



MASTERARBEIT | MASTER'S THESIS

Titel | Title

Geospatial Perspectives on the Second Slavery: Spatial Transformations in the
19th-Century Trans-Atlantic Slave Trade

verfasst von | submitted by

André Novak BSc BA MSc

angestrebter akademischer Grad | in partial fulfilment of the requirements for the degree of

Master of Arts (MA)

Wien | Vienna, 2026

Studienkennzahl lt. Studienblatt |
Degree programme code as it appears on the
student record sheet:

UA 066 647

Studienrichtung lt. Studienblatt | Degree
programme as it appears on the student
record sheet:

Masterstudium Digital Humanities

Betreut von | Supervisor:

Ass.-Prof. Maria Vargha MA MA PhD

Abstract

With the “spatial turn,” methods from the field of GIScience have increasingly been used in the humanities. Particularly in the field of history, this has can lead to valuable new insights and new perspectives on existing research areas. Until now, spatial methods have only been applied in a few cases in the study of slavery and the slave trade. The transformation to the “second slavery” in the 19th century altered the global relationships within the slave trade. By applying spatial analysis methods based on data from the “trans-Atlantic slave trade database,” new insights into the spatial composition of the slave trade have been gained. Even within the newly emerging territories, developments varied. Furthermore, it became clear that no definitive explanation for the abolition of slavery could be established. However, a comparison of both perspectives suggested that a combination of economic and humanitarian reasons likely contributed to its abolition. Further analysis indicated that although the trade volume of British ships remained high until abolition, their destinations shifted towards colonies of other Empires. This points to the decolonisation of the British slave trade. This analysis of the slave trade in the 19th century demonstrates that the application of spatial methods in the humanities opens up new perspectives.

Kurzfassung

Mit dem “spatial turn” kamen Methoden aus dem Bereich der GIScience auch in den Geisteswissenschaften vermehrt zum Einsatz. Vor allem im Bereich der Geschichtswissenschaft lassen sich hier wertvolle neue Erkenntnisse oder neue Perspektiven auf bereits vorhandene Forschungsbereiche erreichen. Im Bereich der Erforschung der Sklaverei und des Sklavenhandels wurden bis dato erst in wenigen Fällen räumliche Methoden angewandt. Durch die Umwandlung hin zur „second slavery“ im 19. Jahrhundert änderte sich die globalen Beziehungen im Sklavenhandel. Durch eine Anwendung räumlicher Analysemethoden basierend auf Daten der „trans-Atlantic slave trade database“ konnten hier neue Erkenntnisse zur räumlichen Zusammensetzung des Sklavenhandels gewonnen werden. Auch innerhalb der neu entstehenden Gebiete gab es unterschiedliche Entwicklungen. Außerdem zeigte sich, dass keine eindeutige Festlegung der Gründe für die Abschaffung der Sklaverei ermittelt werden konnten. Eine Vergleich beider Blickwinkel zeigte jedoch, dass wohl eine Kombination aus ökonomischen und humanitären Gründen für diese herangezogen werden können. Ein weiterer Analyseschritt deutete außerdem darauf hin, dass obwohl das Handelsvolumen britischer Schiffe bis zur Abolition hoch blieb, sich jedoch das Ziel dieser Schiffe hin zu Kolonien anderer Imperien verlagerte. Dies deutet auf die Entkolonisierung des britischen Sklavenhandels hin. Diese Analyse des Sklavenhandels im 19. Jahrhunderts zeigt, dass die Anwendung von räumlichen Methoden im Bereich der Geisteswissenschaften neue Perspektiven ermöglichen.

Table of content

Abstract	i
Kurzfassung.....	iii
List of figures	v
Preface	vi
1. Introduction	1
2. The Spatial Turn in the Humanities and Historical Research	9
3. GIS in the Humanities and in Historical Research	12
3.1. What are GIS?	12
3.2. Spatial Humanities.....	16
3.3. Historical GIS/Spatial History	19
4. Slavery and the trans-Atlantic slave trade	24
4.1. Slavery in the 19 th century: “Second Slavery”	36
4.2. Current Discussions in the field of slavery research: Abolition, Slavery in the 19 th century (“second slavery”)	42
5. “The trans-Atlantic slave trade database” as a data source for understanding the spatial aspects of the trans-Atlantic slave trade	49
5.1. Data Preparation	49
5.2. Preparation of the data from the “trans-Atlantic slave trade database”	51
5.3. Preparing the colonies data	53
6. Spatially analysing the “trans-Atlantic slave trade database”	56
6.1. A spatial assessment of the “new frontiers” of slavery in the 19 th century	57
6.2. Spatial evidence of the causes of abolition	63
6.3. Spatial indicators of the decolonisation of the slave trade	69
7. Discussion of the results	73
8. Conclusion.....	77
9. Sources.....	78
10. Bibliography	78
11. Appendix	86
11.1. Overview Map	86

List of figures

Figure 1 Number of embarked slaves per country	34
Figure 2 elbow method for the period of 1780-1784	59
Figure 3 K-means clustering (each colour represents one cluster)	61
Figure 4 Total number of slaves shipped to British colonies by British Ships	65
Figure 5 Total number of slaves shipped to British colonies by different countries	66
Figure 6 Vessels registered and constructed in GB	67
Figure 7 Vessels registered and constructed, Liverpool and London	68
Figure 8 Voyages by British ships to non-British colonies	70
Figure 9 Target ports by British ships	71

Preface

Several people were particularly supportive in the preparation of this work, and I would like to thank them as follows: Assistant Professor Maria Vargha, MA MA PhD, for supervising the work and providing consistently helpful feedback; Sarah Novak, my sister, for tirelessly proofreading the work; and my fellow students Bianca Plattner and Sebastian Wegerer for their helpful feedback in the initial stages of the work.

André Novak, Vienna, 13.02.2026

1. Introduction

The trans-Atlantic slave trade and the system of slavery shaped global economic structures and trade relations for nearly 400 years. But the system in the 19th century differed fundamentally from that of the preceding centuries. New “frontiers” were established, other countries took over the leading role from the British Empire in the slave trade, and the trade relations were decolonised. While this period has been extensively studied,¹ research focused primarily on the econometric aspects of this process. The spatial contextualisation of the slave trade has been largely left out of these discussions, even though, as this thesis aims to point out, it allows new perspectives on intensively discussed aspects of the slave trade, along with formulating new questions arising from the spatial contextualisation of this complex process.

In this thesis, I use spatio-temporal methods to examine this development in the 19th century from a spatial perspective, which, as mentioned, is a novel approach in the field. Applying this on data from the "trans-Atlantic slave trade database," I demonstrate that a distinct spatio-temporal development within 19th century slavery can be traced. Furthermore, contextualising the slave trade in a global history perspective, I question the earlier established views on the clear character of the abolition of slavery in the British Empire, as suggested previously by Williams and Drescher.² I point out that, depending on the perspective, the reasons for the abolition can be either economic or humanitarian in nature. Therefore, the decolonisation of slavery here plays an important role in dissecting this question.

The trans-Atlantic slave trade, lasting from the 16th to the 19th century, had a sustained impact on the global economic systems³ and was a major factor in the increase of the world trade in the early modern period.⁴ The zones of slave production in the American colonies were strongly connected to their ruling European Empires. The colonies “[...]”

¹ Dale Tomich, *Civilizing America's Shore. British World-Economic Hegemony and the Abolition of the International Slave Trade (1814–1867)*, In: *The Politics of the Second Slavery*, Dale Tomich Ed., (Albany 2016) 1–24, 7; Dale Tomich, *The ‘Great Divergence’: Slavery, Capitalism and World-Economy*, In: *Writing the History of Slavery*, David Stefan Doddington, Enrico Dal Lago Ed., *Writing History* (London/New York 2022) 81–112, 105.

² Eric Williams, *Capitalism & Slavery*, Third Edition (Chapel Hill 2021); Seymour Drescher, *Econocide: British Slavery in the Era of Abolition*, 2nd ed (Chapel Hill 2010).

³ Trevor Burnard, Gad Heuman, *Introduction*, In: *The Routledge History of Slavery*, Gad Heuman, Trevor Burnard Ed., (London/New York 2011) 1–15, here 7.

⁴ Williams, *Capitalism & Slavery*, 39.

provided markets for European manufactures and supplied Europe with primary products [...]”.⁵ Despite this deep connection, the system went through significant transformations in this nearly 400-year-long period. Following the turn of the 19th century, one of the most notable changes was the abolitionist movement in the British Empire, which was a major player in slave trade and plantation economies beforehand. Although slave trade was abolished in 1807 and slavery itself in 1833,⁶ slavery persisted and continued to thrive in new forms.

In this thesis, I focus on this transformation of the slavery system, labelled as “second slavery” by Dale Tomich,⁷ which resulted in a rather different system than in the centuries before. It included the expansion to new territories, where legal prohibition was not yet attained. In Tomich’s view, slavery was an integral part of the development of the capitalist world economic system. *“It plays a crucial role in the expansion of industrial capital during the nineteenth century through the production of new space, the transformation of world division of labour and the expansion of the world market.”*⁸

The “second slavery” had a lasting impact on the worldwide economic system and resulted in an unprecedented peak in the number of slaves who were abducted and forced to work on the plantations in the New World colonies. Another significant change I analyse in this thesis is the development towards a newly established worldwide division of labour, where, following Immanuel Wallerstein’s approach to a world system,⁹ a decolonisation of the slave trade and plantation economy system can be observed. The colonies of the European Empires (which Wallerstein sees as “semi-periphery” and “periphery”¹⁰) are here seen as very much dependent on the “core”, the European Empires they did belong to, from which every decision in the production process is regulated.¹¹

⁵ Tomich, The ‘Great Divergence’, here 105.

⁶ Christopher Leslie Brown, Abolition of the Atlantic Slave Trade, In: The Routledge History of Slavery, Gad Heuman, Trevor Burnard Ed. (London/New York 2011) 281–297, here 287f.

⁷ Dale Tomich, The Second Slavery and World Capitalism: A Perspective for Historical Inquiry, International Review of Social History 63, no. 3 (2018) 477–501, doi:10.1017/S0020859018000536, here 479.

⁸ Tomich, The ‘Great Divergence’, 111.

⁹ Immanuel Maurice Wallerstein, World-Systems Analysis: An Introduction (Durham 2004).

¹⁰ Dale Tomich, Through the Prism of Slavery: Labor, Capital, and World Economy, World Social Change (Lanham 2004), 37.

¹¹ Tomich, The ‘Great Divergence’, 106; Wallerstein, World-Systems Analysis, 56.

This dependence, as well as the “[...] *interdependence of a multiplicity of forms of labor* [...]”¹² very much composites Wallerstein’s world-system-perspective.

Following the principles of the “spatial turn”, which highlights space as a crucial factor in historical research,¹³ my focus in this thesis lies on the spatial characteristics of the slave trade and the plantation economy, aiming to uncover new perspectives on the evolution of the trans-Atlantic slave trade and its major players and their drives by applying geoinformation analytics on data about the “second slavery”. Integrating large historical datasets into Geoinformation Systems (GIS) allows us to analyse historical processes and correlations in a spatial context, providing fresh insights and uncovering previously unknown spatial patterns and connections.¹⁴ GIS are applications not only provide the opportunity for the storage and visualisation of spatial information, but also its manipulation and analysis. The latter two being the novelties that allows us more opportunities on researching connections of space and historical processes than before.¹⁵

Despite the increasing use of digital methods, the application of GIS in the field of Humanities is still not widespread, largely due to the complexity of historical processes and the lack of adequate data. Although the application of spatial approaching is growing, particularly, these latter two issues should be considered as the culprits for the difficulties of establishing best practices, standards, and a schema to follow, which ultimately resulted in a lag of spatial approaches within the field of digital humanities, especially in historical research. Therefore, this work not only aims to investigate the spatial aspects of the “second slavery”, but also to provide an example on contributing to current research discussions and analysing available datasets through the application of digital spatial methods.¹⁶

¹² Tomich, *Through the Prism of Slavery*, 37.

¹³ Doris Bachmann-Medick, *Cultural Turns: New Orientations in the Study of Culture* (Berlin/Boston 2016), 214.

¹⁴ Norbert De Lange, *Geoinformatik in Theorie und Praxis* (Berlin/Heidelberg 2013), 338, 361ff.

¹⁵ Norbert Bartelme, *Geoinformatik: Modelle, Strukturen, Funktionen* (Heidelberg 2005), 1, 5.

¹⁶ Trevor Harris, John Corrigan, David Bodenhamer, *Challenges for the Spatial Humanities: Toward a Research Agenda*, In: *The Spatial Humanities: GIS and the Future of Humanities Scholarship*, David Bodenhamer, John Corrigan, Trevor Harris Ed. (Bloomington 2010) 167–176, here 168.

In the field of slavery research, the usage of GIS and spatial analysis methods is rare. While the focus on micro-level examinations and economic-history-based approaches applied in this field would suit the application of GIS, the lack of knowledge of this technology is the major obstacle for historians, impacting also the creation and structures of datasets. One such example is the “Atlas of the Transatlantic Slave Trade”, where the authors used data from the “trans-Atlantic slave trade database” (hereafter abbreviated as TASTDB) to present the most important subject areas of the slave trade in 189 different maps. While it is a very good starting point if one wants to have an overview on this topic, the aim of this work is a general introduction to the topic of slavery and slave trade, and thus, it does not offer an in-depth analysis.¹⁷

In “Spaces of Enslavement” by Andrea Mosterman, GIS played a minor role. She referred to other works, which all use a micro-scale approach and primarily focused on GIS as a mapping and visualisation tool.¹⁸ Sarah Collins went in the same direction with her article about the slave population of Charleston. In this work, while it still stayed on a micro-scale level, she promoted GIS for the visualisation and analysis of historical sources. In her case, this should aid a better understanding of the urban structure and the social composition of an 18th century town. Using the federal census and the Charleston trade directory of 1790, as well as the 1788 ichnography of Charleston as a basis for mapping the other data sources, the author wanted to show the urban composition in the late 18th century with a focus on the distinction between the slave population and the free whites. She tried different visualisation methods and described their advantages and disadvantages when depicting the slave population of Charleston. Collins briefly mentioned important cartographic principles such as choosing the right colour to achieve an impactful visualisation. Even though she critically engaged with cartographic methods and their properties, she did not fully unlock the analytical potential of mapping such information. In an additional step, further spatial analysis could provide deeper insight into the composition of the city’s population.¹⁹

¹⁷ David *Eltis*, David *Richardson*, David *Brion Davis*, David *Blight*, *Atlas of the Transatlantic Slave Trade* (New Haven/London 2010).

¹⁸ Andrea *Mosterman*, *Spaces of Enslavement: A History of Slavery and Resistance in Dutch New York* (Ithaca 2021), 8.

¹⁹ Sarah *Collins*, *A Visualization Tool for 1790s Charleston: Locating an Enslaved Population Using GIS*, *Journal of Urban History* 49, no. 6 (11/2023) 1342–1357, doi:10.1177/00961442211048500.

Andrew Sluyter used data from the TASTDB to create visualisations on the deaths of the middle passage. This phrase describes the journey of the ships across the Atlantic. As I do in this thesis, Sluyter used a macro-scale approach to the slave trade. He reflected on the importance of good visualisations, especially when dealing with an important topic like the death of slaves on their journey to the Americas. He also accentuated the work that needs to be done to have the necessary data to create such visualisations, which were the focus of his study. However, he made no further use of them to answer topic-related questions and to pose further, space-related ones.²⁰

In this thesis, like the atlas and Sluyter, I take the data from the TASTDB. However, I go beyond visualising the data and instead use it to answer specific questions about the development of the trans-Atlantic slave trade in the 19th century. For this, a macro-level approach is necessary.

To really understand slavery in its global context, it is important not to only look at local events, but to look “[...] *across borders—temporal, spatial, and disciplinary—to better understand slavery and slaving throughout world history.*”²¹ By taking a global perspective on the topic of slave trade, the existing research in slavery studies can be enriched and new insights on how slavery and the trade of slaves were functioning can be gained.²² As shown above, spatial research on the topic of slavery was already conducted, especially on a local scale. However, a new, comparative and synthetic spatial analysis of the slave trade can result in a valuable new perspective, as Dale Tomich describes here:

“Formulating the problem of slave production in terms of global-local relations enables us to understand how particular slave formations are outcomes of world-systemic processes and how such formations contribute to the structuring and restructuring of the capitalist world-system. [...] From this perspective, the slave formations of the Atlantic are treated not as a series of distinct and integral ‘slave economies’, each with its own history that is ‘internal’ to its boundaries, but rather as specific historical-geographic complexes that are continually made and

²⁰ Andrew Sluyter, *Death on the Middle Passage: A Cartographic Approach to the Atlantic Slave Trade*, *Esclavages & Post-Esclavages*, no. 3 (27/11/2020), doi:10.4000/slaveries.3358.

²¹ Damian Pargas, *Introduction: Historicizing and Spatializing Global Slavery*, In: *The Palgrave Handbook of Global Slavery throughout History*, Damian Pargas, Juliane Schiel Ed. (Cham 2023) 1–13, here 1.

²² Tomich, *The ‘Great Divergence’*, 106; Pargas, *Introduction*, 2.

remade through a variety of economic, political and social processes operating at diverse spatial-temporal scales, from local to global, from events to long-term developments.”²³

Thus, contextualising the data from the “trans-Atlantic slave trade database” spatially, and using different spatial visualisation and analysis methods can help gain a deeper understanding of the incisive changes that occurred in the transatlantic slave trade in the 19th century. With this approach, a deeper understanding on the development of the “second slavery” can be achieved. Furthermore, another perspective on the debate on why the abolition in the British Empire happened (in short, Eric Williams²⁴ vs. Seymour Drescher²⁵) can be considered. Moreover, this approach allows the examination of the changing global network of the slave trade and, in this regard, the changing relationship between Empires and colonies. This approach leads up to the following research question:

Which potential do Geographic Information Systems (GIS) hold for uncovering new spatial patterns and connections within the historical processes of the “second slavery”?

To adequately answer this question, the following sub-questions are addressed in more detail:

- Which dynamics can be identified in the emergence of new frontiers of the “second slavery”? – I here pinpoint the newly emerging frontiers²⁶, which mark the beginning of the “second slavery”. While Dale Tomich mostly focuses in his writing on whole countries (Brazil, Cuba, USA), I identify more specific regions and spatial dynamics in this development.
- To what extent does the data from the “trans-Atlantic slave trade database” support Eric Williams’ thesis on the economic causes of the abolition of slavery? – I examine whether the data from the database supports Eric Williams’ thesis on the economic cause for the abolition of slavery. The database therefore provides valuable information on the construction and registration of new vessels as well as the flag

²³ Tomich, *The ‘Great Divergence’*, 107.

²⁴ Williams, *Capitalism & Slavery*.

²⁵ Drescher, *Econocide*.

²⁶ Tomich, *Civilizing America’s Shore*, here 7.

under which the vessels sailed. I also take other arguments on the abolition of slavery provided by Seymour Drescher and others²⁷ into consideration while discussing the findings of this part.

- How did the composition of the trans-Atlantic slave trade change in the context of the transformation from a mercantilist national system to a decolonised transnational flow of commodities? – Here, I analyse the change from a mercantilist national trade to a decolonised transnational flow of commodities. Concerning this transition,²⁸ the focus of my analysis lies on the development of the trans-Atlantic slave trade of British ships to colonies of different Empires.

As a basis for this analysis, I used data from the “trans-Atlantic slave trade database”²⁹ (TASTDB), an extensive collection of voyages with which slaves were brought from Africa to the Americas. This database contains information on voyage level, including attributes like date, number and sex ratio of slaves, starting and ending place or information on the captain and under which flag each vessel sailed. While the database offers a wide array of variables, the sheer volume of data can be overwhelming. Therefore, one has to make sure to use only those variables that are really needed for the analysis. Less is more in this case. By geolocating and analysing this data, I examine the spatial dimension in the above-mentioned areas on the changes in the global slavery system in the 19th century and focus on the shift to the “second slavery” with the turn of the 19th century.

It is important to note that, even though the database is the most complete publicly available resource on the transatlantic slave trade, it naturally reflects only those cases that are available in the underlying data of ship records. Nevertheless, over 80% of the voyages undertaken are recorded here. This means that working with this database can still provide a comprehensive picture of the transatlantic slave trade.

An important limitation is the underlying structure of the database, which breaks down the data to the voyage level. On the one hand, this leads to the victims of this system being abstracted into mere commodities. Built from the perspective of those who traded the

²⁷ *Drescher*, *Econocide*; *Brown*, *Abolition of the Atlantic Slave Trade*; Richard *Huzzey*, *Freedom Burning: Anti-Slavery and Empire in Victorian Britain* (Ithaca 2012).

²⁸ *Tomich*, *Civilizing America's Shore*, 8.

²⁹ *SlaveVoyages*, The Trans-Atlantic Slave Trade Database, 2020, online at <<https://www.slavevoyages.org>>. (last accessed 23.05.2025)

slaves, the database focuses on where the ships were built, where they took on the slaves, and where they were disembarked. Adopting the perspective of the enslaved people using this database is therefore difficult and forces the focus of the analysis on the voyages. Another shortcoming of this otherwise very valuable database is that it was not created and thus structured with the mindset of preparing the data for spatial analysis; as a result, any work requires significant normalisation and restructuring of the data as a first step.

The thesis is composed of a comprehensive overview of spatial research and the application of GIS in historical research (chapters 2 and 3). This is followed by a historical synthesis of the slave trade and slavery in the Americas, with a particular focus on 19th century slavery, abolition, and “second slavery”, outlining the main historical research directions and results (chapter 4). In chapter 5, I detail the TASTDB and describe how I prepared the data for my analysis, which is described in chapter 6. The results from the analysis are then finally discussed in chapter 7.

2. The Spatial Turn in the Humanities and Historical Research

A critical element of spatial historical approaches and analysis is to theoretically ground one's understanding of space, along with providing the reader with an understanding of how space should be understood in that specific context. Only after that it can be explained why and how spatial analysis can provide a deeper understanding or provide new perspectives on certain questions.

We, as humans, live in space or move in it when we travel from one place to another. We are influenced by the space around us, and, at the same time, we also shape it through our interactions. Therefore, space is a vital category for human existence.

As large historical narrations were critically questioned in the second half of the 20th century, different turns heavily influenced research in the humanities and history. The linguistic, postcolonial, material or spatial turn³⁰ have reshaped research directions and perspectives in different fields and introduced different theoretical and methodological frameworks to those fields, while simultaneously opening opportunities for interdisciplinary research. Since the 1980s, space and spatiality have become important categories in the humanities, as these concepts were gradually introduced in the canon of humanities research. But space as an analytical category does not entail a static understanding of closed, immutable spatial entities. With globalisation and supranationalisation, nation-states are no longer the most important categorisation of spatial entities. This classification is critically questioned, and other concepts of space are of more relevance.³¹

Or, as Edward Ayers phrases it: *“For non-geographers, the spatial turn has been largely defined by a greater awareness of place, manifested in specific sites where human action takes place.”*³² But space as a category should not only be seen as this place of human actions, as this implies a static understanding of space: *“[...] the spatial turn does more*

³⁰ A detailed description of these turns and their effects can be found in: *Bachmann-Medick, Cultural Turns*.

³¹ *Ibid.*, 1, 212ff.

³² Edward Ayers, *Turning Toward Place, Space, and Time*, In: *The Spatial Humanities: GIS and the Future of Humanities Scholarship*, David Bodenhamer, John Corrigan, Trevor Harris Ed. (Bloomington 2010) 1–13, here 1.

*than analyze current spatial conditions and generate new spatial differences. It promotes the formation of a critical understanding of space.*³³

This critical understanding is what makes the spatial turn relevant for humanities researchers. Space should not be seen as a physical container, which can be discovered, surveyed, mapped, conquered, colonised, or occupied.³⁴ A more critical assessment of the category “space” does not only see it as a physical container, but also as composed of topological and/or social relationships between the objects and subjects inside it.³⁵ This relational view of space allows a much more critical analysis of spatial phenomena. Space is no longer a geographical entity but is created by different social concepts such as class or capital, which can then be analysed with spatial methods derived from Geography or GIScience.³⁶

Especially in historical research, space is a significant analytical category. As mentioned, history is not only happening in different spaces, but it is also influenced by them.³⁷ To work on historical topics with a spatial focus, Geographic Information Systems (GIS) offer many different application possibilities.³⁸ Such could be the “[...] *visualisation through – also interactive, dynamic – thematic maps and the underlying representations, [...] the analysis of geographical texts and (historical) maps [or] the matching of place names with the help of gazetteers for georeferencing [...]*”³⁹ Whether it is the question of the influence of railroads on the population distribution in the period of 1840 to 1940⁴⁰ which is answered or if one is using historical maps and aerial photographs for the reconstruction

³³ *Bachmann-Medick*, Cultural Turns, 214.

