

Ship graffiti in the North-Central Caribbean: Geocultural context and heritage preservation

Michael J. Lace
Coastal Cave Survey, West Branch, IA, USA
michael-lace@uiowa.edu

Reniel Rodríguez Ramos
Universidad de Puerto Rico, Recinto de Utuado, Puerto Rico
reniel.rodriguez@upr.edu

Tamara González Durán
Coastal Cave Survey, West Branch, IA, USA
aramat139@yahoo.com

Manuel Guivas Gerena
Coastal Cave Survey, West Branch, IA, USA
m_guivas@yahoo.com

Nancy A. Albury
Coastal Cave Survey, West Branch, IA, USA
nancyalbury@gmail.com

More than 500 examples of ship graffiti have now been documented on nine islands in the Antilles Arc of the Caribbean. The ongoing interregional survey of this singular and distinctive form of nautical iconography has revealed a previously unappreciated geographical scope of an incompletely documented cultural tradition. Many of the examples defined in this ongoing study are documented for the first time, occurring as lightly incised petroglyphs or pictographs fashioned with charcoal, lampblack, graphite or paint. They occur in select caves and on interior and exterior surfaces of a range of colonial period structures. The emerging model illustrates a predictable pattern of placement of such images within hallmark historic structures and natural surfaces, potentially constructed by a diverse set of actors who shared oppressed cultural status within English, Dutch, Danish, French, American and Spanish colonial societies. It further invokes a complex range of possible motives behind the cross-cultural tradition of ship graffiti, including the expression of individuality, aspirational escapism, resistance, creativity and ownership. In other words, all things systematically denied to slaves, indentured or itinerant workers, conscripts, prisoners and the quarantined living and dying within the rigid hierarchical boundaries of Caribbean colonial systems.

Plus de 500 exemples de graffitis de navires sont maintenant documentés sur neuf îles de l'arc antillais des Caraïbes. L'étude interrégionale en cours de cette forme singulière et distinctive d'iconographie nautique a révélé une portée géographique jusque-là méconnue d'une tradition culturelle incomplètement documentée. Bon nombre des exemples décrits dans cette étude en cours sont documentés pour la première fois, se présentant sous la forme de pétroglyphes ou de pictogrammes légèrement incisés façonnés avec du charbon de bois, du noir de fumée, du graphite ou de la peinture. Ils se produisent dans des grottes particulières et sur les surfaces intérieures et extérieures d'une gamme de structures de la période coloniale. Le modèle émergente illustre un modèle prévisible de placement de telles images dans des structures historiques et sur des surfaces naturelles, potentiellement créées par un ensemble diversifié d'acteurs qui partageaient un statut culturel opprimé au sein des sociétés coloniales anglaise, néerlandaise, danoise,

française, américaine et espagnole. Il invoque en outre une gamme complexe de motifs possibles derrière la tradition interculturelle des graffitis de navires, y compris l'expression de l'individualité, l'évasion, la résistance, la créativité et la propriété. En d'autres termes, tout ce qui est systématiquement refusé aux esclaves, aux travailleurs sous contrat, aux conscrits, aux prisonniers et aux personnes en quarantaine vivant et mourant dans les limites hiérarchiques rigides des systèmes coloniaux des Caraïbes.

Se han documentado más de 500 ejemplos de grafiti de barcos en nueve islas en el Arco de las Antillas del Caribe. El estudio interregional en curso de esta forma singular y distintiva de iconografía náutica ha revelado un alcance geográfico previamente no apreciado de una tradición cultural incompletamente documentada. Muchos de los ejemplos definidos en este estudio en curso están documentados por primera vez, y aparecen como petroglifos o pictografías ligeramente incisos formados con carbón, hollín de lámpara, grafito o pintura. Ocurren en cuevas seleccionadas tanto en superficies interiores y exteriores de una variedad de estructuras del periodo colonial. El modelo emergente ilustra un patrón predecible de ubicación de tales imágenes dentro de estructuras históricas y superficies naturales distintivas, potencialmente construidas por un conjunto diverso de actores que compartían un estatus cultural oprimido dentro de las sociedades coloniales inglesas, holandesas, danesas, francesas, americanas y españolas. Además, invoca una compleja gama de posibles motivos detrás de la tradición transcultural del grafiti de barcos, incluida la expresión de individualidad, anhelo de escape, resistencia, creatividad y propiedad. En otras palabras, todo lo que se niega sistemáticamente a los esclavos, los trabajadores contratados, los reclutas, los prisioneros y los que viven y mueren en cuarentena dentro de los rígidos límites jerárquicos de los sistemas coloniales del Caribe.

Introduction

Previous studies have defined the global range and cross cultural context of ship graffiti in varied settings (Bigourdan and McCarthy 2007; Demesticha et al. 2017; Hermanns 2010; Le Bon 1997; Navarro Mederos 2004; Paterson et al. 2019). In the Americas, systematic documentation of ship graffiti has been comparatively limited with the exception of the Bahamian and Puerto Rican Islands (Lace et al. 2019; Rivera Collazo 2007; Samson and Cooper 2015; Turner 2006). Examples have also been reported from built heritage and cave sites on other select Antillean islands (Huyghues-Belrose and Barouh 2007; Lopez Belando 2009). Sporadic examples of ship graffiti have also been noted in continental settings of the Circum-Caribbean and adjacent regions (Amórtegui Sánchez 2021; Smith et al. 2004; Troncoso et al. 2018), yet the dispersed occurrences of such historical imagery in the broader insular Caribbean region has been largely overlooked.

Ship graffiti in many instances represents a unique visual genre that stands apart from other images or inscriptions (Champion 2015; Lace et al 2019). Maritime vessels were physical manifestations invoking a wide range of colonial experiences, including the mobility of all segments of society throughout the Caribbean region in the context of migration, conquest,

commerce, slavery and maritime marronage (Chowdhury 2015; Linebaugh and Rediker 1990; Schoepner 2010; Richardson 1980). The widespread inclusion of ship imagery in pictorial narratives presents significant opportunities in defining the archaeological role this singular iconography has played, spanning pre-emancipation and post-emancipation Caribbean contexts.

Recent field research efforts are bringing the true geocultural scope and complexity of this iconographic phenomenon to light as the ongoing survey of the insular Caribbean has steadily expanded, incorporating numerous previously unrecorded sites. Regional methods of ship graffiti production include lightly incised (filiform) and more aggressively engraved (polissoir) forms, similar to techniques defined in other settings (Troletti 2016). The inventory also includes images traced into the powdery corrosion residues of cave walls (i.e., finger fluting), as well as pictographs composed of paint, graphite, lampblack or charcoal.

While examples of historical graffiti have often been dismissed as ludic expressions of little cultural value, we contend that the majority of the ship graffiti examples in the Caribbean transcend such limitations to take their place as deliberate expressions specific to actors from multiple backgrounds and spanning diverse

cultural contexts. Combining empirical distribution data and cultural context provides a foundation for long term site preservation and shapes a clearer understanding of the cultural significance this specific and distinctive common denominator iconography may have played in various segments of colonial life in diverse island communities.

Methods

The methodology integrates multi-scalar distributional data, site photodocumentation, digital analysis and accompanying assessments of physical site integrities. Non-destructive data collection was systematically applied to all georeferenced sites, recording high resolution imagery and comparative densities across Puerto Rico, the British (BVI) and U.S. Virgin Islands (USVI), and the Leeward Antilles. Cave sites were directly mapped using contemporary instrument surveys (Suunto compass, clinometer and Disto laser rangefinder) in conjunction with resource inventory documentation strategies applied to karst structures (Lace, et al. 2019). All graphics were prepared using Adobe Photoshop. Where appropriate, “D-Stretch” (available at www.Dstretch.com) was applied to clarify image details from underlying rock wall and ceiling textures or modern vandalism to further define panel surface vulnerabilities (Gillespie et al 1986).

Results

New discoveries in the Antilles: Site distribution and temporal context

A total of 524 ship graffiti images at 32 sites have been identified on nine islands in the Caribbean to date with more likely to be recorded as field research progresses (Table 1). In contrast to the adjacent Bahamian Archipelago, where the majority of ship graffiti panels are located within plantation era structures, many of the Caribbean sites so far are within caves centered within the Puerto Rican Islands (Figure 1), although this likely represents an explorational bias as surveys are ongoing. The remainder are found within dispersed colonial structures (Table 1). The Caribbean sites with the highest image density are the Spanish fortifications in Old San Juan (Puerto Rico) (Rivera Collazo 2007) yet many of the other sites (no less important) contain a single to several definitive ship representations associated with various forms of built heritage (Figure 2). Both interior and exterior wall surfaces were employed in multiple colonial building types but advanced surficial and structural decay at the majority of sites prevents a quantitative comparative placement delineation of their original scope. Other forms of epigraphic or iconographic historical graffiti are also present in many, but not all, sites and are not strictly correlated to ship graffiti panels (Table 1).



Figure 1. Generalized distribution map of ship graffiti sites in Puerto Rico and the Virgin Islands.

Table 1. Inventory of Ship Graffiti in the Insular Caribbean.

