FROM WATER TO LAND: HOHOKAM PRESENCE AND INFLUENCE AT WUPATKI PUEBLO THROUGH SHELL ARTIFACTS

Alexandra Covert

This article examines prehistoric shell artifacts from Ancestral Puebloan, Sinagua, and Hohokam sites. Shell artifacts are indicators of trade relationships between different cultural groups. Therefore, shells found at Ancestral Puebloan and Sinagua sites shed light on the trade relationships between the Ancestral Puebloans, Sinagua, and Hohokam. By looking at shell assemblages from one Ancestral Puebloan site: Wupatki Pueblo; three Sinagua sites: Elden Pueblo, Winona Village, and Ridge Ruin; and two Hohokam sites: Pueblo Grande and La Plaza, this paper attempts to determine Hohokam influence on Ancestral Puebloan and Sinagua sites. Specifically, shell from Wupatki Pueblo was analyzed for Hohokam style traits in order to determine if the Hohokam traded or brought shell artifacts to Wupatki Pueblo as finished products or if shell manufacturing occurred at Wupatki Pueblo. Ultimately, this research adds valuable information about trade, migration, and social networks between the Hohokam, Sinagua, and Ancestral Puebloans, which is important to understanding function, complexity, ideology, adaptation, resilience, and the foundation of modern Pueblo cultures.

This article aims to place the shell artifacts from Wupatki Pueblo, a Pueblo II to Pueblo III Ancestral Puebloan site, in the context of Southwestern shell manufacturing and distribution. The Wupatki Pueblo shell assemblage was analyzed against shell artifact production and distribution from three Sinagua sites and two Hohokam sites. This analysis was conducted to examine whether the Hohokam influenced Ancestral Puebloans and the Sinagua through migration, down-the-line trade, or Hohokam traders.

HOHOKAM PRESENCE AND INFLUENCE ON ANCESTRAL PUEBLOANS AND THE SINAGUA

The presence and influence of the Hohokam at northern Arizona archaeological sites may be seen through migration and trade.

Migration

Since the 1920s, archaeologists have debated the presence and influence of the Hohokam on Ancestral Puebloans and the Sinagua. Much research focused on Ancestral Puebloan and Sinagua sites with Hohokam traits after the eruption of Sunset Crater Volcano in AD 1064. For example, there is a high frequency of Hohokam traits such as cremation burials, ballcourts, trash mounds, architecture, and traded goods, such as spindle whorls, ceramic figurines, Gila-shouldered jars, red-on-buff pottery, and shell ornaments found at these sites (Murphy 2000). These artifacts and traits indicate influence from the Hohokam, most likely due to migration by the Hohokam to northern Arizona (Colton 1918, 1936, 1960; McGregor 1937a, 1937b).

Early researchers on Hohokam migration to northern Arizona include Lyndon L. Hargrave, Katherine Bartlett, Harold Colton, and John McGregor. All these researchers are associated with the Museum of Northern Arizona (MNA). Michael Stanislawski, a graduate student attending Arizona State University (ASU) in the 1960s, also conducted research on Hohokam migration to northern Arizona. Hargrave and Bartlett determined that there was a strong presence and influence of the Hohokam at the site of Turkey Tanks (NA 2098) (Bartlett 1934; Hargrave 1932). Bartlett (1934) attributed these Hohokam characteristics to Hohokam migration to northern Arizona. Colton created the "black sand hypothesis" which stated that the eruption of Sunset Crater Volcano allowed for better agricultural conditions and therefore attracted other people to migrate to northern Arizona, such as the Hohokam (Colton 1936, 1946, 1960). McGregor agreed with Colton and thought that the eruption of Sunset Crater Volcano attracted migrant populations (McGregor 1941). Additionally, Stanislawski agreed with Colton and McGregor and believed that the Sinagua were a homogenous culture before the

Alexandra Covert / Flagstaff Area National Monuments / alex_covert@nps.gov

Journal of Arizona Archaeology 2019, Volume 7, Number 1:81-96

eruption of Sunset Crater Volcano. After the eruption, various people from different regions, such as Mogollon, Chaco Canyon, and Hohokam, migrated to northern Arizona and led to the cultural blending of the Sinagua (Stanislawski 1963).

Archaeologists (Downum 1988; Fish et al. 1980; Hevly et al. 1979; Kelly 1971; Pilles 1978, 1979) have challenged Colton's "black sand hypothesis." John P. Wilson (1969) proposed that the cause of the influx of migrants from the surrounding culture areas was not due to the increase in agricultural conditions from the eruption of Sunset Crater Volcano, but rather was due to an increase in population in these cultures. Additionally, Pilles (1978, 1979) and Fish et al. (1980) agreed with Wilson's criticisms of the "black sand hypothesis." Pilles (1978, 1979) does not agree with the idea that prehistoric migrants moved to northern Arizona due to an increase in agricultural productivity from the eruption of Sunset Crater Volcano. Instead, an increase in rainfall and warmer temperatures rather than volcanic mulch increased population. Pilles (1979) also states that the increase in population seen in the Sinagua after the eruption of Sunset Crater Volcano can also be seen throughout the Southwest at the same time. Therefore, the increase in population is not just unique to the Sinagua (Pilles 1979).

Many archaeologists, such as Fish et al. (1980), question the idea that Hohokam migration to northern Arizona ever happened. Instead, they propose that Hohokam influence and presence in northern Arizona is a result of trade relations and Hohokam traders co-living at large Ancestral Puebloan and Sinagua sites. Murphy (2000) agrees with this and states that it is likely that Hohokam people were co-residents at Sinagua sites, specifically at Winona Village and Ridge Ruin.

Trade

McGuire and Downum (1982) applied a down-the-line model to examine prehistoric north/south trade networks to help explain shell found at Sinagua sites and Kayenta branch black-on-white ceramics found at Hohokam sites. Jernigan (1978) discussed the near absence of shell ornaments at Ancestral Puebloan sites, which contrasts with Hohokam sites where there is a high presence of shell ornaments. Jernigan (1978) thinks this is due to indirect trade between the Hohokam and Ancestral Puebloans rather than through direct trade. Jernigan (1978) proposes that the Hohokam traded with the Mogollon who then traded with the Ancestral Puebloans. An analysis of the shell artifacts recovered from excavations at Wupatki Pueblo revealed that shell artifacts at Wupatki Pueblo originated from the Gulf of California, coast of California, and Gulf of Mexico. A high quantity of worked shell indicates trade from the Hohokam to the residents of Wupatki Pueblo (Stanislawski 1963). Mills and Ferguson (2008) indicated that the presence of shell trumpets at northern Arizona sites allowed for the identification of social networks related to ritual practices.

Additionally, archaeologists can see the influence of the Hohokam through ballcourts at Sinagua and Ancestral Puebloan sites. Wilcox (1993) and Fish et al. (1980) support the idea that Hohokam style ballcourts at northern Arizona sites were perhaps redistribution centers and therefore allowed for trade and exchange to transpire between the Sinagua, Ancestral Puebloans, and the Mogollon. Murphy (2000) and Hedquist (2012) determined that exotic goods in Sinagua and Ancestral Puebloan sites were more likely to be found at sites with large ceremonial structures such as kivas, ballcourts, and plazas.

After the eruption of Sunset Crater Volcano, there was a dramatic shift in Sinagua communities as evidenced by the construction and use of Hohokam ballcourts. The construction and use of Hohokam ballcourts not only allowed for public ritual, but also allowed for an integration of the region through interaction networks and long-distance exchange (Gruner 2012). The influence of the Hohokam on the Sinagua could be evidence of ritual pilgrimages by the Hohokam to the Sinagua area to see volcanic activity (Lekson 2008; Whittaker and Kamp 1992). O'Hara (1998) examined Hohokam style red-on-buff ceramics at northern Arizona sites and determined that the ceramics were manufactured by Sinagua people who were attempting to create social connections with Hohokam trading partners, the Southern Sinagua introduced these ceramics to the Northern Sinagua, or a Hohokam trader could have lived at Winona Village.