³⁴ *Aleida Assmann*, Geschichte findet Stadt, In: Kommunikation, Gedächtnis, Raum: Kulturwissenschaften nach dem ‘Spatial Turn’, Moritz Csáky, Christoph *Leitgeb* Ed. (Bielefeld 2009) 13–28, here 15.

³⁵ *Bachmann-Medick*, Cultural Turns, 216.

³⁶ *David Bodenhamer*, Beyond GIS: Geospatial Technologies and the Future of History, In: History and GIS: Epistemologies, Considerations and Reflections, Alexander *Von Lünen*, Charles *Travis* Ed. (Dordrecht 2013) 1–14, here 14.

³⁷ *Assmann*, Geschichte findet Stadt, 15.

³⁸ *Ralph Kingston*, Mind Over Matter?: History and the Spatial Turn, Cultural and Social History 7, no. 1 (2010) 111–121, doi:10.2752/147800410X477368, here 111.

³⁹ *Günther Görz*, Digital Spatial Humanities – Some Methodological Remarks and Two Historical Examples, In: Geographical Research in the Digital Humanities: Spatial Concepts, Approaches and Methods, Finn *Dammann*, Dominik *Kremer* Ed. (Bielefeld 2024) 15–35, here 20.

⁴⁰ *Eduard Alvarez-Palau*, *Jordi Martí-Henneberg*, Railroads and Population Distribution. HGIS Data and Indicators for Spatial Analysis, In: The Routledge Companion to Spatial History, Ian *Gregory*, Donald *DeBats*, Donald *Lafreniere* Ed. (London/New York 2018) 54–75.

of historical land use changes⁴¹, spatial methods can help to gain new perspectives on different historical events and processes. The latest development in Spatial Humanities thus introduced a comprehensive analytical approach to space-human relations, one that will be applied in the present thesis also.

⁴¹ Noam *Levin*, Salit *Kark*, From Historical Maps to Remote Sensing: Reconstructing Land Use Changes on Norfolk Island over the Past 250 Years, *The Cartographic Journal* 60, no. 3 (2023) 194–215, doi:10.1080/00087041.2022.2150367.

3. GIS in the Humanities and in Historical Research

3.1. What are GIS?

In its simplest description, Geographic Information Systems (GIS) are applications for managing information connected to space. This is called geo(-spatial) information or data. Most data can in some way be connected to its surrounding space. It is influenced by it or other phenomena in a nearby location. The entanglement of people, places and events in their spatio-temporal context gives us the opportunity to directly examine the interdependence of all kinds of phenomena, whether with a natural science, geographical, social or historical focus. We can look at the connection to the environment and to other phenomena.⁴² The combination of geospatial data with specific thematic information from another field allows the overview of spatial and thematic information, uncovering new paths for research.⁴³

In GIS, models are created in connection to a specific topic or, in my case, research question. Before any analysis, it is critical to underline that these constructed models are always abstractions, which only represent a part of the contemporary world from a specific perspective. In my case, this involves a spatial model of the trans-Atlantic slave trade in the 19th century, focusing on the "second slavery" and the decolonisation of trade relations. For this, not only physical relations but also social processes are modelled to capture the topic as comprehensively as possible and to be able to fully answer the research question. Within GIS, space-related data is collected, stored, managed, updated, modelled, analysed and presented alphanumerically and graphically.⁴⁴ The combination of geometric, graphic and attribute data with other information like pictures or videos, as well as the analysis of the spatial information, are the most important advantages when working with GIS.⁴⁵

While GIS is often only connected to applications as such, Geographic Information Science (GIScience) is a more comprehensive term. GIScience is an interdisciplinary field which functions as a bridge between computer science, information technologies, data modelling, geoscience, remote sensing, cartographic visualisation, geo-communication

⁴² *Bartelme*, Geoinformatik, 1, 5.

⁴³ *De Lange*, Geoinformatik, 355.

⁴⁴ *Ibid.*, 346.

⁴⁵ *Bartelme*, Geoinformatik, 11.

and digital image processing. Users of GIS applications should at least have a basic understanding of those fields, as well as of GIS and the scientific field they want to work with.⁴⁶

GIS can be either defined by their components: hardware (computer, storage, peripheral devices like printers or GNSS devices), software (like ArcGIS or QGIS), data (quantitative and qualitative) and the user (with their specific requirements); or by their functions: collection (by hand or GNSS device), management (organisation and storage), analysis and presentation of data.⁴⁷ Besides, the analytical function the presentation of the data and the results of analytical processes are very important, as the form of data representation affects the reading of them and their interpretation. Readers only draw conclusions about what they see and what they can understand.⁴⁸

Looking at the data itself, geodata can be defined as data with spatial location, in its easiest form points with an X and a Y coordinate. Geodata consists of geometrical (extent size, shape) and topological characteristics (relative location and proximity relationships), as well as discipline-specific information, which complements the spatial information. This could be, for example, the date of a specific event or the affiliation with a colonial power.

Geodata can change over time and space (this is called temporal and spatial variability and dynamics). An example for a spatial variability would be the migration of animals or the voyage of ships. Temporal changes are, for example, changing borders of countries over centuries. Of course, looking at this temporal and spatial variability is of utmost importance in historical research.⁴⁹ So, geo-objects are characterised by geometry, topology, thematics and dynamics.⁵⁰ Another type of data, which is relevant if working with GIS, is metadata: This comprises, for instance, information on when the data was

⁴⁶ *De Lange*, *Geoinformatik*, 1, 5f.

⁴⁷ *Ibid.*, 338.

⁴⁸ Patrick *McHaffie*, Sungsoo *Hwang*, Cassie *Follett*, *GIS: An Introduction to Mapping Technologies*, 2nd edn (Boca Raton 2023), 82f.

⁴⁹ *De Lange*, *Geoinformatik*, 133; Armin *Volkman*, *Geographische Informationssysteme*, In: *Digital Humanities: Eine Einführung*, Fotis *Jannidis*, Hubertus *Kohle*, Malte *Rehbein* Ed. (Stuttgart 2017) 299–314, here 302.

⁵⁰ *De Lange*, *Geoinformatik*, 133.

collected, who the collector was, which reference system was used or information about the copyright.⁵¹

Geodata can take two forms: vector or raster data. Vectors consist of points, lines or polygons. Points are defined by their x, y and sometimes z (height) coordinates. Lines are defined by two or more connected points and polygons are defined by three or more connected lines. These definitions allow a topological connection between different objects.⁵² Examples for such data are the location of a specific ship (point), rivers (lines) or areas of colonial occupation (polygons). As vector data are discrete in their definition, they need much less storage than raster data.

Raster data consist mostly of basic quadratic elements which regularly cover a geographical space. Information is stored in these so-called pixels, which are accessible through their column/line position. Those pixels are topologically connected to their neighbouring cell. Raster data are often used for digital image processing as well as the processing of information of large spaces. This could be, for example, the analysis of former plantation landscapes in a specific region or analysis of historical land use changes on slavery plantations. Geodata can principally take both forms, even if in certain applications one form is preferable. It is also possible to use a mixture of both forms within a GIS-project and a conversion between both is possible. But this conversion can lead to a loss of information. This is also true for historical data. For example, if historical maps are used as a basemap or as sources for the extraction of data, they are usually available in rasterised formats. Data on certain movements or expansion of the plantation economy is better used in vector formats, as vector data can be easier manipulated and processed for further analysis. A combination of both allows for more advanced analysis, as both data types bring their unique content and advantages with them. Static data can often easily be visualised on maps or other map-related ways of expression. For the visualisation of dynamic data, if not working with animations or videos, a discretisation of the data is necessary. This can either be achieved by summarising the data into classes or using multiple maps for different periods.⁵³

⁵¹ *Volkman*, *Geographische Informationssysteme*, 302.

⁵² *De Lange*, *Geoinformatik*, 135, 350.

⁵³ *Ibid.*, 136, 140, 352, 357.

In the field of spatial analysis, GIS offer multiple options: overlay, buffering, intersection, interpolation, boundary calculation, network analysis, heatmaps, spatial clustering, hot-spot-analysis, time-series analysis, proximity analysis, suitability analysis, spatial regression and many more.⁵⁴

One needs to keep in mind that geospatial data can, as all data, not provide a perfect picture of the world. It is not a 1:1 representation of the world. It is only a snapshot which runs through different processes of abstraction. Already when collecting such data, decisions must be made as to which characteristics of the phenomenon of interest are relevant for the examination. The thematic issue should always be the primary focus. Some characteristics could indeed be character-forming for the phenomenon, but not relevant for the examination and the analysis. Therefore, a collection of such characteristics would be unnecessary work. Furthermore, too much information could hide a clear message. Therefore, an easy-to-understand depiction of the topic should be considered as very important, as also in the process of data presentation as well as on the side of the viewer, a process of abstraction of information takes place.⁵⁵ When working with large datasets, a classification is needed for this easy understanding. *“The goal of classification is to reduce the array of symbols found in thematic maps (graphical patterns, colors, etc.) to a manageable set of classes to allow easy interpretation of statistical thematic maps.”*⁵⁶ This, of course, does not only apply to statistical, but all sorts of thematic maps. Classification can apply to both vector and raster data and has much influence on the perceived content of the map. Designing a map for the best reception of the information presented is an art in itself.⁵⁷

For the viewer, some aspects seem more relevant than others. A reduction of information can therefore be necessary for an easy and clear understanding of the data which is

⁵⁴ McHaffie, Hwang, Follett, GIS, 65-68; De Lange, Geoinformatik, 341, 361, 368.

⁵⁵ Bartelme, Geoinformatik, 7.

⁵⁶ McHaffie, Hwang, Follett, GIS, 62.

⁵⁷ For this topic on cartographic visualisation techniques and their influence on the map readers I point to: Mark Monmonier, *How to Lie with Maps*, 3rd ed. (Chicago 2018); Judith Tyner, *Principles of Map Design* (New York London 2010); as well as to the topic of Persuasive Cartography as a whole: Judith Tyner, *Persuasive Cartography*, In: *The History of Cartography. Volume 6. Cartography in the Twentieth Century*, Mark Monmonier Ed. (Chicago 2015) 1087–1095.

presented. These processes happening on the side of the creator as well as the viewer have to be in mind of the creator.⁵⁸

3.2. Spatial Humanities

As the spatial turn became more prominent within the humanities, the usage of Geographical Information Systems (GIS) have grown accordingly, as “*GiS [sic!] lies at the heart of the so-called spatial turn*”.⁵⁹ GIS and methods from GIScience are essential when analysing humanities concerns from a spatial perspective and contextualising human existence within its spatial context.⁶⁰ GIS as a software can help to understand spatial relationships and patterns which are at a first glance not clearly visible in different kinds of research fields.⁶¹

In this regard, it is important to not only try to adapt the tools provided by spatial research, but also critically engage with spatial and geographical concepts from this field (like in the sense of the spatial turn), to fully understand what space as a category in humanities research means.⁶²

It is important to always remember, that GIS functions were and in most cases are primarily not developed with a humanities focus on mind. They are mainly used in administration and natural sciences.⁶³ In this regard, “*GiS [sic!] privileged a certain way of knowing the world, one that valued authority, definition, and certainty over complexity, ambiguity, multiplicity, and contingency, the very things that engaged humanist*.”⁶⁴ This is often difficult to directly apply to humanities research. GIS applications are mainly designed for working with quantitative data and favour a deterministic world view which

⁵⁸ Bartelme, Geoinformatik, 7.

⁵⁹ David Bodenhamer, John Corrigan, Trevor Harris, Introduction, In: The Spatial Humanities: GIS and the Future of Humanities Scholarship, David Bodenhamer, John Corrigan, Trevor Harris Ed., (Bloomington 2010) vii–xv, here vii.

⁶⁰ David Bodenhamer, The Potential of Spatial Humanities, In: The Spatial Humanities: GIS and the Future of Humanities Scholarship, David Bodenhamer, John Corrigan, Trevor Harris Ed., (Bloomington 2010) 14–30, here 17.

⁶¹ Bodenhamer, Corrigan, Harris, Introduction, vii.

⁶² Trevor Harris, Susan Bergeron, L. Jesse Rouse, Humanities GIS: Place, Spatial Storytelling, and Immersive Visualization in the Humanities, In: GeoHumanities: Art, History, Text at the Edge of Place, Michael Dear, Jim Ketchum, Sarah Luria, Douglas Richardson Ed. (London/New York 2011) 226–240, here 238.

⁶³ Bodenhamer, Corrigan, Harris, Introduction, viii.

⁶⁴ Ibid., ix.

does not really comply with qualitative-based humanities research. Therefore, it is either necessary for humanities researchers to adapt their questions and methods to the technology at hand or to adapt the technology in a way to better suit the needs of those researchers.⁶⁵ As stated above, with this adaption of technology within its technical limitations, the researcher creates an abstracted model specifically targeted on their research question. Within GIS it is more challenging to represent and analyse uncertainty, which is often inherent in humanities research areas.⁶⁶ It is my view that an adaption of both humanities researchers' way of work as well as GIS methods for humanities purposes are in demand to allow the full integration of GIScience methods in humanities research. As David Bodenhamer claimed, also GIS have to be adopted for humanities research to create fruitful results.⁶⁷

But this “[...] *linking [of] a positivist technology with predominantly humanist traditions*”⁶⁸ is often difficult, as Harris, Corrigan and Bodenhamer assert here. In GIS, the world is simplified by building a model. This simplification can be challenging for humanist research.⁶⁹ The inert uncertainty of humanist research can, in my view, therefore not only be part of the data modelling and the analysis, but also in critically interpreting the results.

What Harris, Corrigan and Bodenhamer completely leave out in their argumentation is the field of critical cartography/GIS. This is connected to the relations of power, which are reproduced in the mapping and analytical processes and are therefore inherent to the content of maps and GIS analysis.⁷⁰ In their view, GIScience only functions as a real depiction of the world. Within GIScience and cartography, the user only builds a model. But no model can entirely depict even a small part of the world. With this in mind, applying spatial methods to humanities research does not have to be a disadvantage, as they suggest in their chapter. Through a critical engagement with the technology and the applied spatial methods, new perspectives on different humanities topics can be gained. Or, as McHaffie, Hwang and Follet phrase it:

⁶⁵ Ibid., ix f.

⁶⁶ Bodenhamer, *The Potential of Spatial Humanities*, 19.

⁶⁷ Ibid., 23.

⁶⁸ Harris, Corrigan, Bodenhamer, *Challenges for the Spatial Humanities*, 168.

⁶⁹ Ibid., 168; Harris, Bergeron, Rouse, *Humanities GIS*, 228.

⁷⁰ Jeremy Crampton, *Mapping: A Critical Introduction to Cartography and GIS* (Malden 2010), 39 f.

“GIS brings spatial perspectives to the humanities disciplines and helps diversify modes of representation beyond textual or temporal modes. New insight can be gained when space is construed as a medium in which the human condition is embedded. Subject matter can be better understood if put into context (space and time). GIS enable the integration of data across different domains through geography and thus can serve to facilitate the interdisciplinary mode of knowledge production. Conversely, humanities scholars challenge the notion that GIS are only good for representing quantitative data. All in all, these developments cause creative disruption on both sides as they provide an opportunity for broadening a means for revealing the human condition and rethinking GIS through a humanistic lens.”⁷¹

While in most humanities fields, dealing with GIS and space as a research category is not of utmost importance, it is still taking a lot of effort when trying to integrate spatial methods into research or even make them visible and accessible for most researchers. The easiest and quickest integrated part is, of course, the usage of maps for visualisation purposes. This is already commonly used. But apart from archaeology, due to its special needs of spatial methods, it took and is still taking a long time to promote spatial methods in different research fields.⁷² Of course, depicting the spatial distribution of a specific phenomenon, mapping texts or images or building a Gazetteer⁷³ for a specific purpose are not that difficult, but this does not fully integrate the objectives of the spatial turn into humanities research.⁷⁴

Especially when dealing with qualitative or temporal data, different difficulties can arise. Either in modelling the data, using the right classification and analysis method or the best way to visualise it. For the visualisation, for example, one can try to present temporal information in different maps, each covering a different time period. Or, if putting the information on one map, different colours or symbols can be used to effectively

⁷¹ *McHaffie, Hwang, Follett, GIS*, 252.

⁷² Here are some examples from different research fields: Joanna *Taylor*, Ian *Gregory*, *Deep Mapping the Literary Lake District: A Geographical Text Analysis*, *Aperçus* (Lewisburg 2022); Chris *Montgomery*, Philipp *Stoeckle*, *Geographic Information Systems and Perceptual Dialectology: A Method for Processing Draw-a-Map Data*, *Journal of Linguistic Geography* 1, no. 1 (2013) 52–85, doi:10.1017/jlg.2013.4; Chris *Lukinbeal*, *Cinematic Cartography: Scale, Analysis, Topography* (London 2024).

⁷³ A Gazetteer is a collection of geographical place names with their specific coordinates.

⁷⁴ *McHaffie, Hwang, Follett, GIS*, 249, 252.

distinguish between different temporal units. Of course, animations can here play an important role as well.⁷⁵

When dealing with qualitative data, like texts, images, videos, interviews or observations, one can either try to adapt the data so that it can be handled in GIS. This often means a segmentation of the whole text into small parts, making it difficult to assess the whole text again after performing the analysis functions. Otherwise, one could use the data as it is and combine it with GIS for curation and putting the qualitative data in a spatial perspective, ultimately merging these multimedia and unstructured text with maps.⁷⁶ The adaptation of GIS software for qualitative research is also an important field waiting for further development.⁷⁷

However, when turning to historical research, especially its connection to spatial sciences (geography, cartography and, to a lesser extent, GIScience) is a long-standing and important one. While with history, the focus lies on time as the most important category of research, the main category for spatial sciences is, of course, space. As already described above, space and time are vital features of the economic, social and educational lives of humans. Either in teaching or in the engagement with the past, maps are important features of historical research. They can provide good visualisations of historical processes, as well as being the target of the research themselves. As described in detail in chapter 2, with the evolvement of Spatial Humanities, space became an important analytical category, also in historical research. Be it the examination of specific regions within their natural or geographical environments, or the global entanglement that grows with globalisation.⁷⁸

3.3. Historical GIS/Spatial History

Riccardo Bavaj calls history a “*matter of time*”,⁷⁹ because it mainly deals with temporal questions. Analogously, I would call geography (and GIScience) a “*matter of space*”,

⁷⁵ Ibid., 261f.

⁷⁶ Ibid., 266f.

⁷⁷ The following book provides a good overview of the topic: Meghan Cope, Sarah Elwood eds, *Qualitative GIS: A Mixed Methods Approach* (Los Angeles/London 2009).

⁷⁸ Ayers, *Turning Toward Place, Space, and Time*, here 3.

⁷⁹ Riccardo Bavaj, Introduction: Spatial History – An Expansive Field, In: *Doing Spatial History*, Riccardo Bavaj, Konrad Lawson, Bernhard Struck Ed. (Abingdon 2022) 1–36, here 1.

because it mainly deals with spatial questions and topological relationships. Now, in the field of Historical GIS and Spatial History, these two matters are combined to analyse the spatiality of history.⁸⁰ As pointed out multiple times, GIS can help not only to organise historical sources and visualise them, but also to gain results and new insights from performing spatial analysis.⁸¹ For this, a comprehensive understanding of GIS applications and how they function, as well as the theoretical implications of spatial research, is necessary. Only such an understanding makes it possible to comprehend, correctly classify, interpret and explain the results of spatial analysis. However, it also allows asking and answering questions, which could not be tackled with previously used methods.⁸² Antonis Hadjikyriacou places Historical GIS “[...] *at the nexus between economic, environmental, and spatial history* [...]”⁸³, which aligns with the focus of this thesis quite well, as I am focusing on global trading networks in the context of slavery from a spatial perspective.

Especially in the field of global (economic) history methods and the spatial concepts of GIScience can function as valuable lenses for analysis. Space and its critical reflection as a central category in this field can offer valuable insight into global processes. Traditional spatial categories like nation-states, the Eurocentric perspective and categories such as North/South, West/East or city/countryside should be critically questioned.⁸⁴ In this global context, the analysis lies on global connections focusing on topics like “[...] *migrations, diasporas, circulation of ideas, ideologies, knowledge, political models, commodity chains, exchanges of objects, bacteria, diseases but also perceptions, imageries, memories.*”⁸⁵ This, of course, also applies when looking at global trade relations in the field of slavery in the 19th century, as the spatial representations of

⁸⁰ Donald DeBats, Ian Gregory, Donald Lafreniere, Introduction: Spatial History, History, and GIS, In: The Routledge Companion to Spatial History, Ian Gregory, Donald DeBats, Donald Lafreniere Ed. (London/New York 2018) 1–6, here 1.

⁸¹ Ian Gregory, Paul Ell, Historical GIS: Technologies, Methodologies, and Scholarship (Cambridge 2007), 10.

⁸² Bavaj, Introduction: Spatial History, 2.

⁸³ Antonis Hadjikyriacou, Economic Geographies, In: Doing Spatial History, Riccardo Bavaj, Konrad Lawson, Bernhard Struck Ed. (Abingdon 2022) 252–273, here 270.

⁸⁴ Ibid., 252; Laura Di Fiore, Geographies of Global History, Annals of the Fondazione Luigi Einaudi 52 (2018) 45–52, doi:10.26331/1033, here 45f.

⁸⁵ Di Fiore, Geographies of Global History, 45.

global economic data can help to reveal trends and patterns and support the explanation of global dynamics.⁸⁶

When dealing with spatial data in a historical context, it is important to note that, with historical data and sources, spatial and temporal information is always subject to a certain degree of uncertainty. “[...] *[H]istorical sources are often incomplete, inaccurate or ambiguous.*”⁸⁷ This impedes their usage in spatial research and GIS applications, because they are made to deal with easy-to-locate data. This means that researchers need to be creative to successfully digitally engage with a complex spatial concept inside a specific historical field.

As in most cases, texts are the primary sources for the mapping of spatial and temporal information, they can only deliver uncertainty. Therefore, this information has to be examined with its historical context in mind, as, for example, the naming of spatial entities or their spatial extent can change over time. A locational consistency cannot be assumed.⁸⁸ When dealing with data from different periods, the question of temporal classification is important. Again, the unit of analysis should be chosen in a way that no wrong assumption about the level of detail the data provides will be made. Data from earlier periods is often temporally more vague than more recent ones. The temporal scale should be chosen appropriately when conducting GIS-based modelling and analysis.⁸⁹

As already mentioned above, in current Historical GIS and Spatial History research, the main target course lies in the visualisation of historical data. While this can also provide valuable insights, only the full utilisation of GIScience methods can significantly advance the research field and offer completely new perspectives.⁹⁰ Therefore, it is in my view also important that not only GIS has to develop in the direction that it is possible to work more easily with qualitative data. It is not enough to make GIS “fit” for historical research. This direction has already been targeted within the field of “Qualitative GIS”, in which the qualitative sources like texts, images or audio data, as well as narrations, storytelling and

⁸⁶ Hadjikyriacou, *Economic Geographies*, 253.

⁸⁷ Gregory, *Ell*, *Historical GIS*, 18.

⁸⁸ Volkmann, *Geographische Informationssysteme*, 305.

⁸⁹ *Ibid.*, 306.

⁹⁰ DeBats, Gregory, *Lafreniere*, *Introduction*, 3; Gregory, *Ell*, *Historical GIS*, 1.

multiple perspectives are in the main research focus.⁹¹ I think it is also important that historians are open to the full possibilities that GIScience can bring to their field.

Especially in historical research, the spatio-temporal aspect of GIS, that is the ability of coherently handle space and time, is essential.⁹² While GIS as software applications are mainly designed for spatial matters, in historical research, the temporal attribute is of utmost importance. This leads to a partially unsolved problem of a meaningful representation of spatio-temporal phenomena. Different summarising analysis methods and representations can offer solutions here. Either the aggregation of different data points into groups and their representation as map series, as I do below (see chapter 6), or using animated maps can work as valuable visualisation methods, as movement/dynamics in time and space form the core of the representation,⁹³ which I have also applied in my research on the slave trade as a visualisation tool.⁹⁴

As I propose in this thesis, focusing on the spatiality of the trans-Atlantic slave trade in the 19th century can lead to new perspectives. However, before detailing on those, in a first step, it is important to understand what “spatiality” in this context exactly means. Spatiality is often associated with movement. Dodge, Weibel and Lautenschütz construct a taxonomy of such movement patterns in their paper.⁹⁵ They point out that objects can be seen relative to each other. In this way, they are constructing a space. Using the proposed movement patterns as an important aspect of one’s analysis can help to understand the spatiality of the phenomenon and effectively apply pattern recognition algorithms and visualisation tools. As the authors also point out, not only the spatial, but also the temporal dimension can be important. In “Humanities GIS”, Harris, Bergeron and Rouse question Dodge, Weibel and Lautenschütz’s claim that GIS are the perfect tools for this spatio-temporal analysis. They characterise the positivist approach of GIS as incompatible with the humanistic approach, often working with qualitative, non-linear, narrative-driven content. GIS often do not provide the tools needed for humanities

⁹¹ For this, see footnote 77.

