Designing Cemetery Surveys; Current Methodologies & Hiring Practices

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-Current Methodologies for Delineating Cemeteries
-How to Determine a Professional Archaeologist?
-How to hire a Commensurate Professional Archaeologist?

GENERAL STEPS FOR CEMETERY DELINEATION

- 1. Pedestrian Survey
  - -A pedestrian survey of the cemetery should occur utilizing a GNSS receiver to delineate the known, surficial boundaries of the cemetery (I.e. utilizing a Trimble or Emlid), identifying any potential burial depressions and establishing a site datum. Once a boundary of the cemetery has been delineated, a survey grid should be systematically established outlying survey transects for the GPR (no larger than 25cm spacing for the transects).

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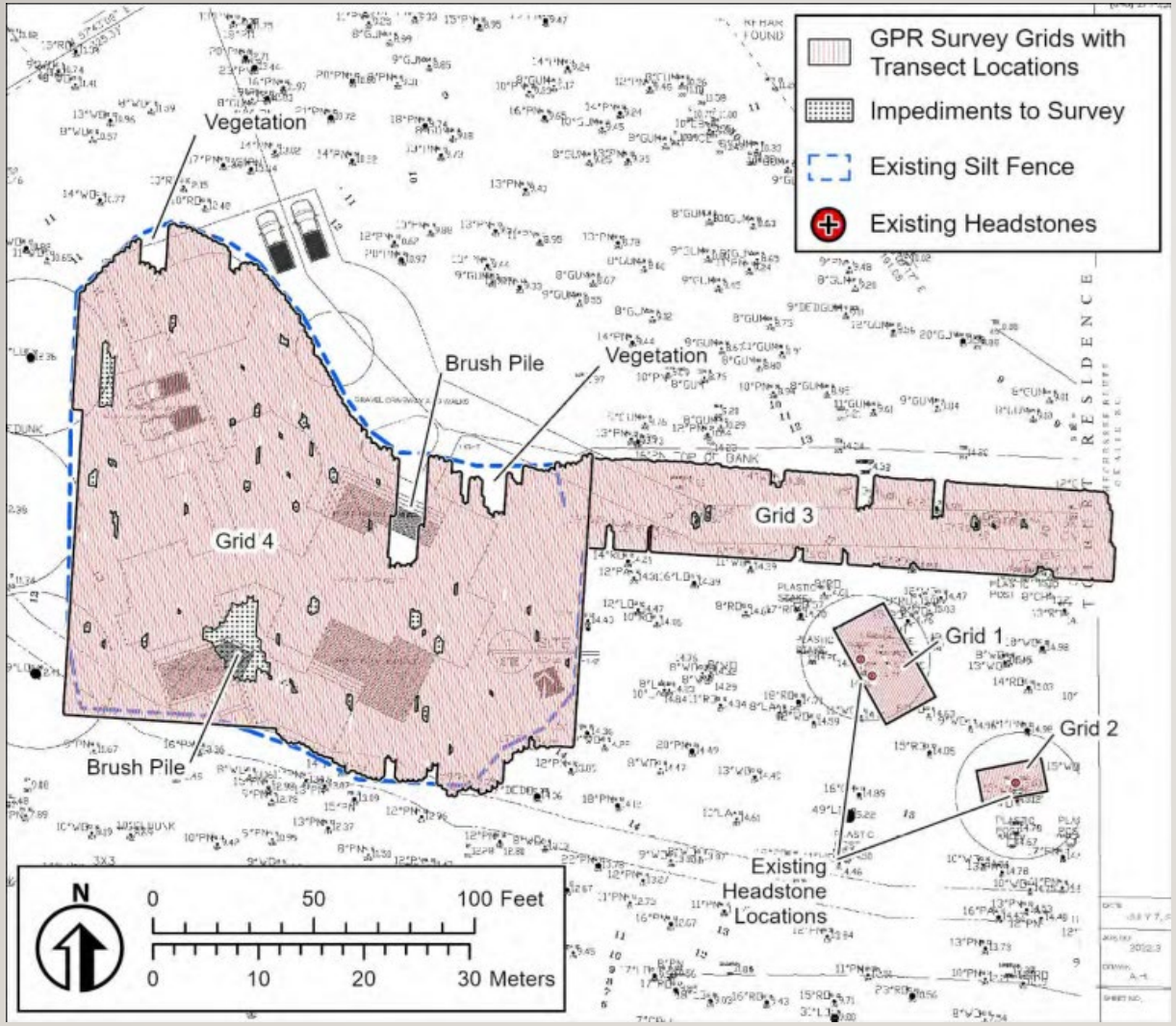