IMPORTANCE OF SHELL

Shell was important to prehistoric peoples because it showed power, esteem, and security through wealth. Shell jewelry was a physical sign of wealth. By wearing shell jewelry as an individual, wealth was visible to all other members of society (Jernigan 1978).

Shell artifacts indicate the degree of Hohokam presence and influence at Ancestral Puebloan and Sinagua sites. Shell artifacts were used as adornment and showed prestige, wealth, and authority. Shell adornment could have signified a person's ethnicity, social status, or membership in a religious or social group (Hedquist 2012). This can be seen through Glycymeris bracelets which are signifiers of being Hohokam (Bayman 2002). Shell bracelets are more common at Ancestral Puebloan and Sinagua sites during the time Hohokam style ballcourts were used and are found concentrated at sites with ballcourts (Murphy 2000; Hedquist 2012). This shows an influence and presence of the Hohokam based on shell bracelets in relation to ballcourts.

The importance of shell can also be seen in modern day Native American tribes. Lyle Balenquah (2013), a member of the Hopi tribe, states that marine shell

has many symbolic traits. Shell tinklers were tied together and worn to make noise. Since water is scarce in the Southwest, the sound of shells rattling together is a way to summon rain. The sound of shells rattling together is also a metaphorical connection to wanting or needing water. Shells carved into frogs also indicate the importance of the connection to water (Balenquah 2013). Prehistoric peoples often used Strombus shells as trumpets to summon horned serpents that lived in water and controlled snow, rain, and the flow of water (Hedquist 2012).

SIGNIFICANCE OF PREHISTORIC SHELL TRADE

Trade and exchange are important research issues in the prehistoric Southwest because they show the importance of relationships with other cultures (Figure 1). Shell is seen as an exotic resource in the Southwest because shells were difficult to acquire since they originated from hundreds of miles away (Hedquist 2012). Prehistoric shell trade often follows a distance-decay model. Typically, people exchange non-prestige utilitarian items within a short distance of their villages and obtain prestige goods, such as shell, from different prehistoric groups spanning hundreds of miles (Bayman 1999). Therefore, generally the farther north an archaeological site is in the Southwest, the less abundant shell is (Vokes 1999). The large quantity of shell at Wupatki Pueblo is significant because it shows that extensive trade networks and trade relationships must have existed in order for the Ancestral Puebloans to acquire such a large quantity of shell objects.

Trade is also important to social networks. Social networks in the Southwest transformed across spatial, temporal, and social scales. Social distance does not always correlate with spatial distance because the presence of network relationships spans long geographic distances. Spatial proximity predicts social connectedness based on material culture from archaeological

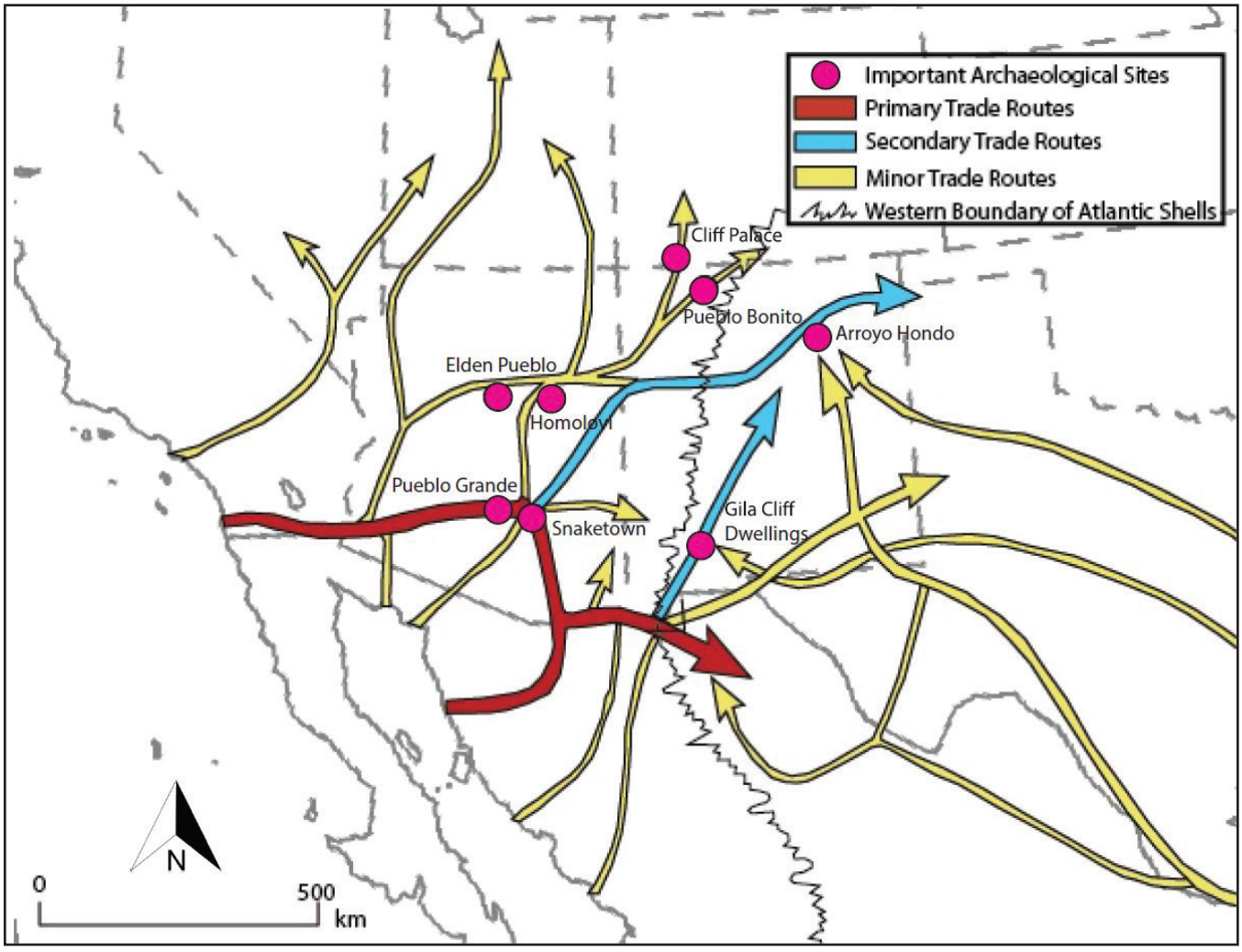

Figure 1. Prehistoric trade routes of shell from the Gulf of California, coast of California, and Gulf of Mexico to the Southwest (Adapted from Brand 1938; Schinsing 2012).

sites. Most social interaction, including the movement of goods, took place within a day's round trip walk from home, thus archaeologists anticipate that sites would have stronger social connections to proximate sites (Mills et al. 2012). The exchange of shell in social networks adds prestige to individuals who acquire, display, and control these objects (Trubitt 2003). The exchange of shell in social networks in turn causes shell to be seen as a prestige good and, therefore, materializes the political, social, and economic relationships between people at local and regional scales (DeMarrais et al. 1996).

OBJECTIVES

In this study, I aimed to address three objectives based on the analysis of the shell assemblage from Wupatki Pueblo. First, I examined where the shell artifacts were being produced and who produced them. Second, I examined whether the shell came to Wupatki Pueblo as a result of down-the-line trade, transportation by traders, or migration. Finally, I examined how the shell assemblage from Wupatki Pueblo compares to the shell assemblages from three Sinagua sites and two Hohokam sites.

