Hawaiian Soils
Part I

Hawaii has a range of soils:
- No Soil Profile
- Green Sand Beach
- Acidified Soil

Some soils provide healthy agricultural land, others provide unique habitats for other species than humans.

Hawaiian Soil Types

1. Low Humic Latosols
   - Moderate slope
   - 20” - 40” rain
   - < 2000 ft
   - No quartz sand
   - Neutral to mildly acid

2. Humic Latosols
   - Wetter areas
   - Often upslope of low humic
   - Clay texture
   - Less silica & alumina and more iron & titanium

3. Humic ferruginous latosols
   - Upslope of low humic on old surfaces of Kaua’i and of the Wai’anae Range on O’ahu
   - Poor structure, erodibility
   - Low capacity to store water and nutrients

Conditions make soils here:
- Rich in iron & aluminum
- Free of quartz sand
- Very permeable
- Resistant to erosion
Humic ferruginous latosols cont’d...
- Low permeability
- Fixation of phosphates

4. Hydrol Humic Latosols
- Very heavy rain
- Volcanic ash
- High organic content
- Excellent water storage
- Shrink when dry
- Weak structure

5. Red Desert Soils
- Young materials in dry places Kawaihae & Koko Head
- White calcium carbonate deposits
- Stony

Sponges as Soil Models

Part II

Sponges show characteristics of soils & water...

Dryness
- Neither of these sponges is truly dry
- How do these sponges model dryness in soil? How does soil behave as it dries?

Wetting & Saturation
- Even saturated soil traps pockets of air

Water Holding Capacity
- Watch carefully to see which pores fill with water as the sponge drains
- Soil can still hold water plants can’t extract, just like squeezed sponges are still damp

Infiltration & Run-off
- These sponges model how soil takes in water how water may escape from soil

Percolation & Drainage
- For drainage to begin, the bottom of the sponge must be approaching saturation
Sponges show characteristics of soils & water... Engineering & Bearing Capacity

What happens to houses as soils get wet or dry?