⁹² Bodenhamer, Corrigan, Harris, Introduction, xi.

⁹³ Harris, Corrigan, Bodenhamer, Challenges for the Spatial Humanities, 173f.

⁹⁴ The animation of the trade activities I created can be found at the GitHub repository (github.com/andren967/master-thesis/Animation/routes_animation_points.mp4).

⁹⁵ Somayeh Dodge, Robert Weibel, Anna-Katharina Lautenschütz, Towards a Taxonomy of Movement Patterns, Information Visualization 7, no. 3–4 (2008) 240–252, doi:10.1057/PALGRAVE.IVS.9500182.

research analysis. As an alternative, they suggest other technologies, such as spatial storytelling or immersive visualisation as alternatives.⁹⁶

What they fail to fully consider is the integral analytical role of GIS. It is not enough to only use GIS and GIScience for visualising data. Therefore, it should not be as Harris, Bergeron and Rouse proposed. Not only GIScience should become aware of the needs of humanities, but humanities scholars should also understand the potential of the application of methods from other fields.

Following this claim, I apply GIScience methods in the field of slavery research. In the next chapter, I comprehensively summarise the topic of slavery and the trans-Atlantic slave trade with a focus on the 19th century. This chapter should enable the reader to understand why slavery is still today an important topic and why especially the changes in its characteristics which happened in the 19th century are of such a high relevance to an investigation from a spatial angle.

⁹⁶ Harris, Bergeron, Rouse, *Humanities GIS*, 227-229.

4. Slavery and the trans-Atlantic slave trade

“Slavery was a form of exploitation in which one human was owned by another person, and in which the slave hovered uncertainly between the contradictory positions of being both a piece of property and also a person.”⁹⁷

This short definition by Burnard and Heuman describes the essence of what slavery meant in the early modern period. Slaves were seen as a piece of commodity which as a value based on their workforce which is used in the production of goods. This commodification of human beings was an existential part of many different societies throughout history. It was present from the ancient societies of Egypt, Greece, or the Roman Empire, in the Medieval Period, throughout the early modern and modern periods and well into the 20th century. In some form it is present until today. Slavery was and is present in all regions of the world.⁹⁸

What slavery in all those different periods and places had in common was the dehumanisation of the slaves. Humans were treated as commodities which could be bought, sold or inherited. By “commodities”, I here mean the transformation of people into goods that have been assigned a value, primarily based on their labour power. This value then allows these people to be exchanged as commodities and thus generate profits. The people directing this process determine the value of the commodity and exercise power over it. Commodification in this regard should thus be seen as a process, as the value and status of the commodified people are not stable but can constantly change and adapt under the influence of the owners.⁹⁹

⁹⁷ *Burnard, Heuman*, Introduction, 1.

⁹⁸ In the last years, the research on slavery also started tackling those other periods and places. The following books give for this a good overview: *Gad Heuman, Trevor Burnard* eds, *The Routledge History of Slavery* (London/New York 2011); *Damian Pargas, Juliane Schiel* eds, *The Palgrave Handbook of Global Slavery throughout History* (Cham 2023).

⁹⁹ *Karin Brondino-Pompeo*, Mapping Spheres of Exchange: A Multidimensional Approach to Commoditization and Singularization, *AMS Review* 11, no. 1–2 (2021) 81–95, doi:10.1007/s13162-021-00196-x, here 82.

In the case of slavery, the abducted human beings were held captive and were subjected to another human. Their main task was to work for their owners.¹⁰⁰ The slaves had no control over their bodies, lives, status, sexuality or labour power.¹⁰¹

The main focus of this thesis is the slavery in the Americas and the trans-Atlantic slave trade of the 19th century, contextualised into the broader process roughly between 1500 and 1900. Therefore, other periods of time, places and forms of slavery are only mentioned to show that the period I am writing about is not unique in its enslavement of humans. However, it is definitely unique in the number of enslaved people and the capitalist and global dimension of slavery and especially the slave trade. In this period, slaves were not only controlled by “[...] individuals [but also by] institutions, or corporations [...]”.¹⁰² In this period, slavery was not only a private form of ownership. The slaves themselves were “[...] the fundamental capital of Atlantic history from 1450 to 1900, and an early driver of globalization. Commodified humans provided a gigantic capital stock and were the basis of [...] colonial territorialization by European powers.”¹⁰³

This inherent connection between slavery and Empires must be highlighted, as the system of slavery was one of their integral institutions. Empires and the system of slavery supported and strengthened one another. In general, Empires and large state constructs inherently provide a good breeding ground for a system of slavery.¹⁰⁴

The structure of those Empires made an innately unequal connection between colonies and the home country. The “[...] metropolis thought itself culturally superior to the subject population in colonies and forced the colonies to be under metropolitan control.”¹⁰⁵

The Empires provided organisational institutions as well as the regulatory framework for the well-being of the slavery system. For example, in the British Empire, the “Royal African Company” was responsible for all trading activities with West Africa and the West Indies

¹⁰⁰ Pargas, Introduction, 2.

¹⁰¹ Michael Zeuske, Handbuch Geschichte der Sklaverei: Eine Globalgeschichte von den Anfängen bis zur Gegenwart, Zweite Ausgabe, De Gruyter Reference (Berlin/Boston 2019), 195.
Michael Zeuske, Migration, Slavery, and Commodification, In: The Oxford Handbook of Commodities History, Jonathan Curry-Machado, Jean Stubbs, W. G. Clarence-Smith, Jelmer Vos Ed. (New York 2023) 311–334, here 313.

¹⁰³ Ibid., 312.

¹⁰⁴ Trevor Burnard, Slavery and Empire, In: Writing the History of Slavery, David Stefan Doddington, Enrico Dal Lago Ed., Writing History (London/New York 2022) 59–79, here 59f.

¹⁰⁵ Ibid., 60.

in the 17th century. In 1651 the “Navigation Laws” were set in place to regulate trade. They were part of a set of mercantilist policies, which target was a complete control and regulation of all trading activities connected to colonies and slavery.¹⁰⁶ Sven Beckert characterises the Atlantic system “[...] by imperial domination, the expropriation of vast territories, decimation of indigenous peoples, theft of their resources, enslavement, and the domination of vast tracts of land by private capitalists with little effective oversight by distant European states.”¹⁰⁷

As Beckert notes here, besides the connection with governmental institutions, the connection between slavery and capitalism becomes ingrained in one another in the 18th century. Slavery became part of an increasingly globalised capitalist economic system. Both strengthened each other.¹⁰⁸ Colonialism, as well as slavery and the exploitation of land, formed the basis for the development of industrial capitalism.¹⁰⁹

With the arrival of the big European Empires in the Americas in 1493, the Europeans suddenly had significantly more land at their disposal for expanding their territory. By the end of the 17th century, most parts of the Americas were colonised. The economy of these new colonies was characterised by these features: “[...] large land holdings, a crop to be sold in the growing markets of Europe, and slave labor.”¹¹⁰ The main reason why European Empires abducted around 10 million slaves¹¹¹ to the Americas was because of the labour power they brought with them.

Abducted African people were a suitable alternative to European people (who were free or in indentured servitude)¹¹² who were not capable to the task needed for the cultivation of the newly seized land. This concept was first applied to small islands off the African

¹⁰⁶ Williams, *Capitalism & Slavery*, 22, 43.

¹⁰⁷ Sven Beckert, *Empire of Cotton: A Global History* (New York 2014), 38.

¹⁰⁸ Dale Tomich, Introduction, In: *Slavery and Historical Capitalism during the Nineteenth Century*, Dale Tomich Ed. (Lanham, Maryland 2017) ix–xiv, here ix; Erik Mathisen, The Second Slavery, Capitalism, and Emancipation in Civil War America, *The Journal of the Civil War Era* 8, no. 4 (2018) 677–699, doi:10.1353/cwe.2018.0074, here 681.

¹⁰⁹ Beckert, *Empire of Cotton*, 220.

¹¹⁰ William Phillips Jr., Slavery in the Atlantic Islands and the Early Modern Spanish Atlantic World, In: *The Cambridge World History of Slavery Volume 3 AD 1420–AD 1804*, David Eltis, Stanley Engerman, K. R. Bradley, Paul Cartledge, et al. Ed. (Cambridge/New York 2011) 325–349, here 325.

¹¹¹ The number is calculated based on all entries in the Trans-Atlantic Slave Trade Database.

¹¹² Indentured servitude was a form of work, where the workers committed to work for an employer for a certain period of time. The employer, in turn, paid for the passage from their country of origin to the new world. (David W. Galenson, *The Rise and Fall of Indentured Servitude in the Americas: An Economic Analysis*, *The Journal of Economic History* 44, no. 1 (1984) 1–26, here 7.)

coast in the 15th century (Canary Islands, Azores, Madeira) and later adopted in the new colonies in the Americas. There, the number of Europeans as a possible workforce was too small, and thus conducting the work solely by them was not feasible. First, American natives were used, but they were soon dying en masse because of diseases brought by the Spanish conquerors and the violent conflicts with them. The failure of this first system led to the implementation of the system already successfully applied on the Atlantic islands. Africans, who were thought to be more suitable for the hard labour conditions and having experience with agricultural and other types of work, were seen as a promising alternative. The Western coast of the African continent was then a new area for the supply of the workforce. This use of a new enslaved workforce began in the middle of the 16th century in the colonies of Spain and Portugal and between 1650 and 1750 in other regions.¹¹³ This description clearly showed the racial aspect of the slavery system in the Americas. White Europeans or people of European descent enslaved first American natives and then Africans.¹¹⁴

The racial argument for the abduction of African people also entailed their dehumanisation. As they were not seen as humans, they did not get the same rights as Europeans. While part of this was also a religious argumentation, even if African people or already enslaved individuals converted to Christianity, this did not mean that they could not be held as slaves. Already in the second half of the 17th century, legislators in Virginia allowed slave holders to hold Christian slaves.¹¹⁵

While slavery was not a foreign concept in African societies before the institutionalisation of slavery by European colonisers, the two are not comparable. Slavery had long been a part of West African societies, mainly connected to frequent wars between different groups, which resulted in the enslavement of defeated enemies, who were then traded within Africa, generating income – not unlike to the slave trade system was present in medieval Europe and the Near East. When the Europeans established their trading posts

¹¹³ *Phillips Jr.*, Slavery in the Atlantic Islands, 329-332; Michael *Zeuske*, The Rise of Atlantic Slavery in the Americas, In: The Palgrave Handbook of Global Slavery throughout History, Damian *Pargas*, Juliane *Schiel* Ed. (Cham 2023) 379–393, 381.

¹¹⁴ Trevor *Burnard*, Plantation Slavery in the British Caribbean, In: The Palgrave Handbook of Global Slavery throughout History, Damian *Pargas*, Juliane *Schiel* Ed. (Cham 2023) 395–412, 397.

¹¹⁵ Betty *Wood*, The Origins of Slavery in the Americas, 1500–1700, In: The Routledge History of Slavery, Gad *Heuman*, Trevor *Burnard* Ed. (London/New York 2011) 64–79, here 68f, 76; *Brown*, Abolition of the Atlantic Slave Trade, 282.

on the West African coast, they stepped into exploiting this system, that resulted in an increased demand for slaves, leading to a transformation of African social structures, and the abduction of people that went beyond the forms of slavery before. The exploitation of these societies by the Europeans and the abduction of people were unquestionably damaging to the society as a whole. Those who benefited contributed to larger changes, such as the import of new goods, the development of larger and more stable political entities, and the increased settlement of coastal areas by urban communities, fuelled by the slave trade. While this brief summary is a simplified view of a much more complex process, as the focus of the present work is the slave trade in the Americas, and a more in-depth overview would exceed the framework of this thesis. However, there are multiple synthetic studies on the starting points of the slave trade, such as the overview by Simon Newman on the situation on the Western African coast.¹¹⁶

As described above, Europeans and American natives were no suitable alternative for the colonisers and planters in the Americas, but African resistance was strong, and Europeans could not create new colonies there. Only trading posts were established, where slaves were bought from local slave hunters and prepared for shipment to the Americas. This also meant that the creation of a monopoly for the slave trade with different regions in Africa was not possible.¹¹⁷ This changed only in the 19th century, when European Empires divided the African continent between them.

Slavery and slave trade were inextricably linked historically.¹¹⁸ But the trans-Atlantic slave trade from the 16th to the 19th century was different in the number of slaves abducted and traded.¹¹⁹ After being sold on the coast of Africa to European traders, the suffering of the enslaved began. On the “Middle Passage” across the Atlantic, which normally lasted a few months but could stretch to around a year, they were held in inhumane conditions

¹¹⁶ Trevor *Burnard*, *The Atlantic Slave Trade*, In: *The Routledge History of Slavery*, Gad *Heuman*, Trevor *Burnard* Ed. (London/New York 2011) 80–97, 83; Simon *Newman*, *A New World of Labor: The Development of Plantation Slavery in the British Atlantic* (Philadelphia 2013), 39f.

¹¹⁷ Pieter *Emmer*, *Slavery and the Slave Trade of the Minor Atlantic Powers*, In: *The Cambridge World History of Slavery Volume 3 AD 1420–AD 1804*, David *Eltis*, Stanley *Engerman*, K. R. *Bradley*, Paul *Cartledge*, et al. Ed. (Cambridge/New York 2011) 450–475, here 452f.

¹¹⁸ David *Eltis*, David *Richardson*, *A New Assessment of the Transatlantic Slave Trade*, In: *Extending the Frontiers: Essays on the New Transatlantic Slave Trade Database*, David *Eltis*, David *Richardson* Ed. (New Haven/London 2008) 1–60, here 1.

¹¹⁹ *Ibid.*, 1f.

with up to 2000 enslaved people per ship,¹²⁰ chained and crowded in a small space. Despite their value to their traders, about 1.1 million slaves died on this route. The mortality rate ranged from 20% in the beginning to 9% in the 19th century. This was mostly due to diseases, contaminated food or water.¹²¹

The first people who brought slaves from Africa to the Americas were Iberians. In the 16th century, Spain and Portugal were the first Empires which started the organised slave trade from Africa to the Americas. Spain brought enslaved people to its island and mainland colonies, while Portugal started in the 1560s with their trade to Brazil. Only in the 17th century did other European Empires (the Netherlands, France, Britain) start their trade, mainly to the Caribbean islands.¹²²

Overall, the most important nations in the trans-Atlantic slave trade were the British Empire, France, Spain and Portugal. But there were also smaller nations, namely the Netherlands and Denmark, which were taking part in the colonisation of the Americas and the abduction and trade of humans in Africa.¹²³ For all these Empires, the integration of the slave trade in their economic system was of great importance, as their economy could only thrive with the supply of the workforce needed for the production in the Americas. *“The Portuguese were the first to shape the transatlantic slave trade according to the demand for labor [...]”*¹²⁴ After a while, France and Britain followed *“[...] in that they first directed their colonizing efforts toward the development of capitalist agriculture in the Caribbean and in the south of mainland North America.”*¹²⁵ They then soon took over the leading role in the trans-Atlantic slave trade.

To better understand the large numbers involved in the slave trade, Barbados offers a good example. Barbados was one of the most headed for areas in the early phase of slavery in the Americas. In the 17th century, more than 200,000 Africans were brought to this island. Until 1808, it was more than 600,000. Barbados was an early example for other

¹²⁰ The numbers are based on the “trans-Atlantic slave trade database”.

¹²¹ Zeuske, *The Rise of Atlantic Slavery*, 385.

¹²² Eltis, *Richardson*, *A New Assessment of the Transatlantic Slave Trade*, 13, 21.

¹²³ Emmer, *Slavery and the Slave Trade*, 450.

¹²⁴ *Ibid.*, 451f.

¹²⁵ *Ibid.*, 452.

regions to follow in this area, namely Jamaica, other Caribbean islands and the US South.¹²⁶

The slaves were abducted and sold in Africa and then brought to the America. Slavery was such an integral part of the economy and society of those empires that it should be viewed with this entanglement in mind.¹²⁷ Or, as Barbara Solow puts it:

“[...] slavery transformed the Atlantic into a complex trading area uniting North and South America, Europe, and Africa through the movement of men and women, goods, and capital. It was slavery that made the empty lands of the western hemisphere valuable producers of commodities and valuable markets for Europe and North America: What moved in the Atlantic in these centuries was predominantly slaves, the output of slaves, the inputs to slave societies, and the goods and services purchased with the earnings on slave products.”¹²⁸

To produce these goods, slaves were, in most cases, forced to work on plantations with large monocultures to sustain the system of agricultural mass production. Resources like sugar, tobacco, coffee, and cotton were produced. These were then shipped to the European continent, or later to the Northern states of the USA, to satisfy the need for colonial goods there.¹²⁹

Those plantations

“[...] were factories in the fields, based on a form of exploitative labor relations that drove enslaved laborers close to death but which resulted in the production of highly desirable crops, notably sugar, that were greatly desired in Britain and which brought fortunate owners vast wealth.”¹³⁰

¹²⁶ Newman, *A New World of Labor*, 1.

¹²⁷ Burnard, *Slavery and Empire*, 66.

¹²⁸ Barbara Solow, Introduction, In: *Slavery and the Rise of the Atlantic System*, Barbara Solow Ed. (Cambridge/New York 1991) 1–20, here 1.

¹²⁹ Ralph Austen, Woodruff Smith, Private Tooth Decay as Public Economic Virtue: The Slave-Sugar Triangle, Consumerism, and European Industrialization, In: *The Atlantic Slave Trade. Effects on Economies, Societies, and Peoples in Africa, the Americas, and Europe*, Joseph Inikori, Stanley Engerman Ed. (Durham 1992) 183–203, here 188; Lorena Walsh, Work and the Slave Economy, In: *The Routledge History of Slavery*, Gad Heuman, Trevor Burnard Ed. (London/New York 2011) 101–118, here 101f; Stanley Engerman, US Slavery and Its Aftermath, 1804–2000, In: *The Cambridge World History of Slavery Volume 4: AD 1804–AD 2016*, David Eltis, Stanley Engerman, Seymour Drescher, David Richardson Ed., Cambridge World History of Slavery (West Nyack 2017) 155–173, here 161.

¹³⁰ Burnard, *Plantation Slavery*, 395.

*“Plantation slavery for the production of colonial commercial agriculture, especially sugar [...], was in virtually all respects a specifically harsh and extreme economic slavery regime.”*¹³¹ In the regions where plantations covered most of the land, slaves made up to 90% of the population.¹³²

Slavery was an important factor of colonial economic growth.¹³³ Increasing the profit of their owners was the most important objective. Therefore, the slaves had to work the whole day in large groups which marched in long lines through the fields and had to keep up their pace with their neighbours. Physical punishment was carried out regularly. Men were tortured, and women were often sexually violated by their white owners.¹³⁴ As the slaves were forced to work for their owners, they were commodified and subjected, by coercion and physical violence, to serve under the direct control of other people.¹³⁵

This inhuman treatment began at the African coast and continued during the voyage to the Americas. Arriving in the Americas, the suffering of the enslaved was not over. They were sold to slaveholders, who often exploited their workforce to the maximum. They could be legally treated differently from other humans.¹³⁶ They were constantly punished and mistreated if their daily pensum did not satisfy their owner. Slaves were whipped, caged and tortured to break their will and extract every portion of their workforce.¹³⁷ Edward Baptist describes this system as a *“whipping-machine”*¹³⁸: *“The whip made cotton.”*¹³⁹

Due to these conditions, the life expectancy of slaves was very short.¹⁴⁰ To keep the system of massive cultivation of specific crops running, a steady flow of new incoming

¹³¹ Zeuske, *The Rise of Atlantic Slavery*, 386.

¹³² *Ibid.*, 386.

¹³³ Edward Baptist, *The Half Has Never Been Told: Slavery and the Making of American Capitalism* (New York 2014), 3.

¹³⁴ Zeuske, *The Rise of Atlantic Slavery*, 386f; Burnard, *Plantation Slavery*, 396.; Edward Baptist oppressively describes this torture in: Baptist, *The Half Has Never Been Told*, 90f.

¹³⁵ H. J. Niebor, *Definition and Distinction from Kindred Phenomena*, In: *Critical Readings on Global Slavery*, Damian Alan Pargas, Felicia Roşu Ed., *Critical Readings* (Leiden/Boston 2018) 13–42, here 17; Zeuske, *Handbuch Geschichte der Sklaverei*, 195; Zeuske, *Migration, Slavery, and Commodification*, 312.

¹³⁶ Baptist, *The Half Has Never Been Told*, 3.

¹³⁷ Edward Baptist, *Toward a Political Economy of Slave Labor*, In: *Slavery’s Capitalism: A New History of American Economic Development*, Sven Beckert, Seth Rockman Ed., *Early American Studies* (Philadelphia 2016) 31–61, here 51f.

¹³⁸ Baptist, *The Half Has Never Been Told*, 141.

¹³⁹ Baptist, *Toward a Political Economy of Slave Labor*, 52.

¹⁴⁰ *Ibid.*, 35.

workforce was needed. This led to the development of a global-scale slave trade system in which all the European colonial Empires took part.

The expansion of the plantation system in the second half of the 18th century and the big increase in the production of goods increased also the prices of slaves, which led to an intensified expectations of production both from humans and machines.¹⁴¹

Besides the work on agricultural plantations, slaves had to work in the production of many kinds of resources. Slaves worked in the silver mines in the Andean mountains. They worked, among other things, as carters, sailors, fishermen, baskers, lumbermen, in clothing production, as confectioners or in artisan shops. Especially skilled slaves were of much value in the manufacturing sector. Others worked as domestic servants.¹⁴²

At the beginning of the 18th century, European consumers were being introduced to sugar as a luxurious colonial good. It reshaped the pattern of Western consumer demand. Besides sugar, other colonial goods, such as tea or coffee, were favoured by the public. Production therefore increased, and soon luxurious commodities became available to a broader public.¹⁴³ The most significant impact on the European economy was made by cotton used in the clothing industry. Some researchers even argue that cotton and other products of slave labour were essential for the industrialisation and the emergence of capitalism in Europe.¹⁴⁴

This globalised system of production and trade is often described with the model of the “triangular trade”. Companies and their ships, which were based in Europe and later in North America, stood in its centre. They were used to ship metalware, textiles and other goods to Western Africa. The gains from selling those items were then used to buy slaves, abducted mainly by locals. The slaves were then locked in a confined space on cargo vessels and shipped across the Atlantic Ocean to the Americas, where they were then sold to slave owners. The slaves had to produce the above-mentioned resources, which were then again sold and transported to Europe. At all those stages, substantial profit was generated, which stayed either with the European traders or the planters. The

¹⁴¹ *Burnard*, *Plantation Slavery*, 398.

¹⁴² *Phillips Jr.*, *Slavery in the Atlantic Islands*, 340f.

¹⁴³ *Austen, Smith*, *Private Tooth Decay*, 184; *Baptist*, *The Half Has Never Been Told*, 43.

¹⁴⁴ *Beckert*, *Empire of Cotton*; *Williams*, *Capitalism & Slavery*.

accumulated capital was then either reinvested or, among other things, spent on constructing representative buildings.¹⁴⁵

Atlantic slavery, within its about 400 years of existence, starting in the 15th century, and ending at the end of the 19th century, can roughly be divided into two main phases. The first one goes until 1640. In it, “[...] *the foundation of Atlantic forced migration for the production of tropical commodities throughout the colonial territories of the Americas* [...]”¹⁴⁶ was laid. Europeans adopted existing forms of slavery by the indigenous and exploited and transferred it into new regions. This system was then gradually turned into a system with the Atlantic Ocean at its centre.¹⁴⁷ One of the first crops that drove European expansion until 1807 was sugar. Beyond the growing European demand, the colonies in tropical and subtropical regions had optimal soil and climate conditions for sugar cane production. It soon replaced other crops because it could be processed easily and therefore exported on a massive scale. Sugar cane cultivation began in Brazil, but it was soon adopted in Barbados and later in Jamaica. Sugar also accelerated technological development. By the first half of the 16th century, a system of large plantations and the accompanying technology, refineries and mills for further processing, had already been developed.¹⁴⁸ Despite the involved machinery in the process, slaves were still needed in all steps in the production cycle of sugar: from the planting the cane to its harvest and further processing.¹⁴⁹

These developments led to the so-called “sugar revolution” in the Caribbean islands in the middle of the 17th century. Sugar was now often grown as the main crop in large monocultures to supply for European demand. Sugar also played a major role in the changing characteristics of local societies. As mentioned, while sugar was first an expensive food item and seen as a luxurious good,¹⁵⁰ the combination of slave labour and technological development in this period led to massive profits, ultimately expanding the sugar production, which made sugar much cheaper and universally available. Sugar “[...]”

