Elemental Analysis of Pre-Contact and Contact Period Ceramics From Northeastern Florida

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ELEMENTAL ANALYSIS OF PRE-CONTACT AND CONTACT PERIOD CERAMICS
FROM NORTHEASTERN FLORIDA

by

JEANIE REBEKAH JACKSON

Under the Direction of Nicola Sharratt, PhD

ABSTRACT

This research focuses on the changing ceramic production centers along coastal Florida during the pre-Contact (AD 800 – 1600) Contact Period (post- AD 1600). This thesis tests how ceramic production changed as a result of European arrival at three sites; San Juan del Puerto, Nombre de Dios and Fountain of Youth. Focusing on sites in northeastern Florida, this thesis uses compositional analysis to examine the impact of sociopolitical change during the Contact Period on ceramic production.

INDEX WORDS: Colonialism, Native Americans, Spanish, Persistence, Resistance, Ceramic Analysis, Compositional Analysis
ELEMENTAL ANALYSIS OF PRE-CONTACT AND CONTACT PERIOD CERAMICS
FROM NORTHEASTERN FLORIDA

by

JEANIE REBEKAH JACKSON

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of
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ELEMENTAL ANALYSIS OF PRE-CONTACT AND CONTACT PERIOD CERAMICS
FROM NORTHEASTERN FLORIDA

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DEDICATION

This research paper is dedicated to all the individuals who have helped me along the way. Dr. Bill Balco and Dr. Victoria Hightower, thank you so much for all the help you gave me in undergrad. Without your support, I would not have even thought graduate school would have been a possibility. Dr. Sharratt, Dr. Glover, Dr. Woodfill, thank you so much for your guidance. Without such a great committee, this thesis would be a shadow of its potential. To Walt; you are a steady force in my life and I love you. To my parents; without your love, I would never be here. Thank you so much for everything you have done. I am eternally proud to be your daughter.
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1 INTRODUCTION

1.1 Goals of Research

The purpose of this research project is to examine if and how the organization of ceramic production changed during the Contact Period. The sites of San Juan del Puerto, Nombre de Dios, and Fountain of Youth all have both pre-contact and Contact Period contexts and as such are ideally suited to examining how ceramic production may have changed throughout these periods.

On the one hand, this project can shed light on aspects of pre-Contact life, and secondly, it can reveal how traditions may have continued into the Contact Period. Some past scholarship argued that indigenous life collapsed entirely as a result of Spanish arrival, but more recent studies demonstrate that there was significant continuation of indigenous life and social structures well past the Contact Period (Cusick 1998; Deagan et al. 2009; Larson 1978; Panich 2013; Silliman 2009). A significant part of daily life was the utilization of ceramics for household, religious, or economic uses. It stands to reason that ceramic traditions, including Ceramic tradition and paste recipes, and trade did not vanish after Spanish arrival and instead continued throughout the Contact Period. The expectation of this thesis project is that paste recipes were still utilized after contact.

Ceramics are used within this study because of their ubiquity within the Southeast. Within the Southeast, ceramics are much more common among coastal sites, and lithic debris is relatively rare on the Southeastern coast when compared to other interior areas of the region (Thompson & Worth 2011:58). The geology of the coast does not allow for an extensive amount of lithic study to be undertaken, which makes ceramics a vital dataset for coastal archaeologists.
Additionally, there has been a large amount of research produced about the ceramics of the Southeast. There is even more literature on the ceramics from the coastal region (Saunders 2004; Deagan 2012; King 1984; Cordell 2002; Saunders 2012; Worth 2009; Deagan et al. 2009; Cordell and Deagan 2013; Riggs 2010; Wauchope 1950). Past research has focused on typology changes because of Spanish arrival. This research, however, employs compositional analysis, which allows researchers to focus more specifically on tracing ceramic production changes rather than relying solely on visual changes. Past research focused ceramic changes as a result of Spanish arrival (Deagan et al. 2009; Riggs 2010). The addition of compositional analysis to this existing body of research allows researchers to focus more specifically on tracing changes in ceramic paste recipes and the organization of production without relying exclusively on visual changes. The present research derives from analyses of ceramics from northeastern Florida to study southeastern pre-Contact and post-Contact ceramics. This data connects broader theories of persistence and resistance that have been used to interpret these transformative years for Native American populations.

Additionally, compositional analysis can answer questions about trade, clay procurement, and ceramic production methods. In order to understand long-distance trade, compositional groupings indicate if group of ceramics share similar paste recipes. Consequently, archaeologists can examine the movement and circulation of ceramics. This thesis focuses on the ways that ceramics can reflect or be impacted by sociopolitical change.

Scholars have also used compositional data from ceramic assemblages to make arguments about the inhabitants organization of craft production. For example, if the compositional signature of an assemblage is homogeneous, this indicates shared use of a paste recipe. It might be suggested that such evidence for use of one, tightly controlled recipe is
indicative of centralized ceramic production, for example in workshops in which ceramists followed consistent recipes. Established ceramic workshops indicate some form of control over the ability to produce ceramics.

Conversely, a more heterogenous compositional signature is indicative of more varied paste recipes and might be interpreted as evidence of small-scale local ceramic production perhaps organized at the household level. The change from workshops to small-scale production (and vice versa) would indicate that changes were happening, at least, economically within society.

1.2 Chapter Outlines

Chapter 2 reviews how archaeological perspectives on colonialism have changed since the 1980s. The emergence of new colonial theories has directly shaped the ways that archaeologists now examine and reconstruct lived experiences. This chapter also frames the theoretical background for this research. The research is placed within theories of agency. By using agency as a method of theoretical analysis, it helps explain ceramic continuity and change through the lived experiences and decisions that individuals were making.

Chapter 3 explores how ceramics can be used to understand the impacts of sociopolitical change. This chapter proposes that how ceramics are often tied to broader economic and social systems they can be utilized as a unit of analysis. The “social labor” of ceramics often ties potters to the community and integrates them into the economic system (Costin 2008). Additionally, ceramics reflect the economics of a given area. Centralized or decentralized ceramic production can indicate levels of economic control within a community or society as well and can reveal how those control mechanisms constrained choices that individuals made when they produce ceramics.
Chapter 4 details the methods of analysis used for the research. The benefits and limitations of portable X-ray florescence (henceforth pXRF), the technique utilized in this study, are detailed. Additionally, the use of LA-ICP-MS analysis for any future studies of this material is discussed. Ceramics from the sites Fountain of Youth, Nombre de Dios and San Juan del Puerto’s and the parameters used when analyzing sampled sherds are also discussed.

Chapter 5 discusses colonialism in the Southeast. This chapter details the deep history of Spanish occupation within Florida and the impacts that Spanish arrival had on Mississippian pre-contact life. This chapter places the missions and the settlements of the Southeast within their historical context to understand what was happening in the region. This history was critical to generate hypotheses about the anticipated effects of Spanish arrival on craft, specifically ceramic, production.

In Chapter 6, the ceramics of the Southeast are detailed. First, a history of Southeastern ceramic studies is presented. Additionally, the ceramic histories of the pre-contact and Contact Period are discussed. This is done to explain the types of ceramics are included in the study and how the particular characteristics of the assemblage shed light on the community who utilized them.

Chapter 7 present the research design of this thesis. The sites are examined more in-depth detailing their occupational history, excavation history, and ceramics. Additionally, the methods of analyzing the ceramics are detailed from the initial pXRF analysis to the statistical analysis in GAUSS 5.0. Chapter 7 also discusses the material correlates used to test the validity of the project’s hypothesis. Finally, this chapter discusses the ethics of working with indigenous materials from a position of privilege as a researcher and why certain ceramic materials were excluded from the study.
In Chapter 8 the results of the study are discussed. Each of the sites was divided into groups, if applicable, and plotted against each other in elemental biplots. Additionally, the pre-contact and contact portion of the sites were plotted against each other. This chapter details the different groups within the sites, and how they compare to the different periods.

In Chapter 9, the results presented in Chapter 8 are analyzed. The ceramic information that had been recorded, type and temper, are brought in to better contextualize the identified chemical groupings. The chapter then considers what these different groups can say about life during the pre-contact and Contact Period. A significant portion of this chapter discusses any shift that happened pre-contact to the Contact Period. The shifts connect to the discussions presented in Chapters 2 and 3 and the ways that data derived from pXRF analyses of archaeological material can reveal changes in production and trade.

2 THE ARCHAEOLOGY OF COLONIALISM

2.1 Introduction

Archaeology has often found itself concerned with ideas of material change throughout time and how that change reflects socio-political change (Costin 2008; Sharratt, Golitko, and Williams 2015; McNeil 2005). As a result, there are various theoretical paradigms surrounding change, continuity, and colonialism (Cusick 1998; Decorse 1992; Silliman 2009; Panich 2013; Silliman 2005). This chapter discusses how these theoretical paradigms have influenced colonial studies in archaeology. Over the past 100 years, colonial studies have moved from Eurocentric studies focused on European domination to a more holistic view of colonialism (Panich 2013; Johnson 1931; Rogers and Wilson 2013). Agency theory, persistence and resistance are the major theories that influence colonial today (Silliman 2001; Panich 2013). These theoretical
models are used within this research to analyze craft changes (Sharratt, Golitko, and Williams 2015; Cordell 2002; Niziolek 2013) across the post-colonial world, but within the United States, the effects of colonialism have been distinctly felt in the Southeast. Focusing on the Southeast, the Florida and Georgia coastlines marked the first Spanish forays onto what would become the United States.

2.2 Prehistory or History?

A significant issue within archaeology and history has been treating prehistoric and historic studies as two separate subjects (Lightfoot 1995). Many moments in the past embody pre-historical and historical elements. Separating them creates gaps in the scholarly record. A site that may have a prehistoric component and also a historic component falls into an awkward position. Should the site be considered historic or prehistoric? Oftentimes, when faced with this dilemma, the same site was treated as if it was two separate sites (Lightfoot 1995:202).

Archaeologists studied the material with little thought to the other prehistoric or historic components. Consequently, there has been little study on the ability to bring together the subjects to understand the transitional period of prehistoric and historic materials in archaeological sites within the Southeast.

Most archaeological work in the Southeast was done along the coast. In these studies, archaeologists examined either the indigenous population or the European population, unless it was to understand how Europeans took the continent. Additionally, Contact Period studies require understanding the prehistory and history of the area. The divide between prehistoric and historic studies also divide prehistoric and historic communities that were coming into contact during the Contact Period. There was very little work undertaken to understand how Europeans and indigenous groups interacted. Unfortunately, there was no clear way to address these issues
without significant changes in how archaeologists approached contact. The St. Catherines Island project, undertaken since the 1970s, has been instrumental in bridging the pre-history and history gap especially in understanding the use of space by different people through time (Keegan 2009).

Putting a specific date on what constitutes the prehistoric past and what constitutes the historic past created several problems for indigenous populations. Since the two subjects were kept separate, there was very little study of changes that occurred because of European arrival with the exception of the St. Catherines Island project (Hurst Thomas 1987; Keegan 2009; Larson 1978). First, focusing on dates ignores that not every tribe was contacted immediately during the Spanish arrival to La Florida in 1513, namely that contact was a process and not a single moment. In fact, it took many years for some groups to come into physical contact with the Spanish, especially the interior tribes of the Southeast. Second, this divide unnecessarily creates temporal boundaries for archaeologists and historians when trying to study contact. Putting arbitrary dates around what constitutes the prehistoric period versus the historic period creates an artificial stopping beyond which does not reflect the reality of that region.

As a result, this divide perpetuated the idea that indigenous cultures did not continue past contact. Instead, they became something new with no links to the past after 1540 (Lightfoot 1995:206). By bringing these two fields together, it contributes more information and context into Contact Period studies. Since historical records during this time favor Europeans, archaeology is a useful tool to help bring in other narratives and experiences (Lightfoot 1995:201). Modern southeastern ceramic studies have focused on how ceramics can show these experiences. Many of these studies (Cordell 2002; K. A. Deagan et al. 2009; Howey 2011; Saunders 2004) involve tracing changes in ceramics from pre-contact through contact to see how ceramic markets and traditions change when indigenous populations move from settlements
towards missions or European settlements. This distinction perpetuated the idea that indigenous cultures did not continue past contact and the impression that, they became something new with no links to the past after 1540 (Lightfoot 1995:206). Bringing both prehistoric and historic archaeology together contributes more information and context into Contact Period studies. Since historical records during this time favor Europeans, especially elites, archaeology is a useful tool to help bring in other narratives and experiences (Lightfoot 1995:201). Modern southeastern ceramic studies have focused on how ceramics can reveal these experiences. Many of these studies involve tracing changes in ceramics from pre-contact through contact to see how ceramic markets and traditions change when indigenous populations move from settlements towards missions or European settlements (Cordell and Deagan 2013; Deagan et al. 2009; Graham 1998; Hensler 2018; Hurst Thomas 1987; King 1984; Larson 1978; Russo 1988; Saunders 2004; Saunders 2012; Worth 2009).

2.3 Changing Theories

Into the 1980s and 1990s, theories about the archaeology of colonialism began to change, changes that are connected with wider shifts in theoretical perspectives in the discipline (Johnson 2010). The 1992 quincentennial of Columbus’ arrival in the Caribbean also contributes to shifting approaches to colonialism. As this anniversary approached, the consequences of his arrival on North and South America were discussed more openly (Cipolla 2008; Silliman 2001; Silliman 2005; Wylie 1992). These changes accelerated from the 2000s and into the present

2.3.1 The 1980s to 1990s

The 1980s and 1990s are a transitional period for theories of colonialism. Theoretical changes were associated with the shift to post-processual archaeology. This new way of thinking focused on how archaeology could remove research bias from the archaeological record and
focused on being more inclusive towards groups that had been historically disenfranchised from
their histories. Previous studies had downplayed colonialism and its ramifications. As a result,
colonialism was regarded as a passive process for both populations. Early scholars and popular
thought had the idea that indigenous population in the New World had adopted European
lifeways and beliefs with very little strife or resistance within and between the communities

Conceptualization of a dead community post-contact contributed to the erasure of
indigenous experiences (Panich 2013). The groups that the Spanish encountered along the coast
had been relegated by scholars based on a narrative that marked their death as a result of the
Spanish arrival (Miller 2004). Due to devastating biological epidemics and massive population
declines, scholars argued that the groups were functionally dead and had little impact on the
years ahead (Miller 2004). As a result, archaeologists decided to focus on the history of the
living communities, push indigenous histories to the side in favor of studying European history.
Miller (2004) and others argued that, due to the importance of the Chesapeake Bay, and by
extension the southeastern coast, in the mythos of the creation of the “American” identity, most
of the historical and archaeological attention has been paid to the English roots of the area. A
byproduct of this mythos building was disregarding indigenous voices and society that had
existed, often side-by-side, within these communities (Miller 2004:238).

To remedy these problems within archaeological theory, to counteract the disregard of
indigenous voices one solution was to bring those voices to the forefront. One such solution was
that archaeology should be used to share the stories and histories of disenfranchised individuals
and cultures rather than focusing on the dominant groups. Wylie (1992) and others argued that
archaeology, historically, had contributed to the continued subjugation of minority groups within
the United States and that the future of the field should be politically engaged archaeology that counters the prominent and false narratives of contact that had erased the experiences of minority groups (Wylie 1992:593).

