

Oral presentation

Ground truthing of satellite images of tropical forests and ancient agricultural terraces in the vicinity of the preclassic Maya site of San Bartolo, Guatemala

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Introduction. Recent ground surveys of rural farmsteads in the catchment basin of the civic/ceremonial center of San Bartolo revealed ancient terraces ostensibly used for agriculture by the Preclassic Maya. The study area is in the far northeastern corner of Guatemala in the heart of the Petén rain forest. The great variability in spectral signatures as seen from high-resolution satellite images of the area indicated a broad diversity of tropical forest cover. To determine the meaning of the spectral signatures and to confirm our hypothesized interpretation (i.e., red represented upland forest, blue represented mesic bajo or swamp forest and intermediate colors represented transitional forest types), we conducted quantitative surveys of forest vegetation through the areas representing the different spectral signatures.

Objectives. The objectives of this study were to determine the nature of the forest cover in the area associated with the terraces and to correlate the spectral signatures of the satellite images with the forest types identified on the ground. In a broader sense, our hope was to use the correctly interpreted satellite images to predict additional areas of terrace construction.

Methods. Belt transects (10 m X 30 m) were defined on a north-south axis through forested areas that corresponded to spectral changes seen in the satellite images. In each transect, all trees greater than 7.5 cm diameter at breast height were recorded. For each tree, the height, diameter, species name and economic uses were recorded. Five transects, connected end to end, were completed in this study.

Results. The results of the belt transects employed in this study enabled us to define several forest types in the study area. The southernmost portion of the transect area was covered by upland forest with characteristic trees such as *Manilkara zapota*, *Pouteria durlandii*, *P. campechiana*, *Astronium graveolens*, *Vitex gaumeri*, *Aspidosperma megalocarpon* and *Pseudolmedia oxyphyllaria*. Transitional forest was composed of such species as *Gymnanthes lucida*, *Croton pyramidalis*, *Nectandra coriacea*, *Simaruba glauca*, *Metopium brownii*, *Lonchocarpus castelloi*, *Talisia olivaeformis* and *Swietenia macrocarpa*. At the north end of the transect was bajo forest dominated by *Haematoxylum campechianum*, *Bucida burceras*, *Gliricidia sepium* and *Cordia dodecandra*.

Conclusion. Vegetation surveys completed as part of this study enabled us to correlate the plant communities on the ground with spectral signatures defined by satellite imagery. Areas of terrace construction appeared to correlate with upland and transitional forest types. These results will aid future interpretations and facilitate the creation of predictive (or postdictive) models of land-use in the past for large segments of the northeastern Petén region.

Keywords: Petén rainforest, ancient Maya, upland forest, bajos

Selected References

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