¹⁴⁵ Kenneth *Morgan*, *Slavery, Atlantic Trade and the British Economy, 1660–1800* (Cambridge 2001), doi:10.1017/CBO9780511622120, 9; *Williams*, *Capitalism & Slavery*, 39f.

¹⁴⁶ *Zeuske*, *Migration, Slavery, and Commodification*, 316.

¹⁴⁷ *Zeuske*, *The Rise of Atlantic Slavery*, 380f.

¹⁴⁸ *Phillips Jr.*, *Slavery in the Atlantic Islands*, 331, 339; Dale *Tomich*, *Slavery in the Circuit of Sugar*, Second Edition (Albany 2018), doi:10.1353/book.100022, 1f; *Baptist*, *The Half Has Never Been Told*, 42.

¹⁴⁹ *Phillips Jr.*, *Slavery in the Atlantic Islands*, 340.

¹⁵⁰ *Burnard*, *Plantation Slavery*, 398.

transformed from a luxury item to an article of mass consumption through the systematic organization of production and exploitation of labor.”¹⁵¹

Besides technological development in the colonies, other industrial developments and their profits in Europe can be traced back to the slavery system. For example, in the processing of cotton, the spinning machine invented at the end of the 18th century fundamentally changed the production of clothing.¹⁵² Beyond that, cotton production in the colonies had major impact on other, seemingly unrelated industries, such as the development of railway networks and the expansion of the iron industry, as Sven *Beckert* describes in “Empire of Cotton”.¹⁵³

Michael Zeuske calls the period which followed 1640 and ended in 1820 the “Second Atlantic”¹⁵⁴. Together with the above-described beginning period, this was the first main phase of slavery in the Americas and the trans-Atlantic slave trade. With the massive

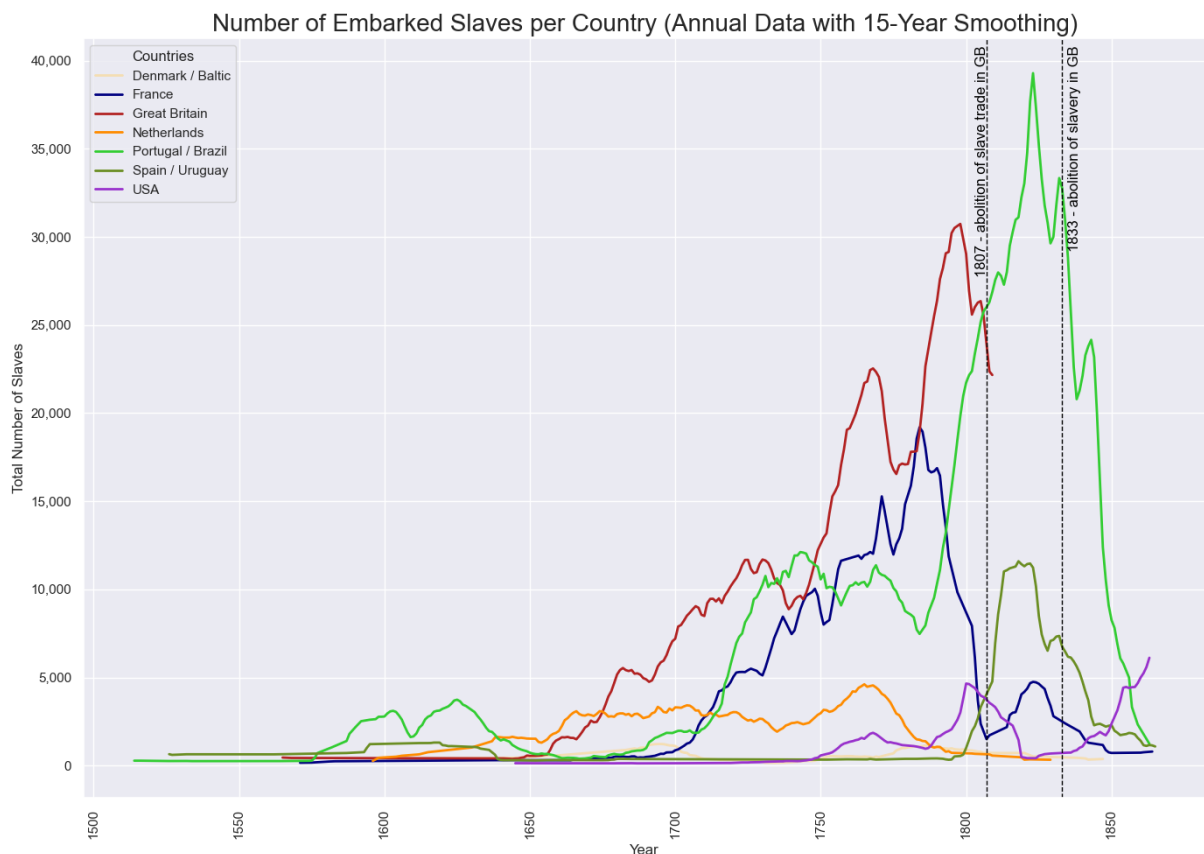


Figure 1 Number of embarked slaves per country

¹⁵¹ Tomich, Slavery in the Circuit of Sugar, 2.

¹⁵² Baptist, The Half Has Never Been Told, 80.

¹⁵³ Beckert, Empire of Cotton, 73, 92.

¹⁵⁴ Zeuske, Migration, Slavery, and Commodification, 316.

expansion of the plantation economy and the subsequent growing demand for new slave labour, other European Empires contested Portugal's monopoly over trade with Africa. First the Dutch and later England and France became new and important players in the slave trade.¹⁵⁵

These developments are visible in Figure 1, which shows the number of abducted slaves by the different European Empires in the period of 1500 to 1880, based on data from the "trans-Atlantic slave trade database". Portugal's dominance over nearly all periods is evident. In total, ships sailing under Portuguese/Brazilian flags brought over five million slaves to the Americas. During some periods, they were outstripped by the Netherlands (a total of over 500,000 slaves) and the British (a total over three million slaves) in the 17th century and by the British and the French (a total of over one million slaves) in the 18th century. The abolition of the trade and later of slavery (see chapter 4.2) mark clear turning points in the trans-Atlantic slave trade. In the 19th century, Spain (a total of over 500,000 slaves) and France became also important slave trading nations, while the US (a total of over 280,000 slaves) started in the 1840s. The fall of the French to nearly zero around 1800 can be traced back to the French Revolutionary Wars of the 1790s.¹⁵⁶

With the rise of the sugar industry, the number of slaves abducted from Africa and shipped to the Americas began to grow heavily. Now, millions of people were captured and abducted from Africa and brought over the Atlantic to the Americas to satisfy the European demand for colonial goods. But especially in the beginning phase of slavery and related trade activities in the Americas, each Empire only supplied its own domestic market in Europe. With a few exceptions, these trade systems were isolated from those of other countries supplying their own colonies with slaves. Each of the European Empires had introduced some mercantilist policies to protect against competition from the others. Actions like monopolies or trading privileges affected all parts of the economy: industrial production, the control over resources, or the slave trade. Products produced in the colonies had to be sent to the mother country only by using ships registered there.

¹⁵⁵ Lorena *Walsh*, *Slavery in the North American Mainland Colonies*, In: *The Cambridge World History of Slavery Volume 3 AD 1420–AD 1804*, David *Eltis*, Stanley *Engerman*, K. R. *Bradley*, Paul *Cartledge*, et al. Ed. (Cambridge/New York 2011) 407–430, here 408.

¹⁵⁶ David *Eltis*, *The Volume and Structure of the Transatlantic Slave Trade: A Reassessment*, *The William and Mary Quarterly* 58, no. 1 (2001) 17–46, doi:10.2307/2674417, 27, 35.

Shipping to the colonies and all trade with foreign products, such as Asian spices, were also affected by these rules. Foreign merchants were forbidden to trade with any other country or its colonies. The above-mentioned “Navigation Laws” were part of those restrictions. This led to a limit of worldwide economic integration.¹⁵⁷

Real competition, which is part of the modern capitalist economy, was not possible. These restrictions began to change only with the revocation of trade barriers at the end of the 18th century.¹⁵⁸

By the 19th century, this mercantilist system had completely disappeared. In the aftermath of the Napoleonic Wars and with the Congress of Vienna, the weakening of the French Empire led to a British dominance at sea. Now, instead of the dominance of the mercantile system in international trade, with the British hegemony, market relations were now the main drivers of world trade.¹⁵⁹ This generally led to an increase in trade flows in the 19th century.¹⁶⁰ This newly established world order also had its consequences for slavery in the Americas.

4.1. Slavery in the 19th century: “Second Slavery”

Even though Abolition in the British Empire ended the slave trade (1807) and slavery (1833) in wide areas of the world at the beginning of the 19th century, slavery did not come to an end yet. The combination of technological developments and the expansion to unexploited land laid the foundation stone for the development of slavery in the 19th century.¹⁶¹ Starting around 1790 and ending in 1888, Slavery reached a new high point

¹⁵⁷ Zeuske, Migration, Slavery, and Commodification, 316; Guillaume Daudin, Kevin O’Rourke, Leandro Prados de la Escosura, Trade and Empire, 1700-1870, 2008, doi:hal-03459838, 2; Tomich, Slavery in the Circuit of Sugar, 51f; Williams, Capitalism & Slavery, 43.

¹⁵⁸ Emmer, Slavery and the Slave Trade, 452f.

¹⁵⁹ Daudin, O’Rourke, Prados de la Escosura, Trade and Empire, 1700-1870, 3f; Tomich, Slavery in the Circuit of Sugar, 53; Fernanda Bretones Lane, Guilherme De Paula Costa Santos, Alain El Youssef, The Congress of Vienna and the Making of Second Slavery, Journal of Global Slavery 4, no. 2 (06/06/2019) 162–195, doi:10.1163/2405836X-00402001, here 164, 167.

¹⁶⁰ Daudin, O’Rourke, Prados de la Escosura, Trade and Empire, 1700-1870, 5.

¹⁶¹ Baptist, The Half Has Never Been Told, 82.

around 1860 in new areas: Brazil, Cuba and the US South.¹⁶² Dale Tomich calls this the “second slavery”:

„At the core of [the] second slavery was the redeployment of slave labor as a mass productive force, that is the mass concentration of slave laborers devoted to monocultural staple production and the creation of new productive spaces to meet growing world market demand.”¹⁶³

At the core of this concept are the temporal and spatial changes in the slavery system compared to previous centuries.¹⁶⁴ In the 19th century, the structure of the Atlantic slavery system changed considerably. Starting with the US-American “War of Independence” at the end of the 18th century, far-reaching changes took place throughout the Americas. *“These changes included not only the spatial redistribution and quantitative increase in the production of tropical products but also the qualitative restructuring of the social relations and processes organizing the world market.”*¹⁶⁵ The “Haitian Revolution” and the emergence of further nation-states at the turn of the century are also counted among these events. During these state-building processes, slavery was banned in many countries. In addition, abolition took place in the European colonial Empires (see chapter 4.2). In these countries, slavery was seen as incompatible with the increasingly modern capitalist economic order and the emerging liberal socio-political values.¹⁶⁶

The plantations, now dependent on free labour, were thus no longer able to compete with newly emerging areas of raw material production using slaves. These major changes presented the profiteers of slavery with new challenges, but also opportunities. Despite the abolition of slavery in their own colonies, it continued to exist in other areas. This ensured the continued supply of cheap raw materials, and the economic system based on the exploitation of slave labour continued to operate profitably.¹⁶⁷ In Cuba and Brazil,

¹⁶² Robin *Blackburn*, *Why the Second Slavery?*, In: *Slavery and Historical Capitalism during the Nineteenth Century*, Dale *Tomich* Ed. (Lanham, Maryland 2017) 1–36, here 6.

¹⁶³ *Tomich*, *The Second Slavery and World Capitalism*, here 482.

¹⁶⁴ *Tomich*, Introduction, ix.

¹⁶⁵ Dale *Tomich*, *The ‘Second Slavery’: Bonded Labor and the Transformation of the Nineteenth-Century World Economy*, In: *Critical Readings on Global Slavery*, Damian Alan *Pargas*, Felicia *Roşu* Ed. (Leiden/Boston 2018) 1326–1349, doi:10.1163/9789004346611, here 1328.

¹⁶⁶ *Tomich*, *The Second Slavery and World Capitalism*, 479–481.

¹⁶⁷ *Mathisen*, *The Second Slavery, Capitalism, and Emancipation*, 678f; *Tomich*, Introduction, x; *Blackburn*, *Why the Second Slavery?*, 2; *Tomich*, *Slavery in the Circuit of Sugar*, 71.

slavery also played an important part in their nation-building process. It boosted the economy of the newly emerging states and made their economy independent of their former mother country¹⁶⁸ Colonial slavery was in a crisis, but this offered the agents new opportunities for making high profits from the exploitation of enslaved people within this transformed system.¹⁶⁹

Even though the abolitionist movements of the 19th century achieved ending slavery in significant parts of the world, including the British Empire, it should be noted that this “second slavery” reached a new peak in the number of enslaved in the middle of the 19th century. The slave trade quantitatively outshone everything previously recorded, even exceeding the former peak in the 18th century. The slave trade took place both legally and illegally across the Atlantic Ocean and increasingly within these new core areas of the slavery system.¹⁷⁰ For example, the number of slaves in Cuba quadrupled between 1792 and 1862.¹⁷¹ (See the relevant places in the map in appendix 11.1) Moreover, in the USA, starting in the 1790s, the slave population in the South (namely Virginia, North Carolina, South Carolina, Georgia, Florida, Mississippi and Louisiana) started to rise drastically. In 1790, slaves made up around 18% of the population. The proportion of slaves soon reached 40 % in 1820 and over 60% in 1860 in South Carolina counties.¹⁷² But Brazil was the target of most slave voyages across the Atlantic.¹⁷³ In the US, there was also internal slave trade. More than one million slaves were moved from their homes into newly emerging areas of production.¹⁷⁴

In the 17th and 18th centuries, the centre of commodity production with slave labour was primarily in the Caribbean and Central and South America. However, in the 19th century,

¹⁶⁸ *Baptist*, *Toward a Political Economy of Slave Labor*, 53; Laird *Bergad*, *Slavery in Cuba and Puerto Rico, 1804 to Abolition*, In: *The Cambridge World History of Slavery Volume 4: AD 1804–AD 2016*, David *Eltis*, Stanley *Engerman*, Seymour *Drescher*, David *Richardson* Ed., 1st ed, Cambridge World History of Slavery (West Nyack 2017) 98–128, here 103.

¹⁶⁹ *Tomich*, *Civilizing America’s Shore*, 6f.

¹⁷⁰ *Mathisen*, *The Second Slavery, Capitalism, and Emancipation*, 681; *Tomich*, *Civilizing America’s Shore*, 7; *Tomich*, *Introduction*, x.

¹⁷¹ *Tomich*, *Through the Prism of Slavery*, 67f.

¹⁷² *Beckert*, *Empire of Cotton*, 103.

¹⁷³ João José *Reis*, *Slavery in Nineteenth-Century Brazil*, In: *The Cambridge World History of Slavery Volume 4: AD 1804–AD 2016*, David *Eltis*, Stanley *Engerman*, Seymour *Drescher*, David *Richardson* Ed., 1st ed, Cambridge World History of Slavery (West Nyack 2017) 129–154, here 132.

¹⁷⁴ *Baptist*, *Toward a Political Economy of Slave Labor*, 54; Damian *Pargas*, *Slavery in the US South*, In: *The Palgrave Handbook of Global Slavery throughout History*, Damian *Pargas*, Juliane *Schiel* Ed. (Cham 2023) 441–457, here 446.

especially between the 1820s and 1888, new core areas, or, as Dale Tomich calls them, “frontiers”, emerged¹⁷⁵: *“The U.S. South, Cuba, and Brazil emerged as dynamic new centers of slave-based commodity production that were of central importance for the expansion of the world-economy and the redefinition of the world division of labor.”*¹⁷⁶ These were primarily regions that had not previously been at the centre of commodity production using slaves on plantations (e.g., the Mississippi region or the region around São Paulo).¹⁷⁷ These areas were largely undeveloped, which brought with it both advantages and disadvantages. On the one hand, these areas first had to be developed spatially and infrastructurally. In the USA, for example, there was a westward movement of people and infrastructure. In around 70 years, the South of the USA was turned into a “subcontinent of slavery”¹⁷⁸. But this was not based on an increase of slave trade activities. In opposite to all other regions, in the US South the number of slaves was stable mainly because of natural reproduction.¹⁷⁹ But this did not mean that those slaves were treated any better.

On the other hand, this underdevelopment also meant that the areas were not yet intensively used for agriculture, and therefore their fertility was better than the depleted soils in areas that had already been cultivated for centuries. This made it possible to achieve an increase in output. For the US, cotton was the new dominant crop of economic growth. In 1820, cotton made up 42% of US exports.¹⁸⁰ Only within a few years, the US became the world’s central market for cotton. In the 1830s, around 80% of the cotton sold in Britain was produced there.¹⁸¹ In addition, Brazilian coffee made up around 80% of worldwide coffee consumption in the late 19th century.¹⁸²

In these regions, labour productivity had to be increased to compete in the constantly growing global market, where different forms of labour organisation competed. In addition to the spatial expansion, the development and use of new labour methods led to the intensification of slaves’ working conditions, as well as new production and transport

¹⁷⁵ Tomich, Introduction, ix.

¹⁷⁶ Tomich, *Civilizing America’s Shore*, 7.

¹⁷⁷ Blackburn, *Why the Second Slavery?*, 13.

¹⁷⁸ Baptist, *Toward a Political Economy of Slave Labor*, 35.

¹⁷⁹ Engerman, *US Slavery and Its Aftermath*, 156.

¹⁸⁰ Baptist, *The Half Has Never Been Told*, 83.

¹⁸¹ Baptist, *Toward a Political Economy of Slave Labor*, 35.

¹⁸² *Ibid.*, 55.

technologies, such as railways, steamships, and steam mills.¹⁸³ *“The all-encompassing control of workers – a core characteristic of capitalism – experienced its first great success on the cotton plantations of the American South.”*¹⁸⁴ This intensification led to increases in efficiency and productivity. The resulting output could be significantly increased compared to previous times.¹⁸⁵ This particularly affected sugar production, which was heavily mechanised.

While the innovations led to cost reductions and increased profits, they did not replace slaves with machines.¹⁸⁶ In cotton production, this is illustrated by the introduction of the cotton gin, which “[...] helped to uncork one of the bottlenecks to production [...]”¹⁸⁷. While this simplified the process of separating the cotton fibres from the seeds, the remaining work still had to be done by hand using a few primitive tools.¹⁸⁸ Slavery enabled mass mobilisation of workers and allowed planters to respond rapidly to rising prices and expanding markets.¹⁸⁹

Nevertheless, new labour methods were also introduced in this area. The shift from tobacco to cotton production in the Southern United States enabled the transition from task to gang labour, which was standardised and included more easily monitored workflows thereby increasing working speed.¹⁹⁰ However, the relationship between the enslaved and the land and tools could not be improved in their favour. Therefore, the use of enslaved people as the primary workforce remained the most important feature of commodity production in the new territories.¹⁹¹

The three centrally produced goods were cotton in the Southern US states as an industrial raw material, sugar in Cuba and coffee in Brazil as raw materials for the ever-growing food industry. The focus of the individual regions on most in-demand raw materials in the

¹⁸³ Tomich, *Through the Prism of Slavery*, 67.

¹⁸⁴ Beckert, *Empire of Cotton*, 115.

¹⁸⁵ Tomich, *Civilizing America’s Shore*, 7; Tomich, *Introduction*, ix; Tomich, *Through the Prism of Slavery*, 72; Bergad, *Slavery in Cuba and Puerto Rico*, 103.

¹⁸⁶ Charles Post, *Plantation Slavery and Economic Development in the Antebellum Southern United States*, *Journal of Agrarian Change* 3, no. 3 (07/2003) 289–332, doi:10.1111/1471-0366.00057, here 296.

¹⁸⁷ Baptist, *The Half Has Never Been Told*, 82.

¹⁸⁸ John Clegg, *A Theory of Capitalist Slavery*, *Journal of Historical Sociology* 33, no. 1 (03/2020) 74–98, doi:10.1111/johs.12259, here 82.

¹⁸⁹ Beckert, *Empire of Cotton*, 91.

¹⁹⁰ Post, *Plantation Slavery and Economic Development*, 296, 316.

¹⁹¹ *Ibid.*, 298.

centre's consumer goods industries enabled these regions to quickly outcompete existing suppliers. This led to the emergence of a new type of global division of labour.¹⁹²

In addition to the relocation of the core areas of raw material production with the help of enslaved people, other additional factors, such as industrialisation, urbanisation and the restructuring and expansion of the world market for raw materials also had a significant influence on the development of the "second slavery". The global order of the slavery system also transformed. The previously exclusively dominant colonial Empires had abandoned this system. This allowed new territories to assume the former role of colonies. However, the centres continued to require raw materials for factories established in connection with industrialisation, such as cotton in textile factories in Northern England.¹⁹³ Therefore, further development was highly relevant for the continued existence of this global division of labour.

As John Clegg noted, within the concept of "second slavery", slavery is connected to the development of capitalism.¹⁹⁴ By then, slavery has become a part of a worldwide cycle of economic and geographical expansion and a newly established capitalist economic order in the Atlantic region.¹⁹⁵ A departure from the previously prevailing mercantilist protectionism made this economic expansion possible.¹⁹⁶

The transition to the "second slavery" in the 19th century ensured that the old zones of raw material production using slave labour, which were centrally controlled by the colonial powers and this connection was characterised by mercantilist principles, could no longer keep up with these new territories. The result of these developments was that the system no longer originated primarily from the colonial powers themselves, but rather from decentralised territories, some of which were themselves nation-states, which assumed more important positions in a now global market-oriented system. This did not mean, however, that the global superpowers themselves no longer continued to play important roles in this system. Nevertheless, the previously existing system of colonial division of

¹⁹² *Tomich*, *Civilizing America's Shore*, 7; *Tomich*, *Introduction*, ix; *Blackburn*, *Why the Second Slavery?*, 2.

¹⁹³ *Tomich*, *The 'Second Slavery': Bonded Labor*, 1328f; *Tomich*, *The Second Slavery and World Capitalism*, 480.

¹⁹⁴ *Clegg*, *A Theory of Capitalist Slavery*.

¹⁹⁵ *Mathisen*, *The Second Slavery, Capitalism, and Emancipation*, 681; *Tomich*, *Introduction*, ix; *Tomich*, *The Second Slavery and World Capitalism*, 480.

¹⁹⁶ *Blackburn*, *Why the Second Slavery?*, 6f.

labour was replaced by a new global division of labour based on market-oriented commodity cycles.¹⁹⁷

Robin Blackburn therefore sees the “second slavery” as a decolonised slavery in which slave owners could operate independently of colony-mother-state relations. This also applies to Cuba, even though it was never able to achieve formal independence during the period of the “second slavery”. Cuba remained a Spanish colony until the turn of the century. Still, the colony had already developed a strong foundation of self-determination.¹⁹⁸

The system of the “second slavery” shaped global economic development in the 19th century. This “modern” system of slave labour came to an end only at the end of the 19th century, following the end of the “American Civil War” in 1865 and the abolition of slavery in Brazil in 1888.

4.2. Current Discussions in the field of slavery research: Abolition, Slavery in the 19th century (“second slavery”)

The abolitionist movement led to the gradual elimination of slave trade throughout the Americas during the 19th century.¹⁹⁹ The disintegration of the slavery system was carried out from both top and bottom: the pressure by the abolitionist movement in the European Empires and resistance from the slaves themselves. An example for this resistance is the Haitian Revolution, where in 1791, an uprising of thousands of slaves from the sugar plantations in Saint-Domingue resulted in the slaying of slave owners and the destruction of their property. This revolt led to the emancipation of the slaves and later to the creation of Haiti as an independent nation in 1804.²⁰⁰

¹⁹⁷ *Tomich*, *Civilizing America's Shore*, 7f; *Tomich*, Introduction, x.