2.3.2 The 2000’s and Beyond

Archaeology of the Contact Period from the early 2000s to the present is characterized by the growth of colonial theories. A major part of the expansion was the acknowledgement of the inequalities of colonial encounters and putting indigenous experiences back into the archaeological record. Research has increasingly focused on reconstructing lived experiences and how indigenous groups navigated the colonial system through cultural persistence and resistance (Panich 2013; S. W. Silliman 2009).

Leading up into the 2000s, the rise of practice theory created new avenues for archaeologists to study ethnicity, identity, gender, space, technology, and resistance (Silliman 2001:191). Colonial studies focusing on the impact on daily practices began to rise (McNeil 2005; Nassaney 2004; S. Silliman 2010). Analyzing the process of colonialism provided a way for theorists to explore colonial experiences. In the preceding decades of the 1980s and 1990s, there was very little thought given to these aspects of the human experience (Silliman 2001:195). Since colonizers look to mundane activities to control daily life and behaviors, archaeologists could study how daily life changed for a more substantial portion of the population. What foods individuals prepare, how their daily life is structured, religious beliefs, and new commodities and craft production were all activities controlled by the colonizer. Colonialism transformed the way that individuals navigated their lives and broke down the existing social structure in ways that benefited the colonizer. It benefits the colonizer to have the colonized population assimilated into
the culture. Daily activities are significant for actors and allow them to exert agency whether it is through resistance, compliance or existing within the system (Silliman 2001:195).

As agency became a prominent way to study social change, two ways to understand agency began to emerge. One is that social agents act strategically and intentionally to advance their own interests (Silliman 2001:192). As an example, scholars working in the Great Lakes area have argued that populations did not abandon their own lifeways or traditions but selectively chose what European commodities to bring into their culture (Miller 2004:246). Miller found that Chesapeake tribes quickly brought European weapons into their communities but rejected European smoking pipes in favor of traditional pipes (Miller 2004:246). The other approach argues that individuals act meaningfully in circumstances that are only partly of their own making. They have rules and resources within their system, but these resources also give opportunities to act out in of their own choice (Silliman 2001:192). At Rancho Petaluma, in the Western US, Silliman’s work indicated that colonialism did alter and change the worlds of everyone involved. However, indigenous groups did not react in a way that did not make sense for their own experiences (Silliman 2001:196). In studying lithic use at the Rancho, Silliman found that native laborers purposefully sought out lithic material for traditional tools rather than using iron or other metal Spanish tools (Silliman 2001:204). They had new resources available but still chose to continue to use the resources were familiar with.

2.4 Change and Continuity

Established during the 1980s and 1990s, the concepts “acculturation” and “change and continuity” models were the main ways for archaeologists to study colonialism. “Change and continuity” models argued that during Contact Periods indigenous communities either changed or continued with no middle ground (Silliman 2009:212). “Acculturation” models looked at
material culture to understand how “European” indigenous communities were becoming (Silliman 2009:227). These theories were not necessarily incorrect, but they did have limitations in the ways that people understood issues regarding colonialism. Beginning in the 2000s, there were pushbacks against “continuity and change,” “acculturation,” and “culture contact” models in favor of understanding persistence and resistance. These arguments were framed in similar ways of previous arguments over prehistory and history.

Silliman argued that the phrase “change and continuity” treats these two concepts as distinct categories that are easily identifiable and measurable. Much like the prehistoric and historic debate, these theories often ignore hybrid artifacts that embody both European and Native American traits which do not easily fit into either category (Silliman 2009:212). This contributed to the idea that indigenous populations either wholly rejected or accepted European life. There was no room for individual or group agency within these models where populations could choose what parts of culture to adopt. Despite the togetherness of “continuity and change” these two phrases embodied, the two phrases began to diverge. Change or continuity became a problem in understanding cultural negotiations which did not fit in with the established ideas of change and continuity. Equally important for these studies was not treating the 14th and 15th century as different and in need of different ways of study. The pre-contact, contact and post-Contact Periods were not distinct periods that bore no relation to the other but were a part of an overarching long-term history (Panich 2013:109). Life existed between these periods, and there was no consistent experience. The Guale’s experience did not reflect the Coosa’s experience during the Contact Period Both Europeans and indigenous groups do not fit into one category or one experience. Both groups had multiple cultures, systems, and many different ethnicities all existing together and were exposed to and manipulated by each other (Lightfoot 1995:200).
2.5 Culture Contact & Persistence and Resistance

Since the 1940s, culture contact models had been a prominent theory in archaeology to describe colonialism. Moving into the 2000s, however, archaeologists began to argue that culture contact is not a good way to understand the Contact Period in North America. It was argued that the phrase was “a general term used by archaeologists to refer to groups of people coming into or staying in contact for days, years, decades or centuries, or even millennia” (Silliman 2005:58). This is more of a general term for passive contact than the system of colonialism. There are no power dynamics or political struggles; individuals simply existed near each other. It does not consider the systematic destruction of indigenous society and the ways that the colonizer takes control over a region and ignores the experiences of the colonized. It disenfranchises individuals from their own experiences and histories of colonialism. It also removes the responsibility and guilt of colonialism by removing the deliberate ways that colonialism was forced upon indigenous cultures (Silliman 2005:58).

From the desire of wanting to move past that limited definition and treat colonialism as a separate process, a new definition emerged in the field. Persistence and resistance models were introduced to fill this void. There were several problems with culture contact models that persistence and resistance attempted to redress. One, ‘culture contact’ treats colonialism as a short-term encounter rather than a long-term process (Silliman 2005:55). The persistence and resistance models that emerged sought to remedy this situation by pointing out that colonialism is not immediately adopted by everyone. Instead, it is a long-term process that escalates through time until the colonizer has complete control over the indigenous population. This could take months, years, or decades, and cultural negotiations happen along the way. In Silliman’s 2009 study of the Eastern Pequot community in Connecticut found that cultural negotiations where
European cultural materials were both absorbed by the Pequot community and rejected by the community were essential in ensuring survival of the group (Silliman 2009:226).

Secondly, culture contact models the term downplay the fundamental political and social inequalities that are integral to colonialism (Silliman 2005:55). Culture contact does not have any specific political and social dynamics ascribed to it. It is merely people encountering each other. However, colonialism is inherently social and political. Colonizers do not want the colonized group to retain aspects of their culture that interfere with or undermine the colonial structure. In persistence and resistance models, archaeologists delved into the topics of how indigenous groups worked within and against the system. How do cultures persist despite the colonial structure attempting to destroy the culture? How can they resist these changes through their own actions? Instead of pushing away the issues of dealing with inequality, these models put unequal dynamics at the forefront in a way that placed indigenous issues up front.

Finally, culture contact models ignore new cultural traits that appear because of creolized culture during colonization (Silliman 2005:55). Persistence and resistance models pushed for the study of hybridization of culture. Both groups took from the other, and it was not just the colonizer pushing their culture on the colonized. Oftentimes the colonizer adopted portions of the colonized culture in ways that were advantageous to them, and vice versa. Persistence and resistance sought to understand how these cultures navigated each other, and how they used adopted parts of each other’s culture – be it religion, material, political – in a way that was advantageous to them.

Rather than relying on the strict definitions of change and continuity or culture contact, persistence and resistance embodied a new way of understanding the turbulent and nuanced colonial period. It is defined as the continuation of existing despite opposition but also in the
ways that cultures and society are maintained, transformed and reinterpreted (Panich 2013:107). Studying persistence and resistance allows archaeologists to understand how the structures of indigenous societies changed and how those transformations led to the continuation and survival of culture during colonialism (Panich 2013:105)

2.6 Conclusion

Throughout this chapter, various theories that have influenced colonial studies have been discussed. Within the Southeast, the work that is being produced is highly influenced by agency theory and theories of persistence and resistance. Although scholars have long been interested in colonial processes, there have been significant shifts in how scholars approach colonialism in the past. Persistence and resistance studies trace their roots to initial culture contact models and refute those models while presenting a new way forward. Moving away from the “gentle consequences” of colonialism, a view that denied the significant political effects of colonialism began to be usurped by persistence and resistance models. As these models gained prominence, indigenous voices began to be more emphasized within the archaeological record. These voices had been largely ignored, and it took nearly 20 years for archaeologists to begin studying indigenous experiences as a standalone research field. As a result, within the United States and the Southeast, there is a growing body of research focused on returning indigenous experiences to the archaeological record (Ethridge and Shuck-Hall 2009; Howey 2011; Mallois 2006; McNeil 2005; Saunders 2012; Silliman 2001; Silliman 2009; Silliman 2010; Wylie 1992).

These theories inform how individuals may act when involved in the colonial system (Deagan et al. 2009). Using agency theory in this thesis, I argue that these individuals and groups will act strategically in ways that make sense for their own world (Silliman 2001). They may continue to procure clay from sources that are already known since it reduces the amount of
labor needed to create new paste recipes near the missions. Additionally, Silliman’s work on Rancho Petaluma shows that individuals will work within their own traditions and routines (Silliman 2001). Southeastern indigenous groups may continue to use paste recipes they already know and are familiar with rather than finding new recipes within the Spanish world. These theories can be used to explain why continuity might be seen within the pre-contact and Contact Period ceramics. Despite the changes that occurred because of contact, indigenous groups may continue to circulate ceramics in similar ways to pre-contact to maintain traditional alliances. However, these circulations may change as these groups form new alliances as a reaction to the turbulence brought by European arrival along the coast.

In this study how indigenous groups on the southeastern coast produced and circulated their ceramics is analyzed in this thesis through the lens of persistence and resistance theories. Ceramics cannot explicitly tell of actions of persistence and resistance that the individuals undertook, but changes within the ceramic composition can indicate that changes were happening, and that life was changing for these individuals (McNeil 2005). Their analysis can indicate new ceramic trade networks and new ways of organizing ceramic production within communities (Sharratt, Golitko, and Williams 2015). Overall, these theories are frameworks for analyzing the data derived from pXRF and the ways in which individuals either changed or did not change their ceramic production and consumption. In later chapters, changing ceramic markets of the Southeast and the effects of trade demands on the ceramics of the region are discussed. These actors worked within the world that they had, they had no ability to see what would come when Ponce de Leon landed in La Florida in 1513. They could only work within their cultural frameworks, and their ceramics reflect their current cultural surroundings at the
time of firing. Overall, these two theories argue that the changing and turbulent times of contact would be reflected in where and how ceramics were produced.

3 CERAMICS AND SOCIOPOLITICAL CHANGE

3.1 Introduction

Ceramics are one of the most ubiquitous material remains found among archaeological sites (Sinopoli 1991: V) . While ceramics are not people, they can indicate larger societal and political trends occurring at a given time. Ceramics can indicate trade routes, alliances, and political and social complexity.

This research employs This project based on compositional analysis of pottery. It uses compositional analysis to study southeastern pre-contact and post-contact ceramics and seeks to examine theories of persistence and resistance through archaeological material. More specifically, it uses compositional analysis to explore questions about trade, clay procurement, and the organization of ceramic production. To understand trade, compositional groupings indicate if a group of ceramics share similar paste recipes from a specific region. By using those groupings, archaeologists can trace how far those ceramics spread within the region. This chapter explores the ways in which ceramic production and exchange can be affected by sociopolitical change. Additionally, heterogenous and homogenous compositional groupings also indicate the scale of ceramic production within a given site or region. Understanding ceramic production methods also aids in understanding the social and political environment of that site. Established ceramic workshops indicate some form of control over the ability to produce ceramics and that there was an established way of producing ceramics. Conversely, heterogenous signatures indicate small-scale local ceramic production where individuals created ceramics for their own households. The change from workshops to small-scale production (and vice versa) indicates that
there were changes happening, at least, economically within society. Overall, this chapter focuses on the ways that compositional analysis can be used to understand aspects of sociopolitical change through changing production methods.

Ceramics are used within this study because of their ubiquity within the Southeast. The clays along the coast are ideal for making ceramics. Additionally, there has been a large amount of research produced about the ceramics of the Southeast and even more so on the ceramics that make up the coastal region (Cordell 2002; Saunders 2004; Saunders 2012;). This thesis complements existing scholarship by utilizing techniques of compositional analysis, instead of visual analysis, to examine shifts in the organization of ceramic production.

3.2 Why Ceramics?

Reconstructing lived experiences of social change can often be illuminated by the material culture that remains. Most plentiful. It is important to not only understand the origin of objects but also how and why they were used (Panich 2013:108). Compositional analysis offers a way for archaeologists to understand how these objects were created and begin to understand the ways that they were used.

Crafting is itself a social behavior. The production of craft goods, as Costin describes, is the “social labor that defines and relates human social experience” (Costin 2008:4). Using Costin’s argument, ceramics then can be used to understand how societies interacted with the material world. By being part of this “social labor,” potters are then participants in the social, political and economic systems of ceramic production and distribution (Costin 2008:5). As a result, potters are active parts of the system and impart their own, even if unintentional, meanings into the ceramics. Potters work within the “languages” of their ceramics and can manipulate those “languages” to their benefit or continue to use them as intended. Manipulating
ceramic languages can be in the ways that motifs are used and changed to fit within the system but have meanings that would not be apparent to the colonizers. Additionally, potters can unintentionally manipulate ceramic “languages” due to external factors. The choices they make regarding the ways in which ceramics employ this “language” are all influenced by the potter's social identity, economic and political identities and beliefs (Costin 2008:6).

Because the idea that ceramic production is, at its root, a material transformation for economic gain, scholars argue that there are social aspects of creating ceramics (Costin 2008:10). Howey’s work on mimesis in the Great Lakes region highlights this social production (Howey 2011). She argues that mimicry, also known as mimesis or skeuomorphs, was a meaningful way to reclaim power or to ward off future European encroachments into indigenous life (Howey 2011:329). The Haudenosaunee (Algonquian) mimicry of European pots, in this case, the iron pot, allowed the Haudenosaunee to create objects that reflected their own cultural practices and reassert their sovereignty and identity by physically replacing a European object with an object that was created and imbued with their own cultural meanings (Howey 2011:332). The social lives of these objects are even more potent in colonial contexts because of the rapid social changes occurring and reflect the complexity of cultural navigations between the colonizers and the colonized (Howey 2011:330).

Studies of memory and practice play a significant role in understanding social change through material culture. One such focus is through understanding the ‘locus of control’ where the choice, or lack of choice, regarding ceramic production, ceramic style, and distribution are controlled (Costin 2000:378). Were these production areas centered around workshops that tightly controlled what was being produced? Or was production more widely dispersed amongst the population? These methods of craft production are imbedded within the political system of
that culture (Niziolek 2013:36). Niziolek found that a centralization of ceramic manufacture correlated with a rise of elite conspicuous consumption. This could be a result of elite groups attempting to control what goods are produced in order to use those goods for political capital (Niziolek 2013:36).

However, there are problems in the accuracy of reconstructing memory and practice. First, memory and practice are an individual act and carries many variables. Second, individual meanings and practices are associated with individual memories, which can make an individual act in seemingly unpredictable ways when compared to the group structure (Silliman 2009:215). If the scale is pushed back from the individual to the group, the expression of social memories is important in understanding persistence and resistance (Silliman 2009:215). However, changes in the environment can lead to beliefs and memories being forgotten or changed due to disuse. No longer using older artifacts or lifeways can lead to them being forgotten since those practices are no longer being actively used (Silliman 2009:223). But despite any broader issues, studying identity and memory through material culture can provide information on how cultures navigated colonialism.

