

Geoarchaeology and Geochronology at the Owens Ridge Site (31Ed369)

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Recent geoarchaeological work on relict dunes in the North Carolina Coastal Plain has shown the potential for contributing data regarding prehistoric hunter-gatherer adaptations to fluvial conditions likely related to Holocene climate change (Daniel 2002; Daniel et al. 2008; Moore et al. 2008; Seramur and Cowan 2002, 2003; Seramur et al. 2003). While the widespread occurrence of dune fields in Georgia and the Carolinas has been the focus of many geological studies (Markewich and Markewich 1994; Ivester and Leigh 2002, Ivester et al. 2001), the archaeological potential of these landforms remains unrealized in North Carolina. To date, 19 locations with potential for buried cultural occupations have been identified along a 42-mile section of the Tar River from Grimesland to Tarboro. Of these, more extensive archaeological testing was conducted at five sites based on shovel test data indicating stratified cultural remains. Stratigraphy at these sites consists of 1 to 2 meters of visually undifferentiated sand overlying remnant fluvial braid-bar or sandy scroll-bar deposits. In particular, dune sediments containing Early Archaic through Early Woodland (ca. 11,500 - 1000 Cal BP) remains have been identified within the upper 1 meter of sand.

Since 2004, this project has focused on identifying relict dune locations as an unrecognized, or at least an unexplored, geological context for identifying early to middle Holocene archaeological sites. Although much attention has been focused on refining and understanding Woodland Period cultural history (e.g., Phelps 1983) in the Coastal Plain, very little data and even fewer chronometric dates exist for stratified Archaic sites in the region.

The objectives of this research are threefold:

- (1) To investigate the origin and development of source-bordering dunes along the Tar River and assess their potential for buried (i.e., stratified) archaeological sites.
- (2) To describe the geomorphology and stratigraphy of source-bordering dunes including archaeological and sedimentological stratigraphy.
- (3) To determine the timing and burial sequence of archaeologically stratified aeolian deposits for understanding site formation history, refinement of cultural chronology and typology and to illuminate linkages between climate and cultural change in the North Carolina Coastal Plain.

Below, I summarize the results of geoarchaeological testing at the Owens Ridge Site (31Ed369). In addition, I discuss recent chronometric dating results from both radiocarbon and luminescence (OSL) dating at the site. The Owens Ridge Site (31Ed369) is a stratified relict "source-bordering" dune located along the edge of the upper paleo-braidplain of the Tar River in southeastern Edgecombe County, North Carolina (**Figure 1**). Relict alluvial-braided stream terraces are preserved to the east and north of the Tar River and are divided into an upper and lower paleo-braidplain. Although generally recognizable with high resolution LiDAR elevation imagery (acquired from the NC DOT Floodplain Mapping Program), the upper paleo-braidplain is only marginally higher in elevation than the lower paleo-braidplain; however, it is characterized by larger relict braided and sandy scroll-bar topography and larger and more numerous source-