SURVEY GRID

- Example of GPR grid established from a pedestrian survey.

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SURVEY GRID

- Additional example of a survey grid with known headstones and footstones

GROUND PENETRATING RADAR

- Once, a systematic grid has been established and transects lines are spaced out, the cemetery is then ready for a GPR survey. GPR utilizes electromagnetic radiation in the microwave band of the radio spectrum to non-invasively probe the sub-surface, which is then read by a receiving antenna, tuned to a specific megahertz (MHz) which aligns to a scanning depth.
- Newer GPR units, can now utilize hyper-stacking antennas, allowing the units to read multiple depths of data. Traditionally, 350-400 MHz antennae have been utilized at burials, which read roughly between 2-7 meters/6-23 feet, often corresponding to burial depths. Once, the survey is completed, and the rough data undergoes post-processing, this will produce GPR aptitude maps of specific timeslices at various depths. This amplitude data will contain anomaly reflections representing changes in the strength/velocity of electromagnectic waves in comparisons to surrounding subsoils. These amplitude maps can be presented as two-dimensional radargrams depicting anomaly reflections at various depths; burial anomalies often appear as hyperbola reflections.

LIMITATIONS OF GROUND PENETRATING RADAR

- GPR is not a full-proof methodology inherently.
- The amount of energy that is reflected back to a GPR antenna is dependent on the contrast in dielectric permittivity that exists across subsurface boundaries or interfaces.
- The detection of an anomaly is affected by 1) the electromagnetic gradient existing between the feature and the soil; 2)the size, depth, and shape of the buried feature; and 3) the presence of scattering bodies within the soil.
- The greater and more abrupt the contrast between an anomaly (e.g., buried archaeological feature) and the surrounding soil, the greater the amount of energy reflected back to the antenna, and the more intense and conspicuous the reflected signal.