METHODS

The methods used for my research are identification and comparison. These methods allowed for a better understanding of the relationship between the Hohokam and Wupatki Pueblo based on shell artifacts. These methods allowed me to determine the shell genus and artifact types; compare shell assemblages between Ancestral Puebloan, Sinagua, and Hohokam sites; and determine the significance of shell at Wupatki Pueblo.

Shell Identification

Shell identification determined shell genus and species, artifact type, and whether the artifacts were Hohokam in style. I recorded the species of the shell when possible. I photographed each shell genus and artifact type. Artifacts that had previously been analyzed were reanalyzed.

Shell genus and species identification was possible with several sources and guides including Dr. Christian E. Downum's comparative shell collection, *A Guide to Field Identification: Seashells of North America* (Abbott 1986), and *A Field Guide to Shells: Atlantic and Gulf Coasts and the West Indies* (Abbott and Morris 1995). If shell genus and species identification could not be determined, artifact photographs were sent to Arthur Vokes and Erika Heacock at the Arizona State Museum Archaeological Repository in Tucson, Arizona in order to make the genus and species identification. Additionally, if a determination was not possible, the artifacts were classified as unidentifiable.

I also analyzed the shell to identify Hohokam style artifacts by referencing *Hohokam Marine Shell Exchange and Artifacts* (Nelson 1991) and *Jewelry of the Prehistoric Southwest* (Jernigan 1978) in order to determine if the Hohokam manufactured the shell objects and traded the objects to Wupatki Pueblo or if the people of Wupatki Pueblo manufactured shell objects. Additionally, there was the possibility of finding shell debitage present in the assemblage. If shell debitage was present in the assemblage, it would allow for determining if shell manufacturing occurred at Wupatki Pueblo. No shell debitage was recorded or located in the Wupatki Pueblo shell assemblage.

Comparative Data

I compared the shell assemblage from Wupatki Pueblo to the shell assemblages of three other northern Arizona archaeological sites (Table 1): Winona Village (Murphy 2000), Ridge Ruin (Murphy 2000), and Elden Pueblo. The comparison between the shell assemblage from Wupatki Pueblo and the shell assemblages from Winona Village, Ridge Ruin, and Elden Pueblo was undertaken to determine the similarities and differences between northern Arizona archaeological sites regarding artifact types and shell genera (Tables 2 and 3).

I also compared the shell assemblage from Wupatki Pueblo to Pueblo Grande and La Plaza which are Hohokam sites. Occupation at Pueblo Grande occurred from AD 500 to AD 1450 with the peak of its occupation during the Classic period between AD 1150 and AD 1450 (Andrews and Bostwick 2000). Occupation of La Plaza occurred from AD 775 to AD 1300, during the Colonial, Sedentary, and Classic periods. The Ancestral Puebloan and Sinagua sites in this paper correspond with the Hohokam Sedentary (AD 950 to 1100) and Classic (AD 1100

Table 1. Comparison of shell artifacts and genera between sites used for this analysis.

Site	Number of Shell Artifacts	Number of Shell Genera	Number of Shell Artifact Types
	Ancestral Pueblo		
Wupatki Pueblo	1,844	22	13
Subtotal	*1,844*	*22*	*13*
	Sinagua		
Elden Pueblo	1,308	21	14
Ridge Ruin Complex	237	9	11
Winona Village	526	14	11
Subtotal	*2,071*	*26*	*17*
	Hohokam		
La Plaza	2,254	18	7
Pueblo Grande	9,099	15	9
Subtotal	*11,353*	*24*	*12*

Table 2. Shell genera by culture.

Wupatki Pueblo	Sinagua	Hohokam
Aequipecten	*Anodonta*	*Anodonta*
Anodonta	*Argopecten*	*Argopecten*
Cardium	*Chione*	*Cardiidae*
Clima	*Chione/Glycymeris*	*Cerithidea*
Conus	*Conus*	*Columbella*
Cowry	*Cardium*	*Conus*
Dentalium	*Cerithidea*	*Glycymeris*
Glycymeris	*Cockle*	*Haliotis*
Haliotis	*Dentalium*	*Helisoma*
Laevicardium	*Glycymeris*	*Laevicardium*
Murex	*Haliotis*	*Muricanthus*
Nassarius	*Laevicardium*	*Nassarius*
Naticidae	*Nassarium*	*Oliva*
Neritina	*Nerita*	*Olivella*
Olivella	*Oliva*	*Pecten*
Oreohelix	*Olivella*	*Pecten/Argopecten*
Pecten	*Oreohelix*	*Pectinidae*
Polinices	*Ostrea*	*Physa*
Spondylus	*Pecten*	*Pisidium*
Spondylus/Chama	*Pyrene*	*Pyrene*
Strombus	*Rumina*	*Spondylus*
Turritella	*Spondylus*	*Spondylus/Chama*
	Spondylus/Chama	*Trachycardium*
	Turritella	*Turritella*
	Trachycardium	
	Trivia	

to 1450) periods and therefore are contemporaneous with Pueblo Grande and La Plaza.

The comparison between the shell assemblage from Wupatki Pueblo and the shell assemblage from the Hohokam sites was conducted to determine the similarities and differences regarding artifact types and shell genus and species. Additionally, the comparison was conducted to determine if shell artifacts with similar styles and designs found at Pueblo Grande and La Plaza were found at Wupatki Pueblo. This would suggest trade of completed manufactured shell objects from the Hohokam to the people of Wupatki Pueblo or the migration of Hohokam people to Wupatki Pueblo.

SITES

Six archaeological sites were used in this study: Wupatki Pueblo, Elden Pueblo, Winona Village, Ridge Ruin, Pueblo Grande, and La Plaza (Figure 2). The sites in this research, respectively, consist of one Ancestral Puebloan site, three Sinagua sites, and two Hohokam sites. Wupatki Pueblo was chosen as the main site to be analyzed because it is one of the largest sites in the Flagstaff area and contains Ancestral Puebloan, Sinagua, Hohokam, and Chacoan attributes (Wilcox 1993) as well as a large shell assemblage. Elden Pueblo, Winona Village, and Ridge Ruin were selected because they are all large Flagstaff area sites that are contemporaneous with Wupatki Pueblo and have significant shell assemblages that have been recently analyzed. Therefore, they are useful sites to analyze for local comparisons. Pueblo Grande and La Plaza were selected because they are significant Hohokam habitations that contain large shell assemblages and are also contemporaneous with Wupatki Pueblo and the three Sinagua sites.

Wupatki Pueblo

Wupatki Pueblo (NA 405) is a Pueblo II to Pueblo III site located in northern Arizona, approximately 45 miles from Flagstaff, Arizona (Figure 3). The site contains 100 rooms with an associated Hohokam style ballcourt (O'Hara 2012), blowhole, and community room (Downum 2004). Wupatki Pueblo is built along a sandstone ledge and would have stood at least three stories tall. It consists of at least 70 ground floor rooms and 30 upper floor rooms. Wupatki Pueblo would have had a population of about 120 people (Stanislawski 1963). Wupatki Pueblo was the region's largest and tallest town. It was a trading center, gathering place, landmark, place of sa-

Table 3. Artifact types by culture.

