne a brig (1806–1808)

The historical context of the loss of *Cygne* is well documented, the wreck was found by the GRAN relying on the available data. The wreck took place between Prêcheur and Lamarre Point batteries, that is a stretch of coast about 2500m long. It was near to the Garenne rock, indicated on 18th-century maps, but a name that was no longer in use. A memoire written by M.P. Monnier, a naval hydrographic engineer, describes the coast and supplied additional information that allowed the diverse clues to be consolidated. The site was found 1 April 1991, on the first dive of the project.

Situated at the entrance to the town of Prêcheur, opposite La Charmeuse, the wreck was found lying 60m from and parallel to the coast, at a depth of 4m. The site measures about 30 × 12m. The remains of the ship are spread around the scattered, smooth rocks rising 1–2m from the seafloor. The hull itself lies under a large metallic concretion topped by an artillery piece in the centre of the site. To the south, two anchors probably mark the bow of the ship. Thirteen carronades and their carriages are spread around the site.

A first test excavation to estimate the extent of the site was carried out in April 1991, which enabled a sketch plan of the site to be drawn (Fig. 12). The remains of the hull were covered by 0.40–0.50m of sand. Five carronades and one piece of artillery were visible (Guillaume, 1991). The keel, sheathed with copper, sits flat, and could only be seen for about 0.40m of the S-E side. It measures 0.25m wide. Covered by concretions, the planking is difficult to record on the west side, it is 50–70mm thick. Of the 40-odd nails found, only 30 are not damaged by electrolysis. They are typical of the French arsenals: flat headed, square shanked, with a chisel point (Boudriot, 1973: 140).

Two anchors were recorded. One lies flat on the seafloor. The wooden stock has not survived but one of the iron assembling rings is preserved. The interior measurements of the ring are 0.14 × 0.18m. The shank is 3.88m long, the bills are 2.65m apart, and this line crosses the stock 1.05m from the crown, the distance from ring to bill is 3.10m. This appears to be a superior model to the reglementary brig issue anchor of the French Imperial navy. The second anchor is incomplete, the stock is preserved over 0.70m, the bills are 1.52m apart, and this line crosses the stock 0.60m from the crown. It is smaller than the first anchor (Guillaume, 1991).

Thirteen highly concreted carronades have been located. Two of them could be measured. They are 1.70m long, the calibre is 136mm, and the vent is 170mm. We expected, following Jean Boudriot's descriptions (1981), to find fixed breaching gun carriages with the principal characteristic of pivoting around a vertical axis fixed to the gunport. While *Cygne* may have been fitted with an experimental type of carriage, those found on the site were of the classic running breech type.