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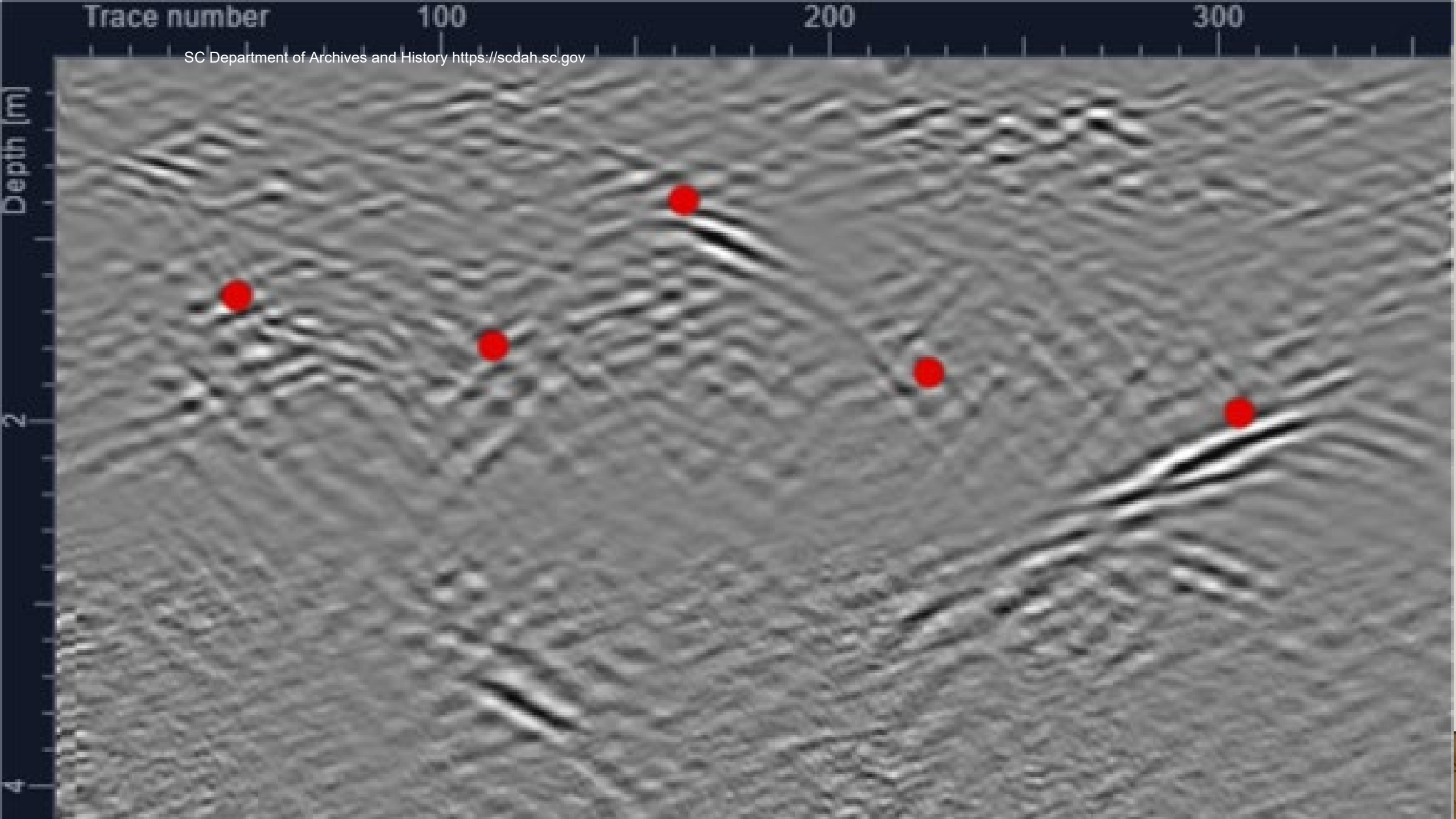
DEMONSTRABLE SOIL DIFFERENCES