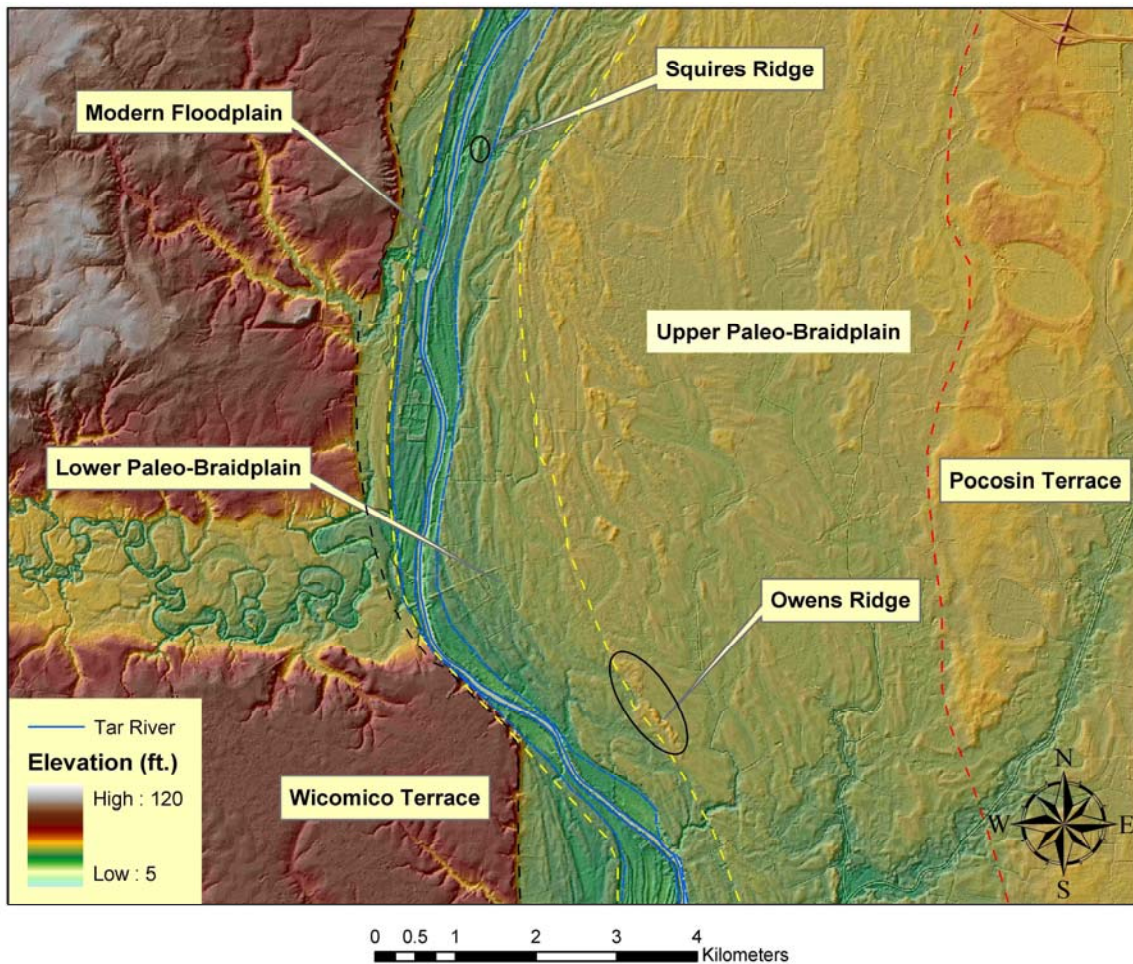


Figure 1. LiDAR image of the Tar River in Edgecombe County, NC, showing the upper and lower paleo-braidplains and the location of Squires Ridge (31Ed365) and Owens Ridge (31Ed369) archaeological sites.

bordering dunes. The Owens Ridge Site represents one of the largest relict source-bordering dunes within the upper paleo-braidplain and was targeted for shovel test survey based on its proximity to paleo-stream channels as well as its potential for containing stratified archaeological deposits.

Limited shovel testing of Owens Ridge revealed buried archaeological deposits located along the highest section of the landform or crest of the sand ridge. Test Unit excavations were conducted along the relatively narrow crest of the landform as it gently rises in elevation from west to east (representing the remnant stoss dune surface). Excavations of two (2x2 meter) Test Units produced buried archaeological deposits including one diagnostic Early Archaic projectile point base, a formal end scraper and debitage frequencies suggestive of stratification to a depth of 80-90 cms.

In addition to a concentration of lithic debitage and a formal "thumbnail" end scraper, large amounts of wood charcoal and charred hickory nut were recovered from Level 8 (Test Unit 2) using 1/8" wire mesh. Funds awarded by the North Carolina Archaeological

Society Grants-in-Aid Program in 2007 were used to acquire a radiocarbon date from Owens Ridge. An AMS radiocarbon date ($9,750 \pm 40$ BP) was obtained from a piece of charred wood recovered from general Level 8 fill (Beta - 238616). The two-sigma calibration for this conventional AMS age is 11,230-11,150 Cal BP and was calculated using the *INTCAL04* calibration database. This calibrated age range is consistent with the archaeology at Owens Ridge and indicates the presence of a very early, Early Archaic or very late Paleoindian occupation below Palmer.

Although no obvious features (soil stains or pits) were observed, the presence of a large amount of lithic debitage in a single level with associated "float" charcoal can be considered a feature in the sense that the cultural event responsible was likely a single flint-knapping episode occurring over a very short time period. Confirmation of buried surfaces (discussed below) suggest charcoal produced either naturally by wildfires or as a result of hearth activities will be stratified along with associated artifacts during episodic aeolian accretion events. Further justification for dating float charcoal in the context of shallowly

stratified aeolian landforms comes from the work at the Barber Creek site (31Pt259) where a series of radiocarbon dates has been obtained from both float and feature contexts in good chronostratigraphic order (Daniel et al. 2008). Thus, while randomly selected “float” charcoal is generally not appropriate or desirable in most instances, its use at Owens Ridge was justified and returned results not unexpected given its stratigraphic position below Palmer.