Wupatki Pueblo	Sinagua	Hohokam
Bead	Bead	Awl
Bracelet	Bead/Pendant	Bead
Disc	Bracelet	Bracelet
Figurine	Bracelet/Pendant	Cut shell figurine
Mosaic	Debitage	Debitage
Needle	Fossil	Needle
Ornament	Inlay	Pendant
Pendant	Pendant	Ring
Ring	Pendant/Ring	Ring/earring/ pendant
Tinkler	Reworked shell	Tinkler
Trumpet	Ring	Unworked shell
Unworked shell	Tesserae	Zoomorph
Worked shell	Tinkler	
	Utility	
	Worked shell	
	Unworked shell	
	Unknown artifact type	

cred ceremony and ritual, and a treasury of exotic goods (Downum et al. 2012). Ancestral Puebloans occupied Wupatki Pueblo from around AD 1137 to AD 1250 (Burchett 1990; Pilles 1996), yet occupation of the Wupatki Basin occurred as early as AD 550. Wupatki Pueblo witnessed a population boom in the early 1100s and abandonment occurred in the late 1200s (Downum 2004).

Shell from Wupatki Pueblo is housed at MNA, Wupatki National Monument, and the Western Archaeological and Conservation Center (WACC). Shell from the first two institutions was analyzed by the author and the shell artifacts at WACC were previously analyzed by WACC staff. The shell data set for Wupatki Pueblo contains information regarding catalog number, artifact type, completeness, measurements, provenience, description, condition, Hohokam style artifacts, shell count, and shell genus and species. The shell assemblage from Wupatki Pueblo consists of 1,844 artifacts.

Elden Pueblo

Elden Pueblo (NA 142) is a Rio de Flag, Padre, and Elden Phase Sinagua site located approximately seven miles north of Flagstaff, Arizona (Figure 4). Elden Pueblo dates from AD 1070 to AD 1275. Elden Pueblo is a

Figure 2. Map of site locations for sites used in this study.

Figure 3. Wupatki Pueblo South Unit, North Unit, amphitheater, and ballcourt, view to the northwest (Image by author 2017).

65 room, two-story tall pueblo with associated trash mounds, smaller pueblos, a community room, a kiva, and pithouses. Occupation of Elden Pueblo took place after the eruption of Sunset Crater Volcano, which is located just 10 miles east. By AD 1100, the Sinagua at Elden Pueblo started to build stone-lined pithouses, pueblos, and masonry structures (Pilles 2009). The pueblos consist of two to three rooms with each room housing a single family. These pueblos later became the center of Elden Pueblo.

By AD 1150, Elden Pueblo was an important trade center. The people of Elden Pueblo made plainware pottery, woven cotton textiles, and obsidian projectile points. These were traded with other cultures for shell jewelry, turquoise, mineral pigments, argillite, painted ceramics, nose plugs, bird effigy vessels, carved bone hair pins, macaws, and copper bells (Pilles 2009). The presence of rare artifacts such as bird effigy vessels, bone hair pins, nose plugs, and turquoise mosaics in the shape of frogs and birds in flight suggests that Elden Pueblo was a hierarchical society (Pilles 2009).

Around AD 1250, many people moved to Elden Pueblo because of a drought in the region. A large community room was built in place of the kiva. Continued drought and cooler temperatures did not allow for agriculture and therefore abandonment of Elden Pueblo occurred by AD 1275 (Pilles 2009).

Figure 4. Overview of a roomblock of Elden Pueblo, view to the northeast (Image by author 2017).

Coconino National Forest staff analyzed 1,308 shell artifacts from Elden Pueblo. The shell data set for Elden Pueblo contains information regarding catalog number, artifact type, completeness, measurements, provenience, description, condition, shell count, and shell genus and species.

Winona Village

Winona Village (NA2131, NA2132, NA2133, NA2134, NA2135, and NA3644) is a Padre Phase Sinagua site complex dating from AD 1075 to AD 1125 and is located approximately 17 miles northeast of Flagstaff, Arizona near the town of Winona (Figure 5).

Winona Village consists of a large pithouse village with five main clusters of pithouses, small surface structures, trash mounds, and a ballcourt (McGregor 1937a, 1937b). When John C. McGregor recorded the site in 1935, he identified each cluster as an individual site. McGregor, with the help of MNA and the Arizona State Teachers College (now known as Northern Arizona University), excavated the Winona Village ballcourt and other features in the area. In 1935, archaeologists trenched the ballcourt walls, tested the center, and completely cleaned the ballcourt. The ballcourt was fully excavated from 1936 to 1937 and was determined to be Hohokam in style. The Works Progress Administration conducted additional excavations at Winona Village in 1938 and 1939 using the same excavation techniques as McGregor (Murphy 2000). The additional excavations showed additional Hohokam influence at Winona Village through a pithouse with Hohokam style architecture, red-on-buff ceramics, cremation burials, and shell ornaments (O'Hara 2012).

This research focuses on six sites from the Winona Village site complex: NA2131, NA2132, NA2133, NA2134, NA2135, and NA3644. NA2131 consists of one pithouse, a three-room masonry pueblo, and an associated trash mound (McGregor 1941).

NA2132 is the ballcourt at Winona Village. It perhaps served a ritual function or as a trade center (Nelson 1991; Wilcox 1993; Wilcox and Sternberg 1983). No shell was recovered from excavations of the ballcourt, but it is interesting to note due to its Hohokam style.

NA2133 consists of a cluster of sites with known Hohokam traits (Murphy 2000, O'Hara 2012). NA2133A is known as "Hohokam House" because its features are representative of a Sedentary Hohokam pithouse (McGregor 1941; O'Hara 1998). The pithouse is deep with parallel sides, rounded corners, and an alcove on the east side. NA2133A is almost identical to excavated pithouses at Snaketown (AZ U:13:1). This pithouse and a pithouse at Turkey Tanks (NA2098) are the only Sed-

Figure 5. Winona Village pithouse depression, view to the northeast (Image by author 2018).

Figure 6. Ridge Ruin, view to the northwest (Image by author 2018).

entary Hohokam style pithouses found in the Flagstaff region (McGregor 1941). Not only is the architecture Hohokam in style, but also Hohokam style ceramics such as Coconino red-on-buff and Winona red-on-buff were found at NA2133A (McGregor 1941; O'Hara 1998). NA2133B is an excavated surface structure located south of NA2133A. It is associated with NA2133A and did not contain any shell artifacts (Murphy 2000). NA2133C is an excavated pithouse with Hohokam features such as curved corners and a ramped entrance (McGregor 1941). NA2133E is also an excavated pithouse. NA2133T is the trash slope associated with the pithouses of NA2133 (Murphy 2000).

NA2134 consists of two excavated pithouses, a cremation area, and a trenched trash mound (McGregor 1941). NA2135 consists of three excavated pithouses and one tested pit depression (McGregor 1941). Pithouse C shows evidence of burning during occupation (Murphy 2000). NA3644 consists of nine excavated pithouses, one tested pit depression, three trenched trash mounds, and one tested and trenched trash mound (McGregor 1941).

Tracy L. Murphy previously analyzed the shell data set for Winona Village for her Master's thesis *Ornamentation and Social Affinity: Shell Ornaments and the Hohokam Influence at Winona Village* (Murphy 2000) at Northern Arizona University. The shell data set for Winona Village contains information regarding site, catalog number, artifact type, completeness, provenience, condition, shell count, and shell genus and species. The shell assemblage from Winona Village consists of 526 artifacts.

Ridge Ruin

Ridge Ruin (NA 3669) is a Padre through Elden phases Sinagua site complex dating from AD 1140 to AD 1170 (O'Hara 2008) and is located approximately 20 miles east of Flagstaff, Arizona on the Coconino National Forest (Figure 6). Ridge Ruin is a masonry pueblo with approximately 20 to 25 rooms. Many of the rooms were two stories tall. The walls were made of sandstone blocks and basalt boulders. Ridge Ruin also consists of a raised platform, rock enclosures, and plazas. Archaeologists discovered an elaborate burial, the Magician's Burial, to the north of the main pueblo in a potential kiva (McGregor 1943). The burial contained over 600 objects including macaw skeletons, painted sticks, ceramics, lithics, painted basketry, shell, animal parts, rare stones, and mineral pigments (Gruner 2012). The Magician's Burial shows how shell adornment was important in distinguishing high-status individuals in the northern Southwest (Table 4; O'Hara 2008, 2015).