### 3.3 Role of Identity and Memory

How societies remember is an important aspect of forming a larger social identity. Group. Their identity is reinforced and manipulated through the memories associated with that social identity. Identity and memory are not two separate processes. Identity creates and reinforces memory, while memory reinforces and manipulates identity (Cipolla 2008). Social memory is an important process in understanding how a person fits into the broader, social landscape and how they define themselves within society. It is the process of how individuals remember and are
shaped by their experiences and circumstances (Cipolla 2008:196). Of course, memory is inherently faulty, and things can be forgotten or misremembered.

One definition of social identity is “the ways in which people classify themselves and their social surroundings” (Cipolla 2008:196). Crafting itself is a part of social identity. In societies where ceramic production is centralized, ceramists would have an identity as a ceramic producer. It is possible that ceramics are inscribed with aspects of belief and identity, and Southeastern ceramics are no exception to that (Saunders 2012:94). While ceramics do not provide immediate clues into what society or a potter was thinking at the time of manufacture, they can be used to understand past lives.

### 3.4 Understanding Ceramic Sources Changing

Changing ceramic sources can indicate changing social dynamics either within the community itself or within that community’s larger world. Sharratt et al.’s (2009:816) analysis of clay sources within the Moquegua Valley of Peru showed that despite groups replicating ceramic styles from the Tiwanaku heartlands, they were producing them locally instead of importing them. This examination showed that it was possible to connect clay procurement along with any variations within the data with larger societal trends.

In Saunders’ investigation of Guale ceramics along the Georgia coast, she notes that visible changes occurred in pottery at the time of Spanish arrival (Saunders 2004:182). These ceramic data mark sociopolitical change changes, since visual changes are a clear sign that something has happened to the traditional method of ceramic production. Significant, abrupt visual changes that can be dated to a significant event (i.e., Spanish arrival) show that the confusion and change that occurred within society can be reflected in its ceramics. As such, it is possible to argue that alongside visual changes there may be ceramic compositional changes...
occurring as well. Whether that change leads to more heterogenous or homogenous paste recipes indicates changes in ceramic production; in particular, production in relation to the larger sociopolitical changes affecting the community.

Additionally, along the southeastern coast, archaeologists also see different cultures come together into the larger mission structure. During the San Marcos period, groups like the Guale, Timucua, Mocama, and the Yamassee all moved into close proximity with each other within the larger Spanish missions (Saunders 2012:96). These cultures all had their own ceramic traditions which include the ways in which clay was procured. Additionally, large-scale movements, like moving from inland villages to coastal missions, can affect the ways that potters procure their clays. This would suggest that changes could be a pragmatic response to the changing social, political and economic world. Pragmatic The groups would have to create new paste recipes or rely on another groups knowledge of that area.

3.5 Relation to Sociopolitical Change

In the Southeast, the Apalachee moved north? from the Apalachee region of Florida following the destruction of Spanish missions in 1704 (Cordell 2002:36). Their move from Spanish to French controlled regions could be reflected in ceramic changes. Besides the noticeable compositional changes associated with such a move, there also stylistic changes, either through elaboration or simplification, involving vessel shape and the motifs on the pottery (Cordell 2002:38). This is especially relevant when examining the social production of ceramics. Cordell’s initial argument was that the change in control, from Spanish to French, would decimate the ceramic production that had emerged under Spanish control (Cordell 2002:52). Ultimately, she found that the political shift was too much and the ceramic traditions fell (Cordell 2002:53).
Arguably, the crux of the questions concerning ceramic change are understanding the choices that are made. These choices can involve clay procurement, the technology used and the ways that ceramics are distributed among the community or larger area. Often ceramic traditions cut across large regions and connect individuals and communities who have been divided into different polities and different political systems (Riggs 2010:33). Previously, these choices were understood through the lenses of either elite control or how efficient it was to create ceramics (Costin 2000:382). Ethnographic studies, however, have shown that this is not always the case and that potters will occasionally continue to use harder to access clay resources when entering the market (Costin 2000:382). These variations must be considered especially when dealing with a culture that has almost no ethnographic data. Changes in compositional data may indicate potters are making new choices, which reduce their efficiency, to create new ceramics to be a part of a rapidly changing market. However, lack of change does not indicate that these potters were not involved in the Spanish-Indigenous trade. It may be that indigenous ceramics were good enough for Spanish use and there was no need to change ceramic production to fit the market. In St. Augustine, ceramic studies of the Contact Period find that due to intermarriage between Spanish and indigenous groups there was an increase of indigenous goods and a decrease of Spanish ceramics used in households (King 1984:81). This was explained by indigenous women choosing to bring indigenous ceramics into the household due to their familiarity. As indigenous ceramics were used more often by the household, there was an increase of demand for indigenous ceramics. King’s study does not note any compositional data which is typical of the time but does find that ceramics were changing regarding the sociopolitical shifts that occurred even during the Contact Period. The changing markets of the Contact Period had a direct effect on the types of ceramics used and which ceramics were
chosen. The lack of Spanish goods combined with intermarriage led to a situation where the ceramic market shifted to favor indigenous ceramics (King 1984:81). Even today, changing markets have impacted the ways that ceramics are produced. In Cherokee, North Carolina tourism has influenced what goods are produced for consumption. Tourists want goods that reflect what they believe Cherokee and Catawba ceramics looked like, which do not reflect the reality. As a result, ceramics produced in Cherokee during the 1900s became focused on effigies of animals and chiefs rather than the traditional ceramics that had been produced before (Riggs 2010:40).

Changing markets will also often have a political component as well. Elite consumption of goods can put demands on the market and affect, what goods have high market values. Elite pressures on the market can put pressures on potters to produce certain types of pottery (Niziolek 2013:36). Saunders’ notes that, as the marketability and commercialization of indigenous ceramic goods grew, design elements like the filfot cross became increasing associated with “aspects of resistance and resilience; taste and agency; and, perhaps most directly, tradition and innovation” (Saunders 2012:96). Niziolek’s study of ceramic changes argued that increasing specialized ceramic production was due to the changes into elite markets in the Philippines serves as a useful cross-cultural comparison (Niziolek 2013). Using LA-ICP-MS analysis of ceramics in the Tanjay region, she found that groupings within the compositional data indicated that specialized ceramic production increased during a period of elite growth and political centralization. (Niziolek 2013:42).

Specialization is another aspect of ceramic analysis that can yield data on socio-political changes. At its most extensive, it can be assumed that specific groups are using chemically similar clays when compared to other social groups within the region (Costin 2000:386). These
specific groups can be aligned politically or economically which creates clusters within the ceramic assemblage. In Conambo, Ecuador, there were two distinct ceramic compositional groups which indicated groups separated by social and political divisions (Costin 2000:386). One way to remove doubts surrounding workshops versus many potters sharing the same ceramic sources is by understanding these groupings through “resource use” (Costin 2000:387). These groupings break down into two basic categories:

A. High resource use groupings – These indicate that there were most likely many individuals working with ceramic production and it would therefore be more dispersed within the population (Costin 2000:387). The higher variability within these ceramic, compositional groupings is more likely to indicate many people individually creating ceramics.

B. Low resource use groupings – These indicate that there were individuals sharing the same paste recipes and most likely indicates a workshop of some sort (Costin 2000:387).

Understanding these groupings can aid in this study’s attempt to tease out ceramic production centers and networks. As Worth notes, as the Mission Period developed into the mid-17th Century different ceramic groups and production centers began to emerge (Worth 2009). These pottery types, San Marcos and Jefferson, seem to indicate two different ceramic markets were developing within La Florida as was being integrated (Worth 2009). With compositional analysis, expected results distinct compositional groupings. This would show, which groups were trading and how much they were trading. The amount of each type within a site starts to paint a picture of emerging, informal, if not formal, indigenous and Spanish trade networks within the region.
Moving beyond understanding that choice is involved in ceramic production is the importance of understanding the lack of choice. This question is not quickly addressed, and there are arguments debating how much knowledge can actually be provided just through compositional analysis (Costin 2000). One way to understand sociopolitical change is through a comparative study. Having compositional data from the pre-contact and Contact Period helps to eliminate some of the issues regarding how to show change occurring. The pre-contact data creates a baseline data for the Contact Period ceramics to be compared against. The ceramics whose compositional characteristics change in the Contact Period should indicate different choices being made by the potter.

3.6 Conclusion

Overall, compositional analysis can aid archaeologists in understanding larger sociopolitical structures. Since colonialism and other massive socio-political changes often involve some level of societies and individuals moving around, it would posit that ceramic sourcing would also change at some level. Taking it further, sociopolitical change can also change trade networks and ceramic production.

Compositional analysis is already used to understand trade networks and ceramic sourcing in a number of global regions (Sharratt et al. 2009; Nizolek 2013; Costin 2000). As a tool, compositional analysis is a useful way of understanding these issues within the Southeast. Due to the lack of writing within pre-contact southeastern indigenous societies and biased accounts of the Spanish, compositional analysis can provide more information on how trade networks and production changed with European contact. It cannot speak directly of sociopolitical change, but it can indicate that changes were occurring within the region.
For this study, compositional analysis is used to understand what effects Spanish arrival had on paste recipes and the organization of ceramic production, and distribution. Within the sites of this study, I also expect to reach similar conclusions that other studies in the region have drawn (Saunders 2012; Worth 2009; King 1984; Riggs 2010; Cordell 2002). As the mission system solidified and strengthened its position within the region, there should be changes in the compositional signatures of the pottery being produced. This should either be in the compositional signature tightening around the mission structure or the destruction of established ceramic workshops.

4 CERAMIC ANALYSIS

4.1 Introduction

The current research included both visual analysis and compositional analysis through pXRF (portable X-Ray Fluorescence) of ceramic sherds. Visual analysis was concerned with identifying and typing ceramics along with a description of the sherds. pXRF analysis was used to understand ceramic groupings. Previous chapters discussed how these methods are used to understand larger theoretical questions.

In this study pXRF was the only method of compositional analysis undertaken. However, LA-ICP-MS is still discussed in this chapter due to its increasing archaeological use and its potential for future use to expand on this study. pXRF was used because the data provides a preliminary picture of ceramic groupings among assemblages from San Juan del Puerto, Nombre de Dios, and Fountain of Youth. These groupings can show how each site ceramic production was organized. As the ceramics from the Contact Period are added, it can show how production methods changed or stayed the same in both through time and place.
4.2 P-XRF Analysis

pXRF analysis is used to understand the chemical makeup of ceramics or other material remains. The machinery used, and the accuracy of these results rely on three concepts:

1) Sensitivity which is the minimum amount of an elemental concentration that can be detected given the conditions (Bishop et al. 1990:538).

2) Accuracy which measures how close a measurement of an element is to its actual concentration within the sample (Bishop et al. 1990:539).

3) Precision, which is how well the analysis can be repeated and obtain the same result (Bishop et al. 1990:540). Additionally, the incidence angle (the angle of the object and the machine) must be reproducible for the data to be reliable (Papadopoulou et al. 2006:1698).

The pXRF measures the ratios of different elements within the object. For this research, it detects and measures the amount of a chemical element to form a chemical fingerprint of the clay used to create ceramics. In order form the chemical signature of a ceramic, the pXRF uses X-rays to excite atoms within the piece and then reads those emissions. Each element has its own emission signature which is used to show the ratios of elements within a ceramic piece. It detects major, minor, and trace chemical elements. Typically, elements like barium (Ba), antimony (Sb), lead (Pb), strontium (Sr), potassium (K), calcium (Ca), manganese (Mn), iron (Fe), arsenic (As), rubidium (Rb), zirconium (Zr), and mercury (Hg) are measured by the pXRF (Liritzis and Zacharias 2011:109, 117). For this analysis, these ratios are used to create a type of “chemical fingerprint.” pXRF can be used to understand clay provenience, fabric similarities and trade exchange networks (Liritzis and Zacharias 2011:125). In this study, the pXRF is used to understand paste recipes. Since ceramics will carry this fingerprint and it is similar to the clay
from which it was made, it will provide information regarding the creation of the ceramic (Pillay et al. 2000:53).

However, there are limitations in using this type of analysis, and there are studies that discuss both the limitations and how to mitigate them (Hunt and Speakman 2015). A major issue is accuracy. Speakman et al. argue that sourcing ceramics is too difficult for the XRF machine and that INAA is a better, more accurate approach (Hunt and Speakman 2015:1). The pXRF does rely on the cleanliness of a bare ceramic piece and a well-provenienced ceramic collection. For the machine to be as accurate as possible, it requires a clean flat surface, homogenous samples, and algorithms that are based on reference materials and standards (Hunt and Speakman 2015:2). Despite this, XRF analysis is still a good method to use when the ceramics cannot be intrusively sampled (Hunt and Speakman 2015:3).

4.3 LA-ICP-MS

While LA-ICP-MS (Laser Ablation Inductively Coupled Plasma Mass Spectrometry) is not used within this initial study, it is a good tool to use going forward to get highly reliable data. LA-ICP-MS uses a laser to excite ions on a piece of ceramic. Those ions then travel to a second chamber which excites the ions further and gives off an emission that relates to the elements within the sample (Applied Spectra). It is used to directly test the chemical composition of solid samples. LA-ICP-MS was not used in this study because the ceramics would have to be sent off to another lab for testing. Additionally, there is a small cost associated with the use of LA-ICP-MS, and in a study of 312 samples it would have been prohibitively expensive at nearly $10,000. In the interest of saving time and money, pXRF analysis was the best method to use for an initial study.
The largest benefit of LA-ICP-MS is its ability to quickly produce data on the multi-element components of various materials (Woodhead et al. n.d.:135). Additionally, it does not require a lot of material preparation and is cost effective for the amount of data received (Sharratt et al. 2009:796). However, the accuracy of the results is questionable due to contamination in the ablation chamber along with any materials on the surface of the sample (Limbeck et al. 2015:6593). Additionally, the raw material and the paste of the ceramic may not closely match due to the introduction of temper and the reduction of clay inclusions (Sharratt et al. 2009:797).

The use of LA-ICP-MS in ceramic sourcing analysis is well established and reveals useful data in understanding ceramic production networks. In Nizolek’s 2013 study on the organization of earthenware production in the Philippines, she uses LA-ICP-MS in order to understand how production changes due to elite or non-elite contexts through dispersed or centralized production networks (Nizolek 2013:36). LA-ICP-MS data indicated that ceramic paste changed due to elite attempts to control the local populations' ability to get craft goods or as a result of the local population changing ceramic production to better take advantage of new trade networks (Nizolek 2013:36). Ultimately, Nizolek found that both production methods were occurring at the same time. Non-elite production continued to be relatively decentralized while elite ceramic production was centralized due to their links to foreign and long-scale trade (Nizolek 2013:36).

While LA-ICP-MS is not used in this study for a few reasons, in future studies it would be highly useful in fine tuning the different compositional groupings. This would help fine tune the results as well and make the analysis of these materials and their relation to Contact Period social changes even more accurate. PXRF analysis made the most sense for this project due to
time and money constraints, in the future a LA-ICP-MS analysis of these ceramics would be beneficial.