In addition to radiocarbon dating, single-aliquot luminescence (OSL) age estimates for Owens Ridge are consistent with late Pleistocene and Holocene burial events. Although weighted mean OSL age estimates returned Holocene ages (as expected) for Test Unit 1 at 40 cmbs (7.0 ± 1.2 ka) and Test Unit 2 at 55 cmbs (9.31 ± 1.05 ka), a single weighted mean OSL age from Test Unit 1 at 80 cmbs returned a late Pleistocene age (16.6 ± 3.4 ka). This age is inconsistent with the presence of buried archaeological deposits and with the radiocarbon date from Test Unit 2, Level 8. Examination of the

paleodose distribution for the older OSL age estimate suggests a minimum-age model may be more appropriate (e.g., Feathers 2006). Given that OSL ages from Owens Ridge came from two different Test Units, differences in thickness of Holocene aeolian deposits may also be a factor.

Application of a minimum-age model to the Test Unit 1 (80 cmbs) OSL sample produced an age-estimate dating to the Younger Dryas (12.8 ± 1.3 ka) and is broadly consistent with the radiocarbon date from Test Unit 1 (Level 8) at the lower end of the standard deviation (Figure 2). Interestingly, the Younger Dryas stadial event (ca. 12,900-11,500 Cal BP) figures prominently at several different relict dune sites along the Tar River (e.g., Barber Creek and Squires Ridge). Combined OSL and radiocarbon dating indicates initiation of aeolian dune or sand-sheet deposits along the lower paleo-braidplain and possibly the most recent reactivation of source-bordering dune rims within higher alluvial terraces (i.e., Owens Ridge) during the Younger Dryas event (Moore et al. 2008).

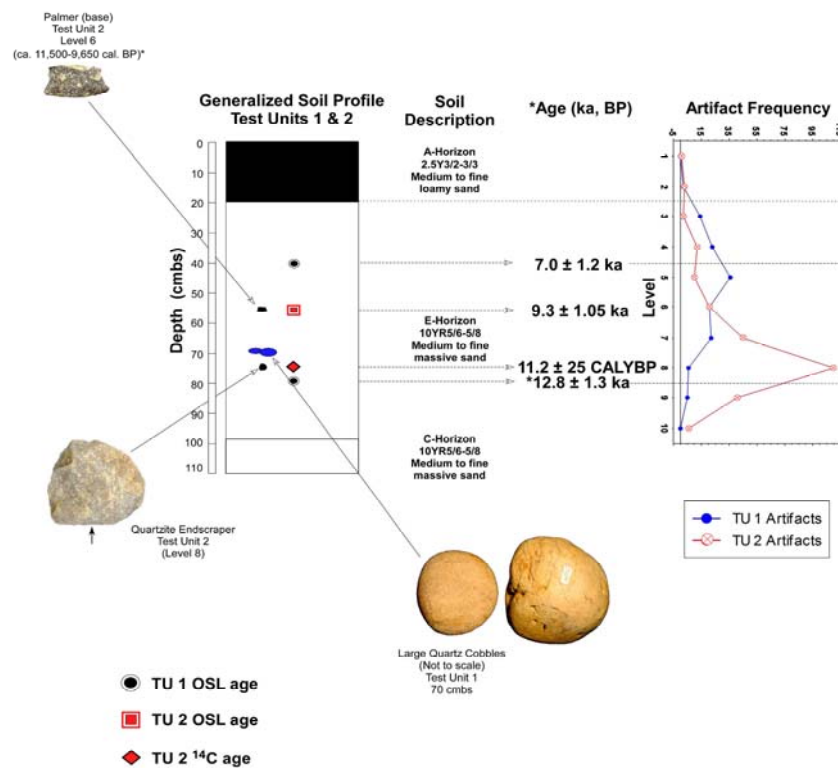


Figure 2. Archaeology, luminescence (OSL) and radiocarbon geochronology at the Owens Ridge Site (31Ed369). *OSL Minimum-age model estimate (see text). Note: Shannon Mahan (USGS Luminescence Dating Laboratory in Denver, CO) and George Brook (University of Georgia) provided luminescence age-estimates.