Island Group	Island	Site	Number of ship images	^a Additional historical graffiti	^b Reference
<i>Puerto Rican Islands</i>	Isla de Mona	Cave site PRM143	1	Y	(2)
		Cave site PRM147	3	Y	(2)
		Cave site PRM164	1	N	(2)
		Cave site PRM008	4	Y	(2)
		Cave site PRM046	4	Y	(2)
		Cave site PRM051	1	Y	(2),(6)
		Cave site PRM052	1	Y	(2)
		Cave site PRM069	1	Y	(2)
		Cave site PRM099	1	Y	(2)
	PR Mainland	Castillos San Cristobal and El Morro	~400	Y	(3)
		Fortaleza El Canuelo	10	Y	(1)
		Isla Cabra	1	Y	(1)
		Leprosarium			
		Tunel Guajataca	1	N	(1)
		Hacienda La Romana	2	Y	(1)
		Faro Ponderosa	1	N	(1)
		Cave Site PR504	1	Y	(2)
		Cave Site PR501	1	Y	(2)
		Cave Site PR513	1	Y	(1)
		Cave Site PR536	1	Y	(1)
		Cave Site PR535	2	Y	(1)
<i>US Virgin Islands</i>	St. Croix	Ft. Christiansvaern	1	Y	(2)
		Coastal site SC001	1	N	(2)
	St. Thomas	Brewers Bay	2	N	(1)
		Plantation			
	St. John	Annaberg Plantation	17	Y	(1)
<i>UK Virgin Islands</i>	Tortola	Catherineberg Sugar Mill	1	N	
		HMS Prison	2	N	(1)
		St. Phillip's Church	7	N	(1)
	Anguilla	Fort Purcell	7	Y	(1)
		Courthouse/Jail	3	Y	(1)
<i>Greater Antilles</i>	Martinique	Plantation	40	Y	(4)
	Dominican Republic	Cueva de la Arena	5	Y	(5)

^aPresence of additional historical period epigraphic or iconographic graffiti. ^bReferences: (1) This report; (2) Lace et al. 2019; (3) Rivera-Collazo 2007; (4) Huyghues-Belrose and Barouh 2007; (5) Lopez Belando 2009; (6) Hübener 1898.

Based on dates of construction and periods of use for colonial structures, the chronological context of the bulk of associated images falls primarily within the 18th and 19th centuries, with a subset extending into the early 20th century. Open air coastal sites, however, present a distinct challenge to relative dating and approximating cultural context in the absence of

a clear association with built heritage or natural repositories of material culture (e.g., caves). As previously noted, (Lace 2012), complex human use patterns associated with some of the cave sites extend well into pre-contact periods; therefore, it remains possible that some of the nautical images documented to date may be of indigenous origin.

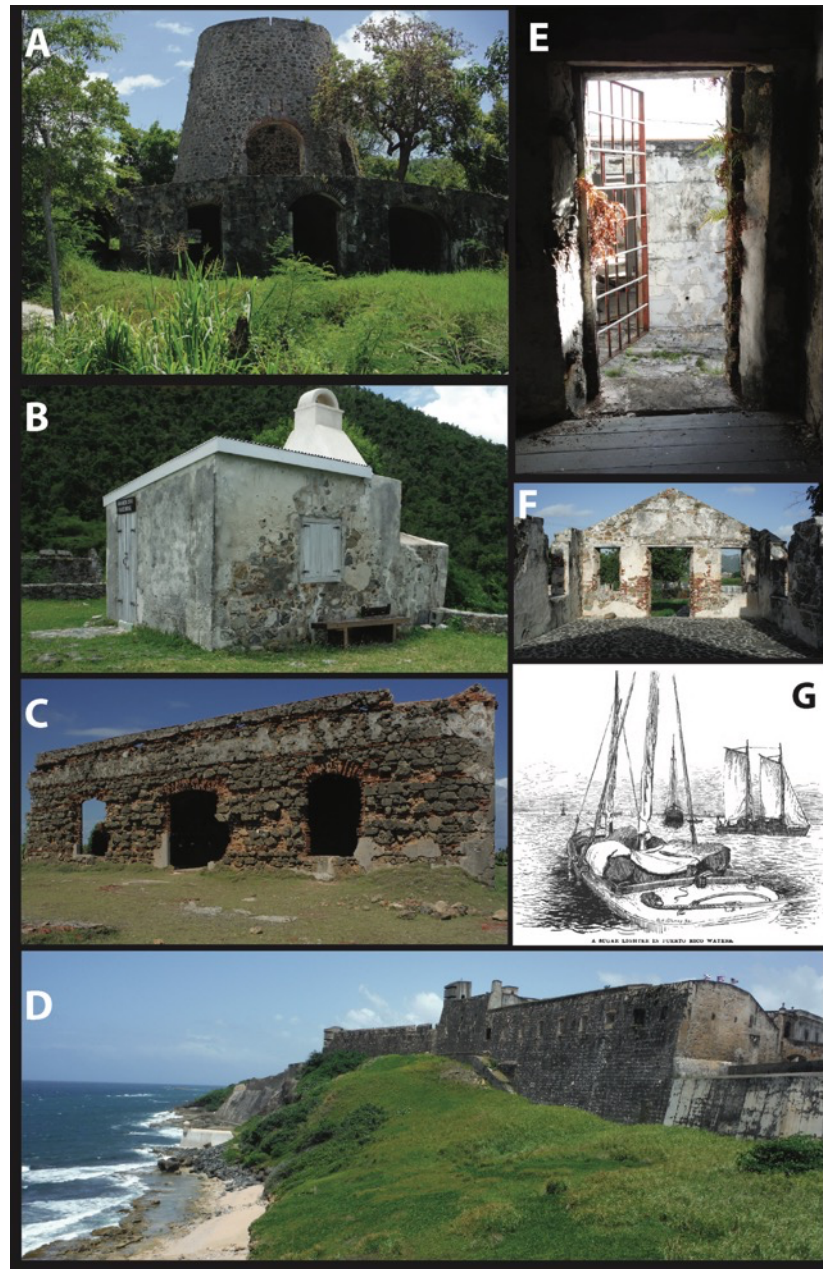


Figure 2. Colonial period architecture associated with ship graffiti. A) Catherineberg and B) Annaberg sugar plantations (St. John, USVI). C) Isla Cabra Leprosarium (Puerto Rico). D) El Morro (San Juan, PR). E) HM Prison (Tortola, BVI) and F) St. Phillips Church (Tortola, BVI). G) Illustration of colonial period maritime vessels in San Juan Harbor (Ober 1893).

Cave sites

A growing number of cave sites within the Puerto Rican Archipelago have now been identified as ship graffiti repositories. Seven caves on the Isla de Mona coast were previously shown to harbor ship graffiti (Lace et al. 2019). In contrast to the coastal caves of Isla de Mona, a total of six ship graffiti images are located within five dispersed caves within the karstic interior of the Puerto Rican mainland (Table 1). Four occur within the predominantly Miocene-aged limestones of the northern karst belt (sites PR501, PR504, PR535, PR536) and one within the Cretaceous-aged limestone of the southern karst (PR513). The majority of the images were placed on parietal surfaces within daylight chambers and constructed with charcoal, presenting opportunities for additional direct dating in the course of future studies.

Similar to many other caves on the respective islands, the identified cave sites were exposed to varying degrees of impact due to historical guano mining excavation (Figure 3A and 3C) but we cannot confirm that all of the ship graffiti images recorded are temporally linked solely to mining activities, with one exception.

Site PRM008 contains a ship graffiti within a more complex mural depicting the guano extraction process (Lace et al. 2019).

Site PR535 is also a contextual outlier. The cave is a heavily-denuded remnant of a once larger structure (Figure 3G) that is further distinguished by a lack of sediments suitable for guano mining. Early surveys of indigenous rock art cited by Dubelaar (1995) noted over 30 charcoal pictographs associated with indigenous use of the site but many of these images have already degraded to the point of being uninterpretable. Therefore, in the absence of direct dating, we cannot confirm or exclude the possibility that the composite rock art panel containing ship graffiti at cave PR535 represents an example of post-contact period site use by indigenous actors, similar to other cave sites in the region (Lopez-Belando 2009; Samson et al. 2016). The vulnerability of this significant indigenous rock art site is of particular concern. While its comparatively remote location provides a degree of protection from modern anthropogenic impact, the rock art panels at this site are significantly exposed to natural weathering.

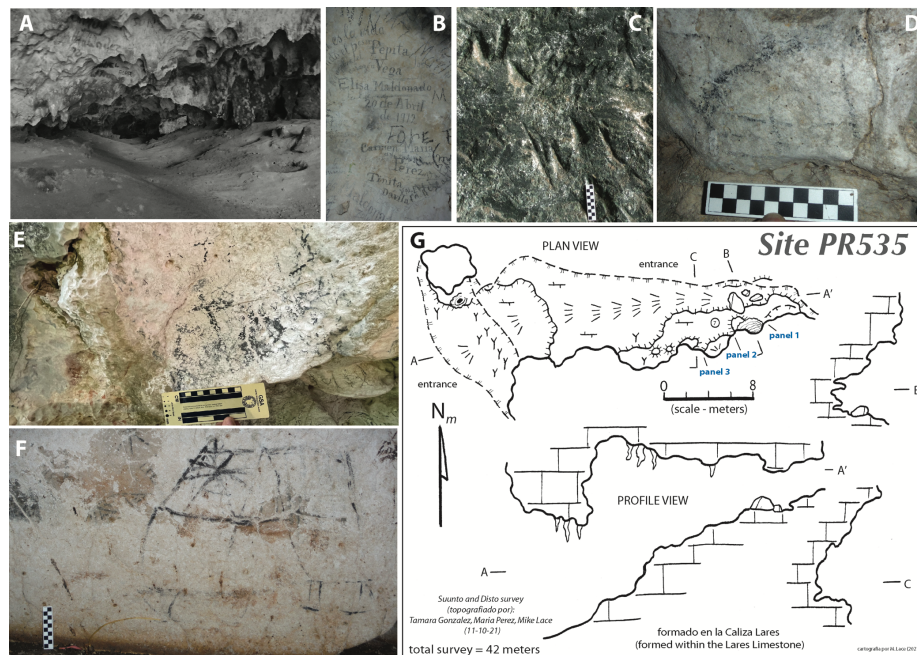


Figure 3. Ship graffiti and the caves of mainland Puerto Rico. A) Cave in the northern karst belt mined for guano. B) Historical epigraphic graffiti (Site PR536) C) Chisel marks from cave sediment excavation. Ship graffiti at cave sites D) PR504, E) PR536 and F) PR513. G) Map of cave site PR535, illustrating geolocation of rock art panels.