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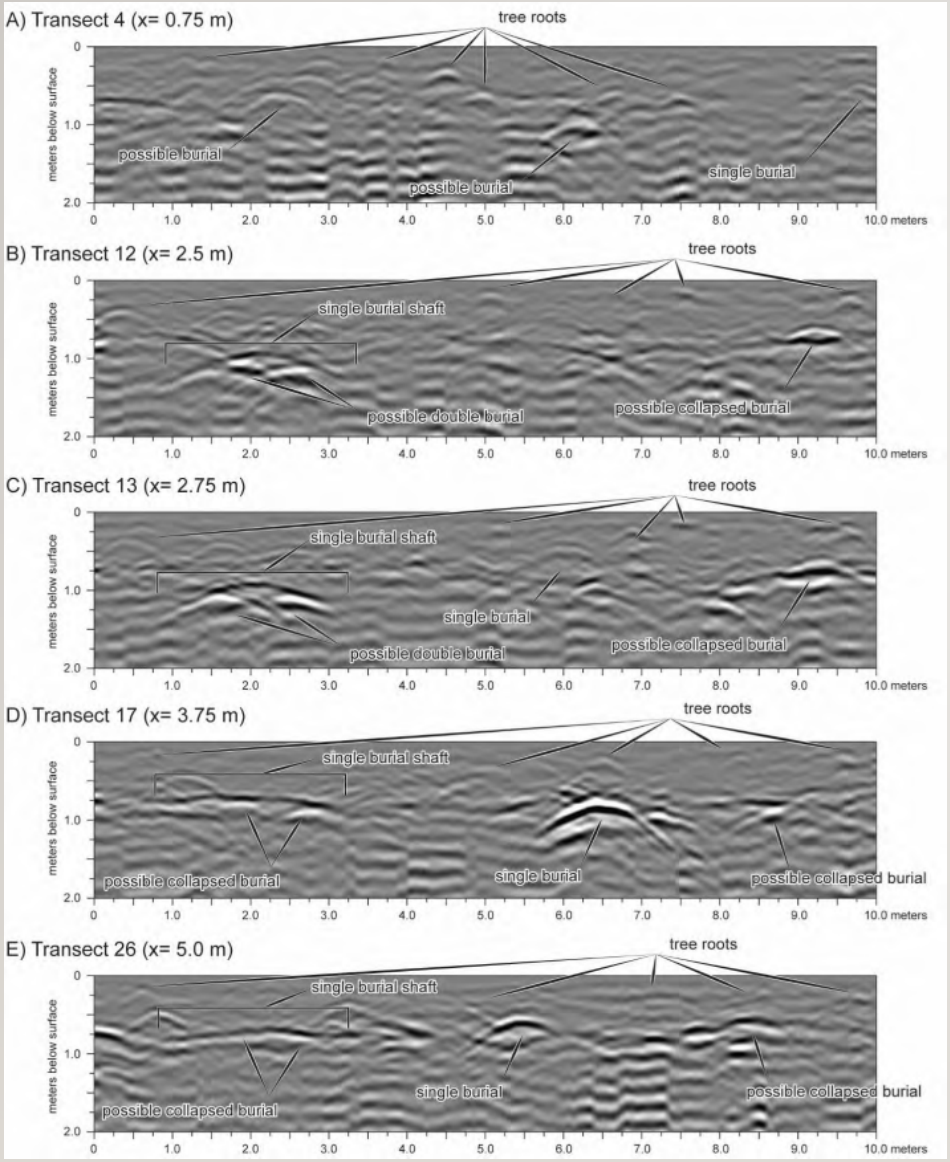
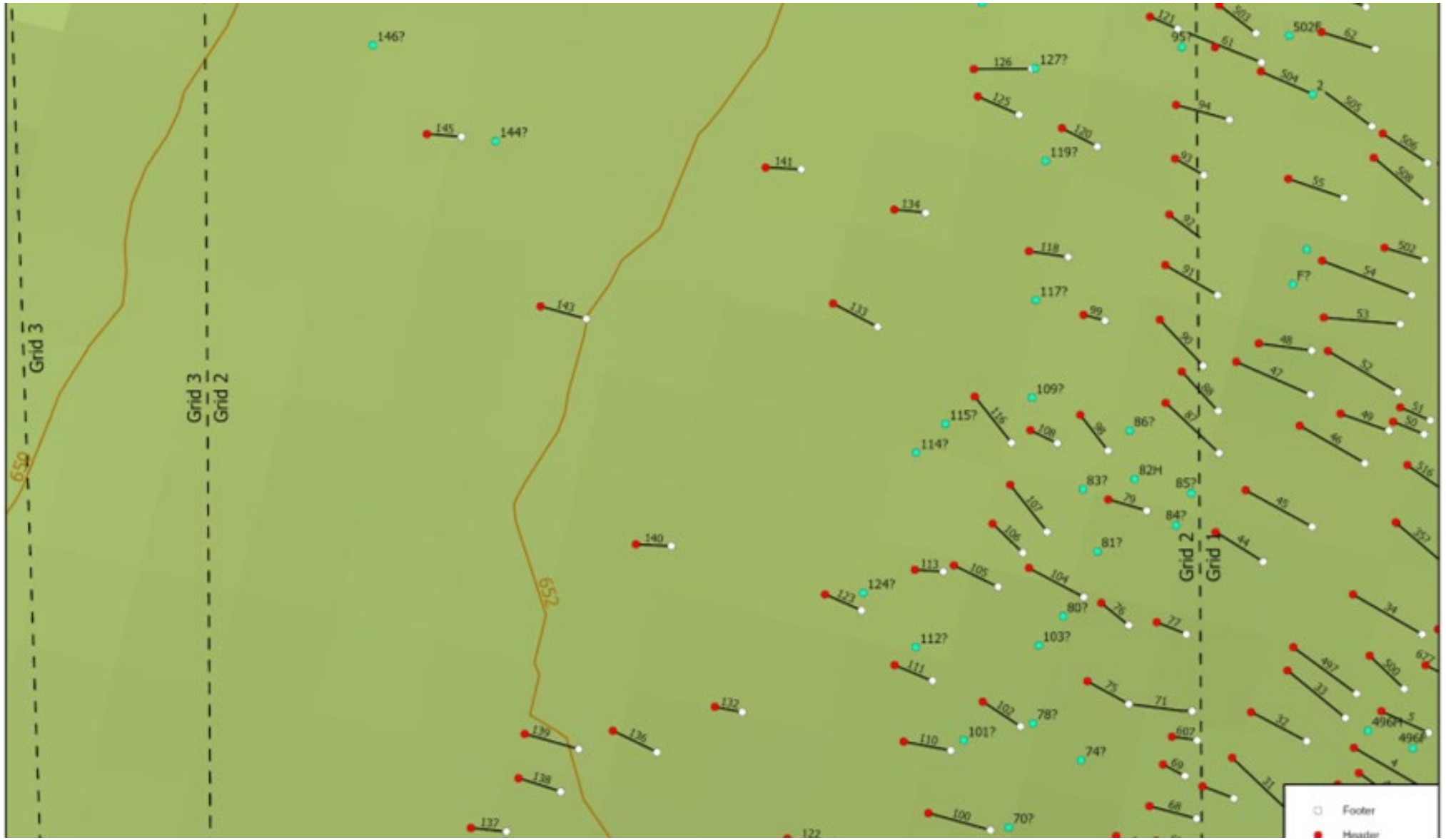


