

Characterization of Amazonian Soils: An Analysis

Jonathan Rhodes – October 30, 2002

pH

- The soil of the Amazon Rainforest Basin is typically acidic, averaging around 4.9.
- The pH of the soil seems to be relatively independent of soil depth, but there is some evidence that pH increases with an increase in sample depth.

Soil Profile

- The average particle size of the soil in the Amazon usually hovers around the <0.1 mm mark (approximately equal to fine sand or silt).
- However, the particle size measurably decreases with an increase in sample depth until a mostly-clay layer is reached as little as 50cm below surface.
- The tiny particle size of clay makes it far less permeable to water and nutrients than the layers above it, therefore the nutrient layer is usually referred to as the top few inches of Amazonian soil.
- Some nutrients are "leached" to deeper soils (I really don't understand how this works....)

Nutrient Concentrations/Volume

- As mentioned above, only the top few inches of Amazonian soil is able to effectively hold nutrients and water. As a result nutrient concentration (i.e. Carbon %, Nitrogen %) is inversely proportional to soil depth.
- However, as it is, Amazonian soil is already lacking in nutrients. Most of the nutrients within the Amazon Rainforest are tied up within the bodies of its flora and fauna.
- To expediate the transfer of what nutrients are available in the soil, micro-organisms (i.e. Mycorrhizae) form a symbiotic relationship with some of the Amazonian flora, converting nutrients into a useful form in exchange for "food."
- A significant amount of carbon dioxide is trapped within the soil after thousands of years of absorption by Amazonian trees.

Underlying Bedrock

- The bedrock of the Amazon Rainforest actually lies approximately four kilometers below the Amazonian surface and is therefore not a significant factor in determining soil stability, pH, etc.
- Nevertheless, for the sake of completeness, the bedrock is labeled as pre-Cambrian rock.

Erosion (?)

Land Use/Problems/Solutions

- Reforestation does not seem to be a practical solution for saving the rainforest, but would probably only be successful as a secondary solution on top of a bigger plan.**

- The problem is that current techniques for preparing land for agriculture deplete the soil of its nutrients and stability, decreasing the viability of restoring its vegetations.
- As well, reforestation requires so much effort, time and money that it will probably be impossible to reforest the Amazon as quickly as it is being deforested.