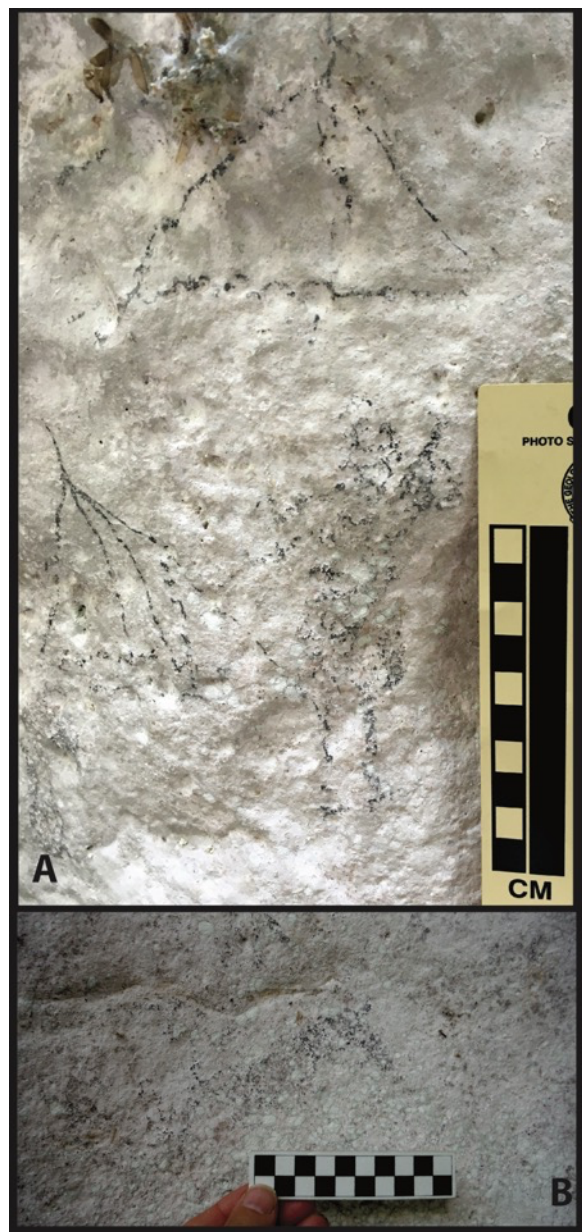


Figure 4. A) Composite post-contact rock art, illustrating a human figure flanked by ship graffiti (panel 2, Cave Site PR535). B) Charcoal pictograph of horse with bridle (panel 3, Site PR535).

As previously reported (Rodríguez Ramos 2021), direct dating of a limited number of suitable ship graffiti or related images has so far been limited to cave sites on the Puerto Rican mainland and supported by dating of associated

images. For example, cave site PR504 (Figure 3D) yielded a maximum radiocarbon date of 330 ± 30 bp for a single expression of ship graffiti. Archival sources describing ship graffiti within the caves of Puerto Rico are rare, with the exception of a single site (PRM051) on Isla de Mona (Hübener 1898). The range of apparent ship types also offers additional temporal and cultural constraints as certain vessel types were associated with technological advances or specific maritime activities but many of the images, by design and/or by subsequent degradation, cannot be definitively categorized by vessel type. Temporal context can also be inferred for a small subset of sites via additional forms of period-specific imagery associated with the same rock art panel. For example, the ship graffiti panels at sites PR535 and PR504 (Puerto Rico) also contain images of horses constructed by the same technique and displaying comparable weathering, potentially limiting context to post-contact periods (Figure 4).

Historic sugar industry sites

Five colonial-era structures associated with sugar industry harbor ship graffiti. While the distribution is limited to four Caribbean islands, the true total is likely much higher as additional sites remain to be thoroughly examined.

La Hacienda Romana (Puerto Rico). Constructed in the 1870s, the plantation ruins lie within a well-maintained natural coastal reserve. One of the remaining standing walls harbors two partial ship graffiti examples (Figure 5A and 5B).

Tunel Guajataca (Puerto Rico). The tunnel was constructed as part of an island-wide railway system to support the sugar industry in the late 19th and early 20th centuries (Figure 5C). A single, badly vandalized graffiti was noted on the structure (Figure 5D and 5E). Currently, the area is managed as a tourist attraction and the site is part of a broader post contact human footprint, illustrating period modification of a coastal karst landscape (Lace 2012). Related structures, for example Tunel Negro, were also examined but no ship graffiti was noted.



Figure 5. A-B) Partial ship graffiti at Hacienda La Romana (Puerto Rico). C) Tunnel Guajataca (Puerto Rico), (image courtesy of the U.S. Library of Congress Archives). D-E) Photo and digital tracing of degraded ship graffiti (Tunnel Guajataca).

Catherineberg Sugar Mill (St. John, USVI). Acquisitions beginning in 1718 would eventually encompass multiple plantations comprising the Catherineberg-Jockumsdahl-Herman Farm, producing sugar and rum until 1896. While portions of the plantation are structurally compromised,

the main tower and rooms beneath it remain largely intact with the exception of the original plaster which is predominantly absent. Of the few surviving segments of plaster, one harbors a single, lightly incised representation of a multi-masted vessel (Figure 6).



Figure 6. A) Catherineberg Plantation (St. John, USVI). A) Bow detail of incised ship graffiti. B) Ship graffiti panel overview. C-D) Ship graffiti and digital tracing.

Annaberg Plantation (St. John, USVI). The Annaberg estate was established by 1779 on the northeast coast of the island. The walls of many of the principal structures remain. A total of 17 ship graffiti examples were noted (Figure 7): one on the exterior wall of the cookhouse (Figure 7A and 7B) with the remainder on the interior walls of the sugar mill prison cell (Figure 7C and 7D) – another example of a broader association between ship graffiti and incarceration in the region. Additional graffiti examples include a period building façade (Figure 7E), not unlike a simpler such image noted etched into the floorboards of one of the cells in Fort Christiansvaern, St Croix

(Lace et al. 2019). Two ship graffiti were also located on the exterior wall of the mill ruin (1850-1874) at the Brewers Bay Sugar Plantation (St. Thomas, USVI) (Figure 8).

The Annaberg and Catherineberg sites are actively managed by the U. S. National Park Service as self-guided tourist attractions. Similar structures were examined but no additional ship graffiti were identified at these localities. The

preservation status of both ship graffiti sites is generally good in terms of current overall structural stability but concerns over the long-term integrity of the original plaster remain. The exterior of the Annaberg cookhouse, for example, is exposed to significant seaside weathering (Figure 7A). While modern access to the prison cell is limited, vandalism to the comparatively sheltered interior walls is present.