GPR REFLECTIONS

SITE MAP

- From this, a site map detailing locations of potential burials can be created, therefore allowing targeted recording to occur.



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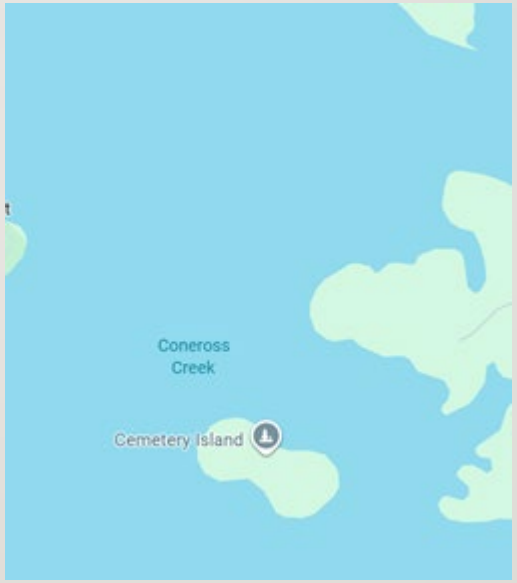
HARRIS-PICKENS CEMETERY

"Cemetery Island"

-Damaged During Helene



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SOUTH CAROLINA STANDARDS AND GUIDELINES FOR ARCHAEOLOGICAL INVESTIGATIONS

- Newly Revised in 2024

- https://scdah.sc.gov/historic-preservation/resources/archaeology

SECTION II. E. 4. D)

- Cemeteries: SHPO and SCIAA recommend recording cemeteries on both a SHPO survey form and a SCIAA archaeological site form. Archaeological site forms and numbers can be obtained by contacting SCIAA. Cemeteries that are unmarked (no markers visible) or prehistoric should be recorded only on a SCIAA archaeological site form. Historic cemeteries with 1 or more grave markers should be recorded on a SHPO survey form, in addition to a SCIAA archaeological site form. This includes cemeteries that are partially marked and markers with no writing (for example, a field stone).