I do not specifically discuss Ridge Ruin in this research, but I do discuss four sites in the Ridge Ruin complex: NA1785, NA3673, NA3676, and NA3680. NA1785 is a pueblo of less than 20 rooms (Murphy 2000). NA3673 is a completely excavated pithouse located below a trash mound (Murphy 2000). NA3676 is a tested trash mound and NA3680 is a single tested pithouse covered by a trash slope (Murphy 2000).

Tracy L. Murphy analyzed the shell artifacts from Ridge Ruin (Murphy 2000). The shell data set for Ridge Ruin contains information regarding site, catalog number, artifact type, completeness, provenience, condition, shell count, and shell genus and species. The shell assemblage from Ridge Ruin consists of 237 shell artifacts from four sites.

Table 4. Shell artifacts recovered from the Magician's Burial (O'Hara 2008).

Genus	Artifact Type	Count
Abalone	Earrings	2
Abalone	Pigment stained shell fragments	Unknown
Abalone	Whole shell	1
Cardium	Whole shell	5
Conus	Tinklers	Unknown
Galeodea	Wooden swallowing sword with whole shell on handle	1
Glycymeris	Bird shaped mosaic bracelet	1
Turritella	Pendant	1
Unidentified	Cut-out shell pendants	2
Unidentified	Lizard-shaped pendant	2
Unidentified	Rim of large shell	1
Unidentified	Stone and shell bead cap	100+
Unidentified	Swallowing sword with turquoise and shell mosaic crescent handle	1
Unidentified	Turquoise and shell earrings	Unknown
Unidentified	Turquoise and shell mosaic crescent	1
Unidentified	Turquoise and shell pendant	1

Pueblo Grande

Pueblo Grande (AZ U:9:1) is a Pioneer, Colonial, Sedentary, and Classic period Hohokam site (Figure 7). Pueblo Grande dates from around AD 500 to AD 1450 with the peak of its occupation between AD 1150 and AD 1450 (Andrews and Bostwick 2000). Pueblo Grande is located two miles west of the Papago Buttes and on the north side of the Salt River (Andrews and Bostwick 2000) in Phoenix.

Figure 7. Pueblo Grande platform mound, view to the northwest (Image courtesy of Selena Soto 2018).

The initial settlement of Pueblo Grande occurred around AD 500 and is evidenced by a canal system on the southern edge of the site. By AD 750, Pueblo Grande consisted of pithouses, trash mounds, cemeteries, and a ball court. During this time, the canal system expanded to irrigate farmlands. Between AD 900 and AD 1150, a small circular platform mound was built. Between AD 1150 and AD 1405, Pueblo Grande expanded several times. A large platform mound was built, coursed-adobe houses arranged in compounds replaced pithouses, more irrigation canals were built, and a tower-like "Big House" similar to that of Casa Grande Ruins (AZ AA:02:14) was constructed. In AD 1358,

large floods of the Salt River occurred. These floods most likely led to the collapse and restructuring of Pueblo Grande and other sites in the surrounding area. By AD 1450, the Hohokam abandoned Pueblo Grande (Andrews and Bostwick 2000).

The shell data set for Pueblo Grande contains information regarding artifact type, provenience, shell count, and shell genus and species. The shell assemblage from Pueblo Grande consists of 9,099 shell artifacts (Gross and Stone 1994).

La Plaza

La Plaza (AZ U:9:165) is a Colonial and Sedentary Hohokam site. Occupation of La Plaza occurred from AD 775 to AD 1300. The site also dates to the 1860s through the 1970s, but the historic occupation of La Plaza will not be discussed. La Plaza is located on Eighth Street near Arizona State University's campus in Tempe, Arizona (Wright and Kwiatkowski 2005).

La Plaza encompasses roughly 380 acres. The site consists of tightly clustered habitation features. Seventeen canal segments run through the site. Additionally, there are pits, pithouses, platform mounds, miscellaneous features, and cremations (Kwiatkowski and Wright 2005; Stone 1991; Turney 1929). Excavations first occurred at La Plaza in 1971 in order to salvage prehistoric cultural material located near Sun Devil Stadium (Hanson 1972). More recent excavations occurred at La Plaza from 2005 to 2007 by Archaeological Consulting Services, Ltd. for the Central Phoenix/East Valley Light Rail Transit Project (Schilz et al. 2011).

Andrea Gregory and Glennda Gene Luhnow analyzed the shell assemblage from La Plaza (Gregory 2011). The shell data set for La Plaza contains information regarding artifact type, completeness, provenience, condition, shell count, and shell genus and species. The shell assemblage from La Plaza consists of 2,254 shell artifacts.

WUPATKI PUEBLO RESULTS

Wupatki Pueblo has a total of 1,844 shell artifacts consisting of 22 different genera and 13 different artifact types (Figure 8). The completeness of the objects ranges from fragmented to whole. Wupatki Pueblo has evidence of burnt, smoothed, polished, incised, and reworked shell. Within the site, archaeologists found shell artifacts in rooms, trenches, trash mounds, retaining walls, room trash, on the surface, in the amphitheater, and in the ballcourt.

The presence of Hohokam influence or Hohokam style in the Wupatki Pueblo shell assemblage is seen through Hohokam style artifacts. Out of 1,844 shell artifacts, 1,115 are Hohokam in style. Of the remaining 729 artifacts, 250 do not exhibit Hohokam style or design and 479 are indeterminate. Therefore, approximately