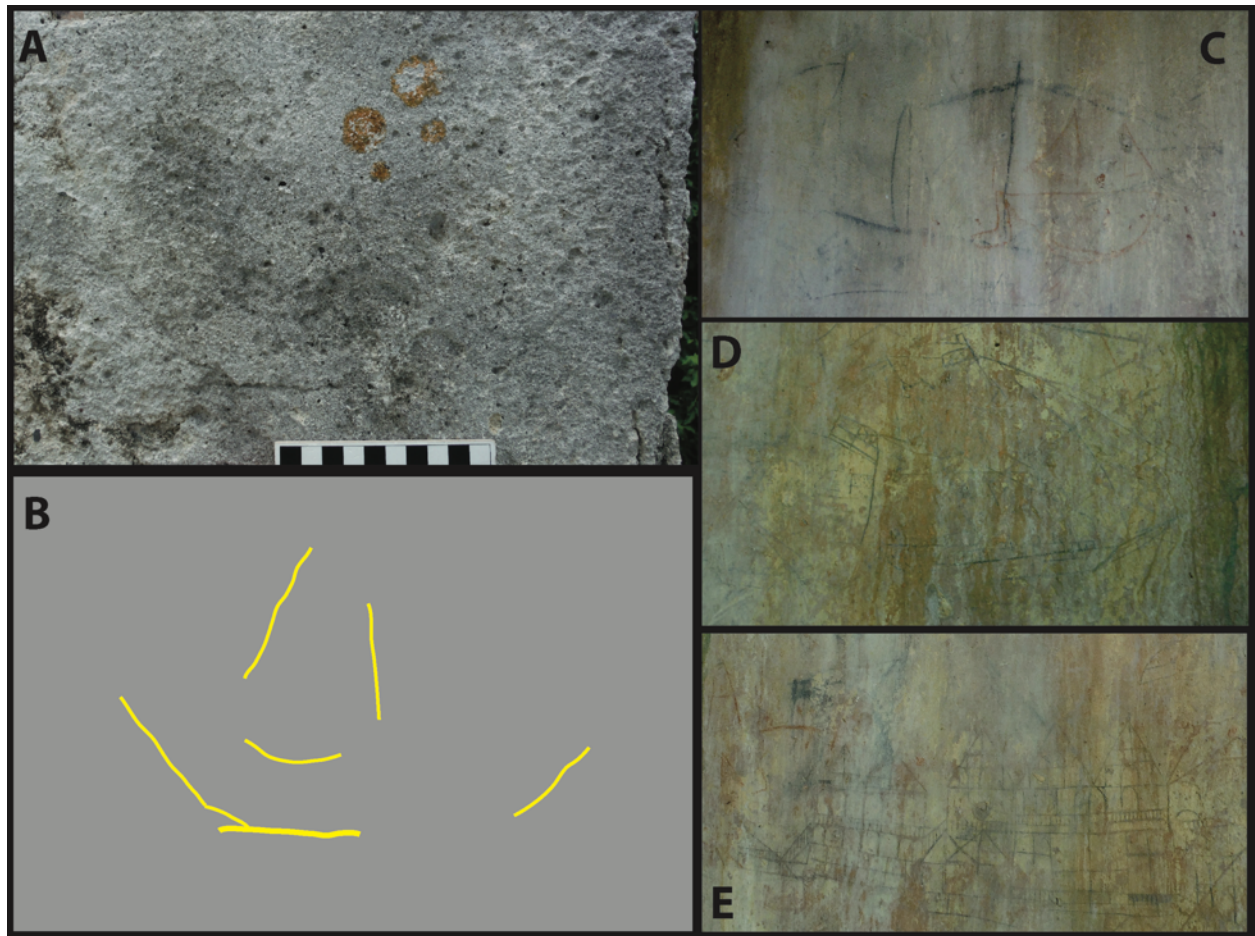


Figure 7. Annaberg plantation (St. John, USVI). A) Cookhouse exterior wall ship graffiti and B) digital tracing. C-D) Ship graffiti images on the interior cell walls. E) Building façade graffiti.



Figure 8. A) Exterior wall panel of plantation structure (St. Thomas, USVI). B) Partial graffiti candidate. C) Digital tracing of ship graffiti.

Fortifications and prisons

More than 13 Caribbean prison-fortification sites harbor ship graffiti as previously unrecorded sites continue to be documented on interregional scales.

Her Majesty's Prison (Tortola, BVI) in Roadtown was built in the mid-1770s and functioned as a prison and for housing administrative offices until its final closure in 2007. Local business interests pushed for demolition of the structure, but fortunately it was restored in 2014-2016 and reopened to the public as a museum attraction. Limited original plaster surfaces remain within the structure, but two examples of ship graffiti remain visible today. The execution cell harbors one such example

(Figure 9A) while one of the other several cells harbors the second. Modern prisoner graffiti expressions were also noted within the cells, some of which include contemporary maritime images.

Fort Purcell (Tortola, BVI). Built in 1794 by the Royal Engineers as one of several emplacements guarding the broader south coast and the Roadtown Harbor (e.g. Fort Burt, Fort George and Fort Charlotte). The “dungeon”, as it is also named, refers to the claustrophobic confines of a lower subterranean cell which retains much of its original wall plaster but no graffiti. The ground level guardhouse, however, remains intact and has a total of seven ship graffiti images, including one multi-masted ship image measuring half a

meter square. The site also features elaborate graffiti forms associated with the same period incised into the mostly preserved plaster. Two images represent uniformed soldiers (Figure 9B, 9C and 9E) and a third illustrates a woman in traditional corseted attire (Figure 9D). The site is

neglected, overgrown and overall in a poor state of preservation. The interior wall segments harboring historical graffiti are experiencing gradual decay with obvious signs of progressive plaster deterioration and exfoliation.

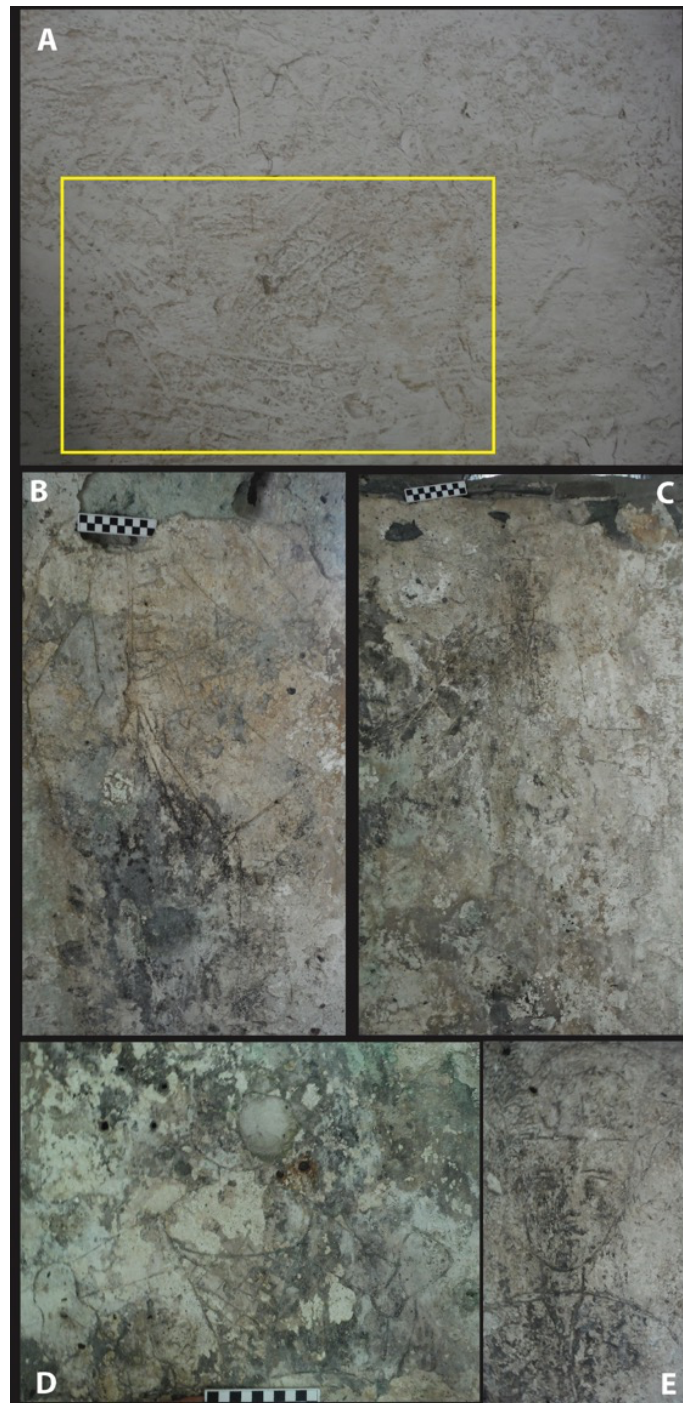


Figure 9. A) Bow and rigging detail of ship graffiti (HM Prison, Tortola). B-C) Additional examples of historical graffiti (Fort Purcell, Tortola). D) Detail of panel B.

The Old Courthouse (Anguilla). The old courthouse/customs house/jail was constructed ca. 1750 but nearly destroyed by hurricane Alice in 1955. The majority of the original plaster is absent. The cell walls were unfortunately replastered in modern times but one of the outer

room walls harbors a composite ship graffiti panel containing three vessels (Figure 10). The structural integrity and wall surfaces are in a poor state of preservation as the site is exposed to the elements.