4.4 Ceramic Analysis of Sites

The three sites within this study (Nombre de Dios, Fountain of Youth and San Juan del Puerto) were all good candidates for p-XRF analysis. Regarding issues of accuracy and precision, these issues were measured through a known obsidian sample to ensure that any measurement issues could be caught before data analysis began. Unfortunately, there were no ceramic standards available for this region or for these sites. But the use of the obsidian standard mitigates these issues enough to show that the data collected from the machine is reliable.

San Juan del Puerto’s collection was in the worst shape of the three sites. After the site’s excavation, the materials had been mainly accessioned and left alone. This led to the materials being not correctly accessed into the larger UF collection. However, excavation data was intact. Each accession and bag number were organized by depth within the site. Additionally, the ceramics within the class had not been typed. However, the provenience and excavation data were still intact. Additionally, I felt comfortable typing the ceramics into, at minimum, pre-contact and contact periods. The ceramics from this site came from a general survey of the site and a postmold. Overall, the number of ceramics sources from San Juan del Puerto was 107 sherds. 61 of these were pre-contact, and 43 were contact period.

Fountain of Youth and Nombre de Dios are parts of the same site. Fountain of Youth contained the largest portion of the pre-contact period ceramics, while Nombre de Dios contained the largest portion of Contact period ceramics. These sites were much better accessioned than San Juan del Puerto and had already been divided into pre-contact and contact period contexts. When working with these sites, I also typed these ceramics as well to ensure that
what was on the accession paperwork matched what ceramics were being scanned. Additionally, both sites were better provenienced when compared to San Juan del Puerto. Additionally, the ceramics from these sites came from features rather than a general overview of the sites. From Fountain of Youth site, 116 ceramics were scanned. 86 of these ceramics were pre-contact and 30 were contact period. In Nombre de Dios, there were 89 ceramics scanned. One ceramic was pre-contact, and 88 were contact period.

In all, 302 ceramic samples were run through the p-XRF machine. Each sample was run for 120 seconds at 900kv40 mr, and every sample was put into a typology and described in a separate document. This was done in hopes that if different compositional groups began to appear, these groupings could possibly be tied to either different ceramic types or ceramics that were visually similar to each other. The results of these data are discussed in later chapters, but by using the p-XRF ceramic groupings should ideally begin to form and both change between sites and change over time can be understood to make larger conclusions towards how ceramic production was changing from the pre-contact through the contact period.

4.5 Conclusion

As discussed in this chapter, pXRF and LA-ICP-MS analysis are the two larger non-destructive methods of compositional analysis. Unfortunately, LA-ICP-MS was unable to be done on these ceramics at this time, but looking towards the future, it could be used for an additional study.

pXRF analysis the primary way that the compositional analysis is done within this research. The benefits of using pXRF far outweigh the limitations. Since this research is not necessarily done very often, especially in the Southeast, it works as a good introductory study into these research questions. Within this research, the compositional analysis instruments cannot
show exactly what indigenous groups thought, but it can begin to show the compositional groupings that can indicate ceramic production networks. Within this study, the goal of using pXRF and visual analysis is to understand production centers and production methods.

5 HISTORY OF COLONIALISM IN THE SOUTHEAST

5.1 Introduction

Contact between European and North American indigenous societies was a turning point in Southeastern indigenous history (Ethridge & Shuck-Hall 2009:37). However, contact with Europeans did not entirely destroy indigenous life. People rebuilt their communities and lifeways and picked up the pieces to form societies that still had traits from their lives pre-European arrival (Ethridge & Shuck-Hall 2009:39). However, the traditional political structures of the Mississippian Period did not work with the new political landscape and had to be altered (Ethridge & Shuck-Hall 2009:40). Because European arrival into the Southeast coincided with the collapse of chiefdoms, the Mississippian world would not survive the next 190 years (Ethridge & Shuck-Hall 2009:9). The Tusacrora War, Yamasee War, and the Natchez Revolt mark the collapses of the last major chiefdoms that still resembled those of the Mississippian Period (Ethridge & Shuck-Hall 2009:115).

5.2 Pre-European Arrival

The early Mississippian period (AD 900-1300) is characterized by societies of intensive horticulturalists that built large towns with mounds, shared a complex iconographic system, (Milanich 1992:3), and laid the foundations for the society that Europeans encountered upon their arrival to the continent. Villages were ruled by chiefs who had religious and political power, and there are examples of confederacies forming within the region (Milanich 1992:3).
Chiefly power came from relations with the supernatural which were the source of leaders’ status and authority (Ethridge & Shuck-Hall 2009:4).

There are two theories regarding the emergence of the Mississippian period from the Woodland period. Homology sees the emergence of the Mississippian period as coming from one core heartland and spreading across the east (Smith 1990:2). The second, analogy theory, proposes that cultural developments occurred independently and isolated from each other as a response to similar challenges that different groups faced (Smith 1990:2). One of the more important events in the Southeast during the Mississippian period is the rising importance of Irene sites around AD 1400, which became a focus for ceremonial life around the region (Anderson 1994:242).

The Mississippian period is generally characterized by settlements of large permanent towns, the adoption of maize-based horticulture, and the emergence of chiefdoms (Gallivan 2011:294). The emergence of maize as an important and dominant farmed crop from AD 800 – 1200 was one important step in the rise of trade and political relations during the period (Smith 1990:257). Along the coast, between AD 400 – 1000, communities relied upon marine resources and mainly deer as a terrestrial food resource (Hutchinson 1998:398), but there was a steady increase towards intensified maize production along the Georgia and Florida coasts starting around AD 1000 (Hutchinson 1998:409).

Ceramics also contributed to the development of distinct cultures and societies emerging during this time. There was a limited distribution of ceramic wares across the different groups which indicates distinct cultural boundaries within the Southeast (Gallivan 2011:299). Motifs and ceramic languages also indicated cultural boundaries. Each group had their own ceramic
languages and different ways of interacting with the other groups which are present in how the ceramics were decorated (Gallivan 2011:299).

Around AD 1200 there is evidence of heightened and more intensified warfare. This is archaeologically visible in an increased presence of palisades surrounding villages, abandoned villages, and abrupt cultural disjunction (Gallivan 2011:296). Warfare was an expression of chiefly power and was related to the religion within the Mississippian world (Ethridge & Shuck-Hall 2009:272).

The Late Mississippian period (AD 1350 – 1600) is characterized by chiefly power and other large communities breaking down. Their regional political power was diminished. At this point, most of the larger chiefdoms throughout the Southeast had broken down into smaller chiefdoms, and in Georgia they were scattered across the river valleys (Dobbs 2002). As the 1500s begun, the Spanish arrival begun in earnest in the region (Milanich 1992:4). The end of the Mississippian Period is characterized by increasing European presence and the collapse of indigenous power structures (Dobbs 2002).

5.3 Spanish Arrival

Spanish arrival onto the soils of the continental US occurred in Florida in AD 1513 (Ewen 1996:44). More expeditions followed, but there was limited contact with the indigenous groups in the region (Milanich 1992:4). There was a generational pause between the de Soto expedition (1539 – 1542) and further Spanish incursions into the southeast (Anderson 1994:63). It was not until 1633 that the first Spanish missions were built along the Florida coast (Ewen 1996:44).

The Spanish strategically chose to settle along the southeastern coast. Spanish history had been one of the Spanish often being colonized by different groups, most recently before
Columbus’ voyage, the Moors (Deagan 2003:4). Spanish colonization efforts began as an economic enterprise between the Spanish crown and the Spanish colonists (Deagan 2003:4). Economic failures and rebellions from both the indigenous population and lower-class Spanish colonists in North America led the crown to change its mission from an economic joint venture to a medieval approach to colonization (Deagan 2003:4). The Spanish elite enforced political and religious control through the domination of the subjects.

Spanish efforts to colonize differed from English efforts because of the mission system. The goal of the mission system was to convert indigenous groups to Catholicism (Ethridge & Shuck-Hall 2009:27). Through papal bulls and religious arguments, the Catholic Spanish empire declared that the indigenous population could not be enslaved as they were found to “have souls.” As such, it was the Spanish mission to convert the indigenous populations (Deagan 2003:6). One way they sought to convert the population was through the construction, maintenance, and operation of the missions. This was an attempt to mitigate the possible danger of rebelling natives by turning the population into obedient, working Catholic Spanish peasants (Mallois 2006:112).

Because of the religious mission of the Spanish government, the Spanish themselves were prohibited from selling guns to indigenous groups unlike other Europeans (Ethridge & Shuck-Hall 2009:27). Additionally, slaving and abusive treatment of indigenous populations were expressly forbidden by the Spanish government, which forced the Spanish to create and maintain good relations with the population (Hurst Thomas 2017:384). As a result, intricate trade networks between the indigenous populations and the Spanish were created. Despite the larger more “humanitarian” goal of the Spanish government, missionization efforts were still violent dominating endeavors that relied upon indigenous labor, and indigenous revolts are a sign of
discontented and angry population (Ethridge & Shuck-Hall 2009:28). In fact, the first Spanish interactions with indigenous groups in the Southeast were marked by violence and war (Ethridge & Shuck-Hall 2009:278). By 1680, the Spanish moved further south into Florida because of the decimation brought by English raiding and indigenous slaving raids (Ethridge & Shuck-Hall 2009:299).

5.4 San Pedro Period

The San Pedro Period (AD 1450 – 1625) is the first of the periods that this research project addresses. Ceramics from this period are dispersed across large areas with no clusters showing a centralized ceramic manufacture which then traveled to farming villages. This indicates a dispersed farming population with small village centers (Deagan & Hurst Thomas 2009:137). By AD 1600, San Marco ceramic production shifts from Timucua to Guale potters (Deagan & Hurst Thomas 2009:161). Through the years 1500 to 1539, Spanish ships reached the Atlantic and Gulf coasts of the Southeast and many coastal indigenous groups had already had limited contact with the Spanish before the major expeditions into the interior of the region (Anderson 1994:56). By the 16th and 17th centuries within the Spanish territory, the dramatic changes due to colonization had generally ended (Hoffman 1997:24). Instead, there was a period of internal stability where the initial social and political structures introduced during the colonial period were expanded (Hoffman 1997:24).

Several significant events mark the San Pedro Period. One of the most important events was Juan Ponce de Leon’s 1514 arrival to La Florida (modern day Florida) which marks the first Spanish arrival to the American coast (Milanich 1992:4). Twelve years later in 1526 along the Sapelo Sound, Georgia, the Spanish attempted to settle. The attempt failed after a few months (Milanich 1992:5). 1540 marks one of the first Spanish incursions into the interior of the
southeast with the de Soto expeditions (1539 – 1542). These expeditions were important since the Spanish, French, or English did not visit many of the indigenous groups they encountered during this time again for another 150 years (Anderson 1994:60). This makes these accounts of the expedition important in that these are the only European accounts of the indigenous groups before the long-scale ramifications of European arrival began.

By the 1550s, Spanish interest in the region grew as the Spanish sought to build new colonies to protect Spanish ships and watch for further European advancements into the continent (Anderson 1994:63). The Spanish government ordered earlier French settlement of Fort Caroline to be destroyed in order to have Spanish control over the region (Bennett 2001:34). After the Spanish victory at Fort Carolina in 1565, St. Augustine was settled, and this marks the beginnings of the Spanish mission system in the United States (Ethridge & Shuck-Hall 2009:26). However, in the upper Southeast in 1568, relationships with the indigenous populations begin to disintegrate along with French attacks on the Spanish as vengeance for the earlier destruction of Fort Caroline (Mallois 2006:42). Additionally, the Guale Revolt in 1597 stressed Spanish control of the Southeast. Guale Indians burned Spanish churches along the Georgia coast (Hurst Thomas 2017:388). This conflict was not solely focused on rebellion against Spanish occupation but also involved competing for indigenous power where the Franciscans were caught in the middle (Hurst Thomas 2017:388). Often because the Franciscans were involved in the economic systems, they became targets for groups with competing interests.

5.5 San Marco Period

The San Marco Period (also known as the Altamaha Period in some states and literature) spans A.D. 1625 to 1702 and is characterized by large-scale population movements during which inhabitants of the interior regions coming together in missions (Deagan & Hurst Thomas
A significant reason for these population movements was slaving raids on indigenous communities. In these slaving raids, women and children were targeted for capture while men were killed. Communities moved to save themselves and rebuild their lives (Ethridge & Shuck-Hall 2009:259). Material remains during this period are almost exclusively found within mission contexts (Deegan & Hurst Thomas 2009:138). In general, the coastal population movements reflect population movements across the southeast. The arrival of the Westos Indian group to the falls of the James River in Virginia by 1656 marks a period of massive slaving raids and population movement away from the area (Ethridge & Shuck-Hall 2009:81). By 1661, Westos and other groups began raiding the Georgia coast for slaves to bring to Jamestown (Ethridge & Shuck-Hall 2009:28). As a result, by 1684 the majority of Guale and Mocamas had moved south and left the Georgia coast virtually empty (Ethridge & Shuck-Hall 2009:29). It was also during this time that the Spanish begin to abandon the Georgia coast (Saunders 2004:178). This period was also marked by a significant religious and spiritual crisis for indigenous communities. Being removed from their lands and the sources of their own mythologies and core belief systems triggered a sociopolitical crisis (Ethridge & Shuck-Hall 2009:163).

5.6 Spanish Mission System

The mission system was the primary way that the Spanish colonized the Southeast. Physically, a mission consisted of at least two buildings; the church and the friary. There could also be a third building, a kitchen (Saunders 1996:24). However, the architecture of missions changed to meet the needs of the friars and the mission community (Saunders 1998:25).

Friars helped to bridge the gap between the indigenous populations and the Spanish (Hurst Thomas 2017:385). The friars had to ensure economic success, were involved with military engagements, and often interceded on behalf of indigenous populations (Hurst Thomas
Indigenous chiefs used that intercession to gain political power in both the Mississippian and Spanish world (Hurst Thomas 2017:385).

5.7 Effects of European Arrival on Indigenous Life

Bringing together these groups during this period had both social and political impacts. There are two main theoretical camps regarding how much change in indigenous life can be attributed to initial European arrival. Some scholars argue that the Spanish did not initially have a significant effect on the populations (Ewen 1995). Ewen’s 1995 work on the Anhaica Site in Florida proposes that the Spanish had little to do with the collapse of Anhaica culture. He found that catastrophic collapse (i.e., the reduction of exotic grave goods, changes in ceramic traditions, smaller homes) took place earlier in the Pre-Contact Period or in the late Contact Period rather than during the initial Spanish arrival (Ewen 1995:50). There were retaliatory strikes against the Spanish as Apalachee were forced to flee their homes, but he found no evidence of a biological epidemic that would have killed much of the population (Ewen 1995:51).

Other archaeologists note that new Southeastern chiefdoms and political organizations began to appear very rapidly after European contact (Milanich 1992:10). These charges were attributed to massive epidemics that decimated the native population (Milanich 1992:10). One of the most substantial changes during the Contact Period was the political changes attributed to interactions between Spanish and indigenous groups. Both simple and complex chiefdoms existed side by side during the Contact Period in the Southeast, but the presence of the Spanish contributed to upsetting the balance of power between these chiefdoms (Ethridge & Shuck-Hall 2009:9). Through the mission efforts, the Spanish shifted politics and lifeways to a more European-style sedentary, agriculturally based lifestyle (Hutchinson 1998:399). Giving and receiving tribute was already established in the Mississippian world before Spanish arrival, so
Spanish tribute began to be a direct link between chiefly power and access to Spanish goods (Hurst Thomas 2017:387). These Spanish goods were not particularly valuable to the Spanish but the goods in indigenous hands become more valuable.

