



STEP UP
YOUR GAME

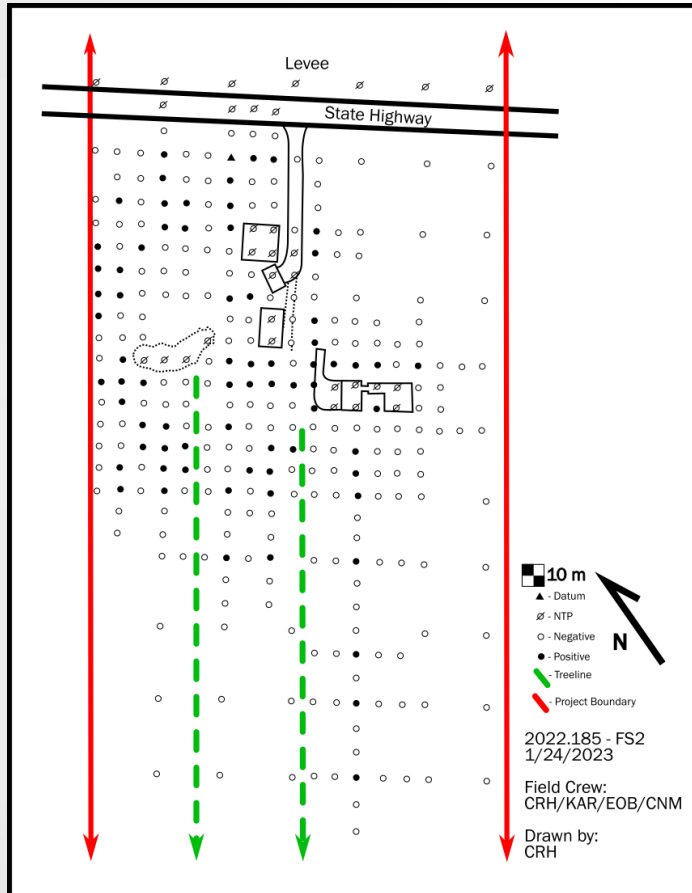


Reading the Past Through Soil and Stone: Methods in Geophysics and Geoarchaeology

Presented by: Cyrus Hulen and Matt Oliver



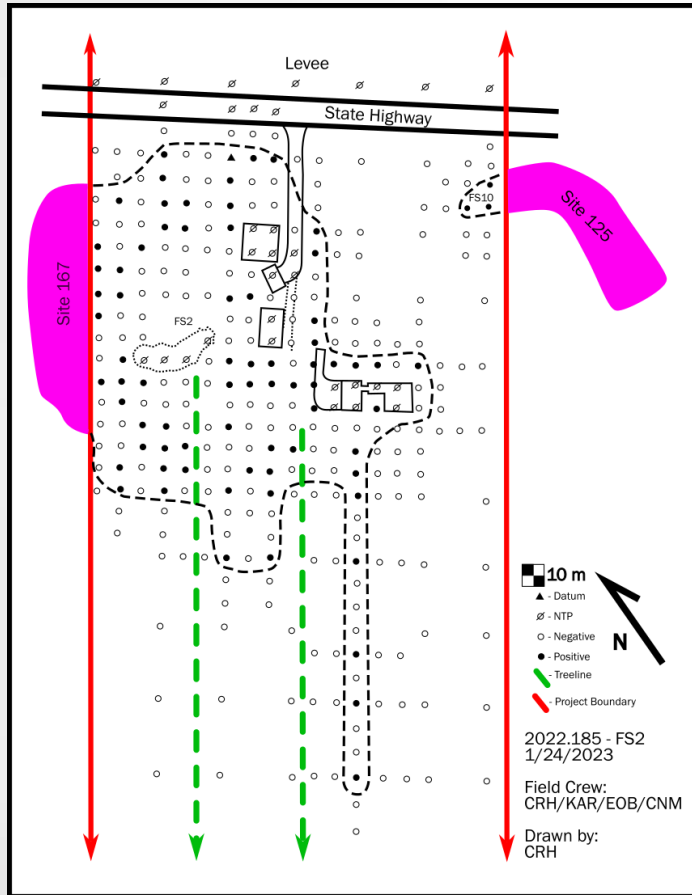
Things that are True:



- Context is the basis of Archaeology
- You can't un-dig a hole
- Traditional archaeological methods are inherently destructive

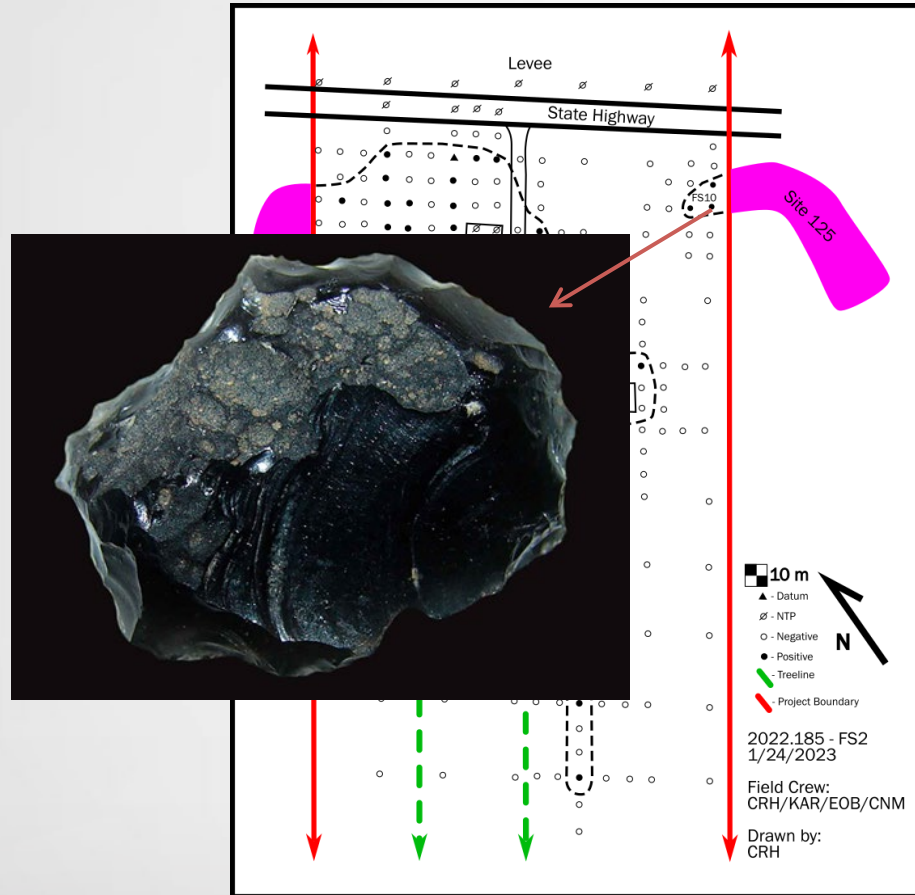
Therefore “Swiss cheesing” sites is bad

Projects Exist in a Broader Context



- Without knowing about Site 125, we would have missed FS10
- **This is normal and expected!**
- Remember: Context is the basis of Archaeology
- More information = better results

