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Short communication

Memorializing the Middle Passage on the Atlantic seabed in Areas Beyond National Jurisdiction

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ABSTRACT

More than 12.5 million Africans were held captive on 40,000+ voyages during the transatlantic slave trade. Many did not survive the voyage and the Atlantic seabed became their final resting place. Exploration for mineral resources on the international seabed (the "Area") in the Atlantic Basin is already underway, governed by the International Seabed Authority (ISA). Through the United Nations Convention on the Law of the Sea (UNCLOS), Member States of the ISA have a duty to protect objects of an archeological and historical nature found in the Area. Such objects may be important examples of underwater cultural heritage and can be tied to intangible cultural heritage, as evidenced through links with religion, cultural traditions, art and literature. Contemporary poetry, music, art, and literature convey the significance of the Atlantic seabed in African diasporic cultural memory, but this cultural heritage has yet to be formally recognized by the ISA. We encourage Member States of the ISA to consider ways to respect and memorialize those who lost their lives and came to rest on the seabed in advance of mineral exploitation. Increased awareness of the Middle Passage seascape may be accomplished without limiting exploitation of mineral resources. An example of how this might be achieved is to place one or more virtual ribbons on ISA maps to depict major slave-trade routes across the Atlantic and in memory of those who died during their Middle Passage.

1. Prologue

The killing of George Floyd in May 2020 (Minnesota, USA) resulted in a wave of action, embodied by the Black Lives Matter movement, that rippled throughout the United States and abroad. Global reaction in pursuit of justice included a meeting of the United Nations Human Rights Council on racism and police brutality. The authors fully support the justice movement and principles iterated in the 2001 World Conference against Racism, Racial Discrimination, Xenophobia and Related Intolerance Declaration (the Durban Declaration). The virtual memorial proposed below may serve as a reminder of past injustice and a contribution to the continuing pursuit of justice that is in line with the Programme of Action of the Durban Declaration and the objectives of recognition and justice for the International Decade for People of African Descent (2015–2024).

2. Introduction

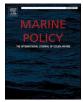
The Middle Passage commonly refers to the experience of enslaved African people as they traveled across the Atlantic Basin to the Americas during the transatlantic slave trade. From before the Spanish Conquest of Mexico in 1519 to after the end of the American Civil War in 1865, more than 12.5 million Africans were held captive on one of more than 40,000 voyages, each voyage averaging ~60 days [1,2]. Conditions for Africans aboard slave vessels were inhumane, with most ships holding between 200 and 400 individuals in close and squalid quarters below deck [3]. Confined spaces, inadequate nutrition, and limited opportunity for personal hygiene led to descriptions of the slave ships as a *"marketplace"* for diseases [4], including scurvy, dysentery and small pox [4,5]. The *"cargo"*—enslaved Africans—experienced unimaginable terror and violence as sailors established authority through physical,

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emotional, and psychological conditioning [5]. Illness, insanity, hunger, dehydration, torture, revolt, suicide, and ship wreck [1-3,5] led to the death of ~1.8 million Africans at sea during their Middle Passage (Supplementary Material, Table S1).

The Atlantic seabed is the final resting place for those cast overboard, those who sought freedom in the Atlantic Ocean through suicide, and those who were lost with a ship. It is also a place where there is emergent interest in mineral resources. We argue that a means to recognize or remember the Middle Passage and its victims at sea should be sought in advance of mineral exploitation of the seabed. This could be undertaken without limiting access to seabed resources and would raise awareness of the Atlantic seabed as a culturally important seascape and of the potential for discovery of sites connected to the transatlantic slave trade.