There is evidence within the missions of culture contact and hybridization. In the Mission San Luis de Talimali, a large *buhio* was found directly across from the church. A *buhio* was an essential part of indigenous life where the longhouse was integral to chiefly power and central to Mississippian life (Hurst Thomas 2017:391). Indigenous groups also often brought Spanish materials into their lives and into their social worlds (Ethridge & Shuck-Hall 2009:27).

Socially, the transformations that occurred also resulted from the Spanish manipulation of indigenous socio-political systems with willing indigenous participation (Ethridge & Shuck-Hall 2009:18). By the 1700s, the cycle of slaving and the political and social rewards for the slaving raids create new cultures where slaving raids remained an important part of these societies (Ethridge & Shuck-Hall 2009:25). The Westos, who moved from Virginia to the Savannah River region, negotiated with European powers to ensure their survival (Ethridge & Shuck-Hall 2009:100). The Westos groups’ experience flies in the face of literature that assumes indigenous groups were unwitting objects of European manipulation. Despite the colonial system, the Westos, and other indigenous groups, still had degrees of autonomy and self-determination in the roles they would have in the colonial world.

5.8 **Conclusion**

As discussed in this chapter, the Southeast underwent a period of significant change between the Pre-Contact and Contact Period. The Contact Period is marked by new sociopolitical and economic systems emerging as the Spanish arrive and begin the mission system. These changes
transformed indigenous and Spanish life in the Southeast and affected all aspects of life including ceramic production.

6 SOUTHEASTERN CERAMICS

6.1 Introduction

Ceramics are physical manifestations of the knowledge of potters. Understanding the differences and similarities among sites through the material remains can be one entry to reconstructing the sociopolitical climate of the region (Ethridge & Shuck-Hall 2009:144). Changes in the ceramic record are often used as indicators of social change (Ethridge & Shuck-Hall 2009:151). For example, shared ceramics styles are often the product of long-term interaction between groups (Ethridge & Shuck-Hall 2009:190).

Southeastern ceramics studies have been very fractured in the past. There are different ways of understanding the same ceramic traditions across the state lines. Additionally, the different archaeological and anthropological histories of Spain and the southeastern United States has limited the conversation between the two groups (Ness 2017:20). Within Spain, ceramic studies would be categorized as a historic study while similar ceramic studies undertaken in the United States would be considered anthropology.

The first evidence of ceramics in North America was found in the Savannah River basin in 4500 BP. Sassaman (2004) argues that the rise of ceramic use along the coast indicates an increased reliance on and exploitation of marine and coastal resources (Thompson & Worth 2011:59). The typologies and groupings created by archaeologists are an attempt to understand their use within society (Braun 2014:107).

However, before the advent of ceramics, there are indications of societies across the Southeast possibly using baked clay as a tool for cooking technology during the Late Archaic
Period (3000 - 1000 AD) (Thompson & Worth 2011:59). These clay objects diffused across the Southeast at different rates, but these baked clay objects generally share the same characteristics of being fiber tempered (Thompson & Worth 2011:59).

6.2 Ceramics during the Pre-Contact Period

The area containing the sites studied in this project is part of the lengthiest periods of human occupation within Florida (Goggin 1947:122; Halligan et al. 2016; Russo 1988). The first ceramics produced in this region were the very early Orange series which are mainly found along the St. Johns River in small settlements (Goggin 1947:122). The majority of the pre-contact ceramics within this area are associated with the St. Johns Periods. Within these periods, there was an abandonment of fiber tempered Orange series in favor of a tan plain ware (Goggin 1947:122).

As the Woodland Period (1000 BC - 900 AD) ended a higher number of occupation sites were established which indicates populations increase (Ashley 2002:163). However, despite the growing population, there seem to be similar ceramics occurring at each site (Ashley 2002:165). This is in contrast to burial mounds and other elite contexts where there is ceramic variability and indications of non-local trade (Ashley 2002:165). Earlier studies (Ashley 2002) argue that the homogeneity of these assemblages is indicative of decentralized household level ceramic production. The evidence pointing to these conclusions is that there seems to be very little elite control over production and that households within the sites were somewhat autonomous (Ashley 2002:166).

Despite the possible autonomy of the villages, there was still significant long-distance trade occurring across northeastern Florida. Within sites, the presence of copper ear spools and ceremonial masks indicate trade networks (Ashley 2002:166). There is also evidence that non-
elites were engaged with trade with groups living in the south-central areas of Georgia including the Ocmulgee and the Altamaha rivers (Ashley 2002:166). Non-local, utilitarian ceramics are also found at these sites which shows that there were larger social and political interactions happening within the region.

During the Pre-Contact Period, the Guale are associated with Irene ceramics with a filfot cross design (Saunders 2012:94). In eastern Timucua groups, they are associated with St. Johns ceramics which are almost entirely check stamped (Saunders 2012:95). Mocana groups are associated with San Pedro ware which is generally cob marked or check stamped (Saunders 2012:95). The sites San Juan del Puerto, Nombre de Dios, and Fountain of Youth follow these chronological trends. Most of pre-contact ceramics are St. Johns plain or St. Johns check stamped. This is expected since all three sites are in the heart of the St. Johns region. It is expected that there were relatively decentralized household ceramic production levels. Later on, the next major development of these ceramics was the St. Johns Check Stamped within St. Johns II (Goggin 1947:122). It was during this period that the Contact Period begins. Archaeological records show that during the St. Johns periods, there was extensive occupation along the coast of northeast Florida. Since the Pre-Contact Period is associated with relatively decentralized ceramic production, it is expected that the sites in this study will follow the same pattern. The three sites should show indications of individual or household level production.

6.3 **Ceramics during the Mission Period**

An increasing lack of ceramic variability characterizes Mission Period ceramics (Saunders 2012). This was a result of new alliances forming and changing market demands (Saunders 2012:96). San Marcos ceramics dominate the Mission Period. This is despite the multiple groups and cultures with different ceramic traditions coming together within mission
walls (Saunders 2012:96). San Marcos emergence in Florida is attributed to the growth of the mission structure and the removal of the Guale in Florida (Saunders 2012:95). Despite the decline in ceramic variability, a significant, pre-contact motif remains in use. The filfot cross, a world symbol, which had meanings from the Woodland Period and would have been understood by most of the regional tribes through the Mission Period (Saunders 2012:96).

The initial markets between Spanish and indigenous groups generally revolved around the trade of deer skins and other animals in exchange for Spanish goods like bells and wax (Waselkov 1989:117). In the later years of the Mission Period, there was extensive trade between the Spanish, indigenous groups living on mission, and the interior, non-missionized, indigenous groups (Waselkov 1989:118).

Most of the ceramics found at St. Augustine, Florida are indigenous coarse earthenware, specifically, St. Johns ceramic types (King 1984:77). This is expected since the Timucua group was present at St. Augustine. Additionally, at St. Augustine, there was not a drastic change in indigenous ceramic forms, but there was an increasing switch to a Spanish style of making ceramics (Graham 1998:33). This is indicative of the larger society within the mission contexts where Spanish men were marrying indigenous women, and the lack of Spanish goods required the missions to rely upon indigenous material culture for everyday use (Graham 1998:34). This resulted in the use of indigenous ceramics that fulfill Spanish needs, like olive jars, while other Spanish ceramics, like majolica, were imported (Graham 1998:34). Ultimately, the strongest hold of indigenous ceramics was in household kitchen production (Graham 1998:34). With this hybridization because of these populations living closely together, Spanish and indigenous groups started to mimic each other’s ceramic traditions. There is evidence that indigenous
ceramics began to put handles onto ceramics which would mimic *ollas*, a Spanish ceramic form (Ness 2017:94).

Within the sites included in the present study, which are very physically near St. Augustine, the trends of the Spanish mission system should be expected to be visible also. The sites should reflect some hybridization of Spanish and indigenous cultures. Additionally, the high rate of indigenous goods when compared to Spanish goods would indicate that, like St. Augustine, the missions had to rely on indigenous goods for their own ceramics. The level of ceramic production within the missions is unknown. Ceramic production may have remained relatively decentralized or production may have shifted to workshops to target the Spanish needs for supplies. Decentralized ceramic production would indicate that individuals still had to produce ceramics that they needed at that moment while a centralized ceramic production would indicate the possibility that indigenous groups came together to make ceramics that the mission would use, and they relied upon a few ceramic production centers. Additionally, friars may have imposed centralized ceramic production groups. Decentralized production could be an indication that the mission system was not as destructive to indigenous production. Instead, the indigenous population could continue to produce as they had using traditional paste recipes. Centralized production could be an indication that indigenous groups were taking advantage of new economic markets within the region. Individuals or small groups of people may produce ceramics for a larger part of the community rather than just for their household.

6.4 Conclusion

As discussed, pre-contact ceramic production and pre-contact life, in general, was much more interconnected in the Southeast than previously thought. The pre-contact world, especially in northeastern Florida, involved connections with groups as far north as Ocmulgee River (311
miles) and were also connected with groups further east along the coast. It reveals that there were significant trade interactions happening in this region before Spanish arrival.

The Contact Period ceramic history shows how interconnected and messy this process was for both the Spanish and the indigenous groups. The Spanish had to rely on indigenous ceramics as their goods broke, and the indigenous groups incorporated Spanish ceramic styles into their own pottery. Additionally, established pre-contact political and economic structures collapsed resulting in a reduction in long-distance trade.

7 RESEARCH DESIGN

7.1 Introduction

The research examines how ceramic production may be impacted by sociopolitical change, specifically contact and conquest. Therefore, identifying archaeological sites with both pre-contact and contact contexts was critical to the research design. If one site was solely pre-contact and another was solely contact, it would yield no meaningful information about ceramic production during the initial Contact Period. Before choosing the sites at the University of Florida, I visited other repositories. Unfortunately, these sites at those repositories did not fit the criteria needed for the research question.

While working with the Florida Museum of Natural History’s collection, the three sites which fit the needs of the research best were San Juan del Puerto, Nombre de Dios, and Fountain of Youth. All three sites had a pre-contact context as well as a Contact Period context. Additionally, the sites had been excavated over the past 70 years and associated excavation documentation was available. Fountain of Youth and Nombre de Dios are located just North of St. Augustine, Florida. San Juan del Puerto is northeast of Jacksonville, Florida (Figs 1 and 2).
Figure 1 Map of Florida with sites highlighted, Florida Historical Society

Figure 2 San Juan del Puerto, Nombre de Dios and Fountain of Youth marked, Florida Historical Society
The goal of the current research was to reconstruct the organization of ceramic production in both the pre-contact and Contact Period at multiple sites. Understanding pre-contact production would aid in the comparison to contact production. By looking at ceramic production changes, then it can tease out the ways that society was changing.

### 7.2 Samples

The three sites within this study are San Juan del Puerto, Fountain of Youth and Nombre de Dios. As mentioned in previous chapters, the study in total analyzed 256 utilitarian, non-diagnostic ceramic sherds. Including all three sites, 66 of these were pre-contact, and 197 were Contact Period. The sample of analyzed sherds was relatively evenly distributed across the three sites. In total there were 26 unidentifiable sherds found in either pre-contact and Contact Period contexts, but they were scanned as well. Unfortunately, due to the size and lack of identifying markings on the sherds, they could not be accurately typed but were able to be placed in a time period. However, excavation data was intact. The ceramics from this site came from test excavations of the site and a postmold, and each accession and bag number were organized by depth within a given context. While the ceramics from the site had not been typed, I felt comfortable typing the ceramics into, at minimum, pre-contact and Contact Periods. These sherds do have limited utility the study since they cannot be traced back to a specific ceramic type. For example, if any of these unidentifiable sherds became marked as an outlier or distinct, there would be no way to connect that sherd to a specific type that could be indicative of large-scale trade or even Spanish-imported goods. Additionally, there were no diagnostic ceramics within the collections. All diagnostics had been removed and placed in a separate area of the collections at FMNH.
The samples are all curated at the University of Florida’s Florida Museum of Natural History. Sample selection was influenced by which samples were appropriate to the research question and be available and accessible during a limited time visit. Additionally, they were chosen because they came from sites with both a pre-contact and Contact Period context. From these sites, I chose what samples to analyze with pXRF with the aim of having a roughly equal amount of pre-contact and contact ceramics.

Fountain of Youth and Nombre de Dios are parts of the same site. Fountain of Youth contained the largest portion of the Pre-Contact Period ceramics, while Nombre de Dios contained the largest portion of Contact Period ceramics. These sites were much better accessioned than San Juan del Puerto and had already been divided into pre-contact and Contact Period contexts. When working with these sites, I also typed these ceramics as well to ensure that what was on the accession paperwork matched what ceramics were being scanned. Additionally, both sites were better provenienced when compared to San Juan del Puerto. The ceramics from these sites came from features rather than a general surface collection. From Fountain of Youth site, 90 ceramics were scanned, of which 48 ceramics were pre-contact and 42 were Contact Period. In Nombre de Dios, there were 84 ceramics scanned. One ceramic was pre-contact, and 83 were Contact Period.

In all, 256 ceramic samples were run through the pXRF machine. Each sample was run for 120 seconds at 900kv40 mr, and every sample was put into a typology and described in a separate document. This was done in hopes that if different compositional groups began to appear, these groupings could possibly be tied to either different ceramic types or ceramics that were visually similar to each other. The results of these data are discussed in later chapters, but by using the pXRF ceramic groupings should ideally begin to form and both change between
sites and change over time can be understood to make larger conclusions about how ceramic production was changing from the pre-contact through the Contact Period.

As mentioned in previous chapters, the study in total analyzed 256 utilitarian, non-diagnostic ceramic sherds. Including all three sites, 66 of these were from pre-Contact, and 197 were Contact Period contexts. Of the three sites, they all were relatively evenly distributed in the number of sherds scanned by the pXRF. In total there were 26 unidentifiable sherds found in either pre-Contact and Contact Period contexts, but they were scanned as well. Unfortunately, due to the size and lack of identifying markings on the sherds, they could not be accurately typed but were able to be placed in a time period based on context of that particular bag. The sherds do limit the study since they cannot be associated with a specific ceramic type. For example, if any of these unidentifiable sherds became marked as an outlier, there would be no way to connect that sherd to a specific type that could be indicative of large-scale trade or even Spanish-imported goods. Additionally, there were no diagnostic ceramics within the collections. All diagnostics had been removed and placed in a separate area of the collections at the Florida Museum of Natural History (FMNH).

The samples are all curated at the University of Florida’s Florida Museum of Natural History. Sample selection was influenced by which samples were appropriate to the research question and be available and accessible during a limited time visit. Additionally, they were chosen because they came from sites with both a pre-contact and Contact Period context. From these sites, I chose what samples to analyze with pXRF with the aim of having a roughly equal amount of pre-contact and contact ceramics.

The sites were selected with assistance from Dr. Donna Ruhl and Dr. Gifford Waters at the Florida Museum of Natural History. After conversations about what would be needed from
the sites to answer the research question, they proposed a number of sites that would be best for this project. Ultimately, San Juan del Puerto, Nombre de Dios, and Fountain of Youth were best suited to the research questions. They have all been scientifically excavated, and all have excavation reports available past excavations.