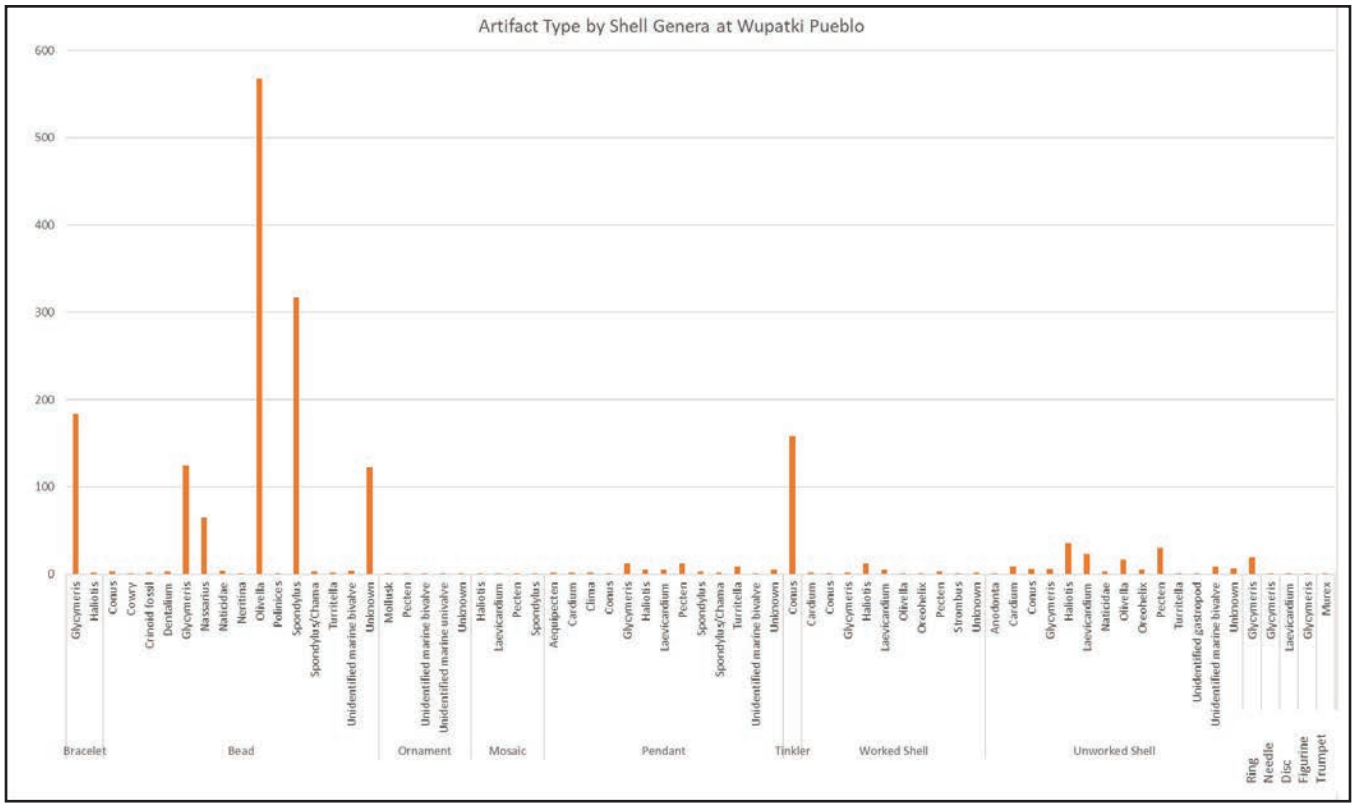

Figure 8. Frequency of artifact types and shell genera at Wupatki Pueblo.

60 percent of the shell assemblage from Wupatki Pueblo exhibits Hohokam style.

Most artifacts that are Hohokam in style are *Olivella* and *Spondylus* beads (Figure 9). These consist of disc, tubular, bilobed, and tabular beads, which are Hohokam in style.

The next most prevalent Hohokam style artifact are *Glycymeris* bracelets (Figure 10). Out of 184 Glycymeris bracelets, 182 are Hohokam in style. *Glycymeris* bracelets are a signifier of being Hohokam and the high presence of Hohokam style *Glycymeris* bracelets at Wupatki Pueblo indicates a strong Hohokam presence due to migration or trade or a combination of the two.

In addition to Hohokam style beads and bracelets are tinklers and figurines. The majority of *Conus* tinklers at Wupatki Pueblo are unmodified, but four exhibit incising. Figurines depict the forms of humans, lizards, and frogs.

Finally, pendants found at Wupatki Pueblo differ in shape and exhibit Hohokam style. The pendants at Wupatki Pueblo exhibit oblong, tabular, disc, hook, needle, bilobed, bird, flying bird, lizard, rattlesnake, sunburst, and phallic shapes. Because pendants are very distinct to time periods, the pendants indicate that the shell from Wupatki Pueblo is contemporaneous to the Hohokam Colonial, Sedentary, and Classic periods. Wupatki Pueblo is almost entirely contemporaneous with the Classic period although there are deposits dating to the Colonial and Sedentary periods. This indicates that the Hohokam style shell at Wupatki Pueblo ranged from AD 750 to AD 1450, which is contemporaneous with the Ancestral Puebloan chronology of Pueblo I to Pueblo IV, which ranges from AD 750 to AD 1400. Since Wupatki Pueblo was occupied from AD 900 to AD 1275, the Hohokam style shell artifacts fit into the appropriate range of late Colonial, Sedentary, and early to middle Classic periods in Hohokam chronology. Since the date ranges correlate, they provide an even stronger example of Hohokam influence through trade, migration, or both occurring at Wupatki Pueblo.

WUPATKI PUEBLO COMPARED TO SINAGUA SITES

The Sinagua sites have a total of 2,071 shell artifacts. The shell assemblage consists of 26 different genera and 17 different artifact types. The completeness of shell at the Sinagua sites ranges from fragmented to whole. The Sinagua sites have evidence of burnt, polished, incised, and reworked shell.

Figure 9. Two *Olivella* whole beads, one *Olivella* tubular bead, eight *Spondylus* disc beads, four *Spondylus* bilobed beads, one *Spondylus* tabular bead, and nine *Glycymeris* whole beads (Image by author 2017).

Figure 10. *Glycymeris* bracelet from Wupatki Pueblo (Image courtesy of Ryan Belnap, Dan Boone, and Christian E. Downum 2011).

Wupatki Pueblo and the Sinagua sites share 14 of the same shell genera. Both the Ancestral Puebloan and Sinagua sites had *Olivella* as the most prevalent shell genera present and *Glycymeris* as the second most prevalent.

Wupatki Pueblo and the Sinagua sites have seven artifact types in common: bead, bracelet, pendant (Figure 11), tinkler, ring, worked shell, and unworked shell. At both Wupatki Pueblo and the Sinagua sites beads are the most prevalent and bracelets are the second most prevalent.

There is a presence of fragmented and whole shell artifacts at Wupatki Pueblo and the Sinagua sites. The condition of shell artifacts plays a part in illuminating the presence and influence of the Hohokam on the Sinagua. Both Wupatki Pueblo and the Sinagua sites have beads as the most commonly found whole objects. The most commonly found fragmented objects in both cultures are bracelets. Wupatki Pueblo has a high presence of fragmented tinklers, while the Sinagua sites have a high presence of fragmented beads, pendants, and unknown artifacts.

Both Wupatki Pueblo and the Sinagua sites have burnt, polished, incised, and reworked shell. What is unusual about the Sinagua sites is that two sites, Elden Pueblo and Winona Village, have evidence of shell debitage. Debitage was recovered at Winona Village (O'Hara 2012), but not at the Winona Village complex sites analyzed in this study. There is no evidence of shell debitage at Wupatki Pueblo or Ridge Ruin indicating shell manufacturing most likely occurred at Elden Pueblo and Winona Village, but did not take place at Wupatki Pueblo or Ridge Ruin.

WUPATKI PUEBLO COMPARED TO HOHOKAM SITES

The Hohokam sites have a total of 11,353 shell artifacts. The shell assemblage consists of 24 different genera and 12 different artifact types. The completeness of the shell ranges from fragmented to whole. There is evidence of burnt, incised, painted, and polished shell. There is also evidence of shell debitage.

Wupatki Pueblo and the Hohokam sites have 11 genera in common. Both Wupatki Pueblo and the Hohokam sites have *Olivella* as the most prevalent genus and *Glycymeris* as the second most prevalent genus. *Spondylus* is the third most prevalent genus at Wupatki Pueblo yet it is rarely found at the Hohokam sites. *Laevicardium* is the third most prevalent genus at the Hohokam sites yet *Laevicardium* is not prevalent at Wupatki Pueblo.

Figure 11. *Laevicardium* frog pendant from Elden Pueblo (Image courtesy of Peter J. Pilles, Jr. and Walter Gosart 2015).

Wupatki Pueblo and the Hohokam sites have eight artifact types in common: bead, bracelet, figurine, needle, pendant, ring, tinkler, and unworked shell. At both Wupatki Pueblo and the Hohokam sites beads are the most prevalent artifact type and bracelets are the second most prevalent. At Wupatki Pueblo tinklers are the third most prevalent artifact type yet at the Hohokam sites unworked shell is the next most prevalent artifact type.

There are similarities and differences between Wupatki Pueblo and the Hohokam sites in terms of what types of artifacts are fragmented and what types are whole. The most commonly found whole objects at Wupatki Pueblo and the Hohokam sites are beads. The most commonly found fragmented objects at Wupatki Pueblo are bracelets and tinklers and the most commonly found fragmented objects at the Hohokam sites are bracelets.