¹⁹⁸ *Blackburn*, *Why the Second Slavery?*, 7; *Tomich*, *Civilizing America's Shore*, 14.

¹⁹⁹ *Franklin Knight*, *The Disintegration of the Caribbean Slave System, 1772-1886*, In: *General History of the Caribbean: Volume III: The Slave Societies of the Caribbean*, *Franklin Knight* Ed. (New York 2003) 322–345, 335.

²⁰⁰ *Laurent Dubois*, *Slavery in the Age of Revolution*, In: *The Routledge History of Slavery*, *Gad Heuman*, *Trevor Burnard* Ed., *The Routledge Histories* (London/New York 2011) 267–280, 272.

In the following, I focus on the abolition of slavery in the British Empire, which was supported across the whole society. The abolitionist movement started in the 1780s.²⁰¹ Franklin Knight calls the Enlightenment a vital prerequisite for the antislavery movement because it “[...] *promoted the ideas of rationality, order, efficiency and social engineering, [...] [and] of individual and collective liberty, of political rights, of equality, and to a certain extent, of democracy.*”²⁰² Still, despite that in this period slaves fought in various independence wars defending these principles, ideas of equality and human rights were not always applied to them.²⁰³

Following these humanistic ideas, it is notable that resistance to the slavery system emerged in the British society which gained significant prosperity from it. Colonial products expanded the possibilities of British markets and the money which was gained in the slavery system was often reinvested to build infrastructure or fund other economic activities. Thus, slavery played a critical role in British industrialisation.²⁰⁴

The abolition of slavery in the British colonies took place in two stages. First, the slave trade in the British colonial Empire was ended in 1807. Other European states followed suit under pressure from the British Empire in the first third of the 19th century.²⁰⁵ These were the first important steps toward the final abolition of slavery which followed in 1833.²⁰⁶ However, as outlined in detail above, in other parts of the world, slavery reached a new peak and was not eliminated until the end of the 19th century.

Both opponents and supporters of slavery conducted campaigns to persuade the public of their respective views. In the case of the campaign advocating for abolition, at its peak (1791/92), more than 500 petitions with over 400,000 signatures were submitted to the British House of Commons. Former slaves also participated in the debate.²⁰⁷

Opponents of abolitionism argued that production using free labour was not competitive on the market and that slavery was therefore essential for the economic survival of the

²⁰¹ Paula Dumas, *Proslavery Britain: Fighting for Slavery in an Era of Abolition* (New York 2016), doi:10.1057/9781137558589, 10.

²⁰² Knight, *The Disintegration of the Caribbean Slave System*, here 325; Brown, *Abolition of the Atlantic Slave Trade*, 287, 290.

²⁰³ Dubois, *Slavery in the Age of Revolution*, here 268.

²⁰⁴ Dumas, *Proslavery Britain*, 14.

²⁰⁵ Brown, *Abolition of the Atlantic Slave Trade*, here 285-288.

²⁰⁶ Knight, *The Disintegration of the Caribbean Slave System*, 326.

²⁰⁷ Brown, *Abolition of the Atlantic Slave Trade*, 285.

colonies. Others, however, noted that an excessive growth of the enslaved population posed the risk of rebellion and that the number of slaves should therefore not be increased.²⁰⁸

There were also lengthy debates in the British Parliament about whether slavery should be abolished. Since many of the members of parliament benefited from this system, either directly as plantation owners and through the slave trade or indirectly as lenders or shipowners, the camp was divided, as it was among the population. Representatives of the major ports in Liverpool and London were also against abolition. The slave trade and slavery, they believed, contributed to the prosperity of the British Empire. Abolition would therefore be counterproductive. In addition, the country was able to develop industrially thanks to the prosperity it achieved.²⁰⁹ Nevertheless, the opponents of slavery ultimately prevailed. With a major majority of 283 over 16 votes, starting with January 1st, 1808, it was forbidden for any ship sailing under a British flag to take part in the trans-Atlantic slave trade.²¹⁰ The abolition of the slave trade resulted in a 14% decline in the number of enslaved people in the British West Indian colonies between 1807 and 1834. But still, over 600,000 slaves were working there.²¹¹

However, abolition within the British sphere of influence alone was not enough. The British government forced other countries to follow its path in abolishing the slave trade: the Netherlands in 1814, France in 1818, Spain in 1820, and Portugal and Brazil in 1830. Independent of the British, the slave trade was abolished in 1803 in Denmark, 1807 in the USA and between 1810 and 1813 in different newly independent American countries. But this did not mean that no more slaves were carried to the Americas: Over two million Africans were illegally transferred across the Atlantic to work in the plantations. Those voyages to the Americas were often carried out by ships under the flags of Portugal, Brazil, Spain, and the USA, countries which had already officially abolished the slave trade.²¹²

²⁰⁸ *Ibid.*, 283.

²⁰⁹ *Dumas*, Proslavery Britain, 10-14.

²¹⁰ Robin *Blackburn*, *The Overthrow of Colonial Slavery, 1776-1848* (London/New York 1988), 314.

²¹¹ *Ibid.*, 423f.

²¹² *Knight*, *The Disintegration of the Caribbean Slave System*, 335; *Brown*, *Abolition of the Atlantic Slave Trade*, 287, 290.

With the “Emancipation Act” of 1833, slavery in the British colonies was finally abolished.²¹³ However, slaves were not compensated for their century-long suffering. The former slave owners received a compensation in form of money. Beyond that, slaves had to apprentice to their masters for six years and many free labourers²¹⁴ were imported to replace their workforce. All these measures were carried out to maintain the hegemony of white people in the former American colonies. In other parts of the world, slavery lasted for many more years: in the USA until the end of the Civil War in 1865, in Cuba until 1886 and in Brazil until 1888.²¹⁵

Since then, a major debate has developed among historians about the reasons for the abolition of the slave trade and slavery itself. Thomas Clarkson made the first contribution to this debate as early as 1808. Like Seymour Drescher (1977)²¹⁶ later, he believed that the abolition was attributable to a humanist movement.²¹⁷ Eric Williams's perspective in "Capitalism & Slavery" (1944) is completely different. In this work, which was foundational for subsequent researchers, he dealt with the interdependence of economic development and the slavery system.²¹⁸

According to him, economic reasons were the main reason for the abolition of slavery: “[...] *The industrial capitalism of the nineteenth century [...] turned round and destroyed the power of commercial capitalism, slavery, and all its works.*”²¹⁹ As long as British industrialists were dependent on British colonies, they were in favour of maintaining slavery. However, as demand for cheaper raw materials from other colonies increased, slavery in British colonies became a constraint. First, slavery in the Caribbean had to be eliminated to defeat the trade monopoly with it. This led to a restructuring of the production in the colonies and their trade relations with the home country.²²⁰ Then, new

²¹³ Blackburn, *The Overthrow of Colonial Slavery*, 457.

²¹⁴ Indentured servitude: see footnote 112.

²¹⁵ Knight, *The Disintegration of the Caribbean Slave System*, 336ff.

²¹⁶ Drescher, *Econocide*.

²¹⁷ Brown, *Abolition of the Atlantic Slave Trade*, 288.

²¹⁸ Barbara Solow, Stanley Engerman, *British Capitalism and Caribbean Slavery: The Legacy of Eric Williams: An Introduction*, In: *British Capitalism and Caribbean Slavery: The Legacy of Eric Williams*, Barbara Solow, Stanley Engerman Ed., *Studies in Interdisciplinary History* (Cambridge/New York 1987) 1–23, here 1.

²¹⁹ Williams, *Capitalism & Slavery*, 168.

²²⁰ Ibid., 136; Tomich, *The ‘Great Divergence’*, here 85.

trade relations could be established with cheaper raw material suppliers, ultimately making production cheaper.

Dale Tomich asserted that Williams' focus on British industrial capitalism as the main source for the abolition of slavery is a bit one-sided. Williams draws a linear progression of the events to form a teleological argument for the abolition. This simplifies the complex structure of the processes which lead to the abolition of slavery.²²¹

In contrast to Williams' view, other scholars see humanitarian reasons as the decisive factor for the abolition of slavery. For example, the act of abduction itself was sometimes addressed in arguments against the slave trade. This act was itself described as an injustice and had a major impact on African societies.²²²

Seymour Drescher also addressed the reasons for the abolition of slavery in "Econocide" (1977).²²³ For him too, the economic context is central. In contrast to Williams, however, he does not regard abolition as a response to market changes due to overproduction. Drescher shows that British trade of consumer goods with the Americas, especially with countries and colonies in the Caribbean and Latin America, flourished. The products were manufactured using raw materials produced by slaves. Import rates of consumer goods to Great Britain, such as coffee, also remained high.²²⁴ *"Economic interests cannot account for either the timing, the occurrence, or the maintenance of the abolition of the slave trade between 1787 and 1820."*²²⁵ Therefore, he describes the abolition of slavery as economic suicide (he calls it "Econocide"), which was only triggered by the abolitionist movement. This movement, as Drescher notes, was mainly based in Manchester and other industrial towns in Northern England, which were the starting point of British industrial development.²²⁶

Drescher shows that almost all local economies based on slave labour at the time of the abolitionist movement were "[...] viable, flexible and dynamic [...]"²²⁷. These were the

²²¹ Tomich, *Through the Prism of Slavery*, 100.

²²² Brown, *Abolition of the Atlantic Slave Trade*, 284.

²²³ Drescher, *Econocide*.

²²⁴ Ibid., 143; Tomich, *The 'Great Divergence'*, 91.

²²⁵ Drescher, *Econocide*, 183.

²²⁶ Solow, *Engerman*, *British Capitalism and Caribbean Slavery*, 18.

²²⁷ Drescher, *Econocide*, xxiv.

most productive and wealth-generating areas on earth at the time.²²⁸ Abolition was therefore only possible through “[...] *military, civil, or political pressure from without or within.*”²²⁹ Thus, according to Drescher, political-ideological motives led to the abolition of slavery. Slavery was increasingly viewed as backward and barbaric. Freedom, both in trade and in society, became the epitome of political thought.²³⁰ Society had evolved in the sense that the dominant part of it now developed a different view of slavery and therefore wanted to abolish it. There emerged “[...] *a new balance of social power sufficient [...] to redefine a thriving trade as manstealing, and then to destroy that trade, regardless of either its economic value or its stage of development.*”²³¹

Until its abolition, the British Empire held a leading position in the slave trade. The mercantilist policies of the British Kingdom had earned it this position, but over time, these policies had negative consequences for British traders. Therefore, they sided with free trade.²³² Following the abolition of the slave trade, the Napoleonic Wars in particular led to rising prices for British export goods. However, since the slave trade had ceased, production could not be increased as easily and, in addition, declined over time.

The growing labour shortage could no longer be easily alleviated. These developments contradicted the otherwise positive economic prospects. The British colonies continued to be important sources of sugar and other raw materials on the world market. The real problem was competition from other colonies such as Brazil and Cuba, which continued to import slaves. This now happened independently of the previously dominant British Royal Navy. The British Empire's worldwide abolition of slavery by stopping the slave trade failed. Therefore, production volumes in these new territories could be maintained or even expanded. This gradually made production cheaper than in the British colonies. Thus, over time, other regions assumed the role of the British colonies in the world market. The abolition of slavery definitively destroyed the economic viability of the British colonies, as they were no longer competitive. They were no longer profitable in the

²²⁸ Ibid., xxiv.

²²⁹ Ibid., xxv.

²³⁰ Tomich, *Through the Prism of Slavery*, 61.

²³¹ Drescher, *Econocide*, 186.

²³² Ibid., 175.

domestic market, as the shift from mercantilism made other sources of raw materials more attractive.²³³

Regardless of which of these varied arguments one supports as the potential root cause for the abolition of slavery, the consequences of the elimination of the slave trade and slavery itself are clear. Several factors had to change in the British economy in the first half of the 19th century. Initially, no new enslaved workers could legally be brought in from outside. The year 1833 marked another major setback in the production of raw materials. High prices, whether before or after abolition, and the opening of the market forced importers to seek new suppliers. These suppliers were found in new territories where, with the help of slavery, new production areas for raw materials were created, which could then be exported to the British motherland.²³⁴ Therefore, this movement did not end slavery but merely relocated it to other territories.

This ends the broad overview of slavery, the slave trade and their composition, with a specific focus on the trans-Atlantic slave trade in the 19th century. I focused on slavery in the period between the 16th and 19th centuries, in which it was a brutal form of abduction and exploitation of humans and their workforce in the Americas by Europeans in the colonies of European Empires. A well-organised trade system of enslaved people from Africa to the Americas developed to meet the demand for labour.

The British Empire, which I will focus on hereafter, played a major role in the slave trade until the beginning of the 19th century. This changed with the abolition of the slave trade in 1807 and the abolition of slavery in 1833, and the emergence of new major players like Brazil, Cuba and the USA. The well-established system was rearranged on a global scale. In the following analysis, I focus on the abolition and its consequences as well as the emergence of the “second slavery” in connection with the decolonisation of the slave trade. The strong connection between the mother countries and their colonies was weakened in favour of the development of new sales markets. My analysis of these topics is based on the data from the “trans-Atlantic slave trade database”, which is described below.

²³³ Ibid., 148-151, 157f.

²³⁴ *Tomich, Through the Prism of Slavery*, 66.

5. “The trans-Atlantic slave trade database” as a data source for understanding the spatial aspects of the trans-Atlantic slave trade

As a basis for the following analysis, I use data from the “Trans-Atlantic slave trade database”²³⁵ (TASTDB). It contains information on the slave trade at a voyage level, including nearly all voyages from 1514 to 1866. More than 95% of British voyages are documented in the TASTDB, and nearly all French and Dutch journeys are also included.

Such a complete availability is possible only because the slave traders kept records about their journeys and carefully documented their trade activities. Governments on both sides of the Atlantic were also very much interested in the slave trade activities. In particular, for the period after 1700, nearly all information remains available today.²³⁶ As the information originates mainly from multiple sources (with over 80% of the voyages),²³⁷ the data can be considered highly reliable.

Overall, over 36,000 voyages are recorded in the TASTDB with a number of around 12.5 million abducted slaves. The database comprises 293 variables. Some of them are imputed, meaning they are estimated from other variables. Examples for variables are the starting and end date of the journey, the sex ratio and age of the slaves, the name of the captain, the flag under which the ship sailed and the places where the slaves were purchased and sold.²³⁸ This geographic information allows a localisation of each journey, allowing the following spatial analyses.

5.1. Data Preparation

I used the programming language Python for the preparation of the data. Using a programming language to automate various tasks is highly beneficial. While examining specific research questions and contrasting them with the data, the requirements for the base dataset may change multiple times. For this, automating data preparation significantly accelerates the iterative process of modifying the data composition, thereby

²³⁵ *SlaveVoyages*, TASTDB.

²³⁶ *Eltis, Richardson*, A New Assessment of the Transatlantic Slave Trade, 3.

²³⁷ *Ibid.*, 6.

²³⁸ David *Eltis*, Methodology, 2018, online at

<<https://www.slavevoyages.org/voyage/about#methodology/coverage-of-the-slave-trade/1/en/>>. (last accessed 23.05.2025)

enabling continued work with it. As Python offers many different libraries for data handling and analysis, it “[...] fundamentally alters how the humanist views their field and the questions they can explore.”²³⁹

There are many different programming languages which could be used for such a task, but I decided to choose Python, because it is widely used and therefore many similar tasks have already been conducted and are documented on different webpages. This is also true for potential errors that occur and are resolved and documented by different users.²⁴⁰

Python offers different libraries when dealing with the preparation and analysis of spatial data. I used, among others, “pandas”, “geopandas”, “shapely” and “numpy” for data preparation and analysis, “sklearn” and “scipy” for the analysis and “matplotlib” and “seaborn” for visualisations. I created three main “python”-notebooks: `data_preperation.ipynb`, `colonies_data.ipynb` and `analysis.ipynb`. All of these can be accessed via my GitHub repository where I documented all analysis steps. All results and visualisations are also available there.²⁴¹ I used “Visual Studio Code” (VS Code) as the programming environment. Within VS Code, I explored AI-supported programming, via the integrated extensions “GitHub Copilot”, which provides inline coding suggestions, and “GitHub Copilot Chat” (using GPT-4.1). The prompts I used in the chat are available in the GitHub repository (`../python/ vsc_copilotchat_prompts.txt`).

I discuss the analysis notebook in detail in chapter 6, where I used a combination of Python-code and QGIS for the spatial analysis of the data. QGIS is an open-source software for working with spatial data. It is a geoinformation system for the collection, storage, management, modelling and analysis of spatial data (details about such systems can be found in chapter 3.1). QGIS is entirely built by volunteers, and its core code is freely available. It has a large community that works on and improves the software, and one of the key development areas is the extensive plugin repository, from which individually developed plugins can be installed selectively.²⁴² Besides its free availability, I used QGIS because of the information and possible solutions provided by the community on the

²³⁹ William Mattingly, *Introduction to Python for Humanists* (Boca Raton 2023), 5.

²⁴⁰ *Ibid.*, 6.

²⁴¹ github.com/andren967/master-thesis

²⁴² McHaffie, Hwang, Follett, GIS, 181f.

internet. This is helpful when analysing and representing humanities-related data, because numerous other use cases documented online can relate to the problem at hand.

In the following, I will shortly explain how I prepared the data from the “trans-Atlantic slave trade database”²⁴³ (TASTDB) for this analysis. The reorganisation and normalisation of the dataset were necessary, because the data from the database was not in the format I needed for the analysis. Therefore, I had to conduct different tasks like data extraction, treating missing values, and converting and enriching the data to make the analysis feasible.

5.2. Preparation of the data from the “trans-Atlantic slave trade database”

I started with reading the whole database file provided on the “SlaveVoyages”-website²⁴⁴ as a data frame, which then can be easily processed further. I converted different columns into a more suitable format (e.g. date-columns → datetime, year columns and total numbers float → integers). The details of those steps, as well as further pre-processing steps, are available in my GitHub repository.²⁴⁵

As the spatial information of the data in the TASTDB is only implicit, recording the names of the embarkation and disembarkation ports, the most important preparatory step was the explicit localisation of this information, i.e. assigning coordinates to place names (toponym resolution).

Toponym resolution is a part of geoparsing, which is used for geographic information retrieval of texts. One starts with a text containing a place name, and the primary objective is to obtain specific coordinates (geographic or projected) for that place.²⁴⁶ As the place names are already atomised, the main goal is to determine the right coordinates for the place names. In short, I used a gazetteer²⁴⁷-based approach for the resolution, as a list of

²⁴³ *SlaveVoyages*, TASTDB.

²⁴⁴ *Voyages Team*, The Trans-Atlantic Slave Trade Database, online at <<https://www.slavevoyages.org/blog/the-transatlantic-slave-trade-database/163>>, (21/09/2025).

²⁴⁵ <https://github.com/andren967/master-thesis>

²⁴⁶ Zilong *Liu*, Krzysztof *Janowicz*, Ling *Cai*, Rui *Zhu*, et al., Geoparsing: Solved or Biased? An Evaluation of Geographic Biases in Geoparsing, AGILE: GIScience Series 3 (10/06/2022) 1–13, doi:10.5194/agile-giss-3-9-2022, here 1.

²⁴⁷ In short, a gazetteer is a collection of placenames and their corresponding coordinates.

the place names and their corresponding coordinates are made available as an Excel file by the University Library of the University of California, Santa Cruz.²⁴⁸

In the following, the gazetteer was loaded into a pandas data frame named ports.

```
#import gazetteer for the toponym resolution
ports = pd.read_csv(data_dir+"slave-voyages-ports.csv")
```

I used this collection of placenames to assign the correct coordinates to each placename. As every voyage contains multiple place names (e.g. registration place, first place of embarkation, first place of disembarkation, etc.), I created a list of these names, called “place_columns”, which is used in the next step for recursively performing the toponym resolution.

```
#place-columns (needed for toponym resolution)
place_columns=[
    "PLACCONS", #Place where vessel constructed
    "PLACREG", #Place where vessel registered

    "MJBYPIMP", #Imputed principal place of slave purchase

    "MJSIMP", #Imputed principal place of slave disembarkation
    "SLA1PORT", #First place of slave landing
    "ADPSALE1", #Second place of slave landing
    "ADPSALE2" #Third place of slave landing
]
```

In this step, the toponym resolution was performed. For each column in place_columns in my database dataframe stdb (slave trade database), each place-name value was matched against my gazetteer (ports, using the port field). When a match was found, the corresponding longitude and latitude were retrieved and written to new columns named <column>_lng and <column>_lat (e.g. MJBYPIMP_lng and MJBYPIMP_lat). If no match was found, the coordinate fields were left empty (None).

```
#toponym resolution for columns in place_columns with ports-dataset (ca.
83s)
start_time = time.time()
for column in place_columns:
    column_name = column
```

²⁴⁸ UC Santa Cruz ed., Mapping Data from SlaveVoyages.Org, online at <<https://guides.library.ucsc.edu/DS/Resources/Class-Specific/LALS194E/MappingData>>, (21/09/2025).

```

#longitude
stdb[column_name+'_lng'] = stdb.apply(lambda x: ports.loc[ports['port']
== x[column], 'long'].reset_index(drop=True).values[0] if x[column] in
ports['port'].values else None, axis=1)
#latitude
stdb[column_name+'_lat'] = stdb.apply(lambda x: ports.loc[ports['port']
== x[column], 'lat'].reset_index(drop=True).values[0] if x[column] in
ports['port'].values else None, axis=1)
print(column+ " finished: "+str(round(time.time() - start_time,2))+ "s")

```

I then used this dataframe to create multiple geopackage-files using the geopandas function `GeoDataFrame`. I used the new columns from the toponym resolution as x and y coordinates. These are in the WGS84 coordinate reference system.

```

#dataframe to geodataframe
gdf = gp.GeoDataFrame(stdb_filtered_geo,
geometry=gp.points_from_xy(stdb_filtered_geo[geocolumn+'_lng'],
stdb_filtered_geo[geocolumn+'_lat']), crs="EPSG:4326")

#export gdf as geopackage
gdf.to_file(data_dir+f"{geocolumn}.gpkg", driver="GPKG")

```

5.3. Preparing the colonies data

A second important step was the preparation of the dataset containing information about the colonial powers and their associated colonies. Here I used a combination of two online-available datasets. As the geographic basic data, I used a country boundary dataset from “Natural Earth”.²⁴⁹ As attribute data, I used Bastian Beckers “COLDAT” dataset.²⁵⁰ This is an integrated dataset, which aggregates different information about colonial powers and their colonisation of the world at different points in time.²⁵¹

While the dataset is only available as an excel-file containing a list of today’s country names and the corresponding coloniser per year, it basically does not contain spatial information. As it uses today’s country names, there is no information on the actual

²⁴⁹ *Natural Earth*, Admin 0 – Countries, online at <<https://www.naturalearthdata.com/downloads/50m-cultural-vectors/50m-admin-0-countries-2/>>, (23/09/2025).

²⁵⁰ downloaded from Our World In Data: *Bastian Becker – with major processing by Our World in Data*, ‘European Overseas Colonies and Their Colonizers Over Time’ [Dataset]. Bastian Becker, ‘Colonial Dates Dataset (COLDAT) 3.0’ [Original Data], 2023, online at <<https://archive.ourworldindata.org/20250909-093708/grapher/european-overseas-colonies-and-their-colonizers.html>>.

²⁵¹ Bastian Becker, *Introducing COLDAT: The Colonial Dates Dataset* (2020), doi:10.31219/osf.io/apvqm, 1f.

territorial extent at the respective point in time. Other datasets like data from the “OpenHistoricalMap”²⁵² contains more specific information on the extent of borders as vector lines. But with only the borders, a spatial join²⁵³, like I performed below, is not possible to be conducted. Therefore, the advantages of the “COLDAT” dataset prevailed. It is based on Becker’s historical research and therefore much more trustworthy than data from an open-source website. It comprises different data sources and contains information on countries which were not colonised at different points in time.

As a first step, I obtained the COLDAT-dataset directly from the “Our World In Data”-website. I then created multiple datasets, each one standing for one year, as the data in the original dataset was sorted by country names.

```
#fetch the data from ourworldindata
colonies_original =
pd.read_csv("https://ourworldindata.org/grapher/european-overseas-colonies-
and-their-colonizers.csv?v=1&csvType=full&useColumnShortNames=true",
storage_options = {'User-Agent': 'Our World In Data data fetch/1.0'})

#export each year's data as a separate CSV file to the specified folder
output_folder = data_dir+"yearly"

#loop through each year and save the corresponding data
for year, data in colonies_original.groupby('Year'):
    data.to_csv(os.path.join(output_folder, f'colonies_{year}.csv'),
index=False)
```

I then loaded the country-dataset from “Natural Earth” as a shapefile. This gave me the corresponding geographic extent of the countries listed in the dataset.

```
#path to the shapefile from Natural Earth Data
#for joining the colonies data with geodata
shapefile_path =
basemap_dir+"ne_50m_admin_0_countries/ne_50m_admin_0_countries.shp"

#read the shapefile
gdf_countries = gpd.read_file(shapefile_path)
```

²⁵² OpenHistoricalMap, online at <<https://wiki.openstreetmap.org/wiki/OpenHistoricalMap>>, (01/11/2025).