SECTION II. F. 3.

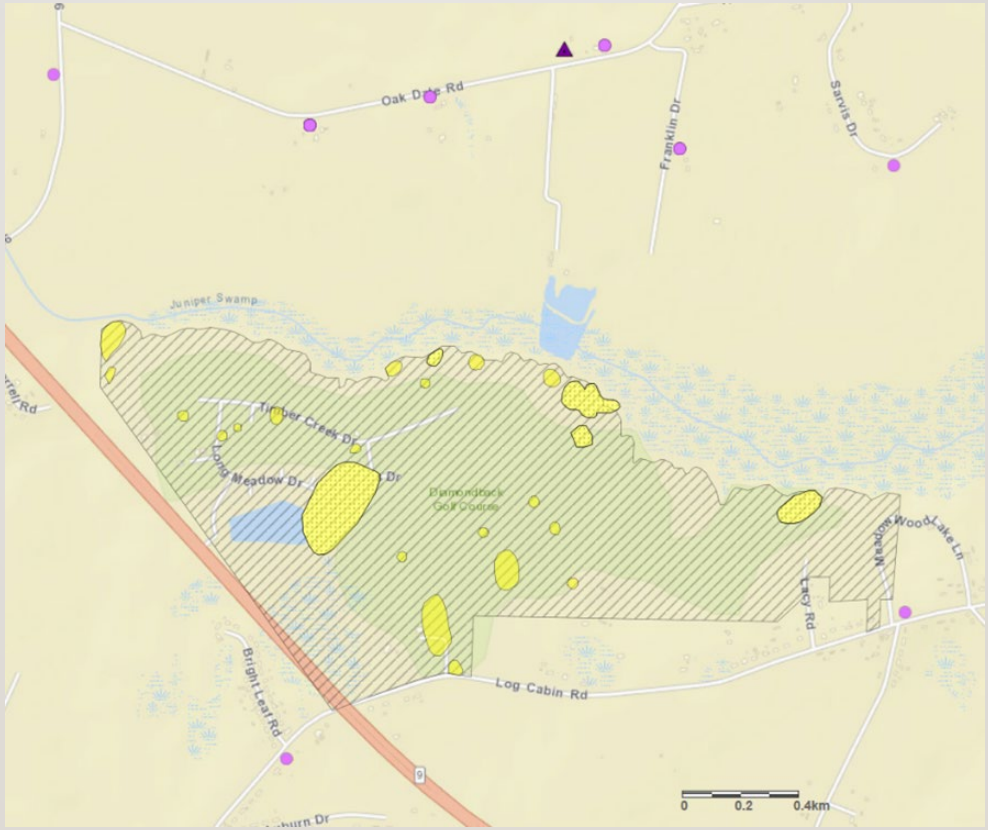
- REMOTE SENSING
- Note-Remote sensing must still be conducted by an individual who meets the qualifications to be listed as an Archaeologist within Section V. Personnel Qualifications of this document (and the Secretary of the Interior's Professional Qualifications Standards). Additional remote sensing qualifications, such as the remote sensing course offered by the National Park Service's National Center for Preservation Technology and Training (NCPTT) are preferred certifications which demonstrates an individual's expertise in remote sensing methodologies.

