



Topcon digs into Mexico's ancient history



Total station and GPS technology are becoming as commonplace at archeological dig sites as shovels, picks and brushes. Although they add a critical mapping element and enable field teams to work more efficiently, not all equipment "colors" are created equal as Dr. Tricia Gabany-Guerrero discovered a few years ago when her team attempted to use a handheld GPS unit that wasn't powerful enough.

"We are very remote and often down in holes so satellite reception can be an issue," says Dr. Guerrero. "We need very powerful and sophisticated positioning equipment to help us create 3D positions of artifacts, which can assist us with dating and determining their use as well as the relationships between artifacts. The equipment is critical to the work and saves time and money in the long term."

Dr. Guerrero found the powerful and sophisticated technology she needs in Topcon's GPT-3007W Reflectorless Total Station and Topcon's HiPer Lite Plus integrated GPS and RTK receiver.

An anthropologist at the University of Connecticut, Dr. Guerrero and a small international team have been digging up dirt on the Purépecha Empire – both literally and figuratively – since 2001. A virtual unknown in the history of Mexico, the Purépecha Empire was a revered rival to the Aztecs who exerted control over major trade routes that extended throughout Mexico and grew a territory covering more than 75,000 kilometers square.

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AT WORK

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- Dr. Tricia Gabany-Guerrero

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In close collaboration with the Mexican Native American Community Comunidad Indígena de Nuevo San Juan Parangaricutiro (CINSJP), the team is using Topcon technology in their field investigations to not only demystify the origins of the Purépecha but reconstruct their world through 3D technology.

"The Topcon equipment has greatly assisted us with these finds because we now understand more clearly the spatial relationships between structures in a region as well as structures in a controlled site," says Dr. Guerrero. "And we can relate that to a broader context of cultural issues in the region such as trade or mining."

Working in a three-hectare area about 100 km west of Lake Pátzcuaro, the team sets ground control with the GPT-3007W and walks the select area with the GPS receiver to record and to map not only the exact location of artifacts found but the tentative boundaries of the controlled site. Based on the specific artifact densities, the team pinpoints where to begin more detailed excavations by digging pits. For the pit work, Dr. Guerrero's group uses the total station and GPS technology together to create very detailed maps of both the hole and all artifacts found within it. Using the total station, they map the four coordinates



of the top of each layer and the bottom of each layer. Each artifact found is shot with the GPS to map its specific location within the particular pit. Having that mapping detail enables the team to associate not only the positions of artifacts with the stratigraphy of the pit but across the entire site.

With the aid of Topcon technology, the group has established the existence of extensive Late Classic and Late Postclassic communities (700 AD and

1450 AD), revealing evidence of both ceremonial and residential sites, organized households and communities as well as patterns of regional interaction and trade. A particular highlight came last summer when they discovered an elite ceremonial residence. Dr. Guerrero says she wants to have Topcon total station and



GPS technology on site when they investigate this recent find further 2007.

"The Topcon total station and GPS technology has completely revolutionized our ability to work," concludes Dr. Guerrero. "It has significantly improved our mapping ability. Most importantly we can now put our data in a spatial context. We can relate specific data about structures, features or artifacts to a broader context of the geography of the region and the social climate of the time. It's thrilling."

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