In the Atlantic basin, deep-sea mining activities in the Area [i.e., the seabed in Areas Beyond National Jurisdiction (ABNJ)] currently include one exploration contract for ferromanganese crusts on the Rio Grande Rise and three exploration contracts for polymetallic sulfides on the northern Mid-Atlantic Ridge (Fig. 1). The remaining ridge axis and other mineral resources in this region of the Area are available for additional exploration contracts. All mining-related activity in the Area is governed by the International Seabed Authority (ISA), whose Member States and stakeholders can discuss how, if at all, the Middle Passage might be recognized. The ISA has initiated formal regional planning for the MidAtlantic Basin, which makes consideration of features of cultural significance in this region timely. The cultural significance of the Middle Passage, and the duty set out to protect certain cultural heritage under the 1982

United Nations Convention on the Law of the Sea (UNCLOS), lead us to propose that one or more memorial ribbons representing slave-trade routes be depicted on ISA maps in recognition of those who died during their Middle Passage (Fig. 1).

3. Contemporary cultural significance of the Atlantic seabed

Enslaved Africans who died in captivity on slave ships were displaced from their native land, separated from their culture, severed from home and family, and denied traditional burial. With no means to ritualize death, "death threatened the deceased with eternal alienation" [3]. Trauma and loss at sea were emblematic of the terror of the Middle Passage, the memories of which were carried into the Americas by the many millions who survived the crossing [3,5]. The Middle Passage and the loss of life suffered therein continue as cultural motifs today. In *∮*The Sea Is History∉ by Nobel Prize-winning poet Derek Walcott, the Atlantic seabed is described as a place to discover hidden elements of African history, and as a burial ground [6] with "Bone soldered by coral to bone,/ mosaics/ mantled by the benediction of the shark's shadow". In *Atlantic* is a Sea of Bones∉, Lucille Clifton, a past Poet Laureate of Maryland, writes about the connection between Africa and the Americas, where the "atlantic is a sea of bones./ my bones./ my elegant afrikans/ connecting whydah and new york,/ a bridge of ivory./ seabed they call it." Elsewhere, the Atlantic seabed is reimagined in an alternative history within the cultural and artistic genre of Afrofuturism, which often combines fiction with the experiences of Black people to bring the African diaspora to life in new ways [6]. In their Afrofuturistic album, The Quest (1997), Detroit

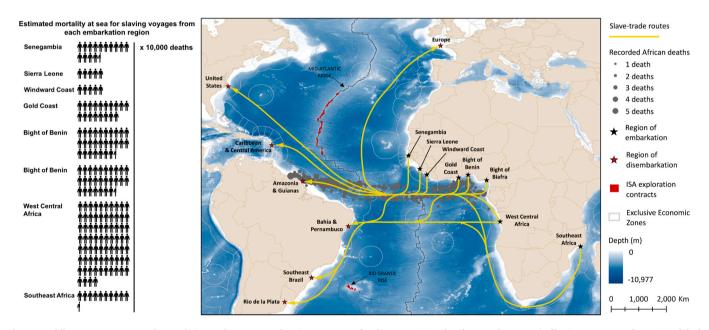


Fig. 1. Middle Passage routes and mortalities, and current exploration contracts for deep-sea minerals. Slave-trade routes (yellow) are presented as a simplified schematic, highlighting connections between each region of embarkation and disembarkation within the north and south Atlantic. This schematic is based on Map 1 within the *Atlas of the Transatlantic Slave Trade* [2]. Estimated mortality at sea from each embarkation region was calculated using the Trans-Atlantic Slave Trade Estimates database (1; Supplementary Materials). The approximate locations where 522 Africans were cast into the sea during 35 Dutch slaving voyages (Atlantic Networks Project [22]) are also shown (gray circles). Exploration contract blocks (red squares) for polymetallic sulfide deposits on the Mid-Atlantic Ridge (each block $\leq 100 \text{ km}^2$) and ferromanganese crusts on the Rio Grande Rise (each block $\leq 20 \text{ km}^2$) are not to scale. Locations of exploration contracts are available via the International Seabed Authority (ISA) website (www.isa.org.jm/maps). Base bathymetry from General Bathymetric Chart of the Oceans (GEBCO_2014 Grid, www. gebco.net).