²⁵³ A spatial join can be used for filtering spatial data or combining their attributes using different sources based on their spatial relationships. For example, if I want only those journeys which are headed to British colonies, I can perform a spatial join using the area of Jamaica to only get the journeys which are landing there.

I then performed a spatial join using the “python” method "merge". This generated yearly geodata as geopackage-files about the colonisation of the world.

```
#paths
shapefile_path =
basemap_dir+"/ne_50m_admin_0_countries/ne_50m_admin_0_countries.shp"
yearly_folder = data_dir+"yearly"
output_folder = data_dir+"yearly_shapefiles"

#read shapefile
gdf_countries = gpd.read_file(shapefile_path)

#reproject to EPSG:4326 (WGS 84)
gdf_countries.to_crs(epsg=4326, inplace=True)

#loop through each yearly CSV and join with shapefile, then export as
shapefile
for file in os.listdir(yearly_folder):
    if file.endswith('.csv'):
        year = file.split('_')[-1].replace('.csv', '')
        colonies_original_year = pd.read_csv(os.path.join(yearly_folder,
file))

        #limit to relevant columns
        colonies_original_year = colonies_original_year[['Entity', 'Code',
'Year', 'colonizer_grouped']]

        #join datasets on country code columns (ISO_A3 and Code)
        merged = gdf_countries.merge(colonies_original_year,
left_on='ISO_A3', right_on='Code', how='left')

        #limit to relevant columns
        merged = merged[['ADMIN', 'ISO_A3', 'Entity', 'Code', 'Year',
'colonizer_grouped', 'geometry']]

        # Export to yearly GeoPackage-files
        merged.to_file(os.path.join(output_folder, f"colonies_{year}.gpkg"),
driver="GPKG")
```

This preparation of the data from the TASTDB allowed me to engage with the research questions on slavery and the trans-Atlantic slave trade in the 19th century I described in chapter 1.

6. Spatially analysing the “trans-Atlantic slave trade database”

I examined the spatial aspects of the 19th century slavery using the above-described, normalised datasets. My analysis focused on the change in the composition and variables in patterns of the extent of enslavement of people and their trade, which are fundamental to get a comprehensive picture of the development of slavery in this period. In this thesis, I particularly focus on the spatial patterns of this change, which provides an alternative way of understanding maritime activities. A critical element of those are the mentioned ship records, which are remnants of the spreading bureaucracy in the Early Modern period, and were also used in the compilation of the “trans-Atlantic slave trade database” providing valuable information.²⁵⁴

My first focus lies on the newly emerging frontiers which mark this change and the beginning of the so-called “second slavery”.²⁵⁵ Using K-means clustering, I examine the development of the new frontiers in Brazil, Cuba and the United States with a greater precision. While Dale Tomichs broad description of the establishment of those frontiers is comprehensible, it is still only a general overview. The clustering I conducted revealed a southward shift in slave trade activities in Brazil and the United States, especially after the abolition of the slave trade within the British Empire, and pointed towards a replacement of the British colonies, especially identifiable in Cuba.

Secondly, I focus on abolition itself, which became critical at the beginning of the 19th century and maintained its importance throughout the century. With a focus on Great Britain and its abolition of the slave trade in 1807 and slavery in 1833, I examine whether the analysis of the TASTDB data supports Eric Williams’ thesis on the economic cause of the abolition of slavery, or if it is more in support of Seymour Drescher’s theory on economic suicide. (For a detailed overview of this, see chapter 4.2)

Here, my research takes two focal points. Performing spatial joins to identify the corresponding coloniser of the landing port of each journey to its specific point in time, the British colonies mainly received slaves from British ships. At the turn of the 19th century, the number of imported slaves was dropping, suggesting a declining importance

²⁵⁴ Matthew Ylitalo, Sarah Easterby-Smith, Ships, In: *Doing Spatial History*, Riccardo Bavaj, Konrad Lawson, Bernhard Struck Ed. (Abingdon 2022) 121–138, here 121, 130.

²⁵⁵ Tomich, *Civilizing America’s Shore*, 7.

of the slave-based economy in the colonies for the British motherland. Secondly, calculations for constructed and registered ships in Great Britain indicate that the 18th-century peak could not be reached at the beginning of the 19th century. The number of ships built steadily declined after this peak.

Lastly, I analyse the shift from a mercantilist national trade of enslaved people to a decolonised transnational flow to foreign colonies. With the internationalisation of trade flows starting in the middle of the 18th century, I examine how this change in global trade patterns is also visible in the trans-Atlantic slave trade, focusing on the trading routes of British ships. Again, using a spatial join, it can be observed that especially at the end of the 18th and the beginning of the 19th century, British ships diversified their trading activities, now also heading for colonies of other Empires, especially the Dutch and Spanish ones.

6.1. A spatial assessment of the “new frontiers” of slavery in the 19th century

The new frontiers of slavery and slave trade following the abolition in the British Empire were Brazil, Cuba and the Southern states of the USA.²⁵⁶ Robin Blackburn, Dale Tomich and others only describe this development on limited terms, without detailing these new frontiers.²⁵⁷ However, a comprehensive examination of these regions is essential for the interconnected study of the global slave trade system and plantation societies, rather than treating them as independent slave plantation economies.²⁵⁸

Below, I examine the changes within these regions and the origins of their emergence. This helps in understanding this change to these newly established regions of slave labour. For this, I used the information on the landing ports from the database (already read as a geodataframe called “gdf_all_landing_ports” in the code below). Using this data, I created five-year intervals from 1750 to 1850. I used this period, because even though the “second slavery” emerged at the beginning of the 19th century, I wanted to have a comparable timeframe before this change started. I decided to merge the data into five-

²⁵⁶ Blackburn, *Why the Second Slavery?*, 6.

²⁵⁷ Ibid.; Tomich, *The Second Slavery and World Capitalism*; Mathisen, *The Second Slavery, Capitalism, and Emancipation*; Dale Tomich ed., *The Politics of the Second Slavery* (Albany 2016).

²⁵⁸ Tomich, *The ‘Great Divergence’*, 108.

year timeframes because, although enslaved people’s journeys typically lasted about half a year, according to my experiments, a finer granularity (one- or three-years intervals) resulted in no discernible difference. This is presumably due to the fluctuation within the process, which, as the experiment shows, needed around five years to conclusively shift interests.

```
#creating geopackages for 5-year periods from 1750 to 1850
#looping through 5-year periods and saving to separate geopackages
for start_year in range(1750, 1851, 5):
    #define the end year for the 5-year period
    end_year = min(start_year + 4, 1850)

    #filter the GeoDataFrame for the current 5-year period (start_year to
    end_year)
    period_gdf_all_landing_ports =
gdf_all_landing_ports[(gdf_all_landing_ports['YEARAM'] >= start_year) &
(gdf_all_landing_ports['YEARAM'] <= end_year)].copy()

    #save the filtered GeoDataFrame to a new GeoPackage file if it's not
    empty
    if not period_gdf_all_landing_ports.empty:
        out_path = os.path.join(output_dir,
f"landing_ports_{start_year}_{end_year}.gpkg")
        period_gdf_all_landing_ports.to_file(out_path, driver="GPKG")
```

Examining these periods, I used k-means clustering for splitting up the data points into meaningful groups. I used this method because

“Cluster analysis is a process where objects (observations) of a dataset are grouped into a number of clusters. Clusters are formed on the basis that objects within a cluster are as similar as possible (in respect to their attributes/characteristics), while objects belonging in different clusters are as dissimilar as possible. The formation of the clusters is based on a distance matrix between all observations in the dataset [...]”²⁵⁹

I used the “K-means clustering”-algorithm provided in QGIS’ “Vector analysis toolbox”. Unlike other clustering algorithms, this one only considers only the distances between

²⁵⁹ George Grekousis, Spatial Analysis Methods and Practice: Describe – Explore – Explain through GIS (2020), doi:10.1017/9781108614528, 292.

points when calculating the nearest mean for each point.²⁶⁰ For my purposes, this is enough, as I focus only on the tempo-spatial distribution of the ship landings, not taking other variables into account here.

As k-means clustering is an unsupervised algorithm, I did not need to create a training and testing set for performing this analysis. I decided to choose four as the number of clusters I wanted to receive, because even though trying the “elbow method”²⁶¹ for calculating the optimum number of clusters for different time periods always gave me a number between two and three (see Figure 2). I decided to use four, because at least three clusters would correspond with the number of newly emerging frontiers within the second slavery. I added one number to see if this would reveal more detailed information about the emergence of the second slavery.

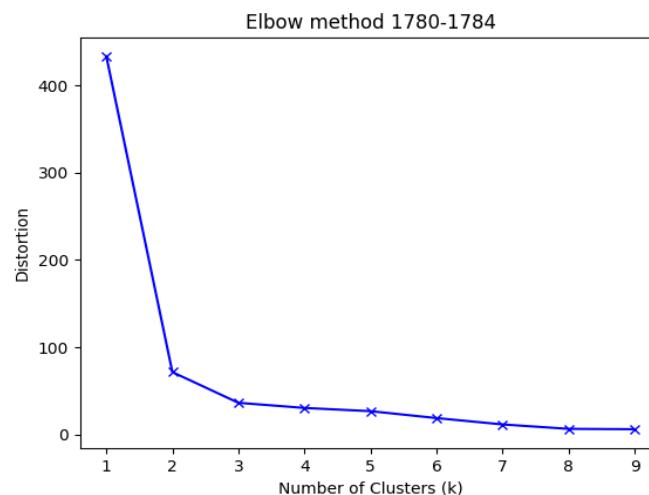


Figure 2 elbow method for the period of 1780-1784

I aggregated the clustered data in “Python” based on their position and affiliation to a cluster for a better visualisation. For this, I used the method “dataframe.groupby.agg”.

```
#aggregate files from k-means clustering (in QGIS) for visualisation
clustering_dir = os.path.join(data_dir, "clustering_kmeans4")
out_dir = os.path.join(clustering_dir, "contracted")
os.makedirs(out_dir, exist_ok=True)

for fname in os.listdir(clustering_dir):
```

²⁶⁰ QGIS-project, K-Means Clustering, online at https://docs.qgis.org/testing/en/docs/user_manual/processing_algs/qgis/vectoranalysis.html#k-means-clustering, (27/09/2025).

²⁶¹ This method is commonly used for calculating the number of clusters. As the optimal number of clusters is not known in advance, it can help to determine the number of clusters, where additional clusters do not improve explaining the variance. (Grekousis, Spatial Analysis Methods and Practice, 300f.)

```

if fname.endswith(".gpkg"):
    fpath = os.path.join(clustering_dir, fname)
    gdf = gpd.read_file(fpath)
    #group by MJSLPTIMP and CLUSTER_ID, aggregate geometry and count
    grouped = (
        gdf.groupby(['MJSLPTIMP', 'CLUSTER_ID'])
        .agg({
            'geometry': 'first',
        })
        .reset_index()
    )
    grouped['count'] = gdf.groupby(['MJSLPTIMP',
'CLUSTER_ID']).size().values
    grouped_gdf = gpd.GeoDataFrame(grouped, geometry='geometry',
crs=gdf.crs)
    out_path = os.path.join(out_dir, f"contracted_{fname}")
    grouped_gdf.to_file(out_path, driver="GPKG")
    print(f"Saved: {out_path}")

```

This clustering revealed a clear distinction between the results from the 18th and 19th centuries. In Figure 3, I depicted four maps of different time periods, which best illustrate these differences. The first map represents the middle of the 18th century (1765-1769) the next two maps represent the period of the abolition of the British slave trade (1805-1809 and 1810-1814) and the last map stands for the middle of the 19th century (1804-1844).²⁶²

While in the 18th century, the major landing ports were mainly on the small Caribbean islands like Barbados or Martinique or on Hispaniola (today Haiti and the Dominican Republic) and Jamaica, as well as the Northern states of what today is the USA, in the 19th century, the main landing area shifted to Cuba, the US-South, and Brazil. While the latter was already involved in the slave trade for centuries, the increase in journeys at this time is significant. This, of course, corresponds with the findings of Dale Tomich,²⁶³ however, my investigation shows the exact trends and shifts, supported with locations and numbers (see the overview map with the most important place names at appendix 11.1.).

Taking a closer look at this development, it is visible that this change did not occur uniformly across space and time in all those regions. In Brazil, already in the middle of the 18th century, slaves were landing mainly on the Northern shore in cities like São Luís or Salvador. This development steadily increased within the second half of the 18th century,

²⁶² All other maps can be found in the repository “..\maps\kmeans”.

²⁶³ Tomich, *The Second Slavery and World Capitalism*, 480ff.

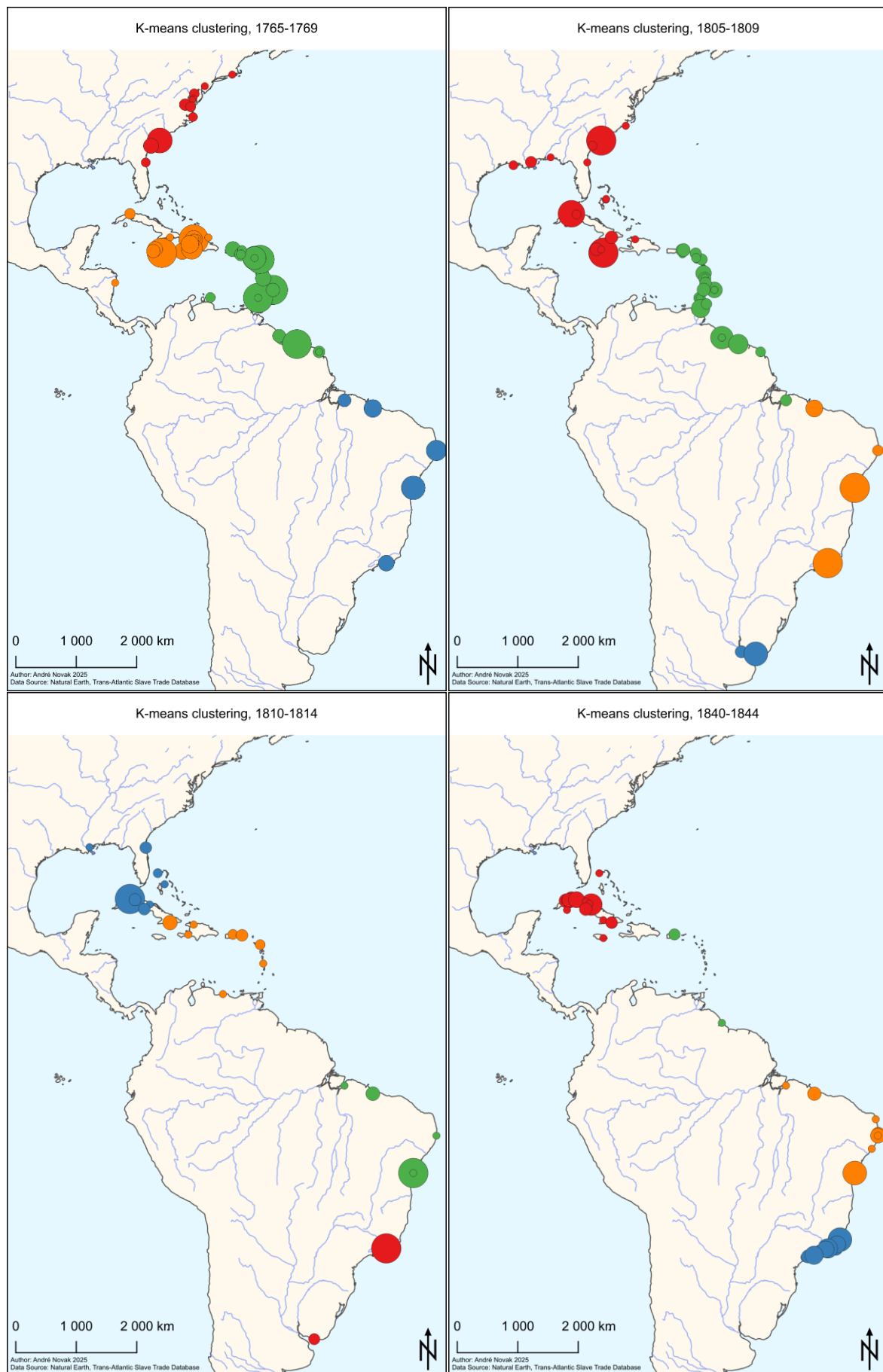


Figure 3 K-means clustering (each colour represents one cluster)

and during the first half of the 19th century the numbers remained high. This increase is accompanied by a southward shift to ports like Rio de Janeiro, São Sebastião or Montevideo and Maldonado in today's Uruguay, which was part of Brazil until 1825. This southward development must be seen in connection with the broader development of the Brazilian society. During this period, the population was growing rapidly, and many urban centres were founded.²⁶⁴

In Cuba, the development was quite different. The first increase started at the end of the 19th century, especially in the Northern city of Havana. Beginning with 1810, other ports also grew in numbers, now also on the Southern (Trinidad de Cuba) and Eastern part (Santiago de Cuba, Banes) of the Island. These replaced nearby Jamaica, where, as a British colony, no more slaves landed after the abolition of the British slave trade in 1807.

The development in the USA was completely different. Until the independence in 1776, the slave trade was directed to both Northern states, such as Virginia, Maryland and New Jersey, as well as to Southern States, including North Carolina, South Carolina, Georgia, Florida, and Louisiana. Similar to Brazil, a southward shift in the US is also visible in the period between 1760 and 1810. This movement is also connected to the westward expansion and the exploitation of new lands. This movement is accompanied by the development of fast and cheap transportation technologies. Rivers such as the Mississippi were heavily used for the freight transport of cotton and played a major role in this development. Therefore, New Orleans became the key port for American cotton exports. Besides the development of steamboats, railroads were also established to connect the hinterland to rivers and seaports.²⁶⁵ After 1810, only a small number of ships directly landed on the American coast, even though the largest slave population of any region was there (over four million in 1865). Most of the slaves there were not captured and abducted, but were already born in slavery.²⁶⁶ This is because, contrary to all other frontiers, in the US South the number of slaves was stable mainly because of natural

²⁶⁴ Herbert Klein, Francisco Vidal Luna, *Brazil: An Economic and Social History from Early Man to the 21st Century* (2023), doi:10.1017/9781009391948, 109, 138.

²⁶⁵ Beckert, *Empire of Cotton*, 143.

²⁶⁶ Pargas, *Slavery in the US South*, 443f.

reproduction.²⁶⁷ Therefore, the slave trade directed to sustain the labour force in the plantations in the US South was not necessary.

The different dynamics of the various frontier areas show that they should not be treated the same:

„Each individual historical-geographical slave complex – that is the Cuban sugar frontier, the US cotton frontier and the Brazilian coffee frontier – is a specific point of concentration of relations and processes operating on diverse spatial and temporal levels. [...]. [The “second slavery”] calls attention to the changing character of slavery within the expansion and reformation of the world-economy and the coexistence and interdependence of slavery, wage labour [...], and industrial production within a unified world division of labour.”²⁶⁸

More on this changing world economy can be found in chapter 6.3, where I discuss the change happening within the trans-Atlantic slave trade.

6.2. Spatial evidence of the causes of abolition

The abolition of slavery in the British Empire is a widely discussed topic in the field of slavery research. I point here to the discussion summarised in chapter 4.2. In the following, I take the data from the “trans-Atlantic slave trade database” and examine whether it more supports Williams’ or Drescher’s direction of arguments on humanitarian vs. economic causes.

In answering these questions, I first focus on trade with the British colonies, as they were the regions most affected by the abolition of the British slave trade. As I have already calculated the colonial power for every region in the New World (see chapter 5.1), for every year, I was able to use only those voyages which headed to a British colony. Thus, subsequently, I conducted a spatial join on all journeys whose landing ports were within a British colony. Of course, this had to be done separately for each year, as the status of colonisation changed over the whole period. With this in mind, I performed the spatial join

²⁶⁷ Engerman, *US Slavery and Its Aftermath*, 156.

²⁶⁸ Tomich, *The ‘Great Divergence’*, 109.

for each year separately within a for-loop using the geopandas function “sjoin” and combined the results into a single file.

```
#list for journeys to british colonies
filtered_journeys = []

#loop for every year from 1700 to 1900
for year in range(1700, 1901):
    shp_path = os.path.join(colonies_dir+"yearly_shapefiles",
f"colonies_{year}.gpkg")
    if not os.path.exists(shp_path):
        continue

    #load the yearly colonies shapefile
    colonies_gdf_all_landing_ports = gpd.read_file(shp_path)

    #filter for British colonies
    british = colonies_gdf_all_landing_ports[
        colonies_gdf_all_landing_ports['colonizer_grouped'].str.lower().isin
(['british', 'united kingdom'])
    ]
    british = british[british.geometry.notnull()]
    if british.empty:
        continue

    #filter journeys for this year
    journeys_this_year =
gdf_all_landing_ports_4326[gdf_all_landing_ports_4326['YEARAM'] ==
year].copy()
    if journeys_this_year.empty:
        continue

    #spatial join
    #keep only journeys whose destination is within a British colony polygon
    joined = gpd.sjoin(
        journeys_this_year.set_geometry('geometry'),
        british[['geometry']],
        how='inner',
        predicate='within'
    )
    if not joined.empty:
        filtered_journeys.append(joined)

# Concatenate all filtered journeys into a single GeoDataFrame
if filtered_journeys:
    british_journeys_gdf_all_landing_ports =
gpd.GeoDataFrame(pd.concat(filtered_journeys, ignore_index=True),
crs=gdf_all_landing_ports.crs)
else:
```

```

british_journeys_gdf_all_landing_ports =
gpd.GeoDataFrame(columns=gdf_all_landing_ports.columns,
crs=gdf_all_landing_ports.crs)

#export all journeys to British colonies as a single geopackage-file
output_path =
data_dir+"to_british_colonies/to_british_colonies_1700to1900.gpkg"
os.makedirs(os.path.dirname(output_path), exist_ok=True)
british_journeys_gdf_all_landing_ports.to_file(output_path, driver="GPKG")
print(f"Exported to {output_path}")

```

I then created multiple visualisations for the period 1700-1860 to examine how the slave trade to British colonies changed during this period.



Figure 4 Total number of slaves shipped to British colonies by British Ships

Figure 4 Total number of slaves shipped to British colonies by British Ships shows the development of British journeys to its own colonies between 1700 and 1860. What is here visible, is that especially the phase between 1750 and 1795 is a phase of high trade activities. The drop in the number of slaves shipped to the British colonies between 1770 and 1790 can be explained by the impact of the credit crisis of 1772, where speculative errors led to a collapse of the London banking system. This resulted in a loss of trust and a decline in transatlantic trade.²⁶⁹

²⁶⁹ Paul Kosmetatos, The Credit Crisis of 1772–73 in the Atlantic World, In: The Atlantic World, D'Maris Coffman, Adrian Leonard, William O'Reilly Ed. (London 2015) 491–509, here 492, 497ff.