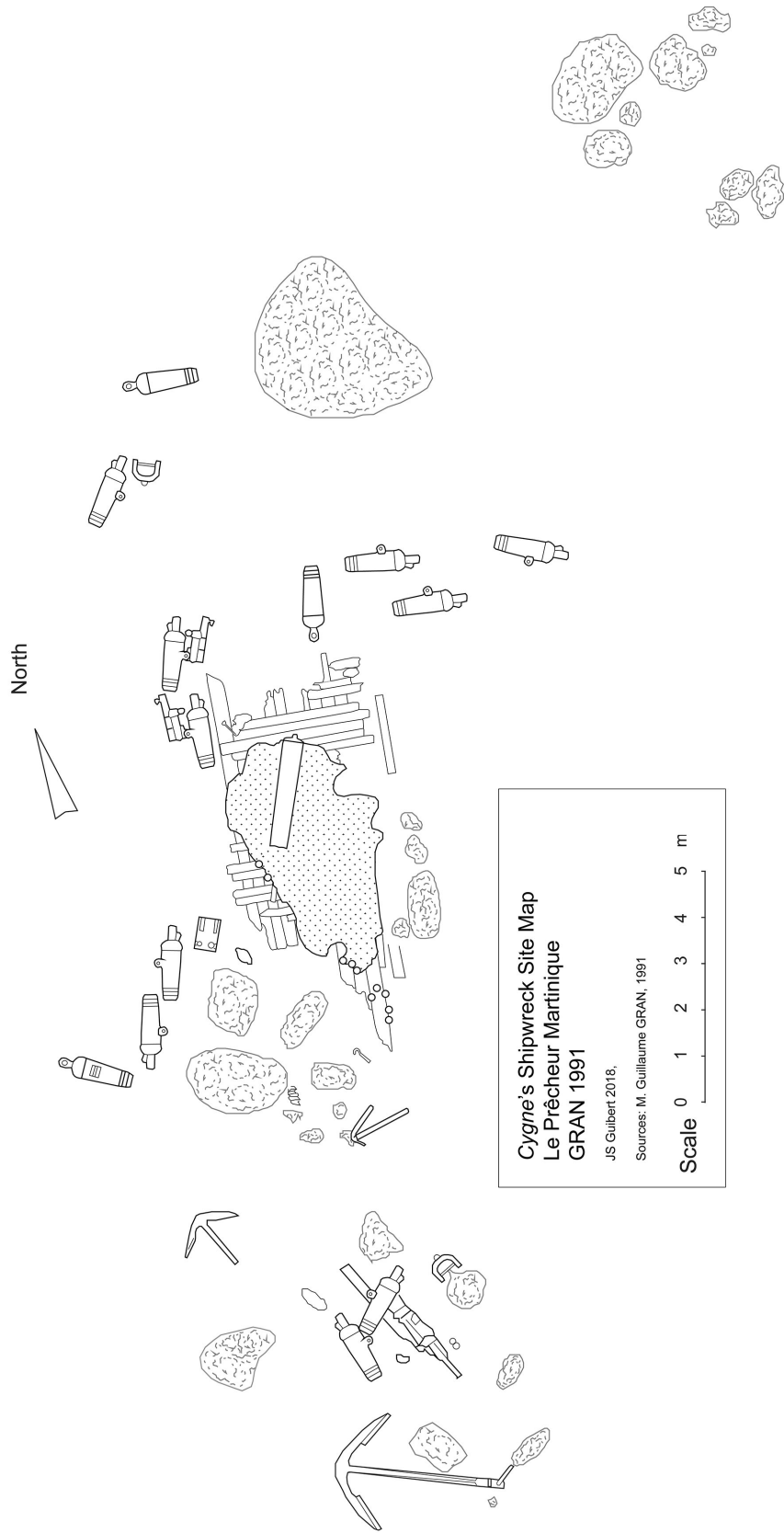


Figure 12. *Cygne* shipwreck site; Le Prêcheur (Martinique) (M. Guillaume, GRAN 1991).



Figure 13. 18mm revolutionary period pistol from the *Cygne's* shipwreck site, Le Prêcheur (Martinique) (P. Mardikian, Archéolyse).

One isolated cannon could not be measured and identified, and taking into account its position it could have served as ballast.

The finds assemblage consists of 130 objects, largely carpentry nails, ceramic sherds, and glass. Five uniform buttons throw a light on the personnel aboard *Cygne*. One button is 22.7mm in diameter, 0.6mm thick and has the number 66. It designates the 66th infantry regiment of the line, which was garrisoned in Guadeloupe in 1808 and left in 1809. It could have belonged to the uniform of a deserting conscript from this infantry regiment, 11 of whom embarked in Cherbourg. Another button 23.5mm in diameter and 0.4mm thick carries the inscription 'République française', it is decorated with a Phrygian bonnet and two crossed cannon, with a cable around the edge. Eight men of the 1st Maritime Artillery Regiment embarked in Cherbourg to complete the crew.

An ebony and copper octant is partially preserved including the articulation of the mobile arm to the Vernier. Nothing allows the maker to be identified.

Three pistols were found in a defined area N-E of the central concretion. They are 18mm-calibre Revolutionary-period pistols, which are relatively rare. One of them has been conserved (Fig. 13) (Guillaume, 1995: 16–19; Mardikian, 1996: 161–169).

The identification of the wreck is based on the location of the site and its coincidence with the written descriptions of the loss of *Cygne*. Moreover, most of the artillery was reglementary armament. *Cygne* was an imperial navy brig, built in Havre at the end of April 1806, and launched 12 September 1806. It was built by Jarnez using Pestel's plans. It was 90ft long (29.23m), 26.5ft wide (8.6m), and 13.5ft deep (4.37m). *Cygne* was equipped with 14 oars. It was armed with two cannon, 14 24-pounder carronades, and had a crew of 86 and 10 passengers (Boudriot and Berti, 1981; Roche, 2005: 2018).

Commanded by Lieutenant Menouvrier Defresne, *Cygne* departed Cherbourg 10 November 1808, to provision Martinique. On its arrival, it anchored in the Anse de Céron to the north-east of Martinique, but was spotted by the English fleet that blockaded the island made up of HMS *Circé*, *Morne Fortunée*, *Stork*, *Epervier*, *Express*, and *Amaranthe*. After the battle, which lasted two days, *Cygne* was sunk near to the coast 13 December 1808. The ship was briefly boarded by the English, though, under fire from the Lamarre Point battery, they withdrew having set the ship alight (ANOM, C8A 116, 80–81; 82–84; 117; 259–260).

