Not to scale? Maya civilizations show strange correlation

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Researchers who study urban areas have long observed a connection

between size and proximity—namely, that cities become more dense as they gain in population. The more people live in a place, the closer together they live and work.

This closeness is important: It likely accelerates learning and facilitates the sharing of ideas. It's readily demonstrated by data on civilizations separated by time and space, from pre-conquest Central Mexico to Medieval European cities to present-day metropolises.

But some societies buck the trend. Archaeologists have found evidence of "low-density urbanism" around the globe, including Maya sites in Mesoamerica. These populous areas didn't undergo a density increase as their numbers swelled; in some cases, they followed an inverse correlation.

"The existing data we have for Maya society shows the opposite pattern," says anthropologist and SFI External Professor Scott Ortman (University of Colorado-Boulder). As the Maya population rose, the city spread out, and the density fell. People didn't live closer together; they spread out.

Together with External Professor José Lobo at Arizona State University, Ortman leads the Social Reactors Project. At a working group at SFI this August, Lobo and Ortman will bring together a group of early career scholars to examine the challenge posed by low-density Maya settlements to the idea that density increases with population.

In recent years, scholars' abilities to probe Maya history and culture have increased thanks to LiDAR surveying technology. LiDAR, a remote-sensing tool, is particularly useful in mapping rugged terrain. It works by ring laser pulses over an area from above, then measuring the return time of the pulses to produce a three- dimensional map of landforms and buildings, including those that might be hidden by jungle. Many scholars who will attend the August working group have expertise in using

LiDAR on Maya sites.

Ortman says that by revealing the hidden boundaries of settlements, LiDAR might help scholars understand how low-density societies align with the general scaling framework observed in other civilizations, old and new. The data from Maya studies challenge not only the correlation between population and density, but also the very idea of what it means to be a city.

"What we're not sure about is whether the difference we see implies that Maya society worked in a different way," says Ortman, "or if it's just a function of the way Maya archaeology has been done."

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