This simplified schematic of slave-trade routes is not intended to represent true ship tracks but emphasizes the extent of the transatlantic slave trade across both the north and south Atlantic. Across the north Atlantic, approximately 886,000 Africans died en route to the Caribbean and Central America (Supplementary Material). Across the south Atlantic, more than 637,000 Africans died en route to Bahia, Pernambuco, and Southeast Brazil, including more than 456,000 Africans who embarked from West Central Africa (Supplementary Material). Though more than 1.8 million Africans died crossing the Atlantic Ocean, approximate locations are only known for 522 Africans cast into the sea during 35 Dutch slaving voyages through the mid-to-late 1700s [22]. We offer these slave-trade routes as a basis for locating memorial ribbons on ISA maps or for stimulating discussion of other means to recognize the cultural significance of the international Atlantic seabed. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

techno duo Drexciva created a musical mythology centered on a civilization located on the Atlantic seabed [6,7]. The inhabitants of this civilization (also called Drexciya) never need to breathe air because they were born in the Atlantic Ocean, descendants of pregnant enslaved Africans who were thrown overboard during childbirth [6,7]. While the historical record offers no examples of this practice, in the contemporary Drexcyian narrative, Drexcyians are the creators of a +Black Atlantis-[8]. This musical mythology inspired Watery Ecstatic, a series of paintings by contemporary African American artist Ellen Gallagher [7]. It also inspired a song by the American experimental hip hop group Clipping., commissioned by the public radio program and podcast This American *Life* (Episode 623, *∮*We Are in the Future*∮*). Clipping.'s Hugo-nominated song 'The Deep' (2017) in turn inspired an Afrofuturist novel of the same name by Rivers Solomon, released in November 2019. Clearly, the Middle Passage and deep Atlantic continue to be a focal point of cultural memory in the 21st century.

4. Cultural heritage value of slave trade sites

Along Atlantic shores, sites linked to the slave trade are protected or repurposed to ensure that the Middle Passage is not forgotten. For example, the Valongo Wharf Archaeological Site in Rio de Janeiro (Brazil) is listed as a World Heritage Site, recognized for its Outstanding Universal Value as a cultural heritage site because it was the landing point for an estimated 900,000 Africans and it carries historical and spiritual importance for people of African descent. In Calabar (Nigeria), the site of a 15th century slave-trading warehouse in Marina Beach is now home to a Slave History Museum. In the United States of America, the Middle Passage Ceremonies and Port Markers Project encourages local communities to hold remembrance ceremonies at each of the 52 documented Middle Passage ports. Similarly, the Slave Wrecks Project was launched in 2008 to locate, study, and protect wreck sites of slave ships, to highlight experiences of those who were enslaved, and to increase understanding of the transatlantic slave trade and its lasting impact on the world [9]. International recognition of the transatlantic slave trade is symbolized by the \oint Ark of Return \oint at the United Nations Visitor Plaza in New York City, a permanent memorial with three primary elements of +acknowledge the tragedy-, +consider the legacy- and +lest we forget- [10]. The 'Ark of Return' was unveiled on 25 March 2015, the International Day of Remembrance of the Victims of Slavery and the Transatlantic Slave Trade, and stands as a reminder that the legacies of slavery-including racism and inequality-still affects us all [11]. These memorials respect and nurture African diasporic cultural memory, but the area where those who lost their lives at sea ultimately came to rest-the Atlantic seabed-has not yet been recognized internationally.

5. International recognition of cultural heritage

The need for international recognition of cultural heritage was first noted by Hugo Grotius in 1646, who considered attacks on +things of artistic value", "things which have been devoted to sacred uses—, and "structures erected in honour of the dead— to be expressly forbidden [12]. For international waters, UNCLOS establishes a framework for the use and protection of the marine environment, including both natural and cultural resources. Specifically, Article 149 states that "[a]ll objects of an archaeological and historical nature found in the Area shall be preserved or disposed of for the benefit of mankind as a whole, particular regard being paid to the preferential rights of the State or country of origin, or the State of cultural origin, or the State of historical and archaeological origin." In addition, Article 303 establishes a duty for States "to protect objects of an archaeological and historical nature found at sea", with consideration given to other international agreements.