Close-interval grain size data from Owens Ridge (Test Unit 1) indicate multiple depositional events with indication of buried surfaces or stratigraphic breaks at ~135, 100, 85, 70, and 45 cmbs (Figure 3). An obvious deviation in mean grain size at ~20 cmbs represents the base of the modern A-Horizon and is useful for comparison to evidence for buried “long-

term” stable surfaces—particularly in the absence of obvious visual cues (e.g., Brooks et al. 1996). From ~100 cmbs to 70 cmbs, two ~15 cm thick depositional “packages” of sediment are indicated. These events are marked by very subtle but uniform (1/100 phi) coarsening-upward trends. Slight deviations in grain size statistical parameters and sand fraction data

indicate stratigraphic breaks possibly associated with burial events but lack backing archaeostratigraphic data below ~90 cmbs. The first instance of a buried archaeological surface or “floor” is in Test Unit 2, Level 8 (70-80 cmbs). Test Unit 1 produced two large quartzite cobbles that were found one leaning against the other at 70 cmbs and support sedimentological data indicating a buried surface at that depth. Although lateral continuity between Test Unit 1 and Test Unit 2 has not been established, the presence of a buried occupation floor in Level 8 of Test Unit 2 most likely represents the general location of the 70 or 85 cmbs buried surfaces indicated by grain size data for Test Unit 1.

Future work at Owens Ridge will focus on understanding site formation processes with the use of additional close-interval grain size data, additional radiocarbon dating and single-grain luminescence dating. Single grain OSL is more accurate than single-aliquot and should help to resolve questions of geochronology and buried occupation surfaces at the site. Based on the data collected thus far, Owens Ridge has the potential to produce evidence of buried Paleoindian occupations in stratified contexts. Additional excavations at Owens Ridge are tentatively planned for summer 2009.

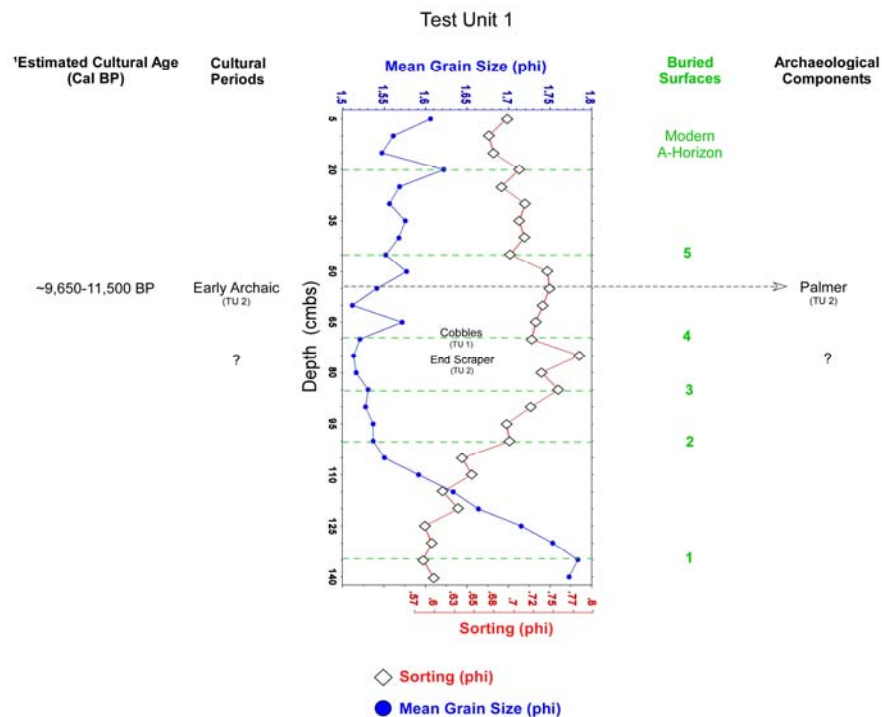


Figure 3. Site formation history and cultural chronology at the Owens Ridge Site (31Ed369).