Baleine Les Saintes pass, Guadeloupe: l'Anémone
Investigations were carried out in 2015 and 2016 (Guibert *et al.*, 2015; 2016) during which the wreck was recorded as the Saints Bay wreck and the Baleine 1 pass wreck (PB 1). It is located to the north of the Terre-de-Haut aux Saintes commune (Guadeloupe), at a depth of 24m. The proposed identification of the wreck is *Anémone*, a Royal Navy schooner built in 1823 in Bayonne and lost at Saintes in 1824 is supported by the initial results.

The site of the Saintes Bay wreck is a 25m-long sand mound with the upper parts of a ship's hull. Copper sheathing sheets and nails/tacks are strewn on the seafloor around the wreck. The wreck was officially found by C. Edouard in 1995, and declared to the Department of Maritime Affairs 14 July 2000. An evaluation conducted by the DRASSM in March 2002 brought the importance of the site to light. Artefacts salvaged by local divers indicated a French wreck dating to the start of the 19th century. The presence of pottery sherds with Creil and Montereau marks suggest an *ante quem* date of 1840 (L'Hour and Massy, 2002: 82–83). However, the wreck could not be identified in the archives of the Musée de la Marine (L'Hour and Massy, 2002: 82–83). Further research suggested *Anémone*. Jacob, Governor of Guadeloupe, recorded the sinking of the ship during a hurricane that hit Guadeloupe and the Saintes archipelago on the 7–8 September 1824 (Roche 2005; Guibert, 2013a: 528–531). *Anémone* was one of six schooners built in the 1820s to a 1823 type. It was built in the naval shipyard of Bayonne from the same plans as *Rose* at Bayonne; *Jacinthe* and *Jonquille* at Toulon, and *Émeraude* and *Topaze* at Cherbourg (Boudriot, 1989).

It was a schooner brig, 21m long, 5.8m wide, launched 7 July 1823. It was equipped with two 12-pounder carronades (SHD Vincennes, 8DD¹ 9, n°7 plan type *Anémone*, 12/2/1823). During its time at Guadeloupe, where it arrived in January 1824, *Anémone* was given the role of a customs vessel and took part in the fight against the illegal slave trade.

The archaeological investigations undertaken support this proposed identification. The aim was to precisely locate the PB1 wreck, study its layout, and confirm its identification. The material culture (pottery and glass) included a late Westerwald jug

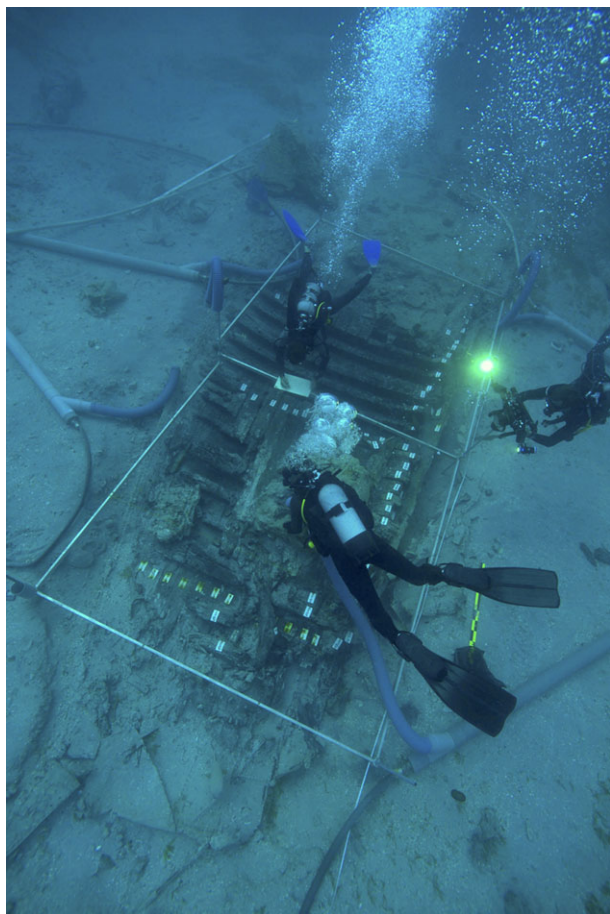


Figure 14. *L'Anémone* shipwreck site, Terre-de-Haut, les Saintes (Guadeloupe) (J.-S. Guibert).