SECTION II. F. 3. CONTINUED

- All ground penetrating radar surveys in cemeteries should involve the collection of radargrams and the later processing of that data into three-dimensional volumes for creating amplitude slice maps. Graves can appear in radar data as positive or negative (gaps in an otherwise strong reflector) anomalies. Real-time flagging of hyperbolas in radargrams visible on the radar system display screen is highly discouraged if it is the sole survey result because tree roots (among other things) look very much like graves in radar profiles; furthermore, grave shafts might be located between hyperbolas, which is only visible in amplitude/time slice maps. Historic graves can present as subtle reflections and identification requires careful analysis by experienced personnel who are familiar with both the cultural context of the cemetery and interpreting GPR results in a cemetery setting.
- Because graves can be relatively small, radar data in cemeteries should be collected along transects spaced no more than 50 cm apart (25 cm spacing recommended). GPR survey transects should ideally be oriented to cross perpendicular to the long axis of observed graves (if graves are oriented east-west, GPR transects should run north-south, if possible). Radar antennas with central frequency ranges from 200-700 MHz are recommended. Lower frequency antennas may be too low in resolution to differentiate side-by-side graves. Most soils in South Carolina rapidly attenuate radar energy, so depth penetration typically does not exceed two meters, unless soils are sandy. Radar surveys in cemeteries typically detect grave shafts (the soil within the grave), roads/paths, building and wall (outer walls, plot boundaries) foundations, utility lines (e.g., irrigation), and burial containers (coffins and vaults) if the depth of penetration is sufficient. If possible, GPR surveys should include a minimum of 10 meters beyond the observable cemetery boundary to investigate the potential for unmarked burials.

WHY DOES RECORDING WITH THE STATE MATTER?

- -Regulatory Agencies Can Access South Carolina ArchSite



SECTION V. PERSONNEL QUALIFICATIONS

- Archaeological projects require the services or input of professionals in archaeology and other related disciplines. It is essential that cultural resource surveys and evaluations be performed and supervised by qualified professional personnel. Agencies, institutions, corporations, associations, or individuals will be considered “qualified” when they meet the Secretary of the Interior’s Professional Qualifications Standards (36 CFR 61 and Federal Register 48:44738-44739). The qualifications for archaeologist, architectural historian, and historian are presented below.

ARCHAEOLOGIST QUALIFICATIONS

- The minimum professional qualifications in archaeology are a graduate degree in archaeology, anthropology, or closely related field plus:
- At least one year of full-time professional experience or equivalent specialized training in archaeological research, administration or management; At least four months of supervised field and analytic experience in general North American archaeology, and demonstrated ability to carry research to completion.
- In addition to these minimum qualifications, a professional in pre-contact archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archaeology shall have at least one year of full-time professional experience at a supervisory level in the study of archaeological resources of the historic period.

PRINCIPAL INVESTIGATOR QUALIFICATIONS

- The Principal Investigator (PI) is the individual responsible for planning and investigating cultural resources and for the validity of the material presented in cultural resource reports. All archaeological investigations must be carried out under the direction of the PI, who will minimally meet the standards outlined by the Secretary of the Interior (see above) and have at least 6 - 12 months of archaeological experience in South Carolina or the southeastern United States. A PI is presumed to meet these qualifications if he/she is certified with the Registry of Professional Archaeologists (RPA). If a PI is not RPA-certified, he/she must attach a vita detailing his/her professional experience as an appendix to the report.

REGISTER OF PROFESSIONAL ARCHAEOLOGISTS

- The Register of Professional Archaeologists' fundamental goal is the establishment and acceptance of universal ethical and professional standards in archaeology. Towards this goal, we also aim to:
- Provide an explicit, written Code of Conduct and Standards of Research Performance for professional archaeologists.

- https://rpanet.org/

RPA CODE OF ETHICS

- **Principle No. 1: Comply with Applicable Laws**
- You shall comply with existing and applicable public federal, state, local, tribal, indigenous, and international law, agency rules and regulations regarding safe work environments, harassment (including that which is related to age, sex, gender, or orientation, or any other applicable protected class), discrimination, gender and sexual violence, antiquities, custodianship or curation of archaeological collections, fraud, deceit, bribery, slander, plagiarism, permits for archaeological work, confidentiality laws, and/or other laws pertinent to archaeology or your position as an archaeologist (referred to hereafter as “Applicable Laws”)1. For the purpose of the Code and Standards, confidential information is defined as information about archaeological site locations and information that is restricted from public distribution by applicable state, federal, or international law. When an existing and Applicable Law conflicts with the Code of Conduct or Standards of Research, the Applicable Law shall govern.