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Acknowledgments

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NCAS Celebrates Its 75th Birthday at Southeastern Archaeological Conference

In October 1933, the North Carolina Archaeological Society (NCAS) was formed by forward-thinking individuals intent on promoting and preserving North Carolina's rich archaeological heritage. Now in 2008, the NCAS celebrates 75 years of maintaining that original mission. Coincidentally, in November of 2008, the Southeastern Archaeological Conference's (SEAC) 65th annual meeting was to be held in Charlotte. With these two events in mind, the NCAS Board of Directors hatched a plan to celebrate our 75th Birthday in tandem with the SEAC event. As such, the Birthday Planning Committee was formed, comprised of NCAS Board of Directors members Matthew Jorgenson and Scott Seibel and President-elect Tommy Stine. Thanks in large part to groundwork laid by NCAS Board of Directors Secretary Linda Carnes-McNaughton, the Birthday Committee took on its new role to coordinate such an event.

After much planning, conniving, emailing, and phone calling, the NCAS Birthday Committee decided three primary things. First, this historic occasion needed to be commemorated with more than just a party. Second, the event also needed to uphold the ideals of the NCAS – that of promoting and preserving North Carolina's archaeological heritage. Third, since a society only gets one 75th Birthday, a big birthday cake and a champagne toast at a bone fide Birthday Party were definitely in order.

To commemorate the 75th Birthday, two limited-run items were added to the traditional lot of NCAS merchandise – a commemorative poster and a stoneware mug. North Carolina artist, and NCAS President-elect, Tommy Stine created and produced the commemorative poster. Tommy donated the posters to the Society, and we are grateful for both his time and effort. The poster features an artist's rendition of our State, across which is depicted the locations of significant sites, exemplary artifacts, and a

few noted archaeologists who have contributed to our understanding of North Carolina's prehistory and history. An historic photo of the founding members of the Society is shown, and the names of all the past presidents of the Society are scripted around the border of the poster. For the special mugs, long-time NCAS supporters and potters at Tate-Walton Pottery were commissioned to produce the mugs, this time in a special multi-tone glaze and marked with the NCAS logo accented by a big "75". Eighty-seven such mugs were produced, and almost half of those were sold at



President-elect Tommy Stine with the "75th" NCAS Birthday Cake.

the Birthday event. While supplies last, both the poster (\$12) and mugs (\$10) are available through the North Carolina Office of State Archaeology in Raleigh (contact Dee Nelms), or at our Spring 2009 meeting (watch future Newsletters for details on that). **GET THEM WHILE YOU CAN!** As mentioned, both are limited-run items, and when they are gone, **THEY ARE GONE.**

In order for the Birthday event to have a lasting mark on the NCAS, the Birthday Committee decided to hold a raffle, with the proceeds contributing to our Endowment Fund which supports archaeological research in North Carolina through the society's Grant-in-Aid Program (see <http://www.rla.unc.edu/ncas/Grants/index.html>). Numerous government agencies, corporate entities, and individuals were contacted, and a wealth of prizes was donated to the NCAS for the raffle. Throughout SEAC, and during the day-long event at the Schiele Museum, raffle tickets were sold for \$1 each, or \$5 for six tickets. During the Birthday Party, Jeff Irwin's (former NCAS Board of Directors At Large Member) two daughters, Lucy and Lily, became the official

ticket pullers during the raffle, with Scott Seibel announcing the winners. Most of the winners were on hand to accept their prizes, and for those that were not, Environmental Services, Inc. of Raleigh North Carolina donated shipping to get the absentee winners their prizes. Without a doubt, interest in the raffle FAR exceeded the Birthday Committee's expectations. In all, 13 lots of prizes were drawn for at the Birthday Party (see list below). Thanks to all of the organizations, companies, and people who donated items for the raffle, and thanks to all who purchased raffle tickets and generously wished to help the NCAS with their donations supporting the Endowment Fund – a true testament to the impact our Society has on many peoples' lives.



Scott Seibel, Jeff Irwin, and Jeff's daughters Lucy and Lily at the NCAS Raffle.

Last, but not least, our Birthday Party was held in tandem with the Schiele Museum's hosting of SEAC's Barbeque Banquet at the end of the SEAC event, on Saturday, November 15, 2008. What a way to celebrate 75 years of the North Carolina Archaeological Society – by bringing together those of us who call North Carolina home with the larger regional archaeological community in the southeastern United States. With a location and date set, we needed to round up an appropriate birthday cake and plenty of champagne for the party attendees. Val's Custom Cakes of Morrisville, North Carolina was contacted, and the wonderful Valerie Plonski agreed to create a cake large enough to feed over 100 people, and to do so in the form of Town Creek Indian Mound. The cake Valerie made was gorgeous, and fittingly represented Town Creek Indian Mound – complete with "stratified" layers of cake under the icing (to be revealed by "excavation" of the cake), and with the Temple Building on its summit deliciously made of chocolate cake and topped with a shredded wheat "thatch roof". During the day on Saturday, the



NCAS members observe skilled primitive technology experts at the Schiele Museum's Catawba Indian Village area.