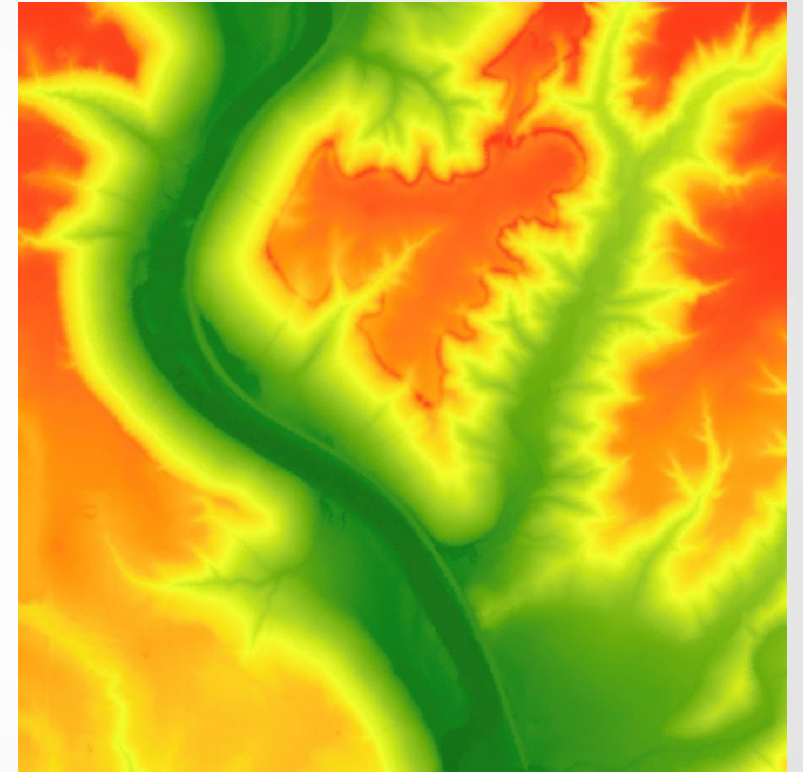
Site 125/FS10

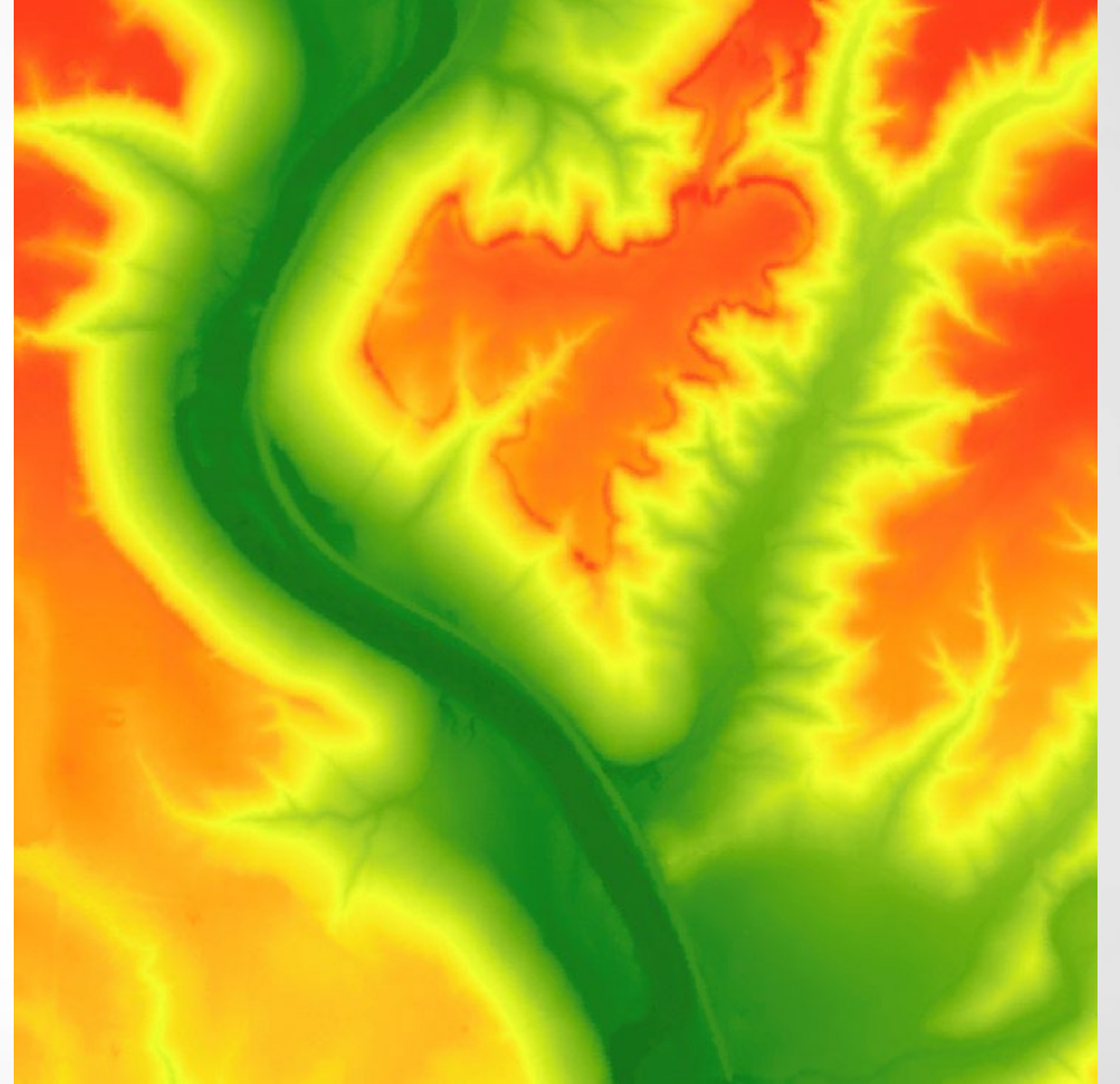
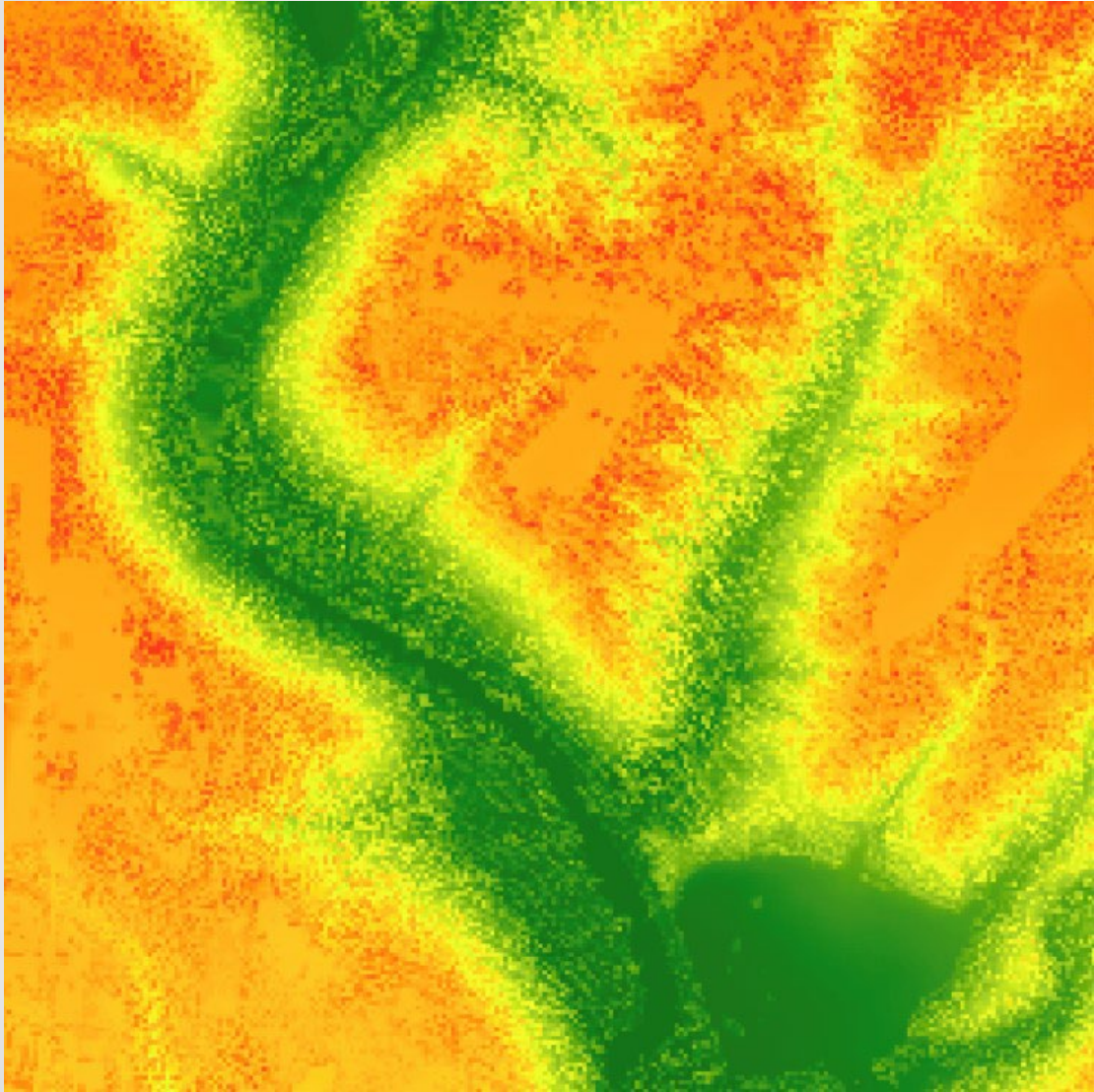


- Known post-emancipation Black community
- Presence of worked French glass in FS10 suggests this site is older
- How can we get more information with less intrusion?