RPA CODE OF ETHICS, CONT.

- **Principle No. 2: Practice Respectful Conduct and Candor**
- You shall treat everyone with dignity and respect. You shall foster a professional working environment, free from illegal, unethical, harassing, degrading, or demoralizing behavior to others. You shall act with candor to the archaeological community by being truthful, honest, and forthright regarding archaeological matters. Further, you shall not disclose confidential archaeological site location information from the archaeological record to the public.
- The Register's ability to investigate and prosecute violations of criminal and civil law regarding non-archaeological matters is limited; however, the Register shall take into account the outcomes from professional law enforcement, courts, and investigators during the enforcement of this Code and any resulting grievance process.

RPA CODE OF ETHICS

- **Principle No. 3: Adhere to Standards of Archaeological Research**
- You shall design, participate in, or conduct projects that will add to the understanding of past cultures and/or that will develop better theories, methods, or techniques for interpreting the archaeological record. You shall design and conduct projects that will engage with descendent and indigenous communities when appropriate and permissible. You shall respect the materials recovered during an archaeological investigation, such as materials, collected materials, artifacts, archaeological materials, cultural materials, and material collections (hereafter, “Archaeological Collections”. You shall comply with local, regional, and national guiding standards that aim to minimize effect to the archaeological resource base.

ARCHAEOLOGICAL RESOURCES ACT OF 2010

- In 2010, the South Carolina State Legislature, under Governor Mark Sanford, passed the Archaeological Resources Act stating "(C) It is unlawful for a person to willfully, knowingly, or maliciously enter upon the lands of another or the posted lands of the State and disturb or excavate a prehistoric or historic site for the purpose of discovering, uncovering, moving, removing, or attempting to remove an archaeological resource. Each unlawful entry and act of disturbance or excavation of a prehistoric or historic site constitutes a separate and distinct offense."

SOUTH CAROLINA STATE BURIAL LAWS

- Destruction or Desecration of Human Remains or Repositories Thereof; Penalties
  16-17-600, SC Code of Laws
  Provides for penalties of up to $5,000 in fines, and imprisonment for not more than ten years for the vandalism or desecration of burials or grave markers, and lesser penalties for the destruction or injury of fencing, plants, shrubs, or flowers.
- Removal of Abandoned Cemeteries
  27-43-10 thru 27-43-40, SC Code of Laws
  Requires a notification process before an abandoned cemetery is moved, approval by the local governing body, the relocation of the graves to a suitable place, and protection of grave markers through the move.

REMOVAL OF ABANDONED CEMETERIES

- 1) It is necessary and expedient in the opinion of the governing body of the county or municipality in which the cemetery or burying ground is situated to remove the graves. The governing body shall consider objections to removal pursuant to the notice under item (2) or otherwise before it approves removal.

- (2) Thirty days' notice of removal is given to the relatives of the deceased persons buried in the graves, if they are known. If no relatives are known, thirty days' notice must be published in a newspaper of general circulation in the county where the property lies. If no newspaper is published in the county, notice must be posted in three prominent places in the county, one of which must be the courthouse door.

- (3) Due care is taken to protect tombstones and replace them properly, so as to leave the graves in as good condition as before removal.

ACTIONS OUR AGENCY WILL NOT ENDORSE

- A professional archaeologist, conducting a professional archaeological survey, should not, as a part of cemetery delineation or cemetery research, exhume human remains.
- Exhumation of human remains should only occur under Removal of Abandoned Cemeteries
  27-43-10 thru 27-43-40, SC Code of Laws, which contains codified steps, as stipulated within state law.

FINAL THOUGHTS

- When does research and preservation, philosophically and physically, turn into desecration?