7.3 San Juan del Puerto

7.3.1 Site History

San Juan del Puerto was first settled by the French as Fort Carolina in 1562, but by 1565 the Spanish had gained control of the area and drove out the French (Dickinson 1989, 398). Within the following year, the first Jesuit missionaries arrived on Saint George’s Island to establish a mission for the Timucuan peoples (Dickinson 1989, 398). As the missionaries arrived, they were caught by the Timucuans and murdered. There were no further missionary attempts on the island until the 1587 intent to establish the Mission of San Juan del Puerto (Dickinson 1989, 398). In 1597 the Guale revolt north of San Juan led to the Guale peoples and the friars of the northern missions relocating to San Juan until the danger had passed in 1603 (Dickinson 1989, 398).

By the end of the 1660s, San Juan del Puerto was one of the few Mocama missions to survive (Worth 1995, 20). By the 1680s, pirates were raiding and vandalizing the mission (Worth 1995, 36). In the end, the Spanish chose to retreat from the area and move the populations that had been under attack to San Juan (Worth 1995, 39). The San Juan mission was one of the longest lasting mission sites in Florida (Dickinson 1989, 398). The site was established in 1587, and by 1602 nearly 500 indigenous individuals lived within the mission (Hurst Thomas 1987, 63, part 2:90). The occupation of the mission was ended in 1702 by the armies of Governor Moore (Hurst Thomas 1987, 63, part 2:90). After the abandonment of San Juan to the British, the area
was owned by various agriculturalists, and the site was used for agriculture until after the end of the Civil War (Dickinson 1989, 399).

7.3.2 Excavation History

The first excavations at San Juan del Puerto occurred in 1951 under the supervision of John Griffin (Hurst Thomas 1987:90). In the late 1960s, William Jones and John Griffin undertook test excavations in order to locate the structures of the mission itself (Dickinson 1989, 399). In 1985 research continued at the site with Martin Dickinson and Lucy Wayne’s excavation (Hurst Thomas 1987, 63, part 2:91). During this excavation, they found there was an earlier limited Timucuan occupation and then a heavier Guale occupation of San Juan. The occupation was identified through the limited presence of St. Johns ceramics and a large quantity of San Marcos ceramics (Dickinson 1989, 401). However, Dickinson found that the lack of St. Johns could have been due to a lack of diagnostic St. Johns ceramics or lack of access to the clay traditionally used for St. Johns in the area and that the scope of the Timucuan occupation may have been larger than suggested (Dickinson 1989, 401).

7.3.3 Samples

I sampled 82 sherds from San Juan del Puerto. Of these 82, 17 were pre-Contact and 65 were Contact Period. Most of the pre-Contact ceramics were Saint Johns Plain (n=12). St. Johns Basketry Impressed (n=2), Mission Red Slipped (n=1) and unidentifiable (n=2). and most of Contact Period ceramics were San Marcos Plain (n=30). San Marcos Stamped (n=16), San Marcos Incised (n=9), Mission Red Filmed (n=4), and plain Colono-ware (n=2) made up the rest of the samples.
7.4 Fountain of Youth

7.4.1 Site History

The area that compromises Fountain of Youth is the site of the initial Pedro Mendez de Aviles encampment in 1565-1566 (K. A. Deagan 2013, 360). This encampment was likely the first fort or encampment for the founding of St. Augustine (K. A. Deagan 2013, 361). The Fountain of Youth site comprises the Timucuan village portion of the Nombre de Dios mission (Hurst Thomas 1987, 63, part 2:90). The initial site of the Nombre de Dios mission seems to be in a small area that is within the modern boundaries of the Fountain of Youth Park (K. Deagan 2012, 21).

Post-1768 and the British incursion into Florida, the land was sold to a number of agriculturalists until the end of the Civil War where the property was bought by a gardener (K. Deagan 2004, Florida Museum of Natural History Miscellaneous Project Reports in Archaeology:9). It was then opened as a tourist attraction celebrating the supposed first landing of the Spanish onto Florida (K. Deagan 2004, Florida Museum of Natural History Miscellaneous Project Reports in Archaeology:9).

7.4.2 Excavation History

Excavations were carried out at the site beginning in 1934 until 2008 (Cordell and Deagan 2013, 95). Ray Dickson, Vernon Lamme, and Matthew Stirling all excavated in the early 1930s after the discovery of burials at the site (K. Deagan 2004, Florida Museum of Natural History Miscellaneous Project Reports in Archaeology:13). Excavations were also undertaken in 1951 and 1953 by John Goggin although no records of the excavation locations remain (K. Deagan 2004, Florida Museum of Natural History Miscellaneous Project Reports in Archaeology:13).
The vast majority of modern excavations (from 1976 onwards) have sought to discover the Menendez period occupation to understand Spanish arrival (K. Deagan 2004, Florida Museum of Natural History Miscellaneous Project Reports in Archaeology:14). It was during these excavations that the extent of the pre-contact Timucuan settlements was discovered and understood (K. Deagan 2004, Florida Museum of Natural History Miscellaneous Project Reports in Archaeology:14).

7.4.3 **Samples**

A total of 90 ceramics were analyzed from the Fountain of Youth site. Fifteen were unidentifiable. Of the identifiable ceramics, 48 were Contact Period, and 42 were pre-Contact. Most of the pre-Contact ceramics were St. Johns Plain (n=22), with a limited number of St. Johns Check Stamped (n=1), St. Johns Checkmarked (n=2), St. Johns Incised (n=1), and St. Johns Simple Stamped (n=1). In the Contact portion, San Marcos Plain made up most of the ceramics (n=13), followed in abundance by San Marcos Stamped (n=10). San Marcos Incised (n=1), Mission Red Filmed (n=1), and plain Colono-ware (n=1) were also contained within this data set.

7.5 **Nombre de Dios**

7.5.1 **Site History**

Nombre de Dios was one of the first Spanish missions established within North America (Hurst Thomas 1987, 63, part 2:90). It was occupied from around 1587 until 1763 (K. A. Deagan 2013, 369). The area was previously occupied by a Timucuan population of which a large portion had converted to Christianity (K. A. Deagan 2013, 369).

During the initial settlement of the area, the Spaniards were met with hostility that drove them to a neighboring island until 1572 (K. Deagan 2012, 12). After they were able to return to
the area safely, the Spaniards moved on to settle St. Augustine staying in the Nombre de Dios and Fountain of Youth area for fortification. In 1573 the first Franciscan friars arrived at the St. Augustine area to establish mission churches (K. Deagan 2012, 20). By 1587 Nombre de Dios became a formalized Spanish mission site and mass moved from St. Augustine to the mission (K. Deagan 2012, 22).

By the early 1700s, conflicts between the Yamassee and the British began and pushed Yamassee groups into Nombre de Dios for protection from the conflict (K. Deagan 2012, 27). By 1728, British raids into Nombre de Dios caused the governor of St. Augustine to declare the area to be destroyed in order to prevent British use for their raiding missions (K. Deagan 2012, 27).

7.5.2 Excavation History

The site was discovered in the early 1930s when a burial at the Fountain of Youth site was discovered. Nombre de Dios underwent extensive excavations in 1934 which were mainly concerned with the burials within the park (K. A. Deagan 2013, 369). Despite a larger Christian Timucuan population, there were indications that the population had not completely become “Spanish.” Traditional burial practices such as a human skull deposit into the burials were still occurring during the initial years of the mission (K. A. Deagan 2013, 370). In 1951 another excavation was directed by Charles Spellman with the University of Florida to find the shrine of La Leche within Nombre de Dios (K. Deagan 2012, 33). Excavations in 1976 by Kathleen Deagan and again in 1985 by Ed Chaney sought to understand the colonial period of Nombre de Dios (K. Deagan 2012, 41, 43).

The most recent excavations of Nombre de Dios took place in 2011 and were conducted by the University of Florida and the St. Augustine Archaeological Association (K. Deagan 2012, 2). This excavation found that the presence of both St. Johns ceramics and San Marcos ceramics
may be indicative of Guale and Timucuan interactions during the Mission Period (K. Deagan 2012, 119). Despite this, excavations found that there was little pre-contact settlement of the site and instead there was a Timucuan settlement that was closer to the current Fountain of Youth site instead (K. Deagan 2012, 133).

7.5.3 Samples

A total of 84 ceramics were examined at the Nombre de Dios site. Of these 84, one was pre-Contact, and 83 were Contact. Eleven ceramics were unidentifiable. The pre-contact ceramics were St. Johns Check Stamped (n=1). Within the Contact ceramics, most of the ceramics were San Marcos Stamped (n=29) and San Marcos Plain (n=19). Mission Red Filmed (n=5), plain Colono-ware (n=17), Dunn’s Creek Red (n=1), St. Johns Plain (n=1), unidentifiable (n=8) and San Marcos Incised (n=1) make up the rest of the ceramics.

7.6 Methods

This research integrated three methods. The first was a simple visual analysis, the second was pXRF analysis, and finally a statistical analysis of the pXRF data. Additionally, the ability to quickly measure a lot of data (for this project 312 ceramic sherds) allowed for quicker visits to collections. It also allowed me to immediately begin results analysis rather than waiting on results to be sent back from other labs unlike LA-ICP-MS or INAA analysis methods. Finally, being able to access the machine for free through Georgia State University was critical in choosing this method. It reduced costs and made the research more feasible, especially for a student.

Visual analysis of the ceramics was not the primary focus of this research. Due to time constraints, a visual analysis of the paste was not conducted but would be integrated into future work. Instead, the visual analysis focused on describing the ceramics within the study. This was
done to ensure that if the compositional data indicated any outliers among the sample of sherds, there was a physical description of the ceramic. It would help determine if these outliers fell into a physical set where they all shared similar tempers, interiors or exteriors. This would be used to bolster analysis to describe any chemical groupings better and be able to infer what types of ceramics were making up these distinct groupings. Overall, most of the ceramics that were recorded were undecorated utilitarian ware. However, there were decorated utilitarian ceramics that were stamped or incised as well. There were no motifs related to the Southeastern Ceremonial Complex or other religious iconography found on any of the ceramics.

I used pXRF as my second method of analysis. As discussed in Chapter 4, pXRF was chosen over other methods of analysis due to its accessibility, ease of use and minimal cost. The machine was available through Georgia State University’s anthropology department, and it was easily transportable to the University of Florida where the data collection took place.

The more significant issue is how to relate the larger theories surrounding social, political change with actual ceramic compositional changes. The connection between the ceramicist and the chemical changes that occur are not easily read by a pXRF machine or by LA-ICP-MS, as in this study but require interpretation by the archaeologist. Methodologically, the best way to account for compositional variables is through ethnographic or ethnohistoric analogy (Arnold, Neff, and Bishop 1991:71). However, there is a larger issue within the Southeast of the ability to get ethnographic ceramic data. Unfortunately, many of the tribes that populated the region at the time of contact have been moved from the region or have disappeared altogether. The best ethnographic data for this period is the Spanish accounts. There are issues, of course, by using sources written by individuals who were attempting to force a cultural change onto the
community. However, bits of truth can still be gleaned from these documents, especially when looked at it critically for bias.

The ceramics that were chosen for pXRF were taken from either features (i.e. postmolds or hearths), in the case of Nombre de Dios and Fountain of Youth, or from systematic test units at San Juan del Puerto. The ceramics were chosen based on their ability to be read by the machine. In order to successfully collect compositional data by the machine, the sherds had to be relatively free of dirt or any other surface contaminants. The ceramics were also chosen for their ability to have both a pre-Contact and Contact context within each test unit. For San Juan del Puerto this involved scanning ceramics from entire test units until the bottom layer of excavation. For Fountain of Youth and Nombre de Dios, when choosing the features, I attempted to choose an equal number of pre-Contact and Contact Period ceramics.

When running the pXRF, the ceramics were run on the 900F490 40Kv mr setting. The mr setting is a mudrock setting calibrated by Bruker for ceramics. The pXRF also has a 900F490 15Kv mr setting; however, due to a limited amount of time at the University of Florida, it was not feasible to rerun all ceramics at this setting. The ceramics were all scanned for a total of 120 seconds under the radiation shield to prevent any outside noise from impacting the data and for the researcher’s safety. To mitigate any issues with inaccurate samples and results due to machine error, each day a piece of obsidian with known compositional data was measured and compared to the previous day. When running the pXRF, the ceramics were run on the 900F490 40Kv mr setting. The “mr” This ensured that the precision, at least for this sampling process, was precise and that the precision and its accuracy were accurate to the obsidian samples.

Finally, statistical analysis was conducted using the GAUSS 5.0 program. This software was developed through the archaeometry laboratory at the University of Missouri. The raw
pXRF data was cleaned up, and the data were given designations based on the site and the period within each site. Additionally, as suggested by Hunt and Speakman, all chemicals except potassium (K), calcium (Ca), titanium (Ti), manganese (Mn), iron (Fe), cobalt (Co), zinc (Zn), arsenic (As), rubidium (Rb), strontium (Sr), yttrium (Y), zirconium (Zr), niobium (Nb) and molybdenum (Mo) were removed from the data (Hunt and Speakman 2015). Research by Hunt and Speakman have shown that the range of elements that the pXRF analyzes often acts as if the object being measured is for an environmental study rather than an archaeological one. Their solution is to remove the elements that are unreliable for archaeological studies (Hunt and Speakman 2015:638). The data were analyzed by time period and then by possible compositional groupings. This was done to test the robustness of the compositional grouping and ensure that the groups were true compositional groups. The first step before beginning statistical analysis involved transforming the data into log base which standardized the data for the analysis. The initial analysis included breaking down the groups into hierarchical clusters. Next, the data were put into bi-plots and plotted to see if there were any groupings within each context of the sites. The Mahalanobis distance probabilities were essential for creating the groups. The distance probabilities helped to refine the groupings and to prove that the groupings were correct (Niziolek 2013:260).

7.7 Hypothesis

The following hypothesis tested in this project is that the social disruption associated with Spanish contact in the southeast impacted ceramic production, resulting in a shift from dispersed to centralized production as populations aggregated and moved into missions.

This hypothesis fits the model of pre-contact and post-contact life within the southeast. Pre-contact, the landscape of the southeast was made up of dispersed village settlements with
maize agriculture with household ceramic production (Gallivan 2011, 294). By the time of Spanish arrival, warfare had broken these large chiefdoms into smaller dispersed settlements centered along the river valleys (Dobbs 2002). As a result, ceramic production should be centered at the household level rather than a workshop.

As the Mission Period began, these villages moved into the mission structure. As a result of competing European interests in the area, inter-tribal warfare, and an increase of slaving raids, indigenous populations began to move into the mission structure for protection (K. A. Deagan et al. 2009, 137). As a result, there should be tightening of compositional groupings within these mission structures. There could be less knowledge of the local paste recipes, and as a result, many different individuals are making ceramics from the same recipe. Another additional explanation is that individuals were making similar choices in paste recipes without being taught the local paste recipe. Both of these scenarios are explained by populations moving into the mission structure and having to make ceramics for their own use.