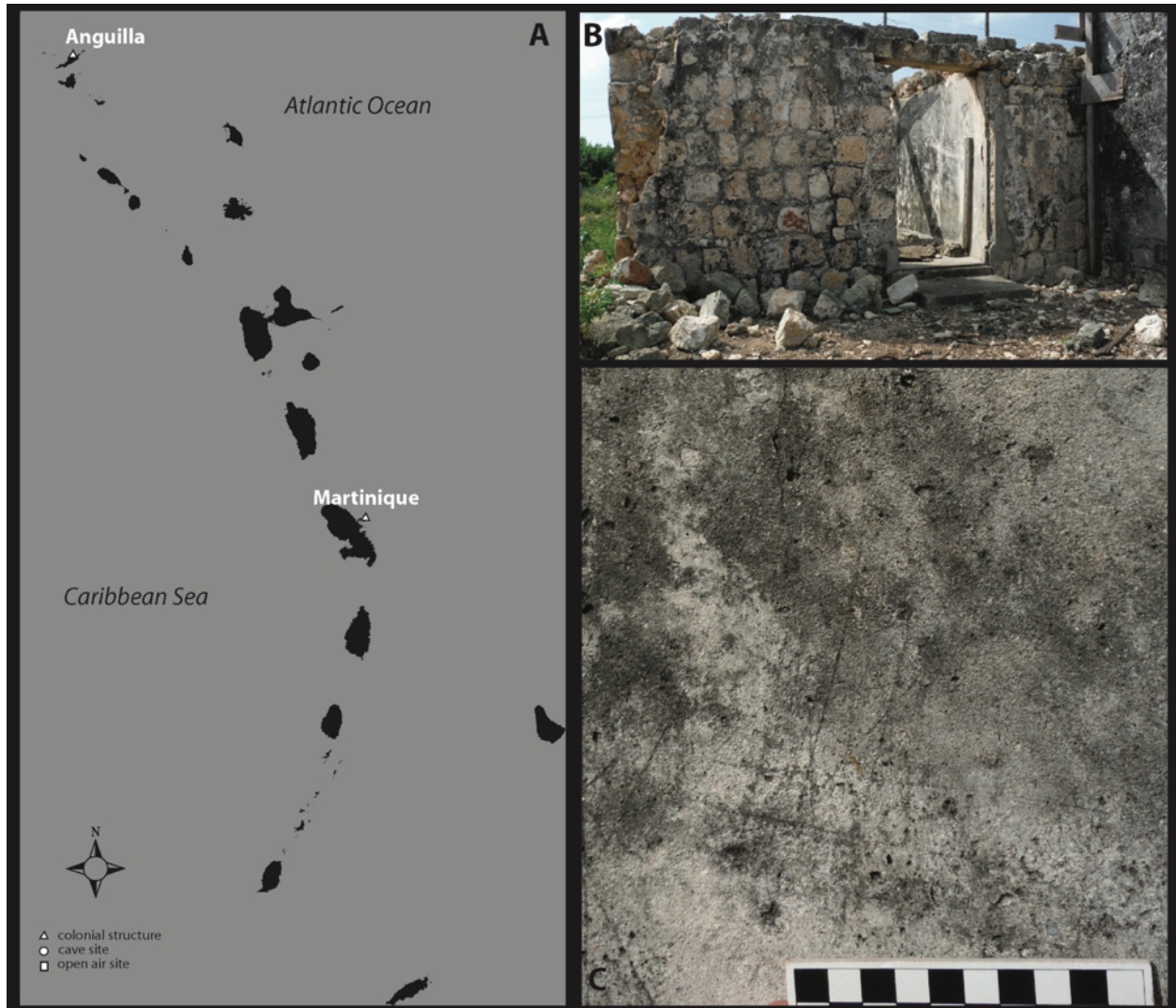


Figure 10. A) Generalized distribution of ship graffiti in the Lesser Antilles. B) Remnants of the Old Courthouse (Anguilla). C) Ship graffiti example on interior courthouse wall.

The coastal fortifications of Puerto Rico. Old San Juan is located on the western edge of San Juan Island. Historic fortifications that encircle the district include over two miles of limestone walls and the two principle sites of El Morro and San Cristobal – both of which harbor high

densities of ship graffiti. Established in 1949 by the Department of Interior, the San Juan National Historic Site is administered by the National Park Service. The historic fortifications were collectively named a world heritage site in 1984 (Berkowitz et al. 1991). The historic structures of

Old San Juan continue to be exposed to natural processes associated with a littoral landscape in a tectonically active region. Its system of built heritage also continues to be exposed to the effects of modern human activities within a densely populated area that receives significant tourist visitation (Feinberg et al. 2016).

Additional military structures were also constructed across the San Juan Harbor. El

Canuelo, for example, was originally constructed offshore of the western peninsula of San Juan Bay as part of a broader strategic harbor defense. Ten examples of ship graffiti are located on its exterior walls (Figure 11A). Troops were garrisoned at the site to protect the harbor and in part to enforce maritime quarantine protocols in the late 19th century.

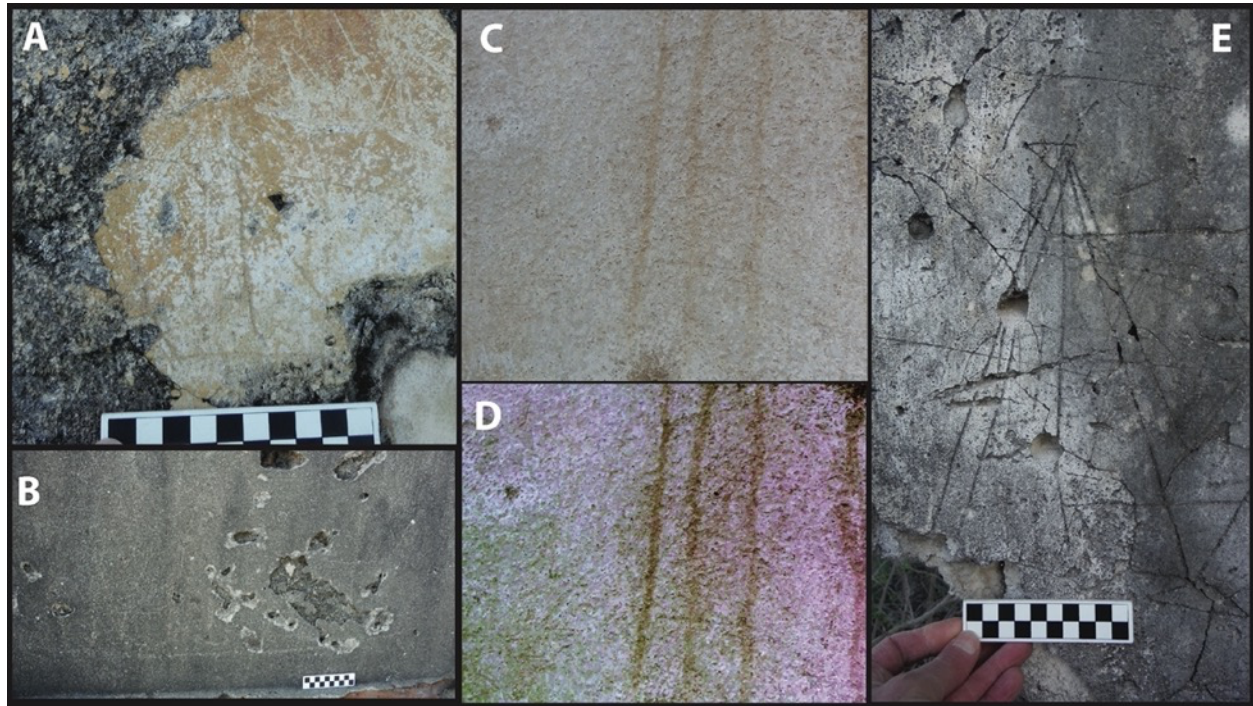


Figure 11. A) El Canuelo (Puerto Rico) ship graffiti. B) Isla Cabras leprosarium (Puerto Rico) ship graffiti. C-D) Decorrelation (DStretch) analysis of partial ship graffiti candidate. E) Comparative quarantine context ship graffiti, Mathew Town Quarantine House (Great Inagua, The Bahamas).

Quarantine facilities

The **Isla Cabras leprosarium (Puerto Rico)** is one notable surviving example of such regional architecture (Levison 2003; Schiappacasse 2011). Completed in 1877, it was originally designed to serve as a hospital and maritime quarantine station but later served as a leper colony facility until its closure in 1926. A handful of indeterminate images are located on the remaining patches of interior and exterior walls distributed across three structures, including the main hospital building, but a single definitive ship graffiti (Figure 11B) and a second potential ship graffiti candidate (Figure 11C-11D) have been identified so far. Unfortunately,

the preservation status and future outlook of the site is questionable with many images no doubt already lost as significant surficial and structural failures are in progress. Surviving quarantine structures in the Caribbean and adjacent regions are rare and those with documented historical graffiti rarer still. The nearest comparative example is a solitary site just north of the Caribbean frontier within the remnants of the Mathew Town Quarantine House (Great Inagua, Bahamas) (Figure 11C).

Maritime and devotional structures

St Philips Church (Tortola, BVI) is reported to be one of the oldest churches in the

Americas specifically designed for newly emancipated African slaves, built in 1831-1834 in the former town of Kingston – one of many freed slave communities constructed during this period. The structure currently has no roof and much of the interior plastered surfaces have destabilized (Figure 2F). One of the exterior

walls, however, retains significant segments of partial plaster where a total of seven ship graffiti examples were recorded (Figure 12). The site is maintained by the British Virgin Islands (BVI) National Parks Trust, community volunteers and the Anglican Episcopal Church.



Figure 12. A-C) Ship graffiti on exterior wall of St. Phillips Church (Tortola, BVI).

Faro Ponderosa (Puerto Rico). A single ship graffiti has so far been noted on an interior wall of one of a broad network of lighthouses constructed during the Spanish occupation (Figure 13). Completed in 1889, the Ponderosa Lighthouse was later destroyed by the earthquake and resulting tsunami of 1918. The ruined walls and foundations are currently managed as a tourist attraction by a community-based conservation organization.

Discussion

Cultural identities and physical settings associated with ship graffiti

Caves, open air sites and colonial period structures are common repositories for epigraphic and pictographic historical graffiti, yet the distribution of maritime iconographies appears more restricted, based on the surviving recorded examples. To date, the current range of identifiable structures used for the placement of ship graffiti in the Caribbean Islands include: Plantations, prisons and fortifications, quarantine buildings, caves, and so far singular examples of a lighthouse, commissioned by the Spanish crown, and a church constructed by emancipated slaves. As noted in previous studies, the specific physical settings and available materials helped define the lives of select colonial inhabitants and could have offered a rare palate with which they

could graphically express themselves while recording physical connections to liminal and non-liminal cultural spaces (Schroedl and Ahlman 2002).

