

FORENSIC ANTHROPOLOGY CENTER





SUMMARY

Due to varied, unique, and often unlawful burial practices of unidentified, presumed migrants in South Texas, the use of geophysical prospection has been critical to locate buried remains and to minimize impact in the community cemeteries where excavations have taken place.



Location of south Texas border cemeteries examined for this study.

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Operation Identification

Searching for the Unidentified in South Texas Cemeteries: The Application of Geophysical Prospection

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Sacred Heart Burial Park, Brooks County, TX - Area 5



Location of Area 5 within SHBP, Brooks County, Texas.



Processed GPR slice from Area 5 (0.20-0.30 m).



Processed GPR slice from Area 5 (0.20-0.30 m) with grave boundaries.



SfM models of the burials from Area 5.



N 0 0.25 0.5 Meters

Detail of SfM models of the burials from Area 5



Area X West with county plot records

Processed resistivity data from the TAR-3

INTRODUCTION

The ongoing mass disaster at the U.S.-Mexico border has overwhelmed local jurisdictions in South Texas creating human rights violations and a humanitarian crisis. In many counties, unidentified, presumed migrants were buried with minimal to no investigation or DNA sampling as required by state law (TCCP Ch 63), denying these individuals the opportunity to be identified and repatriated.

In 2013, Operation Identification (OpID) was founded within the Forensic Anthropology Center at Texas State to help locate, recover, identify and repatriate unidentified presumed migrant remains (see Jasinski et al. and Kaplan and Spradley, HHRRC 2021 session). Few if any records are kept indicating the final disposition of the remains other than temporary markers which fade with time. Even if the cemetery name and location are known, where the remains are buried relies predominantly on memory recall from local officials, groundskeepers, or members of the community. In order to facilitate location burials, corroborate memory recall, and minimize our impact within community cemeteries, geophysical survey of areas of interest are routinely conducted prior to excavation. Additionally, OpID incorporates low altitude imagery and drone imagery to provide high resolution spatial referencing

The purpose of this presentation is to outline how geophysical survey has contributed to OpID's location of unmarked burials through two case examples.

METHODS

- Sacred Heart Burial Park (SHBP) Area 5 is 9 by 6 m with 1 temporary burial marker with no information. Previous photos taken by an NGO indicated 2 additional burials. Geophysical survey included ground penetrating radar (GPR) using the GSSI SIR4000 with a 400mhz analog antenna. This area was excavated by hand in January 2019, and a series of overlapping images were obtained for Structure from Motion (SfM) 3D model generation of the exposed burials..
- Zapata County Cemetery (ZCC) Area X West is 27 by 7 m. A map provided by the county indicates at least 7 unknown individuals. Geophysical prospection included GPR and resistivity. GPR data was collected using the GSSI unit with a 400 MHz analog and HS350 MHz digital antennae. Resistivity data was collected in both grid and line formats using the Frobisher TAR-3. The line mode produces a pseudosection and represents depth.
- All GPR data was processed using GPR-SLICE v7.MT (January 2021 release)
- Resistivity data was processed using TerraSurveyor v3.0.36 and RES2DINVX64 v4.1
- Both sites were mapped with a Trimble RTK base and rover system and a Leica TS06 plus total station. Burials from SHBP were also hand-mapped using traditional archaeological methods.

RESULTS

- SHBP GPR data suggested multiple anomalies consistent with potential burials. Four single burials were located upon excavation. Three burials were recovered from wooded burial containers, while one burial was a bone bundle wrapped by a sheet
- ZCC GPR data indicate several burial anomalies as well as potential burial cuts consistent with previous observations at SHBP. These anomalies align with several of the burial locations depicted on the plot map provided by county officials. The resistivity grid data fails to provide clear grave anomalies. However, the pseudosection shows a series of vertical anomalies (likely grave shafts) which align well with burials on the county plot map.

DISCUSSION & CONCLUSION

OpID has conducted exhumations at four cemeteries in South Texas. Although these burials originate from different jurisdictions, presumed migrants are typically buried within plastic body bags, rather than wooden or metal burial containers. Therefore, when utilizing GPR and other geophysical technologies, data interpretation relies on searching for cut lines, or the burial shaft, rather than a response from the burial itself. As a result, these burial signatures appear in the processed data as a muted response, where detectors are picking up on burial fill rather than the buried individual.

The routine utilization of various geophysical technologies, using differing data collection methodologies has allowed OpID to strategically proceed with excavations across jurisdictions who employ a variety of burial practices. This approach is continually evolving. We continue to acquire new prospection equipment, such as the resistance unit, and we have refined our understanding of the geophysical anomalies expected from these presumed migrant burials which will help us in future investigations and excavations.