Recognition of the Middle Passage through virtual, memorial ribbons on ISA maps of the region (Fig. 1) would show respect and motivate consideration of cultural aspects associated with ocean spaces. Such a recognition would be a step toward fulfilling duties established in UNCLOS and would be consistent with at least two other conventions on cultural heritage. One such agreement is the 2001 United Nations Educational, Scientific, and Cultural Organization (UNESCO) Convention on the Protection of the Underwater Cultural Heritage (2001 UNESCO Convention), which provides a definition of underwater cultural heritage that is more detailed than that found in UNCLOS. Article 1 (a) defines underwater cultural heritage as *"all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years*", such as structures, vessels, artefacts, and human remains.

Although the scope of the 2001 UNESCO Convention is limited to examples of tangible heritage (as is UNCLOS), public interest in cultural heritage is much broader and includes different sources of cultural identity (e.g., poetry, music, rituals, festivals, traditional knowledge systems, customs), collectively known as intangible cultural heritage [13]. The virtual, memorial ribbons proposed here would also be consistent with the public interest reflected in the 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage [14]. In fact, the UNESCO Evaluation Report on the 2001 Convention notes a need to explore connections between tangible and intangible aspects of underwater cultural heritage in order to fully understand the cultural, historical, and social value of heritage ([15], page 8).

Memorializing the Middle Passage would also be consistent with the interest and values of the 1970 World Heritage Convention (WHC). While initially focused on terrestrial sites of natural and cultural heritage, there has been an increasing recognition for the need to conserve marine sites of cultural value on the continental shelf and in Exclusive Economic Zones (EEZs). Again, the scope of the WHC is limited to tangible objects, but there is recognition of the connection to intangible heritage. In the nomination document for Papahānaumokuākea Marine National Monument as a World Heritage Site, consideration was given to the connection between Native Hawaiians and Papahānaumokuākea as а "sacred cultural landscape" [16]. In Hawaiian culture, Papahānaumokuākea represents the place where life originates and where spirits return after death; traditional chants, ceremonies and beliefs were included in the nomination document as examples of living heritage and evidence of cultural value that is cosmological, relating more to intangible than tangible heritage [16]. Papahānaumokuākea was inscribed onto the World Heritage List in 2010 as a mixed (natural and cultural) heritage site, demonstrating recognition of cultural values that go beyond traditional archeological structures and that natural heritage may also be cultural heritage, with potential links to intangible heritage. For many people around the world, cultural and natural heritage are intricately linked to indigenous knowledge and cultural practices that are protected by UNESCO's 2003 Convention on the Protection of Intangible Cultural Heritage ([15], page 8). In the context of the transatlantic slave trade, poetry, music, art and literature describe the Atlantic seabed as a space with cultural significance (Section 3). Finding ways to recognize this intangible cultural heritage is as important as establishing procedures to respect and preserve human remains, shipwrecks and artefacts that may be discovered during mining-related activities on the seabed.

6. Tangible cultural heritage: preservation of human remains, objects and sites

There is potential for discovery of both human remains and humanworked objects on the seabed beneath Middle Passage slave-trade routes. The Slave Wrecks Project estimates that ~1000 ships participating in the transatlantic slave trade were wrecked. If a shipwreck discovery should be made, the site would need to be treated with respect. A shipwreck may contain human remains and may serve as a memorial to those who died during their Middle Passage. Such a memorial concept has precedent through the recognition of the RMS *Titanic* wreck site as a maritime memorial to the 1523 people who died during the disaster [17]. In addition to shipwrecks, smaller objects relating to trade [e.g., glass trade beads, manillas (a form of West African currency)] as well as to the capture and imprisonment of African people (e.g., manacles, shackles) may be found [18]. Such items may be tangible evidence of the African experience of the Middle Passage, and of archeological and historical value under Article 149 of UNCLOS. African nations from which enslaved people were taken would have a preferential interest in this heritage. Such interests will need to be considered in the ultimate disposition of the objects, including preservation.