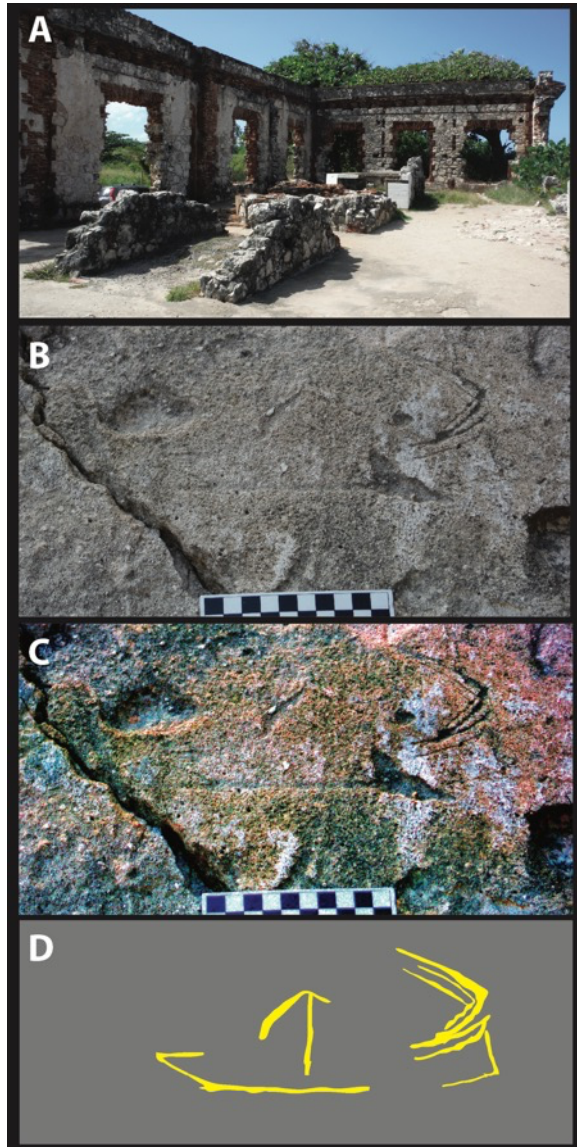


Figure 13. A) Faro Ponderosa site, northwest coast of Puerto Rico. B-D) Digital analysis of ship graffiti on interior wall.

As the ship graffiti dataset expands, the refined model becomes more nuanced as it integrates a wider range of localities and potentially varied actor motivations within a broader regional cultural context. Distribution patterns appear to be generally consistent with the observed trends in ship graffiti contexts on a

global scale, but clearly influenced by unique Caribbean perspectives and traditions - reflections of which persist to the present day (Merced 2017).

Ship graffiti in Caribbean Caves. Caves form prominent geological and cultural landscapes throughout much of the insular Caribbean, particularly in the Greater Antilles where island cave densities are higher than the Lesser Antilles. While many caves serve as repositories of indigenous rock art, only a handful are known to contain ship graffiti. Similarly, the natural surfaces of open air sites are common settings for rock art in general but not statistically associated with ship graffiti (Figure 1D).

The majority of colonial structures associated with ship graffiti are located in coastal settings, but the distribution of cave sites is more complex. Cave sites on Isla de Mona, for example, are all located within coastal settings, however, the cave sites associated with ship graffiti on the Puerto Rican mainland are located within the island interior with no direct association with the coastline or other navigable body of water. More than 200 coastal caves have been recorded on the main island, yet none harbor ship graffiti. Thus, simple site proximity to maritime settings and sailing vessels is insufficient to explain the placement of ship graffiti in the Puerto Rican caves.

In contrast to the restrictive activities within colonial structures, historic patterns of human cave uses in many cases are more complex and potentially driven by distinct motivations of a diverse set of actors and spanning multiple cultural periods (Samson and Cooper 2015). The mining of cave guano, for example, initially utilized forced labor and later contract labor that included economically disadvantaged farmers, families and immigrant workers (Serrano Puigdoller 2021).

Sugar Plantation Graffiti. In addition to commercial guano mining in the region, ship graffiti is also associated with the pre and post-emancipation sugar industry which dominated colonial economics in the 18th and early 19th century British, Danish, Dutch, French and Spanish Caribbean (Hall 1992; van den Bel et al. 2018). Similar to other agricultural industries in

the Bahamas, the Caribbean sugar plantations relied on slave labor and indentured workers to drive productivity in a competitive, volatile and ultimately unsustainable market (Figueroa 2005).

Ship graffiti, convicts, conscripts and the quarantined: Contrasting experiences and common ground across the many manifestations of colonial confinement

The experience of confinement and conflict spans many cultural periods and landscapes harboring concomitant lexicons of historical graffiti, including ship representations (Casella 2009; McAttackney 2016; Muscat and Cassar 1994; Palmer 2016; Petitjean 2018). By design and available materials, a significant number of colonial fortifications and associated prisons still survive across the Caribbean compared to other examples of built heritage. The placement of ship graffiti at many of these sites can be clearly delineated between spaces accessible to those confined (i.e., convicts within prison cells) and spaces accessed by a culturally diverse pool of military personnel, managing confinement (i.e., soldiers guarding the cells). While sharing a compulsory institutional setting common in the colonial Caribbean, the two sets of actors obviously were exposed to starkly contrasting experiences. Yet, the common pictographic expression between them in many cases is manifested in the form of ship graffiti.

Quarantine graffiti. Ship graffiti have been identified within the context of historical quarantine in a wide range of settings worldwide (Clarke and Frederick 2016; Hobbins 2016). Quarantine protocols were initiated to control the spread of cholera, typhus and yellow fever, in colonial settings across the Caribbean and North America (Jenson et al. 2011). Following the devastating cholera outbreaks beginning in 1850, public health initiatives were slowly implemented in the Caribbean colonies in hopes of containing the spread of a range of diseases transported by mobile maritime populations of the day and persisted into the early 20th century (Pemberton 2012).

Quarantine and related protocols were consistent with a broader colonial period context of confinement, as previously defined. In some instances, contextual crossover could have been

experienced by segments of colonial societies. For example, during the height of the cholera epidemics in the British colonies, prisoners were used for burial details, thus exposing them to collateral effects of the same crude public health initiatives that generated quarantine populations.

In contrast to quarantine protocols, where detainees determined to be disease-free were later released into the general population, leprosy patients were consigned to a darker design. Patients were isolated not to recover but to perish apart from the general population, often by starvation or exposure in badly constructed, understaffed and poorly maintained facilities across the region (Gilmore 2008; Jason 1925). Thus, a contrasting context of inherent uncertainty in quarantine versus a grim certainty within leprosaria persisted in the Caribbean through the 19th and early 20th centuries.

As in leprosaria across the Caribbean Islands, the sites on Isla Cabras (Puerto Rico) and Great Inagua (Bahamas) predictably fit within the general parameters of the model with the same ship imagery constructed by individuals in confinement. Yet, their context adds additional layers to the underlying complex historical significance of ship graffiti expression. As few of the leper colony structures in the Caribbean still endure, there are limited opportunities to record the epigraphic and pictographic remnants left by their inhabitants.

Church ship graffiti. Ship graffiti is found within churches and other devotional structures on a global scale (Calera Carretero and Carmona Barrero 2017; Champion 2015; Westerdahl 2013) yet only a single example has been found in the Caribbean. The Tortolan church of St. Philip is intimately linked to the post-emancipation plantation period in the British colonies. The structure was built ca. 1840 by freed slaves as part of the freed slave settlement of Kingston. As few examples of such settlements have survived in the Caribbean, it may appear anomalous, but such a tradition may have been more common in similar communities founded in the mid-19th century British colonies which transitioned from institutional slavery to the use of indentured workers.

The role of ship graffiti in a modern post-colonial Caribbean archaeology

Modern Caribbean archaeology seeks to counter entrenched traditional narratives by reevaluating complex migration patterns and integrating the perspectives of all segments of island societies across multiple periods to establish a more complete understanding of Caribbean heritage (González-Tennant 2014; Pagan Jiménez and Rodríguez Ramos 2008). As China (1996) noted, the broader sweep of post-colonial Caribbean histories has often been limited by a narrow emphasis on conflict, slavery and confinement without fully integrating the underlying complexities of human migration and cultural context. We contend that a multi-scalar distributional analysis of ship graffiti, integrated with associated patterns of historical site uses, supports an inclusive discussion of marginalized segments of colonial communities across multiple temporal and cultural contexts and is consistent with a modern post-colonial narrative.

In cultural systems where compliance and conformity were compulsory, epigraphic and pictographic expressions offered a rare opportunity for individual expression on natural or man-made surfaces. Consistent with the initial observations by Rivera Collazo (2007), the physical and societal confines of colonial structures designed to impose stringent limitations on the lifeways of its disadvantaged members are countered by a firsthand iconography designed to transcend the physical and societal boundaries of everyday life. On a regional scale, where such surviving written and oral narratives are limited, ship graffiti represents one of the few surviving expressions fashioned by the hands of marginalized and frequently forgotten segments of past Caribbean island societies, including the enlisted, conscripted, incarcerated, quarantined, indentured, enslaved and emancipated.