dated between the late 18th century and the early 19th century. The presence of armaments (135 lead shot and a carronade) and part of the load being salted meats are consistent with the vessel having a military role. The calibre of the lead shot matches that used by the French military between 1780 and 1830 (Guibert *et al.*, 2015: 39). Most of the faunal material was sampled from a coherent stratigraphic layer, was identified as beef (*Bos taurus*), and has butchering marks (Guibert *et al.*, 2015: 33–35). The 12-pounder carronade of 1818 type, matches the armament of *Anémone* and suggests the identification is correct.

The structural characteristics revealed during the excavations need to be confirmed, but they suggest a lightly built ship with single frames 0.11 m sided, a filling piece 0.17 m wide, and a double frame 0.24 m wide, the ceiling is 0.03 m thick, the planking is 0.04 m thick. It is sheathed in sheets of copper (Fig. 14). Wood samples were taken from the frames, keelson, and planking, and were identified as deciduous oak, with the exception of a removable stringer, which is pine.

The archaeological data (finds, fauna, artillery, and construction details) suggest a light naval vessel dating

to the end of the first quarter of the 19th century. *Anémone* is the only known candidate from the archival data and this identification is supported by the archaeological evidence.

The site has all the assets of a moderately deep wreck. There is a high potential for well-preserved hull structure and finds, as indicated by the presence of complete hourglasses (L'Hour and Veyrat, 2005: 112). The site has research potential for the study of ship construction at the start of the 19th century and, above all, of a type of naval vessel that is little known from nautical archaeology. It would allow certain theories concerning schooners (Boudriot, 1989: 8–26) to be tested against the archaeological data. This vessel type is a product of the American and Antillean sea area, was appropriated by European navies in the 18th century, followed by standardization of construction in the 19th century, of which *Anémone* should be an exemplar.

The site has heritage interest as a French Royal Navy vessel of the Restoration period that was used as a customs vessel in the fight against the illegal slave trade.

Cabotage and transhipment

Several sites can be linked to cabotage, local transport, and transhipment in different periods. However, considering the importance of these maritime activities to the colonies, the number is small.

The site of Pothuau at Carbet (Martinique) can be mentioned even if no wreck has yet been found. A series of 17th-century olive jars have been raised by divers since the 1990s indicating a site dating to the period of Spanish frequentation of the islands and of European and Amerindian contact. One hypothesis suggests the site represents the loss of a sloop that had come to charge fresh water is the most probable until further research can be carried out (L'Hour, 2010: 80). On Martinique Cay south of Fortune Islet (Guadeloupe), the remains of a barge/lighter has been located the construction of which suggests a date in the 19th century. A brief investigation allowed three timbers to be sampled (Guibert, 2015). L-shaped frames indicate a sharp turn of the bilge, suggesting a barge or lighter serving the transhipment of goods to what was Goyave. The vessel is a type used in the coastal zone (Pomey and Rieth, 2005) integrating rivers, and lagoons. This is also suggested by the presence of plantations along the rivers of the Basse-Terre coast (Bégot, 1991). This boat is likely of local production being made of a local wood species (*tabebuia heterophylla*). Dating is uncertain, but the fasteners used (iron nails with square shank, diamond head, and flat point) suggest the start of the 19th century, if not earlier.

The wreck of the English schooner *Pigwidgeon*, of 29 tons, is linked to inter-island trade. The captain was Thomas Besson when the ship wrecked on the night of the 29–30 March 1856, at Mocos Cay, opposite Céron (Martinique). The ship had left Saint Lucia on the 28 March in the evening with a cargo of logs

and a bundle of handkerchiefs, bound for Saint-Pierre (Martinique) (*Le Moniteur*, 3 April 1856).

During the survey carried out by the GRAN in 1996, the site was quickly recorded by four skin divers at a depth of 4m in the south-east of a reef off Mocos Point. The site is orientated SE/NW and measures 20m long and has a pile of ceramic tiles 0.16×0.16 m and a 0.35m-long bronze pintle visible (Guillaume, 1996).

Investigations without results

The projects that yielded negative results should also be mentioned, if only in recognition of the mobilization of human and logistical resources. This has been the case of the ship *Marquis de Montesclaros* (1603) lost in Guadeloupe while attacking the Amerindians of the Spanish fleet while at anchor in an area estimated between Vieux-Habitants and Baillif (Moreau, 1992; 1999).