Both Wupatki Pueblo and the Hohokam sites have burnt, incised, and polished shell. Both have burnt bracelets, incised rings, and polished bracelets. Shell debitage is present at the Hohokam sites, but is not present at Wupatki Pueblo indicating shell manufacturing was occurring at the Hohokam sites, but not at Wupatki Pueblo.

CONCLUSIONS

In conclusion, there is a strong connection between Wupatki Pueblo and the Hohokam. The people of Wupatki Pueblo were not manufacturing shell objects. Instead, the Hohokam were manufacturing shell objects and trading these objects north to Wupatki Pueblo. The absence of shell debitage or shell manufacturing stone tools at Wupatki Pueblo indicates shell manufacturing was not occurring there but instead, shell artifacts were being traded in by the Hohokam. Minimal shell manufacturing is evident at two Sinagua sites, Elden Pueblo and Winona Village, but most of the shell at the Sinagua sites was manufactured by the Hohokam which can be seen by the large quantity of Hohokam style shell artifacts at these Sinagua sites. The quantity of shell, genera of shell, and shell artifact types at Wupatki Pueblo are like that of the Sinagua sites. This indicates there is a similar influential relationship between the Hohokam and Sinagua. The quantity of shell at Wupatki Pueblo and the Sinagua sites is significantly smaller than at the Hohokam sites. This pattern suggests down-the-line trade rather than Hohokam traders living at Wupatki Pueblo and the Sinagua sites. The people of Wupatki Pueblo likely exchanged turquoise, ceramics, or lithics with the Hohokam for shell artifacts. The Hohokam are mainly represented by artifacts such as shell ornaments and red-on-buff ceramics at Wupatki Pueblo and the Sinagua sites. For architecture, ballcourts are present at Winona Village, Ridge Ruin, and Wupatki Pueblo indicating that there was some sort of Hohokam influence on these sites. Therefore, based on the data presented in this article, there is a strong connection between Wupatki Pueblo and the Hohokam.

REFERENCES CITED

Abbott, R. Tucker
1986 *A Guide to Field Identification: Seashells of North America*. Golden Books Publishing Company, New York.

Abbott, R. Tucker and Percy A. Morris
1995 *A Field Guide to Shells: Atlantic and Gulf Coasts and the West Indies*. Houghton Mifflin Company, Boston.

Andrews, John P. and Todd W. Bostwick
2000 *Desert Farmers at the River's Edge: The Hohokam and Pueblo Grande.* City of Phoenix Parks and Recreation Department, Phoenix, Arizona.

Balenquah, Lyle
2013 Sea Shells at Wupatki National Monument. US National Park Service and Museum of Northern Arizona Wupatki Virtual Museum Project. Electronic document, https://vimeo.com/68407615, accessed February 15, 2017.

Bartlett, Katherine
1934 The Material Culture of Pueblo II in the San Francisco Mountains, Arizona. *Museum of Northern Arizona Bulletin No. 7*. Northern Arizona Society of Science and Art, Flagstaff.

Bayman, James M.
1999 Craft Economies in the North American Southwest. *Journal of Archaeological Research* 7(3):249-299.
2002 Hohokam Craft Economies and the Materialization of Power. *Journal of Archaeological Method and Theory* 9(1):69-95.

Brand, Donald D.
1938 Aboriginal Trade Routes for Sea Shells in the Southwest. *Yearbook of the Association of Pacific Coast Geographers* 4(1): 3-10, University of Hawaii Press, Honolulu.

Burchett, Tim W.
1990 Household Organization at Wupatki Pueblo. Master's thesis, Department of Anthropology, Northern Arizona University, Flagstaff.

Colton, Harold Sellers
1918 The Geography of Certain Ruins Near the San Francisco Mountains, Arizona. *The Bulletin of the Geographical Society of Philadelphia* 16:37-60.
1936 The Rise and Fall of the Prehistoric Population of Northern Arizona. *Science* 84(2181):337-343.
1946 The Sinagua: A Summary of the Archaeology of the Flagstaff Region. *Museum of Northern Arizona Bulletin No. 17*. Northern Arizona Society of Science and Art, Flagstaff.
1960 *Black Sand*. University of New Mexico, Albuquerque, New Mexico.

DeMarrais, Elizabeth, Luis Jaime Castillo, and Timothy Earle
1996. Ideology, Materialization, and Power Strategies. *Current Anthropology* 37:15-31.

Downum, Christian E.
1988 One Grand History: A Critical Review of Flagstaff Archaeology, 1851 to 1988. PhD Dissertation, Department of Anthropology, University of Arizona, Tucson.
2004 Wupatki Construction Sequence. *Anthropology Laboratories of Northern Arizona University*, Flagstaff. Electronic document, http://jan.ucc.nau.edu/~d-antlab/Wupatki/history.htm, accessed February 15, 2017.

Downum, Christian E., Ellen Brennan, and James P. Holmlund
2012 Wupatki Pueblo: Red House in Black Sand. In *Hisat'sinom: Ancient Peoples in a Land without Water*, edited by Christan E. Downum, pp. 79-88. School for Advanced Research Press, Santa Fe, New Mexico.

Fish, Paul R., Peter J. Pilles Jr., and Suzanne D. Fish
1980 Colonies, Traders, and Traits: The Hohokam in the North. *Current Issues in Hohokam Prehistory: Proceedings of a Symposium*, edited by David Doyel and Fred Plog, pp. 151-175. Anthropological Research Papers No. 23. Arizona State University, Tempe.

Gregory, Andrea
2011 Shell Analysis. In *Tracks through Time: Urban Archaeology along The METRO Light Rail Corridor*, Vol. 4, Part 1, edited by Allan J. Schilz, Margeri Green, Lourdes Aguila, and Glennda Gene Luhnow, pp. 1467-1608. Cultural Resources Report No. 147. Archaeological Consulting Services. Tempe, Arizona.

Gross, G. Timothy and Tammy Stone
1994 Marine Shell. In *The Pueblo Grande Project: Material Culture, Vol. 4,* edited by Michael S. Foster, pp. 167-202. Publications in Archaeology No. 20, Soil Systems, Phoenix, Arizona.

Gruner, Erina
2012 Post-Chacoan Ceremonial Societies on the Chaco Periphery. Master's thesis, Department of Anthropology, Binghamton University, New York.

Hanson, Glen T.
1972 Ceramics and Stratigraphy, AZ U:9:72 (ASU), the Stadium Site. Unpublished manuscript on file, Department of Anthropology, Arizona State University, Tempe.

Hargrave, Lyndon L.
1932 The Museum of Northern Arizona Archaeological Expedition, 1932. *Museum Notes* 5:25-28. Museum of Northern Arizona, Flagstaff.

Hedquist, Saul L.
2012 Exotic Goods in the Sierra Sin Agua. In *Hisat'sinom: Ancient Peoples in a Land without Water*, edited by Christian E. Downum, pp. 141-147. School for Advanced Research Press, Santa Fe, New Mexico.

Hevly, Richard H., Roger E. Kelly, Glenn A. Anderson, and Stanley J. Olsen
1979 Comparative Effects of Climate Change, Cultural Impact, and Volcanism in the Paleoecology of Flagstaff, Arizona, A.D. 900-1300. In *Volcanic Activity and Human Ecology*, edited by Payson D. Sheets and Donald K. Grayson, pp. 487-523. Academic Press, New York.

Jernigan, E. Wesley
1978 *Jewelry of the Prehistoric Southwest*. School of American Research, Santa Fe, New Mexico.