ISA draft exploitation regulations include provisions for preserving human remains, objects, and sites of an archeological or historic nature, and places responsibility on the mining contractors to recognize sites and respond accordingly [19]. In this draft ISA text, if human remains, objects, or sites are discovered during mining-related activities in the Area, the contractor must notify the Secretary General of the ISA, and activities within a reasonable radius of the discovery must cease. The ISA is then to decide on appropriate further actions, in consultation with the sponsoring State, the State from which the remains or objects originate (if known), the Director General of UNESCO, and other relevant international organizations [19]. To enhance preservation of such sites, the ISA may wish to consider additional procedures whereby experts in underwater archeology are also consulted.

The 2001 UNESCO Convention encourages in situ preservation as the first policy option (Article 2.5). Activities directed at underwater cultural heritage are permitted if the activity complies with Annex Rules and will make a significant contribution to knowledge, protection, or enhancement of underwater cultural heritage (Rule 1). For activities that will incidentally affect underwater cultural heritage, the Convention requires each State Party to use the "best practicable means at its disposal to prevent or mitigate any adverse effects" (Article 5). The emphasis on in situ preservation is akin to a precautionary approach to ocean management and may be considered by the ISA when deciding on a course of action following any discovery of tangible cultural heritage.

7. Conclusion

Mortalities suffered during the Middle Passage suggest that certain sites or areas of the Atlantic seabed may be recognized as culturally significant by Member States of the ISA. The importance of the Middle Passage and the Atlantic seabed in African diasporic cultural memory is evidenced in poetry, music, art and literature, but a compelling question posed by historian Sowande' M. Mustakeem remains: "how, and more aptly, can the dead be remembered if many of slavery's dead are never found?" [5]. To facilitate remembrance, one possibility is to extend a virtual memorial ribbon, or multiple ribbons, across the Atlantic seabed on all ISA maps of the region to honor and respect those who came to rest there during their Middle Passage. Placement of one or more memorial ribbons along transatlantic slave-trade routes would position such ribbons in historic and geographic contexts and would serve as a reminder to those engaged in mining and other seabed-related activities that culturally significant artefacts of the Middle Passage may be encountered. The proposed virtual ribbons may also serve as a reminder of past injustice and contribute to the continuing pursuit of justice during the International Decade for People of African Descent (2015-2024) and beyond. We encourage Member States of the ISA General Assembly and relevant stakeholders to consider a goal of remembering the lives lost during the Middle Passage before the end of the United Nations International Decade for People of African Descent in 2024. This goal would also contribute to the United Nations Decade of Ocean Science for Sustainable Development, which aims to ensure that the multiple values of the ocean, including cultural values and underwater cultural heritage, are recognized and widely understood [20,21].

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Author contributions

PT and CLVD co-wrote the manuscript. All authors contributed to the development of ideas and manuscript revisions. PT, CLVD, SD and DE curated data.

Competing interests

The authors declare no competing interest.

Data availability

All data is publicly available via the Trans-Atlantic Slave Trade Estimates database: https://www.slavevoyages.org/assessment/estima tes.

Declarations of interest

None.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.marpol.2020.104254.

