

3d Reconstruction of Natural Soil Aggregates From the Tropics

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Soil collected from 0-8cm depth in a forested region near Manaus, Brazil was previously described as a Xanthic Hapludox[1]. It consists primarily of kaolinite clay, quartz, and lesser amounts (<5%) of feldspar, muscovite, and hematite. The mechanism for soil sustainability in the tropics is based on organic compounds in the soil which contain nutrients for plant growth and act as glues which bind soil aggregates into stable structures.

An attempt was made [2], to characterize the structure of the soil by the examination of sections of aggregates from different size fractions. One outcome of the study was the importance of small colloidal structures in the overall breakdown and creation of larger soil aggregates. To investigate the structure of these colloidal fractions more fully, a complete 20 μm diameter soil aggregate was sectioned serially into 300 sections. These sections were then imaged in a transmission electron microscope (TEM), and then imported into a 3d reconstruction using the software IMOD.

The process of creating the model, and the resulting 3d model itself, will be presented.

References

- [1] N. Malengreau. and G. Sposito, *Geochimica et Cosmochimica Acta* 61 (1997) 4297.
- [2] A. Violante, et al., *Soil Mineral-Organic Matter-Microorganism Interactions and Ecosystem Health*, Elsevier, San Francisco, 2002.