Kelly, Roger E.
1971 Diminishing Returns: Twelfth and Thirteenth Century Sinagua Environmental Adaptation in North Central Arizona. PhD dissertation, Department of Anthropology, University of Arizona, Tucson.

Kwiatkowski, Scott M. and Thomas E. Wright
2005 Previous Archaeological Studies at La Plaza and Related Sites. In *La Plaza Y La Cremaría: Archaeological Investigations in a Portion of AZ U:9:165 (ASM), A Multicomponent Site in Tempe, Maricopa County, Arizona*, pp. 31-44. Project Report No. 2001:107. Archaeological Research Services, Tempe, Arizona.

Lekson, Stephen H.
2008 *A History of the Ancient Southwest*. School for Advanced Research Press, Santa Fe, New Mexico.

McGregor, John C.
1937a Winona Village: A Prehistoric Site Showing Hohokam Influence in the Flagstaff Area. *Museum Notes* 9:39-42. Museum of Northern Arizona, Flagstaff.
1937b Winona Village: A 12th Century Settlement with a Ballcourt Near Flagstaff, Arizona. *Museum of Northern Arizona, Bulletin No. 12*. Northern Arizona Society of Science and Art, Flagstaff.
1941 Winona Village and Ridge Ruin: Part 1. *Museum of Northern Arizona Bulletin No. 18*. Northern Arizona Society of Science and Art, Flagstaff.
1943 Burial of an Early American Magician. *Proceedings of the American Philosophical Society, Symposium on Recent Advances in American Archaeology* 86(2):270-298. American Philosophical Society, Philadelphia, Pennsylvania.

McGuire, Randall H. and Christian E. Downum
1982 A Preliminary Consideration of Desert-Mountain Trade Relations. *Mogollon Archaeology: Proceedings of the 1980 Mogollon Conference*. Acoma Books, Ramona, California.

Mills, Barbara J. and T.J. Ferguson
2008 Animate Objects: Shell Trumpets and Ritual Networks in the Greater Southwest. *Journal of Archaeology Method and Theory* 15:338-361.

Mills, Barbara J., Jeffery J. Clark, Matthew A. Peeples, W. R. Haas, Jr., John M. Roberts, Jr., Brett Hill, Deborah L. Huntley, Lewis Borck, Ronald L. Breiger, Aaron Clauset, and M. Steven Shackley
2012 Transformation of Social Networks in the Late Pre-Hispanic US Southwest. *Proceedings of the National Academy of Sciences* 110(15):5785-5790.

Murphy, Tracy L.
2000 Ornamentation and Social Affinity: Shell Ornaments and the Hohokam Influence at Winona Village. Master's thesis, Department of Anthropology, Northern Arizona University, Flagstaff.

Nelson, Richard S.
1991 *Hohokam Marine Shell Exchange and Artifacts*. Archaeological Series 179, Arizona State Museum, University of Arizona, Tucson.

O'Hara, F. Michael
1998 Red-on-Buff North of the Mogollon Rim: A Comparative Analysis and Cultural Assessment. Master's Thesis, Department of Anthropology, Northern Arizona University, Flagstaff.
2008 The Magician of Ridge Ruin: An Interpretation of the Social, Political, and Ritual Roles Represented. Paper presented at the 73rd Meeting of the Society for American Archaeology, Vancouver, BC.
2012 Hohokam and Chaco in the Sierra Sin Agua. In *Hisat'sinom: Ancient Peoples in a Land without Water*, edited by Christian E. Downum, pp. 59-67. School for Advanced Research Press, Santa Fe, New Mexico.
2015 Suyanisqatsi/Koyaanisqatsi, Creating Balance in a Land of Little Water and Burning Rock: Cooperation, Competition, and Climate in the Flagstaff Region of the U.S. Southwest, A.D. 1000-1300. PhD dissertation, Department of Anthropology, Arizona State University, Tempe.

Pilles, Peter J., Jr.
1978 *The Field House and Sinagua Demography. Limited Activity and Occupational Sites: A Collection of Conference Papers*, edited by A. E. Ward, pp. 119-133. Contributions to Anthropological Studies, Albuquerque, New Mexico.
1979 Sunset Crater and the Sinagua: A New Interpretation. *Volcanic Activity and Human Ecology*, edited by Payson D. Sheets and Donald K. Grayson, pp. 459-485. Academic Press, New York.
1996 The Pueblo III Period along the Mogollon Rim: The Honanki, Elden, and Turkey Hill Phases of the Sinagua. In *The Prehistoric Pueblo World, A.D. 1150-1350*, edited by Michael J. Adler, pp. 59-72. University of Arizona Press, Tucson.
2009 Elden Pueblo: Historic Excavations to Contemporary Public Archaeology. In *Archaeology in America: An Encyclopedia, Volume 3, Southwest and Great Basin/Plateau*, edited by Francis P. McManamon, Linda S. Cordell, Kent G. Lightfoot, and George R. Milner, pp. 114-118. Greenwood Press, Westport, Connecticut.

Schilz, Allan J., Glennda Gene Luhnow, and Glenn S. L. Stuart
2011 Introduction. In *Tracks through Time: Urban Archaeology along the METRO Light Rail Corridor*, Vol. 1, edited by Allan J. Schilz, Margeri Green, Lourdes Aguila, and Glennda Gene Luhnow, pp. 1-22. Cultural Resources Report No. 147. Archaeological Consulting Services, Tempe, Arizona.

Schinsing, Simone Marie
2012 Prehistoric Marine Shell Exchange on the Colorado Plateau: A Comparison of Basketmaker II – Pueblo II Period Shell Artifact Origins. Master's thesis, Department of Anthropology, Northern Arizona University, Flagstaff.

Stanislawski, Michael Barr
1963 Wupatki Pueblo: A Study in Cultural Fusion and Change in Sinagua and Hopi Prehistory. PhD dissertation, Department of Anthropology, University of Arizona, Tucson.

Stone, Tammy
1991 *The Cemetery and Architectural Features of the Stadium Locus of Tempe Plaza (AZ U:9:72 [ASU])*. OCRM Report No. 79. Office of Cultural Resource Management, Department of Anthropology, Arizona State University, Tempe.

Trubitt, Mary Beth D.
2003 The Production and Exchange of Shell Prestige Goods. *Journal of Archaeological Research* 11(3):243-277.

Turney, Omar
1929 Prehistoric Irrigation. *Arizona Historical Review* 2(5). Phoenix, Arizona.

Vokes, Arthur W.
1999 The Ancient Use of Seashells in Arizona and Beyond. *Bulletin of Old Pueblo Archaeology Center*, Issue 18(1-6). Old Pueblo Archaeology Center, Tucson, Arizona.

Whittaker, John C. and Katheryn A. Kamp
1992 Sinagua Painted Armbands. *Kiva* 58(2):177-187.

Wilcox, David R.
1993 The Wupatki Nexus: Chaco-Hohokam-Chumash Connectivity, A.D. 1150-1225. Ms. on file, Museum of Northern Arizona, Flagstaff.

Wilcox, David R. and Charles Sternberg
1983 *Hohokam Ballcourts and Their Interpretation*. Archaeological Series 160. Arizona State Museum, Tucson.

Wilson, John P.
1969 The Sinagua and Their Neighbors. PhD dissertation, Department of Anthropology, Harvard University, Cambridge, Massachusetts.

Wright, Thomas E. and Scott M. Kwiatkowski
2005 Introduction. In *La Plaza Y La Cremaría: Archaeological Investigations in a Portion of AZ U:9:165 (ASM), A Multicomponent Site in Tempe, Maricopa County, Arizona*, pp. 1-11. Project Report No. 2001:107. Archaeological Research Services, Tempe, Arizona.