Research into the loss of a part of the fleet in 1666 in Saintes after the battle that led to the rout of the French fleet shows the difficulties of research into these periods and the need for a critical reading of the contemporary documents (Hoyau, 2015). In fact, research centred on the French vessels, while the losses recorded on the Blondel map were English vessels lost in the hurricane. Moreover, the search area, beside the Anse Mire, was based on an erroneous analysis of the topography recorded on the contemporary maps (Hoyau, 2015).

Research led by the GRAN at Anses d'Arlet, Martinique in search of the wreck of *Stanislas*, sunk in 1744, was inconclusive. Despite archival research and available survey equipment the fieldwork has not revealed the location of this merchant vessel lost *en route* to South America.

Conclusions

Despite mixed results, these investigations allow a new reading of the history of the Lesser Antilles through maritime archaeology. They have thrown a light on both practical and technical aspects of particular events in Antillean history. While it is evident that these investigations provide essential information about colonial society, this synthesis shows that research is in its infancy. Similarities can be seen between research carried out in Guadeloupe and Martinique, though following different rhythms. The method of combining archaeological and historical techniques has been proven, and this approach allows a unique approach to the past.

This synthesis has underlined four areas for future research: coastal structures, harbour deposits, the shallows around micro-islands, and wrecks. Several sites present homogenous assemblages and could usefully be investigated further to allow comparisons between them. Excavations of coastal and port structures are highly complementary to those carried out under water. It is particularly interesting to

combine and compare the results of investigations carried out at Saint-Pierre, harbour structures and wrecks, principally from 1902, and of the port deposit. They provide a coherent and integrated image of the structures and archaeological finds from the principal port towns of the Antilles. Even if these individual projects provide only a series of starting points, combining the data provides relevant results.

The results of investigations carried out at Saint-Pierre in three of these archaeological areas illustrates another aspect of coastal and maritime research in the Lesser Antilles: the gap between potential remains from the Colonial period (17th–19th centuries) and the reality of the known archaeological remains that are largely dated to the end of the 18th and 19th centuries. The wreck-sites also follow this pattern and there are few indications of earlier sites, such as the bronze cannon founded in the middle of the 16th century, found near to Loup Garou Islet, Martinique (Guérout and Guillaume, 1998). Current research has led to an over-representation of wrecks from the 19th century. Two reasons can be given for this: first, site formation processes and find preservation conditions in coastal and underwater contexts (Guibert *et al.*, 2017); second, the insufficient and inadequate means available, linked to a lack of overarching research goals. This situation is changing; the GRAN in Martinique has served to engage people even if the projects have not always been successful. Implicating different actors, notably institutions, with respect for each group's prerogatives, with the aim of combining competence and materials, opens the possibility of more structured research in the French Antilles. This rising force should also permit maritime archaeology to make a full contribution to the dynamics of archaeological research in the Caribbean area.

Investigation of the wreck-sites provides interesting research perspectives, both of the technical characteristics and function of the vessels, and of the social space that they represent. The varied examples given here include previously unpublished sites, as well as groups of wrecks, rare evidence of the maritime traffic within the Antilles, and the transatlantic voyages at the end of the 18th and 19th centuries. On another level, they are evidence of maritime risk in the Lesser Antilles; the dangers of the Atlantic coast of Martinique are particularly well known (Guérout, 2000) and illustrated by some of the examples given here.

On the scale of the Lesser Antilles it is evident that the potential for maritime archaeology of the Colonial period is real and that the French Antilles have the asset of having initiated home-grown research relatively early, and have even exported their skills, for example during a GRAN mission to Tobago in 1995. Investigations in the other Lesser Antilles islands have often been carried out by exterior institutions (Saint-Vincent, Saint-Kitts, Saint-Marten, Antigua). Nevertheless, it is now necessary to structure research to

a greater extent. Reflections, initiated by the GRAN, on the different types of maritime traffic present could be a lead in investigating the various types of sites presented here. They suggest also, and it now appears essential,

to carry out a full excavation of a site that would serve as exemplar on which to anchor a strong policy of archaeological outreach. The alternative is that one of the strands of Antillean cultural legacy is in danger of being forgotten: the maritime heritage.

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Notes

1. French national archaeological research strategy 15, titled 'archéologie d'Outre-mer', concerns modern and contemporary archaeology and calls for a review of current research perspectives, a report on the current situation, and the definition of future strategic research objectives (Conseil National de la Recherche Archéologique, 2016: 205–207).

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