Schiele Museum provided extra activities for everyone and provided free admission to NCAS members. In the Schiele's Catawba Indian Village area, primitive technologies experts conducted flint knapping and basketry/weaving demonstrations. The outdoor Piedmont Farmstead was also open for viewing. And for those who thought it was a tad too cold outside, the temporary Swamp Things exhibit was located indoors, along with all the wonderful permanent exhibits in the museum. At 5pm, the Museum doors were closed to the public, and the SEAC barbeque and NCAS Birthday Party events were held. Over 100 people turned out for the events. A slide presentation, created by NCAS Board of Directors Secretary Linda Carnes-McNaughton, provided a visual depiction of various NCAS events over the past several decades, being shown on the Museum's flat-screen display. After dinner, the official NCAS Birthday party was held. After a few words of inspiration and

Raffle Winners, Item, and Donor

Hester Sachse – Item 1: Bracelet (Donated by Susan Myers)
 Alex Parsons – Item 2: Formative Cultures of the Carolina Piedmont (Donated by OSA)
 Paulette McFadden – Item 3: Reproduction Bifaces (Donated by Chris Espenshade at New South Associates)
 Owen Ford – Item 4: Reproduction Redware Vessels (Donated by Loretta Lautzenheiser at Coastal Carolina Research)
 William Lees – Item 5: Reproduction Prehistoric Pots (Donated by Joe Herbert)
 Matt Jorgenson – Item 6: Fort Bragg Bag of Swag (Donated by Fort Bragg CRMP)
 David Anderson – Item 7: Stoneware Bottle (Donated by Janet Levy)

appreciation were given by current NCAS President Terri Russ, the Cake was “excavated” and served, the champagne started flowing, and the Raffle Drawings were held.

In all, the 75th Birthday Party was a huge success and exceeded all expectations of the Birthday Committee. But none of it would have been possible without the dedication and donations of many people, organizations, and corporations. Tommy Stine and Tate-Walton Pottery are graciously thanked for their work in creating and producing our limited-edition merchandise items (still for sale while supplies last). Our gracious hosts, the Schiele Museum, in particular Museum Director Ann Tippitt and her staff, provided a wonderful location for the event, extra-curricular activities for the attendees, and the resources to provide a stimulating and all-around FUN event. Thank you also to Lucy and Lily Irwin for the excellent raffle ticket picking. Great appreciation is extended to Valerie Plonski of Val's Custom Cakes in Morrisville for the wonderful (and delicious) rendition of Town Creek Indian Mound. The NCAS Birthday Committee—Matthew Jorgenson, Scott Seibel, and Tommy Stine (along with Secretary Linda Carnes-McNaughton and OSA support by Dee Nelms and Joy Shattuck)—are also to be commended for organizing a well-rounded event that included fun events, but also left a lasting impression on the Society in the way of funds generated for our Grant-in-Aid Program. We would also like to thank all the party attendees, all of the people who purchased raffle tickets, and all of the donors of the items given away during our Raffle. Finally, to You, all of our Society members, we thank you for your continued support and dedication to the NCAS mission.

Maggie Needham – Item 8: Tom Stine Prints (Donated by Tom Stine)
 John Kelly – Item 9: Backcountry Books (Donated by Schiele Museum)
 David Anderson – Item 10: Tom Stine Prints (Donated by Tom Stine)
 Rochelle Marrison – Item 11: Collection of Old Books (Donated by Dan Morse)
 George Sabo – Item 12: Reproduction Prehistoric Pot (Donated by Tammey Beane)
 David Anderson – Item 13: NCAS 75th Birthday Print and Coffee Mug (Donated by NCAS)

Respectfully Submitted – Matthew Jorgenson, former At Large member of the NCAS Board of Directors.

**NCAS Newsletter
Publication Schedule**

All NCAS members are encouraged to submit articles and news items to Dee Nelms, Associate Editor, for inclusion in the *Newsletter*. Please use the following cut-off dates as guides for your submissions:

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