References

- D. Eltis, A. Tullos, et al., Voyages: The Trans-Atlantic Slave Trade Database, (2019). (https://www.slavevoyages.org), (accessed 28 September 2018).
- [2] D. Eltis, D. Richardson, Atlas of the Transatlantic Slave Trade, Yale University Press, 2010.
- [3] V. Brown, The Reaper's Garden: Death and Power in the World of Atlantic Slavery, Harvard University Press, 2008.
- [4] D.P. Mannix, M. Cowley, Black Cargoes: A History of the Atlantic Slave Trade 1518-1865, The Viking Press, Inc, New York, 1962.
- [5] S.M. Mustakeem, Slavery At Sea: Terror, Sex, and Sickness in the Middle Passage, University of Illinois Press, Champaign, 2016.
- [6] R. Mayer, "Africa As an Alien Future": the middle passage, afrofuturism, and postcolonial waterworlds, Am. / Am. Stud. 45 (2000) 555–566.
- [7] K. Eshun, Further considerations on Afrofuturism, CR N. Centen. Rev. 3 (2003) 287–302, https://doi.org/10.1353/ncr.2003.0021.
- [8] S.A. Hameed, Black Atlantis: Three Songs, Sternberg Press and Forensic Architecture, 2014. (https://content.forensic-architecture.org/wp-content/ uploads/2019/05/Forensis-interior-FINAL.pdf), (accessed 20 July 2020).
- [9] National Museum of African American History & Culture, Slave Wrecks Project, (n. d.). (https://nmaahc.si.edu/explore/initiatives/slave-wrecks-project-0), (accessed 20 July 2020).
- [10] UNGA, United Nations General Assembly RES/70/7: Permanent memorial to and remembrance of the victims of slavery and the transatlantic slave trade, 2015.
- [11] United Nations, Permanent Memorial to Honour the Victims of Slavery and the Transatlantic Slave Trade at the United Nations, Rememb. Slavery. (n.d.). (https:// www.un.org/en/events/slaveryremembranceday/memorial.shtml), (accessed 16 August 2020).
- [12] H. Grotius, Moderation in laying waste and similar things, in: Jure Belli Ac Pacis Libr. Tres, 1646, Oxford University Press, 1925, pp. 745–756. Vol. 2.
- [13] M. Bouchenaki, The interdependency of the tangible and intangible cultural heritage, 2003. (http://openarchive.icomos.org/468/1/2_-Allocution_Bouchena ki.pdf).
- [14] UNESCO, Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, 2018. (https://ich.unesco.org/doc/src/2003_Convention_Basic_ Texts-2018_version-EN.pdf), (accessed 20 July 2020).
- [15] E. Sediakina-Rivière, T. Dlamini, O. Varmer, D. Kourkoumelis, Evaluation of UNESCO's standard-setting work of the Culture Sector, part VI – 2001 Convention on the Protection of Underwater Cultural Heritage, 2019.
- [16] State of Hawai'i, National Oceanic and Atmospheric Administration, Office of Hawaiian Affairs, U.S. Fish and Wildlife Service, Nomination of

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Papahänaumokuäkea Marine National Monument for Inscription on the World Heritage List, Honolulu, 2008. (https://whc.unesco.org/uploads/nominations/1326.pdf), (accessed 20 July 2020).

- [17] UK Foreign and Commonwealth Office, Treaty Series No. 8 (2019): Agreement concerning the Shipwrecked Vessel RMS Titanic, 2019.
- [18] J. Webster, Slave ships and maritime archaeology: an overview, Int. J. Hist. Archaeol. 12 (2008) 6–19, https://doi.org/10.1007/s10761-007-0040-8.
- [19] ISA, ISBA/24/LTC/WP.1/Rev.1: Draft Regulations on Exploitation of Mineral Resources in the Area, 2018. (https://www.isa.org.jm/document/isba24ltcwp1r ev1), (accessed 20 July 2020).
- [20] Intergovernmental Oceanographic Commission of UNESCO, IOC Circular Letter No. 2798: United Nations Decade of Ocean Science for Sustainable Development (2021–2030) - Implementation Plan - Zero Draft for Peer Review, 2020. (https ://unesdoc.unesco.org/ark:/48223/pf0000373298?poslnSet=2&queryId=0f96b 0d4-2cab-41fc-9b24-aca120f58f1f).
- [21] Intergovernmental Oceanographic Commission of UNESCO, IOC/EC-53/4.1.Doc (2): Revised draft implementation plan for the United Nations Decade of Ocean Science for Sustainable Development (Version 1), 2020. (http://ioc-unesco.net/ind ex.php?option=com_oe&task=viewDocumentRecord&docID=26869).
- [22] A. Sluyter, The Atlantic Networks Project, (2013). (https://sites.google.com/site/ atlanticnetworksproject/home), (accessed 20 July 2020).