LiDAR

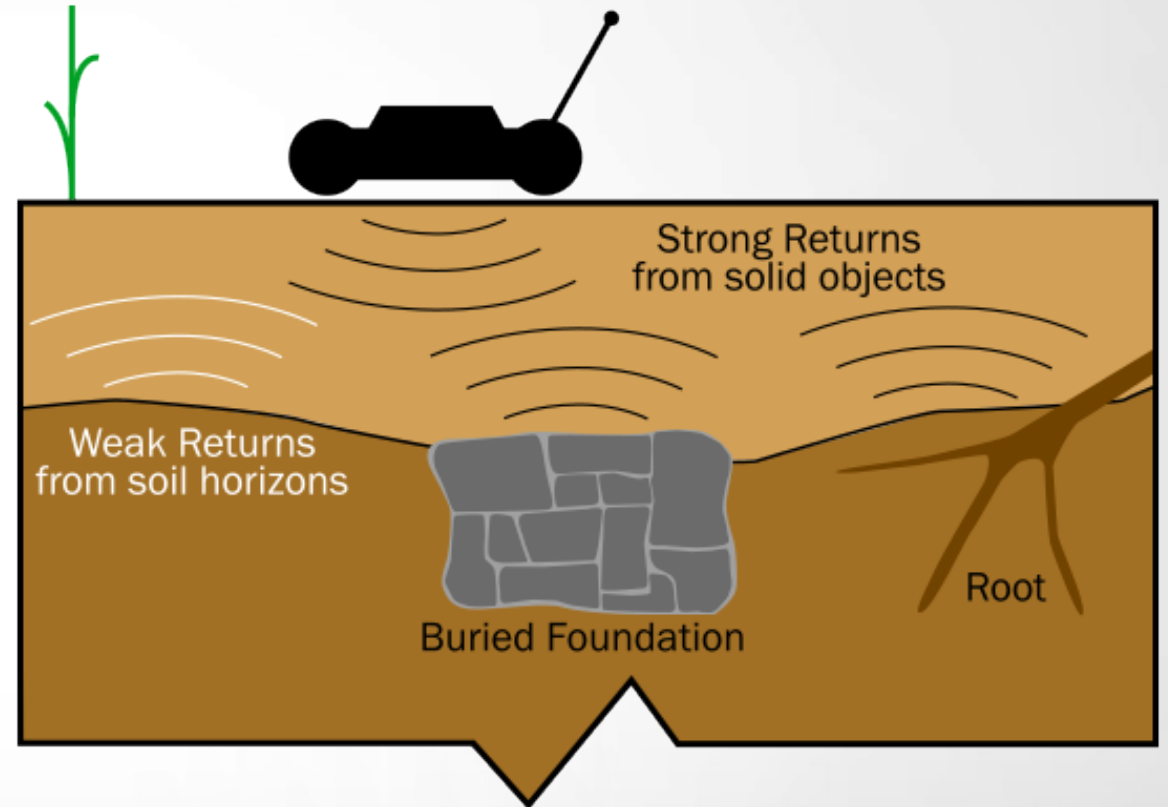
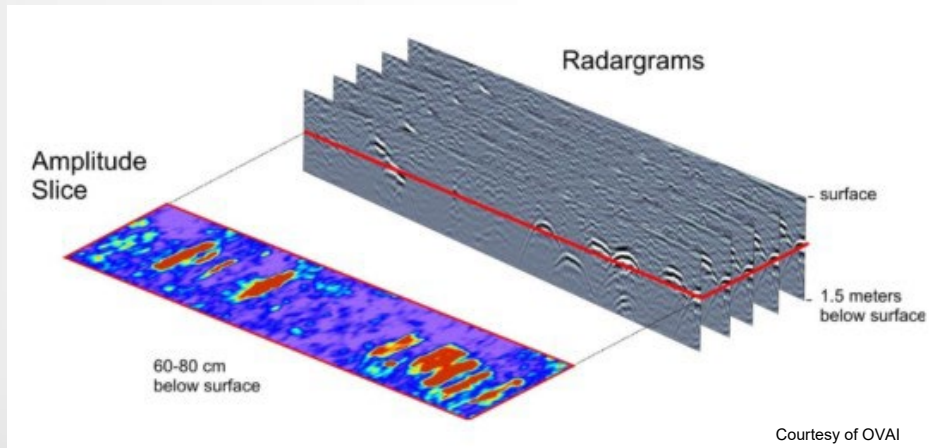
- Identify ground-based features
- Inform survey methods
- Better timeframe for clients
- Better visualization for reports





