Physicist Uses Radio Signals to Search Downtown Las Vegas for Signs of Ancient Pit Houses

February 16 2009

(PhysOrg.com) -- Using radio signals instead of shovels, a physics faculty member from Ithaca College, along with local archeologists, has found evidence of additional 1,300-year-old pit houses five miles from the Las Vegas Strip. This recent find promises to give archaeologists new insights into how people who once lived in the Southwest transitioned from a foraging society to a sedentary one.

Using ground penetrating radio equipment, Michael “Bodhi” Rogers and two of his undergraduate researchers have produced images showing the possible location of two ancient dug-out dwellings known as pit houses. It is anticipated that more pit houses will be identified as the researchers further analyze the data. The ancestral Puebloans who lived in those pit houses were seasonally using the location.

Rogers made his discovery in Springs Preserve, a 180-acre national historic site within the Las Vegas city limits. He and sophomore physics majors Chris Hastings and Kevin Hurley were working in collaboration with preserve archeologist Patti Wright. Previous digs at the site unearthed two pit houses as well as ceramics and other ancient artifacts. But where those earlier investigations employed traditional excavation methods, Rogers’s team used ground-based remote sensing (GBRS) techniques, which use radar, radio waves, and other technologies that can “see” under the ground to reveal disturbed soil patterns and other geophysical changes created by human occupation of the site.

“Depending on the scope of the project, we can obtain information much more quickly with remote sensing technology,” Rogers said. “We can accomplish in days what might take years using traditional methods. By telling archaeologists if something’s down there or not, GBRS lets them know where to dig and also where not to dig. They save a lot of time, and there’s a lot less destruction of the site. The results of the excavation help confirm the interpretation of the geophysical data, which can then be used to help understand house shapes and organization.”

Ancestral Puebloans occupied the southwestern United States as early as 1200 B.C. Archaeologists had evidence indicating that some of those ancient people had come to Springs Preserve in search of water. After carefully mapping the area into grids, Rogers and his team sent periodic radio signals into the ground with radio antennas. The transmitting and receiving antennas were pulled along the ground, taking a reading every centimeter. When the signals encountered something different from the surrounding soil, they reflected back to a receiving antenna. Data points were recorded for each signal and distinct patterns emerged.

“When we’re investigating areas in Cyprus and other places we know to have had large stone buildings, it’s not unusual to record images of structures,” Rogers said. “But in Las Vegas, what the radar showed was a subtle difference in the properties of the soil making up the floor of the pit house compared to the fill soil.”Where many pit houses have been discovered with plaster floors, however, the floors of the Las Vegas houses were little more than tamped down dirt.

“The excavation and GBRS evidence we found shows a site that’s remarkably ephemeral in terms of how people inhabited them,” Rogers said. “But no matter how ephemeral it is, this is one of the oldest Ancestral Puebloan sites in the Las Vegas area. This find is going to give archaeologists a perspective into the way the ancestral Puebloans were seasonally using the site. The next logical step is for the archaeologists to

conduct test excavations to confirm what the radar is telling us."

Rogers and his various teams of student researchers have collaborated with archaeologists on numerous GBRS projects, including explorations of unmarked burials in historic cemeteries, Late Bronze Age cities in Cyprus, and located remains of the French and Indian War-era Fort Hardy, which played a role in the American Revolution.

Provided by Ithaca College