Ship graffiti iconography is clearly associated with maritime cultural consciousness, yet it is not strictly confined to maritime or littoral landscapes, as the distribution data demonstrate. We maintain that ship graffiti can serve as a cross-cultural indicator linking subterranean, sea, coast and inland topographies into a broader unified cultural landscape. Aside from the obvious graphic allusion to mobility, ship graffiti

and associated imagery potentially represent both expression and intent of cultural identity and individuality – as votive, memory, aspiration and/or resistance. Thus, the range of possible motivations for actors generating ship graffiti in the colonial Caribbean forms a common theme, representing an alternative firsthand narrative to entrenched institutional perspectives imbedded within traditional post-colonial histories on a regional scale. The distribution pattern further expands the cultural context of ship graffiti beyond the sole diasporic domain of a single cultural group to include multiple economically-exploited or otherwise disenfranchised segments of colonial society, offering a unique connection between modern stakeholders and descendent cultures who have inherited a rich cultural legacy and those who literally and figuratively shaped a complex Caribbean past.

Preservation of a rapidly vanishing historical tradition

Similar to other material studies, the caveat to this report is that the true extent of ship graffiti in the region may never be known as we are left with only the last remnants of a once broader colonial presence in the Caribbean. The opportunities, challenges, benefits and potential pitfalls associated with preservation of imperiled cultural resources must be carefully considered on site-specific, island and archipelagic scales. However, consistent with the broader scope of Caribbean material heritage preservation, time is decidedly not in the collective favor of modern island communities. The need for rapidly applying comprehensive inventory and site monitoring strategies to rock art sites (including those harboring nautical iconographies) on a regional scale is abundantly clear as the deterioration of the vast majority of the sites, demonstrated in this and previous reports, is advanced and in many cases nearly complete.

As tectonic and climate-driven natural disasters increase in frequency and intensity, concomitant economic resources available for heritage management and preservation have declined in many areas of the Caribbean. Subterranean (caves) and open air sites are modified at different rates by distinct environmental processes, particularly those in coastal settings (Lace and Mylroie 2013), yet they

share common vulnerabilities to deleterious human activities on multiple scales (Hernández-Delgado et al. 2012). Unfortunately, historic structures of wood, stone and plaster continue to erode at more advanced rates than natural surfaces due to inherent material instabilities and limited interventional preservation. In contrast to most cave environments, the timeframe associated with complete loss of many image panels harboring ship graffiti within built heritage structures is likely a matter of years, not decades.

The proven resource management approaches are not new, including site monitoring, restoration, proactive management and collaborative outreach to multi-level stakeholders in island communities (Chapman 1987). Yet, durable examples of successful implementation of such protocols are often limited by incomplete cultural inventories. The identification and preservation assessment of previously unreported sites remains a key tool for cultural resource managers across the region that can be effectively complemented by a range of techniques, such as automated environmental data collection and 3D imaging of rock art panels and associated built structures. It is hoped that current and future site inventories will support broad-based conservation strategies and encourage protection of what historic imagery remains on the structural and theoretical edifices of a complex colonial past of the Caribbean and adjacent areas.

Long-term monitoring of fragile cultural sites is also critical to gauging the combinatorial effects of natural and human processes and the potential

for preservation. It further allows local resource managers to identify and prioritize management of open air or subterranean sites which prove most vulnerable by incorporating distinctive geomorphologies specific to cave sites and geophysical processes unique to cultural stone structures (Hall 2009; Vieten et al. 2016). but firsthand assessments of site integrities, landscape uses and structural stabilities remain invaluable.

Heritage-based tourism has grown significantly in the region as management entities on many levels continue to explore new revenue streams based on cultural resources. Yet, modern cultural identities of island communities often conflict with complex historical narratives and the tourism-based monetary value of heritage sites (Palmer 1994; Siegel et al. 2013). Restoration and protective modification of historical structures, while critical in maintaining structural integrities and associated cultural resources, can also introduce conflicting consequences as replastering of interior or exterior stone walls or repairing impaired mortar can inadvertently, and often irreparably, alter original surfaces (Smith et al. 2004; Verdonck et al. 2011).

A limited number of small scale community-based conservation efforts have demonstrated degrees of success in reversing cultural site deterioration and provide reason for optimism. The opportunities for robust heritage preservation are clear but so are the obstacles that currently enable the accelerating attrition of a rich cultural patrimony across the Insular Caribbean.

Acknowledgements: The authors wish to thank the Oficina Estatal de Conservación Histórica de Puerto Rico for their support. The authors also thank Abel Vale Nieves and Maria A. Perez for critical logistical support.

References Cited

Amórtegui Sánchez, Andrea (2021). Voces marginales del siglo XVIII-XIX: La vida en el Fuerte de San Fernando de Bocachica, Cartagena de Indias, a través del graffiti histórico. Trabajo de Grada, Universidad Externado De Colombia, Facultad De Estudios Del Patrimonio Cultural Programa De Arqueología.

Berkowitz, Joan, E. Blaine Cliver, Judy Jacob, Frank Matero and Barbara Yocum (1991). The Fortifications of San Juan National Historic Site; Historic Structure Report, volume II: El Fuerte de San Cristóbal. Atlanta, GA: Southeast Regional Office, National Park Service.

- Bigourdan, Nicolas and Michael McCarthy (2007). Aboriginal watercraft depictions in Western Australia: On land, and underwater? *Journal of the Australasian Institute for Maritime Archaeology* 31:1-10.
- Calero Carretero, Jose Á. and Juan D. Carmona Barrero (2017). Grafitos históricos en la ermita de Nuestra Señora de las Nieves en la alcazaba de Reina: Otro caso de representación popular de barcos con carácter votivo. In *La España del Quijote: IV Centenario Cervantes*, edited by F. Lorenzana de la Puente and F. J. Mateos Ascacíbar (pp. 321-333). Llerena: Sociedad Extremeña de Historia.
- Casella, Eleanor C. (2009). Written on the Walls: Inmate Graffiti in Places of Confinement. In *The Archaeology of Institutional Life*, edited by A.M. Beisaw and J.G. Gibb, pp. 172-186, Tuscaloosa: University of Alabama Press.
- Champion, Mathew (2015). Medieval ship graffiti in English churches: Interpretation and function. *The Mariner's Mirror* 101: 343-350.
- Chapman, William (1987). Preservation in the Virgin Islands: Problems in Translating Cultural Values. In *Old Cultures in New worlds*. Proceedings of 8th ICOMOS General Assembly and International Symposium. Programme report - Compte rendu. US/ICOMOS, Washington: pp. 846-853.
- Chinea, Jorge L. (1996). Race, colonial exploitation and West Indian immigration in nineteenth-century Puerto Rico, 1800-1850. *The Americas* 52(4): 495-519.
- Clarke, Anne and Ursula K. Frederick (2016). "Born to be a stowaway": Inscriptions, graffiti, and the rupture of space at the North Head Quarantine Station, Sydney. *International Journal of Historical Archaeology* 20(3): 521-535.
- Chowdhury, Amitava (2015). Freedom Across the Water: British Emancipation of Slavery and Maritime Marronage in the Danish West Indies, In *Abolitions as a Global Experience*, edited by H. Suzuki, pp. 149-160, Singapore: UAS Press.
- Demesticha, Stella, Katerina Delouca, Mia G. Trentin, Nikolas Bakirtzis and Adonis Neophytou (2017). Seamen on land? A preliminary analysis of medieval ship graffiti on Cyprus. *International Journal of Nautical Archaeology* 46(2): 346-381.
- Dubelaar, Cornelius N. 1995. Recent rock art studies in the Caribbean Islands. *Latin American Indian Literatures Journal* 11(1):83-92.
- Feinberg, J., David Woodham and Carlo Citto (2016). Synergism in conditions evaluation technologies: The example of the San Juan fortification walls. *International Journal of Heritage Architecture* 1(1): 17-26.
- Figuerola, Luis A. (2005). *Sugar, Slavery, and Freedom in Nineteenth-Century Puerto Rico*. Chapel Hill: University of North Carolina Press.
- Gillespie Alan R., Anne B. Kahle and Richard E. Walker (1986). Color enhancement of highly correlated images. I. Decorrelation and HSI contrast stretches. *Rem. Sens. Environ* 20(3): 209-235.
- Gilmore, Joanna K. (2008). Leprosy at the lazaretto on St Eustatius, Netherlands Antilles. *International Journal of Osteoarchaeology* 18(1): 72-84.
- González-Tennant, Edward (2014). The "color" of heritage: Decolonizing collaborative archaeology in the Caribbean. *Journal of African Diaspora Archaeology and Heritage* 3(1): 26-50.
- Hall, Neville A.T. (1992). *Slave Society in the Danish West Indies: St. Thomas, St. John, and St. Croix*, edited by W.B. Higman, Jamaica: University of the West Indies Press.
- Hall, Kevin (2009). Rock art vs. cultural stone: Some geomorphological perspectives on weathering and conservation under a changing climate. *South African Geographical Journal* 91(2): 58-62.
- Hermanns, Marcus H. (2010). 16th-Century ship graffiti on the town walls of Eivissa, Balearic Islands, Spain. *International Journal of Nautical Archaeology* 39(1): 66-75.