Testing this hypothesis provides an avenue for examining how one particular aspect of indigenous life was or was not impacted by the social disruption wrought by Spanish contact. While this research cannot necessarily identify how the individuals felt about moving into missions, it can answer questions about how indigenous peoples restructured their lives, specifically around craft production, a central component of daily life. Understanding how ceramic manufacture changed and reformed within the mission structure can show how these individuals have reoriented their lives in response to the new pressures and conflicts within their world.
7.8 Correlates

Due to the research that shows that there was a change in the village and political structures, it is to be expected that ceramic production will change as well. I also expect that there will be reasonably little chemical overlap between the pre-contact and Contact Period ceramics since there was a high amount of population movement. Regardless, if the hypothesis is either rejected or accepted there should be a minimal amount of non-local ceramics within the data. This would be correlated with both the dispersed settlements of the Pre-Contact Period and the confusion of the initial Contact Period.

If the hypothesis is supported, the data will show dispersed or very little compositional groupings during the Pre-Contact Period. As the Contact Period proceeded and populations came together within the missions, there should be an increase of distinct compositional groupings within the data. These will be less dispersed than the Pre-Contact Period.

If the data reject the hypothesis, there will be little to no change between the pre-contact and Contact Period settlements. Although the lack of change does indicate interesting aspects of indigenous society, namely that communities continued to use known sources and ceramic production centers remained the same, it does not answer how communities change because of contact.

Whether the hypothesis is accepted or rejected, this study addresses aspects of the pre-contact to Contact Period southeast world. The changes that are expected show that ceramic production had to adapt in the new sociopolical world of the Contact Period and that under the Contact Period there was a limited amount of paste recipes and populations had to rely on those rather than multiple recipes that were already known. If the hypothesis is rejected, then it shows that the Contact Period was not as destructive to indigenous ceramic production than the
hypothesis suggests. Overall, the expectations of this work are that due to the history of the region that there will be changing ceramic chemical compositions.

7.9 Ethics

One of the critical aspects of this research was doing this research as ethically as possible. Since the materials for study are indigenous, it is critical that the groups not be essentialized. Each of these groups underwent similar circumstances. However, there was no set way that any person within these groups reacted or lived through these experiences. It is important to acknowledge that despite these ceramic assemblages being studied together, they encompass the experiences of many different groups and individuals living at San Juan, Fountain of Youth or Nombre de Dios.

The history that is being studied is not my direct history but is a legacy of European colonization. It is straightforward to view this period from a distance rather than a history that still has consequences for indigenous groups today. However, this view must be confronted when doing this type of research. It must be viewed within in the context of past US history and the ramifications it has had within the United States today.

Additionally, it was imperative that none of these ceramics came from any funerary or religious contexts. Since funerary and religious materials are still used and sacred to these groups here and many groups do not want those materials to be studied, it was essential to ensure that this study respected those beliefs (Norder 2010:394). The North American Graves Repatriation Act in 1990 (NAGPRA) was a culmination of efforts to return culturally significant objects and human remains that had been looted or illegal taken and displayed back to the tribes. Because of NAGPRA, the funerary and religious ceramics have been removed from the collection of study
and placed in a different area of the collections department awaiting repatriation. As a result, there were no, to my knowledge, any materials of religious or funerary origins.

7.10 Conclusion

Ultimately the key to answering this research question is the sites that were chosen. San Juan, Fountain of Youth and Nombre de Dios all have the materials and the excavation histories to begin to answer the questions regarding ceramic production. In the next chapter, the results of the pXRF analysis are presented.
8 RESULTS

8.1 Introduction

After the pxrf analysis, the statistical program GAUSS 5.0 was used to analyze the compositional groupings. In each of the pre-contact and Contact Period portions of the sites, the groupings were compared between total pre-contact analysis to Contact Period sub-groups. This was done to understand if the paste recipes were changing during the shift from pre-Contact to Contact. Additionally, each period of the sites was analyzed to see if there were any compositional groupings within that period.

The elemental analysis first consisted of limiting the elements to be analyzed to 14. The next step was to remove elements that were below levels of detection and would provide no meaningful information. Then, all remaining elements except potassium (K), calcium (Ca), titanium (Ti), manganese (Mn), iron (Fe), cobalt (Co), zinc (Zn), arsenic (As), rubidium (Rb), strontium (Sr), yttrium (Y), zirconium (Zr), niobium (Nb) and molybdenum (Mo) were removed from the data set. As Hunt and Speakman argued, all of the elements that the pXRF tests for are not always reliable or useful for an archeological study and the most reliable were these 14 (Hunt and Speakman 2015:638). Next, the data were transformed into Log-10. Transforming the data is important because only logged data can be used for principle component analysis (Niziolek 2003:250). This was done to ensure that the data was then divided by site, and then each site was divided by period. Initially, the data were put into hierarchical clusters to look for major groups. Most of the analysis involved elemental biplots of the different groups and sites. From the elemental biplots, visual analysis tentatively formed the groups. Divisions into pre-Contact and Contact period were based upon the typologies assigned by myself. The groups and the sites then underwent principle component analysis. The principle component analysis makes the variables
more manageable without losing any valuable information in order to understand patterns in the data (Niziolek 2003:255). The principle components associated with the total Fountain of Youth ceramics were potassium and calcium. PC1 and PC2 at Nombre de Dios are associated with potassium and calcium as well. At San Juan del Puerto, PC1 and PC2 were associated, again, associated with potassium and calcium. While there were outliers within each period of these sites, the outliers are not plotted in this discussion. Since the outlier groups were so small, it limited the Mahalanobis distance probabilities to 5 or fewer factors which significantly affected the groupings themselves. After the groups were established through Mahalanobis probabilities, the groups were again plotted using elemental biplots. After each group had been plotted, pre-Contact and Contact groups were plotted against each other.

Each period of the sites was then plotted using principle components. From there, groups were tentatively defined through the results of these graphs. Mahalanobis distance probabilities were then used to further define and refine the groupings within each site. Defining these groups was done tentatively, as with pXRF analysis the distance probabilities can be statistically very close. In situations where the distance probabilities fell within 1-2% of moving the sherd to a different group, the sherd was left in its initial grouping. Frequently, if the sherd was moved to the different group, the distance probability remained the same, and the sherd was suggested to be moved back into its original group designation. For example, if a sherd had a 48% probability of being in Group A and a 52% probability of being in Group B, the sherd was left in Group A. If the sherd was moved to Group B, it would often show that it had a higher probability of belonging to Group A. When the sherds were that close to being in another group, moving the sherd to another group would not change the group designation. Instead the sherd would be
assigned to be moved back to its original group designation. In these situations, the best solution was to leave the sherd in its original group.

8.2 Fountain of Youth

8.2.1 Pre-Contact

The total ceramics within the Pre-Contact Period of Fountain of Youth consists of 48 sherds. Two groups were found within these materials.

![Figure 3 Fountain of Youth, Pre-Contact Groups](image)

Group A consists of 21 sherds, of which 13 of them were more concentrated together compared to the remaining sherds. Overall, neither group was tightly clustered. However, Group A is distinct from Group B with no overlap between the two. FYA83 is outside of the confidence ellipse. However, Mahalanobis distance probabilities reliably place this sherd within Group A when compared to Group B or the outliers.
Group B consists of 27 sherds. The ceramics within these groupings are much tighter
within the confidence ellipse when compared to Group A. Two sherds fall outside of the
confidence ellipse (FYA28 and FYA40) but when they were placed within the Mahalanobis
distance probability with Group A.

8.2.2 Contact

Two groups are contained in the Contact Period portion of this site. Group A consists of
18 sherds, and Group B had 17 sherds. There were seven sherds which were outliers that were
not associated with either Group A or Group B and could not be grouped.

Figure 4 Fountain of Youth, Contact Period Groups

Group A consists of 18 sherds. Within these groupings, there is an overlap between
Group A and Group B. However, Mahalanobis distance probabilities reliably show the groups as
distinct. Within Group A, there are two tight groupings with two sherds that are distinct from the
core of the group. There are two subgroups within Group A. Group Ai consists of six sherds and Group Aii consists of nine sherds.

Group B consists of 17 sherds. These sherds are relatively dispersed across the total sherds from Fountain of Youth. Despite the heterogeneity of this grouping, they were still considered a grouping through Mahalanobis probabilities.

Group B consisted of 17 sherds. These sherds were relatively dispersed across the total sherds from Fountain of Youth. Despite the heterogeneity of this grouping, they were still contained within the Fountain of Youth contact period.

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*Figure 5 Fountain of Youth, Sub-Groups*
8.2.3 Pre-Contact to Contact Period Comparisons

When comparing the entirety of the Fountain of Youth Pre-Contact Period with the two groupings of the post-Contact Period, the compositional data shows the Contact Period ceramics are mainly within the pre-Contact compositional groupings. This would suggest that the Contact Period ceramic production still used traditional paste recipes from the Pre-Contact Period.

![Figure 6 Fountain of Youth, Pre-Contact compared to Contact Period groups](image)

When the Contact Period Fountain of Youth ceramics are plotted against each other, the plot shows that the Contact Period paste recipes are similar to Pre-Contact Period recipes. Group B, however, is mostly inside of the confidence ellipse but there is a small amount that falls outside of the ellipse. Additionally, there is an overlap between Group A and Group B when compared against the pre-Contact ellipse. However, when the ceramics contained in Group B are plotted, all the ceramics in Group B are contained within the pre-Contact confidence ellipse.
8.3 Nombre de Dios

8.3.1 Pre-Contact

The pre-Contact ceramic aspects of Nombre de Dios consist of one sherd. This was too little to test for GAUSS 5.0 to be able to form any statistical analysis. The sherd itself was typed as St. Johns Plain.

8.3.2 Contact

Nombre de Dios’ Contact Period ceramics contained three ceramic groupings. Group A consisted of five sherds, Group B consisted of 33 sherds, and Group C consisted of 46 sherds. There were no outliers within these ceramic sherds.
Group A consists of five sherds. All five sherds fall reliably outside of the confidence ellipse of the total composition of Nombre de Dios. Despite falling outside of the ellipse, distance probability analysis reaffirmed that the sherds were part of Group A. There are significant limitations with only have 5 samples. The Mahalanobis distance probability can only be calculated with two fewer principle components than the number of samples (Niziolek 2013:260). The Mahalanobis probability was calculated using principle components one through three.

Group B consists of 33 sherds. There are a limited number of sherds that fall outside of the central cluster within Group B. Group B is also dispersed through across the larger Nombre de Dios ceramics. There is some overlap between Group B and Group C, but distance probability analysis did statistically keep those sherds within Group B.

Group C consists of 46 sherds. Many of these sherds are clustered, but a few are dispersed away from the main group. These sherds were not outliers according to the Mahalanobis distance.
probability and did belong to Group C. One sherd fell outside of the total Nombre de Dios confidence ellipse, but the rest all fell within the ellipse.

8.3.3 Pre-Contact to Contact Comparisons

Since Nombre de Dios pre-contact component is part of Fountain of Youth’s site, Nombre de Dios’ Contact Period ceramics are compared against Fountain of Youth’s Pre-Contact Period ceramics. When the Contact ceramics are plotted against pre-Contact ceramics, the groups are again contained within the pre-Contact confidence ellipse.

![Figure 9 Nombre de Dios Contact Period groups compared against Fountain of Youth](image)

8.4 San Juan del Puerto

8.4.1 Pre-Contact

Within the pre-contact ceramics of San Juan del Puerto, the groupings are fairly dispersed between the two groups. Group A consists of 14 ceramics, and Group B consists of 12 ceramics. There is a sub-group, Group C (n=3), which is part of Group A.
Group A consists of 14 ceramics. There is minimal overlap between Group B and Group C. This group is relatively clustered and not as dispersed as Group B or C. There is a small cluster occurring within Group A, but most of the sherds are dispersed. The sub-group, Group Ai, consists of three ceramics.

Group B consists of 12 ceramics. These ceramics are more dispersed than Group A or Group C. There is no significant clustering occurring, but these sherds are placed within the same group through distance probability analysis. These sherds are also spread across a wider section of the San Juan Pre-Contact ceramics rather than being more tightly associated together as in Group A.

8.4.2 Contact

There are three groups within this context. Group A consists of 32 ceramics, Group B consists of 26 ceramics, and Group C consists of seven ceramics. Four outliers within this group were outside of the confidence ellipse and not near any of the other groups.
Group A consists of 32 ceramics. There is little overlap between Group A and Group B. The ceramics are relatively dispersed within their plots but have a tight signature within the total Contact Period ceramics from San Juan. SJB5 is an outlier within this group but still belonged to Group A as shown through the Mahalanobis differentials.

Group B is more dispersed within San Juan’s Contact Period ceramics than Group A. Within Group B. There are two, possibly three, clusters. However, they all statistically belonged in the same group together. Besides these two clusters, there are some sherds within Group B that are not clustered with the rest but still statistically belong to Group B. Within Group B there are three subgroups. Group Bi consists of four sherds, Group Bii consists of five sherds and Group Biii consists of seven sherds. Group C is the most dispersed ceramic grouping within San Juan’s Contact Period. Six of these ceramics lay outside of the confidence ellipse for the total Contact Period ceramics from San Juan.
8.4.3 Pre-Contact to Contact Comparisons

Comparing San Juan’s pre-Contact and Contact Period compositional groupings shows similar results to Nombre de Dios and Fountain of Youth. Contact Period ceramics are enveloped within the pre-Contact portion of the sites.

![Figure 12 San Juan del Puerto Contact Period groups compared to Pre-Contact Period](image)

8.5 Conclusion

The pXRF analysis defined 13 groupings within this dataset. At Fountain of Youth, the data shows that there were two dispersed groups during the Pre-Contact Period. During the Contact Period at Fountain of Youth, there are two groups with Group A being less dispersed than Group B. Nombre de Dios’ Contact Period ceramics show three groups. Group A and Group C were clustered while Group B was more dispersed. When the two periods were compared, it shows that during the Contact Period Fountain of Youth and Nombre de Dios utilized similar paste recipes.
In San Juan del Puerto, there were two groups within the Pre-Contact context. Both of these groups were dispersed with a small sub-group in Group C. In the Contact Period contexts, there were three groups. Within Group C, there are two sub-groups; Group Bi and Group Bii. These three groups were less dispersed than the Pre-Contact groups, but they still show that during the Contact Period similar paste recipes were still be utilized. Across all sites, the groups showed no significant overlap between other groups within the site. Within the Contact Period, most of the groupings showed indications that they had come from similar paste recipes as the pre-Contact ceramics. Within both the pre-Contact and Contact Period ceramics across all sites, there is a mix of dispersed and clustered groupings, the significance of which I discuss below.

9 DISCUSSION

9.1 Introduction

Fountain of Youth, Nombre de Dios, and San Juan del Puerto all underwent similar circumstances during Spanish arrival. As a result, it is expected that these circumstances would shape similar changes in ceramic production. However, as shown in the following discussion, there was less change than expected within the sites and across time. As detailed in Chapter 7, this thesis study examined the validity of the following hypothesis: as populations moved into the mission structure, ceramic production became centralized. What this research has revealed is that the utilization of paste recipes remained similar over time with only small changes between the pre-Contact and Contact period.
9.2 Fountain of Youth

9.2.1 Pre-Contact

During the pre-Contact period at Fountain of Youth, two groupings can be identified within the ceramics. Group A consisted of 21 St. Johns Plain sherds and one unidentifiable type. St. Johns Plain was a generally utilitarian type used within households for cooking and storage. The connection between the household and these sherds suggests that production for Group A was at the household level but a larger portion of the population was utilizing the same paste recipe. Group B consisted of 22 St. Johns Plain, one St. Johns Checkmarked, one San Marcos Incised, two St. Johns Check Stamped and two unidentifiable type sherds. Again, there is a significant amount of household ceramics within this context. The larger conclusions that can be drawn from both groups is that household utilitarian ceramics within Fountain of Youth were made from two paste recipes. Neither group was tightly clustered. This pattern may be interpreted as evidence that there were two common recipes known to the population. The heterogeneity of the ceramic groups also indicates that production levels were not highly centralized. One explanation for this is that production was decentralized with households or groups of households sharing paste recipes.