Another reason is the reduced trade activity due to the American independence movement during the “American Revolution”, which further contributed to a decrease in trade activity because of less credit and less money available due to military and defence spending.²⁷⁰

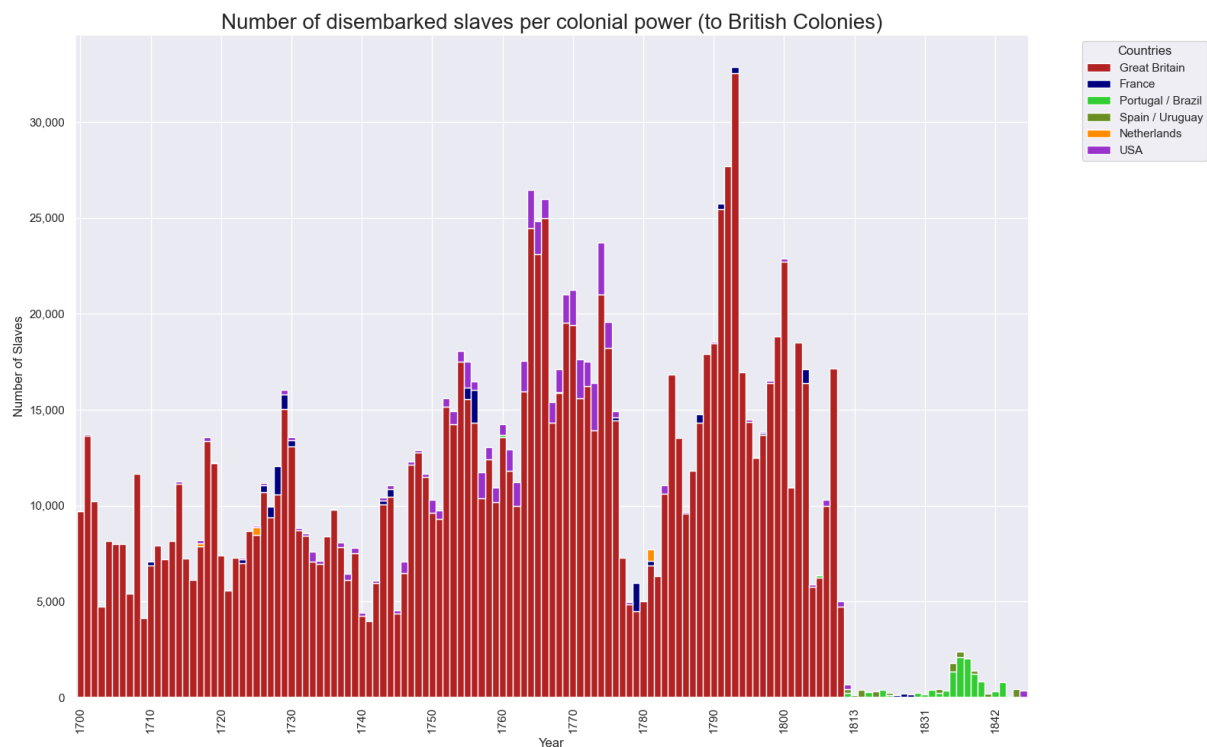


Figure 5 Total number of slaves shipped to British colonies by different countries

However, after 1795, the trade dropped significantly, even before it was banned in 1807. Other colonial powers compensated for this development, but the total number of enslaved people arriving in the British colonies was dropping significantly, as shown in Figure 5. Before 1807, British journeys made up over 95% of all journeys to British colonies. Even at the late stages of slavery, in British colonies, the number of enslaved people imported under the flag of other countries was comparably very low. This indicates a decline in the importance of British colonies and their production using slave labour for the British economy.²⁷¹ This can be seen as connected to the expansion in other regions (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**) as well as the “[...]”

²⁷⁰ Burnard, The Atlantic Slave Trade, here 85.

²⁷¹ Of course, I am only basing this conclusion on data about the trans-Atlantic slave trade. Williams, Drescher and others mainly focus on economic key figures for their analysis. What I here want to point out is, that the numbers of the British slave trade are an indicator for the development of the British colonies and their importance for the British economy.

political and economic restructuring of the world-economy [...].”²⁷² (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**)

Another indicator of the diminishing importance of the slave trade and slave-labour production of goods within the British economy lies in the maritime industry, as it was directly linked to trans-Atlantic trade activities and specialised in building ships designed for the transport of enslaved people. The ships specialised for this trade were constructed in a way that they were as fast as possible but also reduced the mortality of the abducted slaves to raise revenue.²⁷³

As each voyage recorded in the “trans-Atlantic slave trade database” contains information on the place where the ships were constructed and registered, I used this information to examine the development of the British maritime industry. For the information presented in Figure 6 Vessels registered and constructed in GB I limited the data to ships constructed or registered in Great Britain. I also eliminated duplicate values (ships that made more than one journey) to prevent double counting.

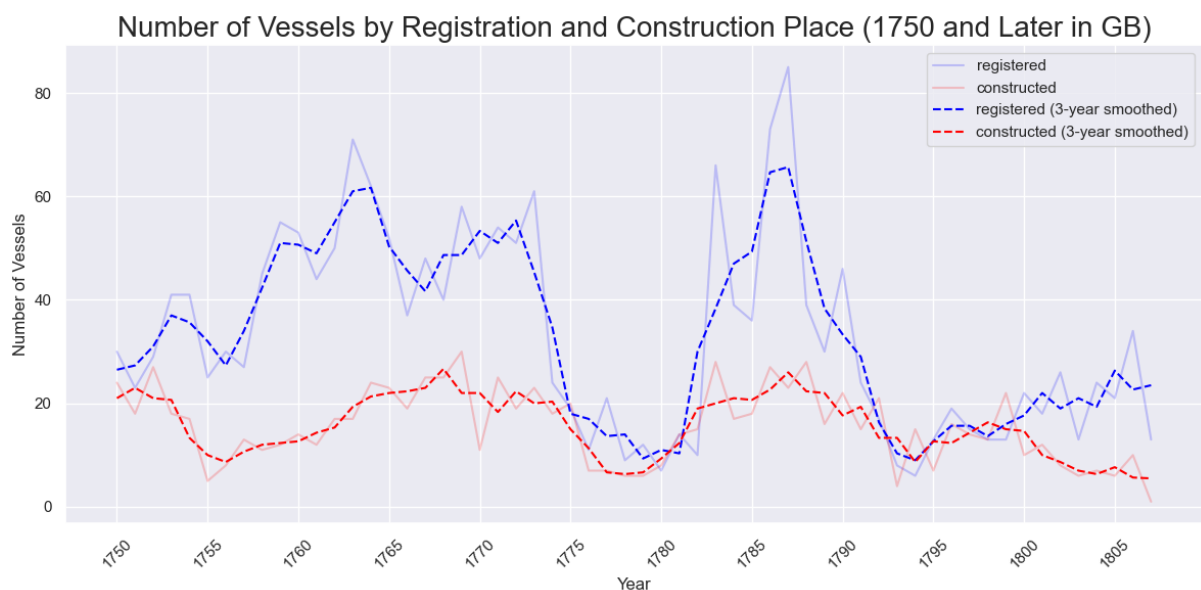


Figure 6 Vessels registered and constructed in GB

Figure 6 Vessels registered and constructed in GB shows the development of the number of ships constructed and registered in the period between 1750 and 1810. The number of ships constructed was relatively stable, but it started to fall at the beginning of the 19th

²⁷² Tomich, *The 'Great Divergence'*, 110.

²⁷³ Williams, *Capitalism & Slavery*, 45.

century. Important places of construction include Liverpool, Lancaster, Newcastle and several other ports on the Southern coast of England. Especially Liverpool (for slaves), Bristol (for sugar) and Glasgow (for tobacco) became major hubs for the trans-Atlantic slave trade. In Liverpool, more than 40% of all ships leaving the British Empire were cleared. Apart from the slave trade, the city also served as a tertiary hub for sugar and cotton, which were extensively transported from the city to the British mainland. In the surrounding areas of the city, various sectors of the processing industry developed. Liverpool, in connection with nearby Manchester, was the major centre of British industrial development.²⁷⁴

The number of ships registered differs a bit from this development. The most important cities here were Liverpool and London, two important financial and industrial hubs for the trans-Atlantic slave trade. Many shipwrights there were slave traders themselves.²⁷⁵ London functioned as the main trade centre for the British Empire and most of the trade activities of the trans-Atlantic slave trade were controlled from there.²⁷⁶

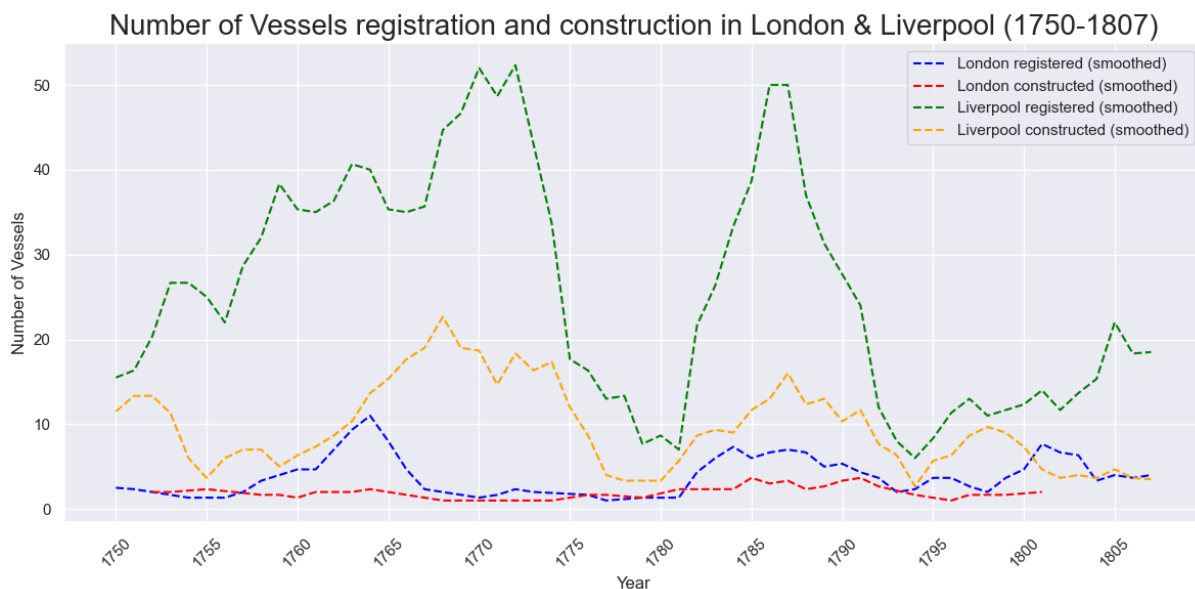


Figure 7 Vessels registered and constructed, Liverpool and London

The number of ships registered there shows an upward trend during the 18th century, but after 1788, it declines rapidly until 1795. The number rose then again until the abolition of the slave trade in 1807, but on a much smaller scale. This development was mainly

²⁷⁴ Morgan, *Slavery, Atlantic Trade and the British Economy*, 85, 88f.

²⁷⁵ Williams, *Capitalism & Slavery*, 45.

²⁷⁶ Morgan, *Slavery, Atlantic Trade and the British Economy*, 92ff; Tomich, *Slavery in the Circuit of Sugar*, 61.

influenced by the fluctuation of the maritime industry in Liverpool, while the numbers in London were relatively stable (see Figure 7). In both developments, the influence of the crises of the 1770s, as already described above, is clearly evident.

6.3. Spatial indicators of the decolonisation of the slave trade

Another important development of the trans-Atlantic slave trade was the development towards a decolonised transnational flow of commodities compared to the former mercantilist-shaped national trade flows. Analysing this, I took the information on where the slaves were bought, where they were sold and under which flag the vessel sailed provided in the “trans-Atlantic slave trade database”. As already shown above (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**), I conducted a spatial join with the colonies dataset to determine the colonial power of both purchasing and selling places to compare this information with the information on under which flag each vessel sailed. As most of the African continent was not colonised before the middle or end of the 19th century, the purchasing port records did not hold much information of interest for this analysis. This is because the slaves were mainly bought in trading ports on the African coast, headed by ships from different colonial powers.

However, examining the colonial power from which the ships sailed and comparing it with the targeted port provided much more information for answering this question. Here I again focus on the British Empire, now on the ships sailing under the British flag, due to its important and leading role in the slave trade and plantation economy in the period between 1650 and 1810.

One may refer to Immanuel Wallerstein’s world-systems perspective to account for this development toward a more integrated capitalist world-economy, driven by the restructuring of international trade relations. This development is also true for the slave economy. Especially the development towards the “second slavery”, a restructuring of

both regions of plantation slavery and trade flows, which led to a decolonisation of international trade relations in the area of the slave trade, can be observed.²⁷⁷

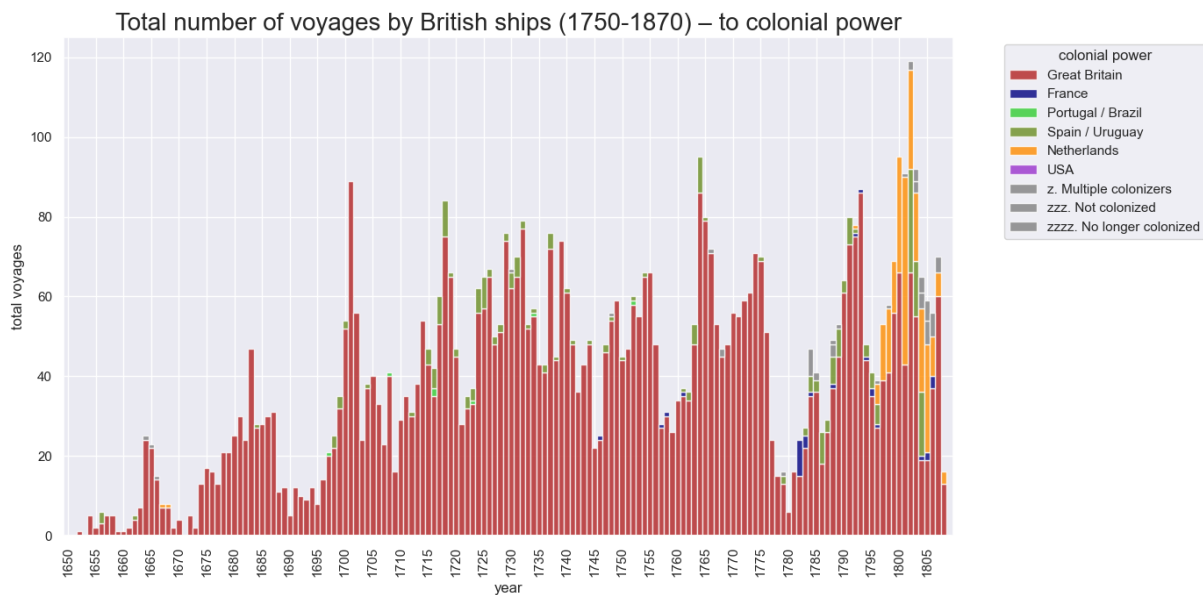


Figure 8 Voyages by British ships to non-British colonies

Figure 8 Voyages by British ships to shows the number of British voyages between 1650 and 1810. The colours here show to which colonial power the targeted port belonged to. What is first clearly visible, is that there is a steady rise of voyages in the 17th century. Ships in this period are mainly going to the big British colonial islands of Barbados and Jamaica (as can be seen in Figure 9). An overview map with the most important place names can be found in the appendix 11.1.

The number of voyages in the 18th century increasingly fluctuated but remained at a much higher average level. An exception to this is the crisis years of the 1770s, triggered by the credit crisis of 1772 and the “American Revolution” (see chapter 6.2). The number of targeted ports was more diverse, as ships were now also calling at the coasts of the North and South American mainland, as well as at St. Kitts. Suriname, a Dutch colony, was an important port through both periods. The highest number of voyages was reached at the end of the 18th and the beginning of the 19th century. During the whole 17th century and

²⁷⁷ Tomich, The ‘Great Divergence’, 105.

most parts of the 18th century, nearly all ships went to ports which were part of the British Empire.

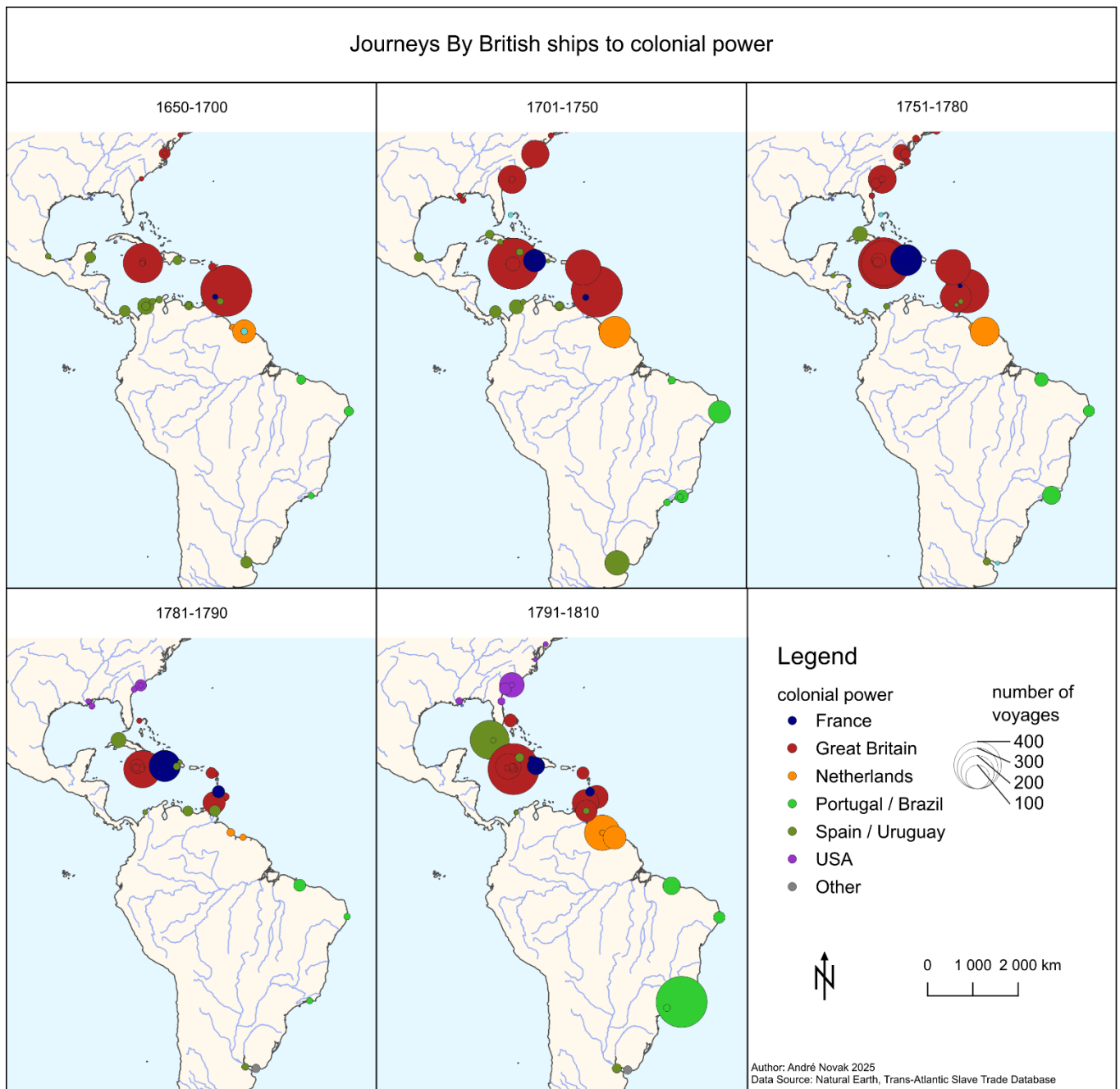


Figure 9 Target ports by British ships

In the first half of the 18th century, some ships were also going to Spanish colonies. The Spanish colonies depended on the slaves brought in by their rival. This supply of rival sugar producers was secured with the exchange of bullion, which the British needed. Other colonial powers could not provide this, so the interests of the British sugar planters succeeded against those of the British slave traders.²⁷⁸ But even this meant only a low

²⁷⁸ Williams, *Capitalism & Slavery*, 24.

share with a maximum of around 10-15% of the yearly journeys. This changed again in the period after 1750, when nearly all of ships sailing under British flags were heading for British colonies. Grenada became one of the most targeted islands, as it became a British colony during that period. Since the beginning of the 18th century, Haiti, a French colony, has grown in importance.

A sudden shift started within the period of 1780-1790, when British ships first travelled to French, and later again, Spanish colonies. Haiti played a major role during this period, and Cuba, as a Spanish colony, became important as well. From around 1795 onward, British colonies became much less important to British ships as ports of call, while Rio de Janeiro in Brazil, Havana in Cuba and Demerara, along with various U.S. ports, grew in importance. The British slave trade in the period preceding its abolition was much more diversified than in earlier periods, when British colonies made up, in average, 70% of the journey targets. The lowest share was recorded in 1804, with only around 30% of journeys going to British ports.

This diversification of trade partners was necessary due to the high demand for new supply sources of raw materials (especially cotton and sugar) required by the expanding British industries. This also necessitated the allotment of new supply markets.²⁷⁹ Therefore, the development in the years before abolition does not show a decline in British trading activities. It only became more diversified by expanding into colonies of different Empires. This shows a decrease in the importance of trade with their own colonies. An economy-based justification of the cruel slave-trading activities was therefore no longer possible. Although trade activities remained high, they were completely cut off by the 1807 abolition. This indicates that Seymour Drescher's theory of economic suicide is at least partly true. He showed that the British trading activities were higher than ever before.²⁸⁰ The diversification of trading activities removed the last arguments for the trade itself, even though it remained on a high level.

²⁷⁹ *Tomich*, *Slavery in the Circuit of Sugar*, 62.

²⁸⁰ *Drescher*, *Econocide*, 73-75.

7. Discussion of the results

The spatial analysis of the trans-Atlantic slave trade, with a special focus on the 19th century, produced remarkable results. First, I demonstrated that, with a solid database, a new perspective on this topic can be achieved. For different research directions, the emergence of the “second slavery”, the abolition of the slave trade in the British Empire, as well as the change to a decolonised trans-national trade of slaves, were analysed. It needs to be stated that “[...] *slave plantation complexes of the New World were structurally part of the European world economy since the sixteenth century [...]*”.²⁸¹ Without the slave plantation complex, the economic development of the European Empires would have been much different.

Especially the development towards the “second slavery” in the 19th century is an important marker in the history of slavery and the development of economies in both Europe and the Americas. It is deeply entangled with many events: industrialisation, technological developments, the decolonisation of trade relations in the core, the abolition and technological and humanitarian developments in both the core and peripheries.²⁸²

Taking a global approach and spatially analysing these developments can, on the one hand, provide a comprehensive overview and, on the other, offer a new point of view, allowing for new insights on previously overlooked aspects, such as the spatial localisation of the development towards the “second slavery”, as well as the effects on the slave trade relations due to the decolonisation of global trade relations.

A meticulous preparation of the data, tailored to the relevant research questions is absolutely necessary to allow its spatial exploration. However, even a spatial analysis does not yield definitive, synthetic knowledge, rather, it highlights the processes that should be taken under further consideration in a comparative historical evaluation.

When looking at the question of the emergence of the “second slavery”, the tempo-spatial analysis of slave voyages landing at different ports in the Americas showed that the development within those frontiers was not uniform. Some regions in those spaces had

²⁸¹ Tomich, *The ‘Great Divergence’*, 105.

²⁸² Blackburn, *Why the Second Slavery?*, 5; Beckert, *Empire of Cotton*, 92ff; Brown, *Abolition of the Atlantic Slave Trade*, 283ff.

already been established before, while others obviously took over the part of the British colonies, where the slave trade was abolished in 1807. This is especially true for Brazil and Cuba, whereas the USA must be seen as a distinct case. While in some Northern states, slavery was abolished, in the Southern states, slaves comprised nearly half of the population and were a very important factor in the economy there. The development within the USA, especially the westward movement, cannot satisfactorily be addressed using the data source and the type of analysis I employed. The slave trade with the American coasts steadily declined, as the slave population in this area was able to sustain itself, and therefore, the trade of slaves was not of greater relevance there.²⁸³ This limits the possibility of analysing developments based on the trans-Atlantic slave trade to the Americas. Furthermore, the database covers only trade to the Americas, but not the onward transport of enslaved people from their respective landing ports, which would be critical in the detailed analysis of the USA.

The reasons for the abolition of the slave trade in 1807 (and later of slavery itself in 1833) within the British Empire, which in a way led to or supported the emergence of the “second slavery”, are widely discussed. As the “trans-Atlantic slave trade database” contains information on trade activities within the slave trade at a journey level, I examined what perspective on this topic could be gained through a spatial analysis of these data. Of course, considering only the trans-Atlantic journeys of the slave trade offers only a limited, but still previously unexamined perspective. Because of this limitation, I used two aspects that could be analysed using the database. Firstly, the analysis of the activities of British colonies showed that the volume of the slave trade declined significantly at the turn of the century. Ships from other nations did not absorb this volume, as almost exclusively British ships continued to land slaves in British colonies. Secondly, the analysis of the British marine sector showed that it reached its peak primarily in the 18th century and that, at the beginning of the 19th century, a consolidation of development took place at a much lower level.