- Hernández-Delgado, Edwin A., Carlos E. Ramos-Scharrón, Carmen R. Guerrero-Pérez, Mary Ann Lucking, Ricardo Laureano, Pablo A. Méndez-Lázaro and Joel O. Meléndez-Díaz (2012). Long-term Impacts of Non-Sustainable Tourism and Urban Development in Small Tropical Islands Coastal Habitats in a Changing Climate: Lessons Learned from Puerto Rico, In *Visions for Global Tourism Industry-Creating and Sustaining Competitive Strategies*, edited by M. Kasimoglo, pp. 357-398, Rijeka: InTech Publications.
- Hobbins, Peter (2016). 'Stories from the sandstone': Messages from ships, sailors and travelers caught in quarantine. *Signals* (114): 2.
- Hübener, Theodore. 1898. "Die Inseln Mona und Monito." *Globus: Illustrierte Zeitschrift Für Länder- Und Völkerkunde* LXXIV (23): 368-72.
- Huyghues-Belrose, Vincent and Marie-France Barouh (2007). Les Graffitis de l'habitation La Caravelle dite Château Dubuc presqu'île de la Caravelle, commune de la Trinité Martinique. *Études Caribéennes* (7).
<https://doi.org/10.4000/etudescaribeennes.361>
- Jason, Jennie M. (1925). The leper colony of the Virgin Islands of the United States. *Naval Medical Bulletin* 22(5).
- Jenson, Deborah, Victoria Szabo and the Duke F.H.I. Haiti Humanities Laboratory Student Research Team (2011). Cholera in Haiti and other Caribbean Regions, 19th century. *Emerging Infectious Diseases* 17(11): 2130.
- Lace, Michael J. (2012). Anthropogenic use, modification and preservation of coastal caves in Puerto Rico. *Journal of Island and Coastal Archaeology*, 7(3): 1-25.
- Lace, Michael J. and John E. Mylroie (2013). Coastal Cave and Karst Resource Management. In *Coastal Karst Landforms*, edited by M.J. Lace and J.E. Mylroie, pp. 127-143, Dordrecht: Springer.
- Lace, Michael J., Nancy A. Albury, Alice V.M. Samson, Jago E. Cooper and Reniel Rodriguez Ramos (2019). Ship graffiti on the islands of the Bahamas, Turks and Caicos and Puerto Rico: A comparative analysis. *Journal of Maritime Archaeology* 14(2):239-271.
- Le Bon, Elizabeth (1997). *Images Out of Water: Aspects of the Interpretation of Ancient Maritime Graffiti*. Ph.D. dissertation, University of St Andrews.
- Levison, Julie H. (2003). Beyond quarantine: A history of leprosy in Puerto Rico, 1898-1930s. *História, Ciências, Saúde Manguinhos* 10: 225-245.
- Linebaugh, Peter and Marcus Rediker (1990). The many-headed hydra: Sailors, slaves, and the Atlantic working class in the eighteenth century. *Journal of Historical Sociology* 3(3): 225-252.
- Lopez Belando, Adolfo (2009). El Arte Rupestre en el Parque Nacional los Haitises. *Rupestreweb*. <http://www.rupestreweb.info/haitises2.html> (accessed 06/29/21).
- McAtackney, Laura (2016). Graffiti revelations and the changing meanings of Kilmainham Gaol in (post) colonial Ireland. *International Journal of Historical Archaeology* 20(3): 492-505.
- Merced, Jarieth N. (2017). Painting Identity and Resistance: Muralism in Puerto Rico. Master of Arts Thesis, Simon Fraser University.
- Muscat, Joseph and Joanne Cassar (1994). The Gozo prisons graffiti. *Melita Historica* 11(3): 241-273.
- Navarro Mederos, Juan F. (2004). Grabados rupestres con representación de Barcos en el Lomo Gailón (Isla de La Gomera, Canarias). *Revista Tabona* 12:159-192.
- Ober, Frederick A. (1893). *In the Wake of Columbus: Adventures of the Special Commissioner Sent by the World's Columbian Exposition to the West Indies*. Boston: D. Lothrop Company.

- Pagán Jiménez, Jaime R. and Reniel Rodríguez Ramos (2008). Sobre arqueologías de liberación en una “colonia postcolonial” (Puerto Rico). *Revista de Ciencias Sociales* 19: 8-41.
- Palmer, Catherine A. (1994). Tourism and colonialism: The experience of the Bahamas. *Annals of Tourism Research* 21(4): 792-811.
- Palmer, Russell (2016). Religious colonialism in Early Modern Malta: Inquisitorial imprisonment and inmate graffiti. *International Journal of Historical Archaeology* 20(3): 548-561.
- Paterson, Alistair, Ross Anderson, Ken Mulvaney, Sarah de Koning, Joe Dortch and Jo McDonald (2019). So ends this day: American whalers in Yaburara Country, Dampier Archipelago. *Antiquity* 93(367): 218-235.
- Pemberton, Rita (2012). Dirt, disease and death: Control, resistance and change in the post-emancipation Caribbean. *História, Ciências, Saúde-Manguinhos* 19: 47-58.
- Petitjean, Johann (2018). Inscribing, writing and drawing in the prisons of the inquisition. Methodological issues and research perspectives on graffiti. *Quaderni storici* 53(1): 15-38.
- Richardson, Bonham C. (1980). Freedom and migration in the Leeward Caribbean, 1838–1848. *Journal of Historical Geography* 6(4): 391-408.
- Rivera Collazo, Isabel C. (2007). Graffiti As Resource For Historical And Archaeological Research: The Figurative Graffiti On The Walls Of San Juan’s Spanish Defense System, Puerto Rico. In *Proceedings of the 21st International Association of Caribbean Archaeologists*, edited by B. Rei, H. Petitjean Roget and A. Curet, pp. 1-8, University of the West Indies School of Continuing Education, St. Augustine.
- Rodríguez Ramos, Reniel, Angel A. Acosta-Colón and Roberto Perez Reyes (2021). Una aproximación a la temporalidad absoluta del arte rupestre pictográfico de Puerto Rico. *Ciencia y Sociedad* 46(3): 7-27.
- Samson, Alice V.M. and Jago E. Cooper, (2015). History on Mona Island: Long-term human and landscape dynamics of an ‘uninhabited’ island. *New West Indian Guide/Nieuwe West-Indische Gids* 89(1-2): 30-60.
- Samson, Alice V.M., Jago E. Cooper and Joshue Caamaño-Dones (2016). European visitors in native spaces: Using paleography to investigate early religious dynamics in the new world. *Latin American Antiquity* 27(4): 443-461.
- Schoeppner, Michael A. (2010). *Navigating the Dangerous Atlantic: Racial Quarantines, Black Sailors and United States Constitutionalism*. Ph.D. dissertation, University of Florida.
- Schiappacasse, Paola A. (2011). *Archaeology of isolation: The 19th Century Lazareto de Isla de Cabras, Puerto Rico*. Ph.D. Dissertation, Syracuse University.
- Schroedl, Gerald F. and Todd Ahlman (2002). The maintenance of cultural and personal identities of enslaved Africans and British soldiers at the Brimstone Hill Fortress, St. Kitts, West Indies. *Historical Archaeology* 36(4): 38-49
- Serrano Puigdoller, Victor E. (2021). Centro de Estudios Avanzados de Puerto Rico y El Caribe, personal communication.
- Siegel, Peter E., Corinne L. Hofman, Benoit Bérard, Reg Murphy, Jorge U. Hung, Roberto V. Rojas and Cheryl White (2013). Confronting Caribbean heritage in an archipelago of diversity: Politics, stakeholders, climate change, natural disasters, tourism and development. *Journal of Field Archaeology* 38(4): 376-390.
- Smith, Bernard J., Jose A. Baptista-Neto, Maria A. Martin de Silva, J.J. McAlister, Patricia A. Warke and Joanne M. Curran (2004). The decay of coastal forts in Southeast Brazil and its implications for the conservation of colonial built heritage. *Environmental Geology* 46(3-4): 493-503.

Troletti, Francisco (2016). Threadlike engravings of historical period on the rocks and plaster of churches and civic buildings. Some comparisons and proposals of interpretation. In *Post-Palaeolithic Filiform Rock Art in Western Europe: Proceedings of the XVII UISPP World Congress (1–7 September 2014, Burgos, Spain) Volume 10/Session A18b* (p. 43), edited by F. Ciombra and U. Sansoni, Archaeopress Publishing Ltd.

Troncoso, Andres, Felipe Armstrong and Mara Basile (2018). Rock Art in Central and South America. In *The Oxford Handbook of the Archaeology and Anthropology of Rock Art*, edited by B. David and I.J. McNiven, pp. 273-316, New York: Oxford University Press.

Turner, Grace S.R. (2006). Bahamian ship graffiti. *The International Journal of Nautical Archaeology* 35(2): 253-273

van den Bel, Martijn, Nicolas Biwer, Hélène Civalleri, Anne Jégouzo, and Xavier Peixoto (2018). Les Structures d'Exploitation et de

Production du Sucre. *Les Nouvelles de l'Archéologie* [En ligne] 150:1-13.

Verdonck, Ann, Dieter Nuytten and Liesbeth Dekeyser (2011). The Reuse of the Detention Centre of Vilvoorde (Belgium): Three Centuries of Convicts' Graffiti. In *Structural Studies, Repairs and Maintenance of Heritage Architecture XII*, edited by C.A. Brebbia and L. Binda, pp. 185-194, Southampton: WitPress.

Vieten, Rolf, Amos Winter, Alice V.M. Samson, Jago E. Cooper, Lucy J. Wrapson, Patricia N. Kambesis, Michael J. Lace and Miguel A. Nieves (2016). Quantifying the impact of human visitation in two cave chambers on Mona Island (Puerto Rico): Implications for archeological site conservation. *Journal of Cave and Karst Science* 43(2):79-85.

Westerdahl, Christer (2013). Medieval carved ship images found in Nordic churches: The poor man's votive ships? *International Journal of Nautical Archaeology* 42(2): 337-347.