The two groupings here indicate that two paste recipes were being used by potters at Fountain of Youth. The broader signature of Group A indicates that a large portion of the population utilized this paste recipe. Group B was more centralized than Group A. One explanation for Group B being tighter than Group A is that Group A indicates a broader use of a paste recipe across the community.
9.2.2 **Contact**

As the Contact Period begins and through the initial construction of the Nombre de Dios mission next to Fountain of Youth, the number of paste recipes remains the same, but Group A becomes more homogenous than Group B. This indicates that the Group A from both the Pre-Contact and Contact Period utilized a very similar paste recipe. San Marcos Plain made up the majority of the ceramics with eight, San Marcos Stamped made up seven, St. Johns Plain made up two, and one plain Colono-ware sherd was among the group. Group A was more homogenous and clustered than Group B. One explanation for this is that ceramic production became more centralized than had been seen during the Pre-Contact Period. There are still households utilizing the paste recipes, but an explanation could be that a few households are producing for the larger part of the population. The two sub-groups within Group A consisted of similar ceramic types. Group Ai was made up of two San Marcos Stamped, three San Marcos Plain and one plain Colono-ware. Group Aii consisted of five San Marcos Stamped and four San Marcos Plain. Despite there being a sub-group within Group A, there is no indication that Group Ai paste recipe is drastically different than Group A. Additionally, the ceramics do not indicate that these paste recipes were used for specific ceramic types.

Group B was dispersed across the Contact Period ceramics. Group B consisted of eight St. Johns Plain sherds, five San Marcos Plain sherds, three San Marcos Stamped sherds, and one St. Johns Incised. Group B was heterogeneous when compared to Group A. This indicates that while one paste recipe’s production was being centralized, this paste recipe was becoming even more decentralized. One explanation for the centralization of Group A and the decentralization of Group B is that Group A’s paste recipe was more closely associated with the Spanish than Group B. The sherds found in Group A include plain Colono-ware which indicates that the
Spanish were utilizing indigenous paste recipes to have access to Spanish-like goods. Therefore, there may be a shift where the paste recipes associated with the Spanish centralized to provide goods to the Spanish while Group B’s paste recipe decentralized to household level production.

9.2.3 Pre-Contact to Contact

As shown in Chapter 8, Contact Period ceramics from Fountain of Youth utilized the same paste recipes as the Pre-Contact Period. One explanation for this continuity is that the people living at Fountain of Youth were utilizing the paste recipes that they already knew. Since they were already known among the village, it would have been easy to continue to use the paste recipes rather than find new ones. Additionally, there could be an aspect of keeping a ceramic tradition alive. The continued use of the paste recipes could be an intentional use of traditional paste recipes in the face of Spanish arrival and Spanish occupation within Fountain of Youth. Overall, during the pre-contact to Contact Period shift at Fountain of Youth the community is still utilizing pre-contact paste recipes into the Contact Period.

Overall, there does not seem to be a significant change to ceramic production. Group A during the Contact Period does seem to indicate that there is shifting production, but there is still a sizeable portion of ceramic production that is decentralized. It is logical that while life and society changed, the ways that utility goods were made did not change to a significant degree. Utilitarian ceramics may be the last to change because of their lack of ties to the religious or political system. As a result, paste recipes and utilitarian production can remain relatively unchanged into the Contact Period. No evidence suggests that the collapse of indigenous life was so complete that even ceramic traditions and traditional paste recipes were annihilated.
9.3 **Nombre de Dios**

9.3.1 **Contact Period**

The Contact Period consisted of three groupings. Group A was the smallest group. Group A consisted of 4 sherds of plain Colono-ware and one unidentifiable sherd. That the plain Colono-ware is different and unique from the rest of the Contact Period ceramics indicates that these specific ceramics came from a non-local source. Colono-ware was generally produced in North American by indigenous potters, so the presence of non-local Colono-ware indicates that most likely the Spanish brought these goods into Nombre de Dios from a non-local source. Group B consisted of 12 San Marcos Stamped, ten plain Colono-ware, five San Marcos Plain, two St. Johns Plain, one Mission Red Filmed, one Dunn’s Creek Red and two unidentifiable sherds. Group B was heterogeneous. This indicates that the Contact Period ceramics of Group B were decentralized. These ceramics were produced at a household level.

In Group C, there were 17 San Marcos Stamped, 14 San Marcos Plain, four Mission Red Filmed, three plain Colono-ware, one San Marcos Incised, and seven sherds were unidentifiable. Group C was homogeneous when compared to the rest of the groups at Nombre de Dios. There are no real differences in the types of ceramics made in Group B, and Group C. This may indicate that ceramic production took two paths during the Contact Period. There seems to be a centralized ceramic production group (C) and a decentralized production group (B). Perhaps, the centralized group produced goods within the mission itself or produced and sold goods to the mission. While Group B produced ceramics for the local population within the mission, another explanation may be due to new populations moving into Nombre de Dios. As the groups move into Nombre de Dios, they may be utilizing known paste recipes, but they are only producing ceramics for themselves or their household.
Within the three groups found at Nombre de Dios, there seem to be two local paste recipes that form. Group B seems to indicate decentralized production while Group C indicates slightly more centralized production. Regardless, there was no tightly controlled ceramic production within Nombre de Dios. It seems that some individuals had more control, the case of Group B, over a paste recipe, but it seems no workshops are occurring within the mission. The presence of non-local Colono-ware is indicative that there was non-local trade occurring. Without having any clay standards, the source of the Colono-ware cannot be identified, but it does indicate that there were possibly new economic trading forming.

9.3.2  Pre-Contact to Contact Period

The Pre-Contact Period of Nombre de Dios consisted of the Fountain of Youth site. Again, the paste recipe used at Nombre de Dios was chemically like the paste recipes used. Group A, although it was very distinct from Groups B and C, it still fits within the larger paste recipes of Fountain of Youth.

However, again, there is a continuation of utilitarian ceramics between the pre-contact and Contact Period. The utilization of Fountain of Youth sources makes sense considering there was no colony at Nombre de Dios and before the mission was built, Fountain of Youth was used as an encampment. The sites are extraordinary close together, and it was the same population moving between Fountain of Youth and Nombre de Dios. It was whether the individual lived inside of the mission or outside of the mission that designates if they lived in Fountain of Youth or Nombre de Dios. Again, like Fountain of Youth, it shows that paste recipes were still being utilized. There was no measurable difference in the types of ceramics found in Group C rather than Group A or B during the Contact Period. Each grouping contained a relatively similar amount of each type within in each group. This suggests that the groupings were not due to elite
versus non-elite use, but rather different groups, possibly families, producing ceramics from paste recipes that had been passed down.

### 9.4 San Juan del Puerto

#### 9.4.1 Pre-Contact

The two groups in San Juan are still heterogeneous. Group A consisted of 10 St. Johns Plain sherds, 2 San Marcos Stamped, and two unidentifiable sherds. Group C within Group A consisted completely of St. Johns Plain. Within Group B, there was 7 St. Johns Plain, 2 St. Johns Basketry Impressed, 1 Mission Red Slipped and two unidentifiable sherds. Both groups consist of household and utilitarian ceramics. The heterogeneity of Group A indicates that production was relatively decentralized. Group B shows more centralized production. Two paste recipes were being used within San Juan. Both groups production was decentralized, however. This indicates that within San Juan the level of production was at the household level or smaller. Despite having two paste recipes being utilized during this period, they both seem to be indicative of household level production.

#### 9.4.2 Contact

Within the Contact Period, there are three groups. Group A consisted of 11 San Marcos Plain sherds, 10 San Marcos stamped sherds, 5 San Marcos Incised, 4 Mission Red Filmed and two plain Colono-ware. Within Group B there were 14 San Marcos Plain, 4 Mission Red Filmed, 4 San Marcos Stamped, and 4 San Marcos Incised. There is no indication that either one of these groups is producing different any ceramics that are different from the other.

However, Group B seems to be more decentralized when compared to Group A. There were three small sub-groups within Group B. Group C consisted of one Mission Red Filmed ceramic, one San Marcos Plain, and two San Marcos Incised. Group Bi consisted of one San
Marcos Plain, one San Marcos Incised and three other ceramics which were unidentifiable.

Group E consisted of seven sherds. One Mission Red Filmed, one San Marcos Plain, and three San Marcos Stamped and two unidentifiable sherds. The sub-groupings indicate that the paste recipes utilized were not used for specific ceramic types. It seems that the subgroups may be small variations within the paste recipe.

One explanation for this could be that the two recipes are being used to produce ceramics for different purposes. Possibly the individuals producing Group A’s ceramics had tighter control over the paste recipe for any social, political or economic reason. Group A could have been a result of production for the mission. Therefore, those producing ceramics within Group B relied on household production levels for individuals living within the mission.

Group C seems to indicate ceramics that are distinct from the rest. Group C consisted of 4 San Marcos Plain and 2 San Marcos Stamped. None of the ceramics are Colono-ware or Spanish ware, so it stands that the ceramics were produced by individuals who knew local clay sources but did not know the paste recipes. This could indicate that these ceramics were produced by individuals who moved into the mission.

9.4.3 Pre-Contact to Contact

During the pre-contact and the Contact Period, it seems that the potters are still utilizing the same paste recipes as the Pre-Contact Period. Again, the paste recipes being utilized seem to carry over into the Contact Period. This could be related to using sources that were familiar and continuing traditional paste recipes. This also addresses questions about how destructive Spanish arrival and the mission system was to ceramic production. It seems that production, at least utilitarian and household ceramics, did not change or was not significantly affected by Spanish arrival. There is a slight difference in the homogeneity of the pre-contact and contact groups.
Perhaps, the contact groups are more centralized than the pre-contact groups, but it does not change enough to be highly indicative of the creation of workshops. Instead, the homogeneity of the Contact Period groups could be due to a lower population, and potters were producing ceramics for a few households rather than for their household. It never was quite to the level of a formalized workshop producing for the mission.

Despite the apparently non-locality of Group C in the Contact Period, when the group was plotted against the Pre-Contact Period, it looks like Group C is still locally produced. However, the lack of connection to Group A or Group B’s paste recipes indicates that this could be individuals using a new paste recipe. This could be related to new populations moving in and using paste recipes of their own making. Perhaps they had not been shown any established paste recipes and relied upon the knowledge that they brought.

9.5 Conclusion

Between all three sites, there is a continuation of paste recipes from the pre-contact to the Contact Period. Unchanging paste recipes indicate a level of continuity at least through ceramic production. The traditional thought was that the arrival of the Spanish meant that all indigenous life had been largely destroyed and that indigenous society shifted dramatically. However, as these comparisons show, paste recipes continued through the Contact Period. The relative even distribution of types across each grouping and across

The most exciting shift was the tightening (or not) of the different ceramic groups in Fountain of Youth, and Nombre de Dios showed that despite how structured life became within the mission system, there was not a significant change in the production of utilitarian ceramics on the missions. There was no creation of ceramic workshops.
Oppositely, San Juan does show evidence of the creation of small-scale workshops within the mission structure. The paste recipes have remained mostly the same from the Pre-Contact Period, but it is being utilized in a slightly different way. The tightness of the groupings shows that there may be the beginnings of a workshop-like production, or at least, ceramic production has centered among fewer families than the general population.

Overall, the changes in this research show there was a surprising amount of continuity of paste recipes. The continuation of the paste recipes indicates that the Spanish arrival did not destroy ceramic production. The expectation is that there was a shift to the mission system, all aspects would be affected. This would include production. However, production seems to remain relatively unchanged, and traditional paste recipes are still utilized. Ease of access and common knowledge can be attributed to the continued use of paste recipes. The most compelling aspect of these changes was the relative lack of change in ceramic production. In both Fountain of Youth and Nombre de Dios, ceramic production remained relatively unchanged indicating that both ceramic production and the economic use of utilitarian ware remained the same through the Contact Period.

Conversely, San Juan del Puerto does show indications that their production was changing. The groupings tighten up when compared to the Pre-Contact Period, and this could be attributed to economic shift within San Juan. The economic pressures or changing markets that caused this shift within San Juan may not have existed, or existed yet, within Nombre de Dios and Fountain of Youth. The nature of pXRF data limits the results of this data. In future studies, the inclusion of INAA or LA-ICP-MS would be best to have certainty with the group designations.
10 CONCLUSION

As shown in this research, the arrival of the Spanish had some effects on ceramic production, but they were limited. Within Fountain of Youth, the data revealed that ceramic production during the Pre-Contact Period was not highly centralized. As the Contact Period began, there was no real change to the organization of ceramic production. At Nombre de Dios, again, during the Contact Period, there does not seem to be highly centralized ceramic production. Different paste recipes are being utilized, but the data does not indicate that it is a workshop level. At San Juan del Puerto, pre-contact ceramic production was dispersed. During the Contact Period of San Juan, there is again a group that seems more centralized than the other but no evidence of highly centralized production. The continuity of paste recipes indicates that production did remain relatively stable through the Contact Period. The utilization of traditional paste recipes suggests that on the one hand, knowledge was not lost because of Spanish arrival and that ceramic production was not significantly affected during the Contact Period. This indicates that despite significant social and political changes in the region, craft production remained relatively stable.

Overall, these results indicate continuity between the pre-contact and Contact Period within the sites. Additionally, this study shows that Spanish arrival did not affect ceramic production as anticipated. The emergence of the mission structure and the populations moving into the missions did not significantly alter the ways that ceramics were produced at any of the sites. The lack of non-local ceramics is were not expected, but it can be readdressed within a different study. In future studies, using decorated ceramics associated with elite use could be used to understand non-local trade. Elite and decorated goods would be more likely to be used in trading rather than utilitarian ceramic wares.
Overall, this research shows that within the different aspect of society that was being affected by Spanish arrival, the level of ceramic production was affected but the use of paste recipes was not. Therefore, it can be argued that at the household level, individuals were still utilizing known paste recipes from the past and still performing traditional ceramic production. This indicates that there was a connection to pre-contact life in the use of paste recipes. This indicates that traditional knowledge was not lost and that paste recipes continued to be used.

10.1 Future Research

This study was preliminary but provides the basis for ongoing work. Future plans for this research include more analysis methods including INAA or LA-ICP-MS. Additionally, only a small sample of the sites were included in this research. Expanding the ceramic samples and focusing only on one site at a time will yield more information about production and trade. Inclusion of decorated ware into the study would help to address questions of trade during this time. It is essential to understand how these contacts helped to shape the social and political landscape into the 18th century in the southeast. Including fine-ware and other elite goods into this study, or as another study entirely, would aid in understanding trade networks in the pre-contact and Contact Period. More research into the sites would clarify the very early contacts that the missions had with indigenous groups.
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