A combination of these two aspects suggests that the importance of goods production using enslaved labour in the colonies, and of all economic sectors associated with this

²⁸³ Engerman, *US Slavery and Its Aftermath*, 156ff.

system, was declining for the British economy. This perspective confirms Eric Williams's view that this declining importance can be seen as a reason for abolition.²⁸⁴

However, the findings of the analysis of the third question, on how the composition of the trans-Atlantic slave trade changed in the context of the transformation from a mercantilist national system to a decolonised transnational flow of commodities, call these results into question. They showed that with the decolonisation of trade relations in the 18th and 19th centuries,²⁸⁵ the slave trade activities of British ships remained high, even though the share of British colonies as landing ports decreased. I focused here on the British ships, because I wanted to enable a comparison with the findings of the second question, which focused how the data from the TASTDB supports Eric Williams' thesis on the economic causes of the abolition of slavery. Furthermore, British trading activities accounted for the largest share of the slave trade during this period until the abolition of the slave trade, and overall, most slaves were transported across the Atlantic by British ships. Observing these changing core-periphery relations is highly valuable for analysing the evolution of world trade during this period of transformation from a mercantilist national system to a decolonised transnational commodity flow.

These findings suggest that, as Drescher argued, British trade, in this case involving enslaved people, continued to flourish in the period preceding (and following) the abolition. Therefore, factors other than economic ones led to the abolition of the slave trade and, later, to the abolition of slavery.²⁸⁶ The British economy no longer seemed to have been as dependent on its own colonies (see chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**), and therefore it was easier to invoke humanitarian reasons.²⁸⁷

This was because the slave trade was increasingly occurring in the colonies of other empires. In sum, whereas this is neither a clearly economic nor a humanitarian reasoning, it still creates a more multifaceted understanding of both of those than before.

A comparison of the results of questions two and three impressively demonstrates that the choice of question, the data basis, and the perspective can lead to significantly different findings. It must be assumed that aspects of both Williams' and Drescher's work

²⁸⁴ Williams, *Capitalism & Slavery*, 136.

²⁸⁵ Tomich, *The 'Great Divergence'*, 105.

²⁸⁶ Drescher, *Econocide*, 143.

²⁸⁷ Tomich, *Through the Prism of Slavery*, 61.

are correct, but that both should be questioned in their absolute positions. Therefore, it is not surprising that this topic has been the subject of discussion for decades. While providing a definitive answer to these research questions is beyond the scope of a master's thesis, expanding them by including the aspect of spatial consideration pointed out that there is many more nuances worthy of further study.

Since I did not collect my own data, I was fully dependent on the opportunities provided by the TASTDB. For future research, expanding the data or incorporating other data sources, such as information on general trade trends, could help to more precisely define the spatial aspect of the development of the slave trade in the 19th century, as well as including other perspectives than just a focus on the voyages with which the slaves were brought from Africa to the Americas.

With this, I demonstrated the potential of GIScience methods in slavery research. Until now, the spatial perspective has been underrepresented in this field, even though the slave trade is a thoroughly spatial phenomenon, one that has many aspects left to be unlocked.

8. Conclusion

The “spatial” turn in the humanities and historical research has led to an increased focus on spatial perspectives in answering questions as well as in formulating new ones. With the development of digital humanities, Geographic Information Systems (GIS) and temporal-spatial analyses have enabled to find new perspectives through the digital lens on historical research questions. For historians, this has offered the opportunity to explore existing research topics from different angles and to discover entirely new areas of application.

Especially in the field of slavery research, a geographical perspective can be of the greatest value in analysis, given the extensive, transcontinental transport of enslaved people and their connections to natural conditions. *“Spatializing slavery has entailed recentering the geography of slavery, appreciating for example just how exceptional and atypical Atlantic slavery was and what made it so, and illuminating regional contexts of slavery around the world.”*²⁸⁸

In this thesis, by applying spatial analysis, I addressed the question of what potential GIS hold for uncovering new spatial patterns and connections within the historical processes of the “second slavery”. I offered a new look at the spatial emergence of the “second slavery” as well as multiple views on the question of the reasons for the abolition in the British Empire. Here, I showed that with the decolonisation of trade relations in the 19th century, the importance of British colonies to British slave traders declined, as trade relations diversified.

However, this can only be the beginning. For me, further in-depth application to a wide range of historical questions, as well as in the field of slavery research, is of immense relevance, as it can provide new insights into existing research debates and also give rise to entirely new research areas.

²⁸⁸ Pargas, Introduction, 3.

9. Sources

Bastian Beckert – with major processing by Our World in Data, ‘European Overseas Colonies and Their Colonizers Over Time’ [Dataset]. Bastian Becker, ‘Colonial Dates Dataset (COLDAT) 3.0’ [Original Data], 2023, online at <https://archive.ourworldindata.org/20250909-093708/grapher/european-overseas-colonies-and-their-colonizers.html>, (23/09/2025).

Natural Earth, Admin 0 – Countries, online at <https://www.naturalearthdata.com/downloads/50m-cultural-vectors/50m-admin-0-countries-2/>, (23/09/2025).

SlaveVoyages, The Trans-Atlantic Slave Trade Database, 2020, online at <https://www.slavevoyages.org>, (23/05/2025).

10. Bibliography

- Eduard *Alvarez-Palau*, Jordi *Martí-Henneberg*, Railroads and Population Distribution. HGIS Data and Indicators for Spatial Analysis. In: The Routledge Companion to Spatial History, edited by Ian Gregory, Donald DeBats, Donald Lafreniere, 54–75 (London/New York 2018).
- Aleida Assmann, Geschichte findet Stadt. In: Kommunikation, Gedächtnis, Raum: Kulturwissenschaften nach dem ‘Spatial Turn’, edited by Moritz Csáky, Christoph Leitgeb, 13–28 (Bielefeld 2009).
- Ralph Austen, Woodruff Smith, Private Tooth Decay as Public Economic Virtue: The Slave-Sugar Triangle, Consumerism, and European Industrialization. In: The Atlantic Slave Trade. Effects on Economies, Societies, and Peoples in Africa, the Americas, and Europe, edited by Joseph Inikori, Stanley Engerman, 183–203 (Durham 1992).
- Edward Ayers, Turning Toward Place, Space, and Time. In: The Spatial Humanities: GIS and the Future of Humanities Scholarship, edited by David Bodenhamer, John Corrigan, Trevor Harris, 1–13 (Bloomington 2010).
- Doris Bachmann-Medick, Cultural Turns: New Orientations in the Study of Culture (Berlin/Boston 2016).
- Edward Baptist, The Half Has Never Been Told: Slavery and the Making of American Capitalism (New York 2014).
- Edward Baptist, Toward a Political Economy of Slave Labor. In: Slavery’s Capitalism: A New History of American Economic Development, edited by Sven Beckert, Seth Rockman, 31–61 (Philadelphia 2016).
- Norbert Bartelme, Geoinformatik: Modelle, Strukturen, Funktionen (Heidelberg 2005).

- Riccardo Bavaj, Introduction: Spatial History – An Expansive Field. In: *Doing Spatial History*, edited by Riccardo Bavaj, Konrad Lawson, Bernhard Struck, 1–36 (Abingdon 2022).
- Bastian Becker, Introducing COLDAT: The Colonial Dates Dataset (2020), doi:10.31219/osf.io/apvqm.
- Sven Beckert, *Empire of Cotton: A Global History* (New York 2014).
- Laird Bergad, Slavery in Cuba and Puerto Rico, 1804 to Abolition. In: *The Cambridge World History of Slavery Volume 4: AD 1804–AD 2016*, edited by David Eltis, Stanley Engerman, Seymour Drescher, David Richardson, 1st ed., 98–128 *Cambridge World History of Slavery* (West Nyack 2017).
- Robin Blackburn, *The Overthrow of Colonial Slavery, 1776-1848* (London/New York 1988).
- Robin Blackburn, Why the Second Slavery? In: *Slavery and Historical Capitalism during the Nineteenth Century*, edited by Dale Tomich, 1–36 (Lanham 2017).
- David Bodenhamer, Beyond GIS: Geospatial Technologies and the Future of History. In: *History and GIS: Epistemologies, Considerations and Reflections*, edited by Alexander Von Lünen, Charles Travis, 1–14 (Dordrecht 2013).
- David Bodenhamer, The Potential of Spatial Humanities. In: *The Spatial Humanities: GIS and the Future of Humanities Scholarship*, edited by David Bodenhamer, John Corrigan, Trevor Harris, 14–30 *The Spatial Humanities Ser* (Bloomington 2010).
- David Bodenhamer, John Corrigan, Trevor Harris, Introduction. In: *The Spatial Humanities: GIS and the Future of Humanities Scholarship*, edited by David Bodenhamer, John Corrigan, Trevor Harris, vii–xv (Bloomington 2010).
- Fernanda Bretones Lane, Guilherme De Paula Costa Santos, Alain El Youssef, The Congress of Vienna and the Making of Second Slavery. *Journal of Global Slavery* 4, no. 2 (06/06/2019) 162–195, doi:10.1163/2405836X-00402001.
- Karin Brondino-Pompeo, Mapping Spheres of Exchange: A Multidimensional Approach to Commoditization and Singularization. *AMS Review* 11, no. 1–2 (2021) 81–95, doi:10.1007/s13162-021-00196-x.
- Christopher Leslie Brown, Abolition of the Atlantic Slave Trade. In: *The Routledge History of Slavery*, edited by Gad Heuman, Trevor Burnard, 281–297 (London/New York 2011).
- Trevor Burnard, Plantation Slavery in the British Caribbean. In: *The Palgrave Handbook of Global Slavery throughout History*, edited by Damian Pargas, Juliane Schiel, 395–412 (Cham 2023).
- Trevor Burnard, Slavery and Empire. In: *Writing the History of Slavery*, edited by David Stefan Doddington, Enrico Dal Lago, 59–79 *Writing History* (London/New York 2022).
- Trevor Burnard, The Atlantic Slave Trade. In: *The Routledge History of Slavery*, edited by Gad Heuman, Trevor Burnard, 80–97 (London/New York 2011).

- Trevor Burnard, Gad Heuman, Introduction. In: *The Routledge History of Slavery*, edited by Gad Heuman, Trevor Burnard, 1–15 *The Routledge Histories* (London/New York 2011).
- John Clegg, A Theory of Capitalist Slavery. *Journal of Historical Sociology* 33, no. 1 (03/2020) 74–98, doi:10.1111/johs.12259.
- Sarah Collins, A Visualization Tool for 1790s Charleston: Locating an Enslaved Population Using GIS. *Journal of Urban History* 49, no. 6 (11/2023) 1342–1357, doi:10.1177/00961442211048500.
- Meghan Cope, Sarah Elwood eds, *Qualitative GIS: A Mixed Methods Approach* (Los Angeles/London 2009).
- Jeremy Crampton, *Mapping: A Critical Introduction to Cartography and GIS* (Malden 2010).
- Guillaume Daudin, Kevin O'Rourke, Leandro Prados de la Escosura, *Trade and Empire, 1700-1870*, 2008, doi:hal-03459838.
- Norbert De Lange, *Geoinformatik in Theorie und Praxis* (Berlin/Heidelberg 2013).
- Donald DeBats, Ian Gregory, Donald Lafreniere, Introduction: Spatial History, History, and GIS. In: *The Routledge Companion to Spatial History*, edited by Ian Gregory, Donald DeBats, Donald Lafreniere, 1–6 (London/New York 2018).
- Laura Di Fiore, Geographies of Global History. *Annals of the Fondazione Luigi Einaudi* 52 (2018) 45–52, doi:10.26331/1033.
- Somayeh Dodge, Robert Weibel, Anna-Katharina Lautenschütz, Towards a Taxonomy of Movement Patterns. *Information Visualization* 7, no. 3–4 (2008) 240–252, doi:10.1057/PALGRAVE.IVS.9500182.
- Seymour Drescher, *Econocide: British Slavery in the Era of Abolition*. 2nd ed. (Chapel Hill 2010).
- Laurent Dubois, *Slavery in the Age of Revolution*. In: *The Routledge History of Slavery*, edited by Gad Heuman, Trevor Burnard, 267–280 (London/New York 2011).
- Paula Dumas, *Proslavery Britain: Fighting for Slavery in an Era of Abolition* (New York 2016), doi:10.1057/9781137558589.
- David Eltis, Methodology, 2018, online at <<https://www.slavevoyages.org/voyage/about#methodology/coverage-of-the-slave-trade/1/en/>>, (23/05/2025).
- David Eltis, The Volume and Structure of the Transatlantic Slave Trade: A Reassessment. *The William and Mary Quarterly* 58, no. 1 (2001) 17–46, doi:10.2307/2674417.
- David Eltis, David Richardson, A New Assessment of the Transatlantic Slave Trade. In: *Extending the Frontiers: Essays on the New Transatlantic Slave Trade Database*, edited by David Eltis, David Richardson, 1–60 (New Haven/London 2008).

- David Eltis, David Richardson, David Brion Davis, David Blight, *Atlas of the Transatlantic Slave Trade* (New Haven/London 2010).
- Pieter Emmer, *Slavery and the Slave Trade of the Minor Atlantic Powers*. In: *The Cambridge World History of Slavery Volume 3 AD 1420–AD 1804*, edited by David Eltis, Stanley Engerman, K. R. Bradley, Paul Cartledge, Craig Perry, David Richardson, Seymour Drescher, 450–475 (Cambridge/New York 2011).
- Stanley Engerman, *US Slavery and Its Aftermath, 1804-2000*. In: *The Cambridge World History of Slavery Volume 4: AD 1804–AD 2016*, edited by David Eltis, Stanley Engerman, Seymour Drescher, David Richardson, 155–173 (West Nyack 2017).
- David W. Galenson, *The Rise and Fall of Indentured Servitude in the Americas: An Economic Analysis*. *The Journal of Economic History* 44, no. 1 (1984) 1–26.
- Günther Görz, *Digital Spatial Humanities – Some Methodological Remarks and Two Historical Examples*. In: *Geographical Research in the Digital Humanities: Spatial Concepts, Approaches and Methods*, edited by Finn Dammann, Dominik Kremer, 15–35 (Bielefeld 2024).
- Ian Gregory, Paul Ell, *Historical GIS: Technologies, Methodologies, and Scholarship* (Cambridge 2007).
- George Grekousis, *Spatial Analysis Methods and Practice: Describe – Explore – Explain through GIS* (2020), doi:10.1017/9781108614528.
- Antonis Hadjikyriacou, *Economic Geographies*. In: *Doing Spatial History*, edited by Riccardo Bavaj, Konrad Lawson, Bernhard Struck, 252–273 (Abingdon 2022).
- Trevor Harris, Susan Bergeron, L. Jesse Rouse, *Humanities GIS: Place, Spatial Storytelling, and Immersive Visualization in the Humanities*. In: *GeoHumanities: Art, History, Text at the Edge of Place*, edited by Michael Dear, Jim Ketchum, Sarah Luria, Douglas Richardson, 226–240 (London/New York 2011).
- Trevor Harris, John Corrigan, David Bodenhamer, *Challenges for the Spatial Humanities: Toward a Research Agenda*. In: *The Spatial Humanities: GIS and the Future of Humanities Scholarship*, edited by David Bodenhamer, John Corrigan, Trevor Harris, 167–176 (Bloomington 2010).
- Gad Heuman, Trevor Burnard eds, *The Routledge History of Slavery* (London/New York 2011).
- Richard Huzzey, *Freedom Burning: Anti-Slavery and Empire in Victorian Britain* (Ithaca 2012).
- Ralph Kingston, *Mind Over Matter?: History and the Spatial Turn*. *Cultural and Social History* 7, no. 1 (2010) 111–121, doi:10.2752/147800410X477368.
- Herbert Klein, Francisco Vidal Luna, *Brazil: An Economic and Social History from Early Man to the 21st Century* (2023), doi:10.1017/9781009391948.

- Franklin Knight, *The Disintegration of the Caribbean Slave System, 1772-1886*. In: *General History of the Caribbean: Volume III: The Slave Societies of the Caribbean*, edited by Franklin Knight, 322–345 (New York 2003).
- Paul Kosmetatos, *The Credit Crisis of 1772–73 in the Atlantic World*. In: *The Atlantic World*, edited by D’Maris Coffman, Adrian Leonard, William O’Reilly, 491–509 (London 2015).
- Noam Levin, Salit Kark, *From Historical Maps to Remote Sensing: Reconstructing Land Use Changes on Norfolk Island over the Past 250 Years*. *The Cartographic Journal* 60, no. 3 (2023) 194–215, doi:10.1080/00087041.2022.2150367.
- Zilong Liu, Krzysztof Janowicz, Ling Cai, Rui Zhu, Gengchen Mai, Meilin Shi, *Geoparsing: Solved or Biased? An Evaluation of Geographic Biases in Geoparsing*. *AGILE: GIScience Series* 3 (10/06/2022) 1–13, doi:10.5194/agile-giss-3-9-2022.
- Chris Lukinbeal, *Cinematic Cartography: Scale, Analysis, Topography* (London 2024).
- Erik Mathisen, *The Second Slavery, Capitalism, and Emancipation in Civil War America*. *The Journal of the Civil War Era* 8, no. 4 (2018) 677–699, doi:10.1353/cwe.2018.0074.
- William Mattingly, *Introduction to Python for Humanists* (Boca Raton 2023).
- Patrick McHaffie, Sungsoon Hwang, Cassie Follett, *GIS: An Introduction to Mapping Technologies*. 2nd edn (Boca Raton 2023).
- Mark Monmonier, *How to Lie with Maps*. 3rd edn (Chicago 2018).
- Chris Montgomery, Philipp Stoeckle, *Geographic Information Systems and Perceptual Dialectology: A Method for Processing Draw-a-Map Data*. *Journal of Linguistic Geography* 1, no. 1 (2013) 52–85, doi:10.1017/jlg.2013.4.
- Kenneth Morgan, *Slavery, Atlantic Trade and the British Economy, 1660–1800* (Cambridge 2001), doi:10.1017/CBO9780511622120.
- Andrea Mosterman, *Spaces of Enslavement: A History of Slavery and Resistance in Dutch New York* (Ithaca 2021).
- Simon Newman, *A New World of Labor: The Development of Plantation Slavery in the British Atlantic* (Philadelphia 2013).
- H. J. Niebor, *Definition and Distinction from Kindred Phenomena*. In: *Critical Readings on Global Slavery*, edited by Damian Alan Pargas, Felicia Roşu, 13–42 *Critical Readings* (Leiden/Boston 2018).
- OpenHistoricalMap, <https://wiki.openstreetmap.org/wiki/OpenHistoricalMap>, online at <https://wiki.openstreetmap.org/wiki/OpenHistoricalMap>, (01/11/2025).
- Damian Pargas, *Introduction: Historicizing and Spatializing Global Slavery*. In: *The Palgrave Handbook of Global Slavery throughout History*, edited by Damian Pargas, Juliane Schiel, 1–13 (Cham 2023).

- Damian Pargas, Slavery in the US South. In: The Palgrave Handbook of Global Slavery throughout History, edited by Damian Pargas, Juliane Schiel, 441–457 (Cham 2023).
- Damian Pargas, Juliane Schiel eds, The Palgrave Handbook of Global Slavery throughout History (Cham 2023).
- William Phillips Jr., Slavery in the Atlantic Islands and the Early Modern Spanish Atlantic World. In: The Cambridge World History of Slavery Volume 3 AD 1420–AD 1804, edited by David Eltis, Stanley Engerman, K. R. Bradley, Paul Cartledge, Craig Perry, David Richardson, Seymour Drescher, 325–349 (Cambridge/New York 2011).
- Charles Post, Plantation Slavery and Economic Development in the Antebellum Southern United States. *Journal of Agrarian Change* 3, no. 3 (07/2003) 289–332, doi:10.1111/1471-0366.00057.
- QGIS-project, K-Means Clustering, online at https://docs.qgis.org/testing/en/docs/user_manual/processing_algs/qgis/vectoranalysis.html#k-means-clustering, (27/09/2025).
- João José Reis, Slavery in Nineteenth-Century Brazil. In: The Cambridge World History of Slavery Volume 4: AD 1804–AD 2016, edited by David Eltis, Stanley Engerman, Seymour Drescher, David Richardson, 129–154 (West Nyack 2017).
- Andrew Sluyter, Death on the Middle Passage: A Cartographic Approach to the Atlantic Slave Trade. *Esclavages & Post-Esclavages*, no. 3 (27/11/2020), doi:10.4000/slaveries.3358.
- Barbara Solow, Introduction. In: Slavery and the Rise of the Atlantic System, edited by Barbara Solow, 1–20 (Cambridge/New York 1991).
- Barbara Solow, Stanley Engerman, British Capitalism and Caribbean Slavery: The Legacy of Eric Williams: An Introduction. In: British Capitalism and Caribbean Slavery: The Legacy of Eric Williams, edited by Barbara Solow, Stanley Engerman, 1–23 (Cambridge/New York 1987).
- Joanna Taylor, Ian Gregory, Deep Mapping the Literary Lake District: A Geographical Text Analysis *Aperçus* (Lewisburg 2022).
- Dale Tomich, Civilizing America's Shore. British World-Economic Hegemony and the Abolition of the International Slave Trade (1814–1867). In: The Politics of the Second Slavery, edited by Dale Tomich, 1–24 (Albany 2016).
- Dale Tomich, Introduction. In: Slavery and Historical Capitalism during the Nineteenth Century, edited by Dale Tomich, ix–xiv (Lanham, Maryland 2017).
- Dale Tomich, Slavery in the Circuit of Sugar. Second Edition. (Albany 2018), doi:10.1353/book.100022.

- Dale Tomich, The 'Great Divergence': Slavery, Capitalism and World-Economy. In: Writing the History of Slavery, edited by David Stefan Doddington, Enrico Dal Lago, 81–112 Writing History (London/New York 2022).
- Dale Tomich ed., The Politics of the Second Slavery (Albany 2016).
- Dale Tomich, The Second Slavery and World Capitalism: A Perspective for Historical Inquiry. International Review of Social History 63, no. 3 (2018) 477–501, doi:10.1017/S0020859018000536.
- Dale Tomich, The 'Second Slavery': Bonded Labor and the Transformation of the Nineteenth-Century World Economy. In: Critical Readings on Global Slavery, edited by Damian Alan Pargas, Felicia Roşu, 1326–1349 (Leiden/Boston 2018), doi:10.1163/9789004346611.
- Dale Tomich, Through the Prism of Slavery: Labor, Capital, and World Economy World Social Change (Lanham 2004).
- Judith Tyner, Persuasive Cartography. In: The History of Cartography. Volume 6. Cartography in the Twentieth Century, edited by Mark Monmonier, 1087–1095 (Chicago 2015).
- Judith Tyner, Principles of Map Design (New York/London 2010).
- UC Santa Cruz ed., Mapping Data from SlaveVoyages.Org, online at <<https://guides.library.ucsc.edu/DS/Resources/Class-Specific/LALS194E/MappingData>>, (21/09/2025).
- Armin Volkmann, Geographische Informationssysteme. In: Digital Humanities: Eine Einführung, edited by Fotis Jannidis, Hubertus Kohle, Malte Rehbein, 299–314 (Stuttgart 2017).
- Voyages Team, The Trans-Atlantic Slave Trade Database, online at <<https://www.slavevoyages.org/blog/the-transatlantic-slave-trade-database/163>>, (21/09/2025).
- Immanuel Maurice Wallerstein, World-Systems Analysis: An Introduction (Durham 2004).
- Lorena Walsh, Slavery in the North American Mainland Colonies. In: The Cambridge World History of Slavery Volume 3 AD 1420–AD 1804, edited by David Eltis, Stanley Engerman, K. R. Bradley, Paul Cartledge, Craig Perry, David Richardson, Seymour Drescher, 407–430 (Cambridge/New York 2011).
- Lorena Walsh, Work and the Slave Economy. In: The Routledge History of Slavery, edited by Gad Heuman, Trevor Burnard, 101–118 (London/New York 2011).
- Eric Williams, Capitalism & Slavery. Third Edition. (Chapel Hill 2021).
- Betty Wood, The Origins of Slavery in the Americas, 1500–1700. In: The Routledge History of Slavery, edited by Gad Heuman, Trevor Burnard, 64–79 (London/New York 2011).

- Matthew Ylitalo, Sarah Easterby-Smith, Ships. In: *Doing Spatial History*, edited by Riccardo Bavaj, Konrad Lawson, Bernhard Struck, 121–138 (Abingdon 2022).
- Michael Zeuske, *Handbuch Geschichte der Sklaverei: Eine Globalgeschichte von den Anfängen bis zur Gegenwart*. Zweite Ausgabe. (Berlin/Boston 2019).
- Michael Zeuske, Migration, Slavery, and Commodification. In: *The Oxford Handbook of Commodities History*, edited by Jonathan Curry-Machado, Jean Stubbs, W. G. Clarence-Smith, Jelmer Vos, 311–334 (New York 2023).
- Michael Zeuske, The Rise of Atlantic Slavery in the Americas. In: *The Palgrave Handbook of Global Slavery throughout History*, edited by Damian Pargas, Juliane Schiel, 379–393 (Cham 2023).

11. Appendix

11.1. Overview Map