Ground Penetrating Radar (GPR)

- Identify subsurface features and soil disturbance
- Radar conductivity
 - Water Content
 - Particle Size

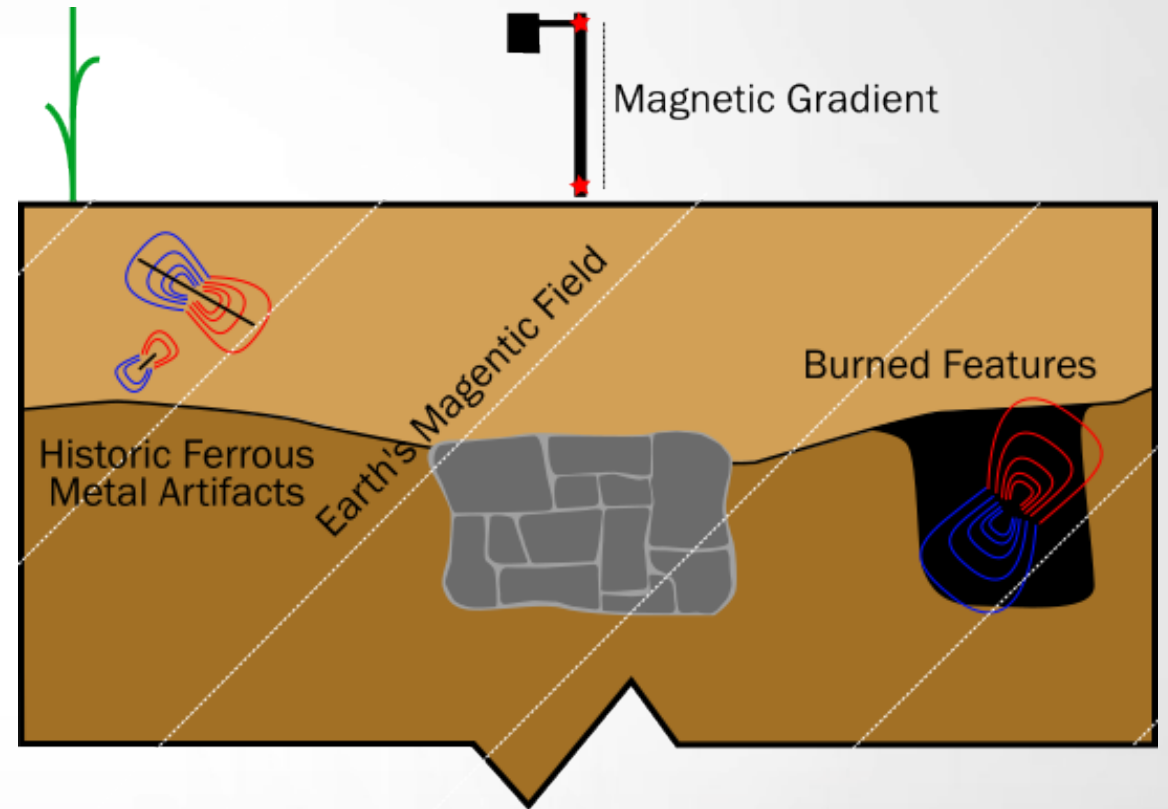


Ground Penetrating Radar (GPR)

Example Data Pending Client Release

Magnetometry

- Identify magnetic anomalies below the surface
- Washout
- Non-magnetic cultural materials

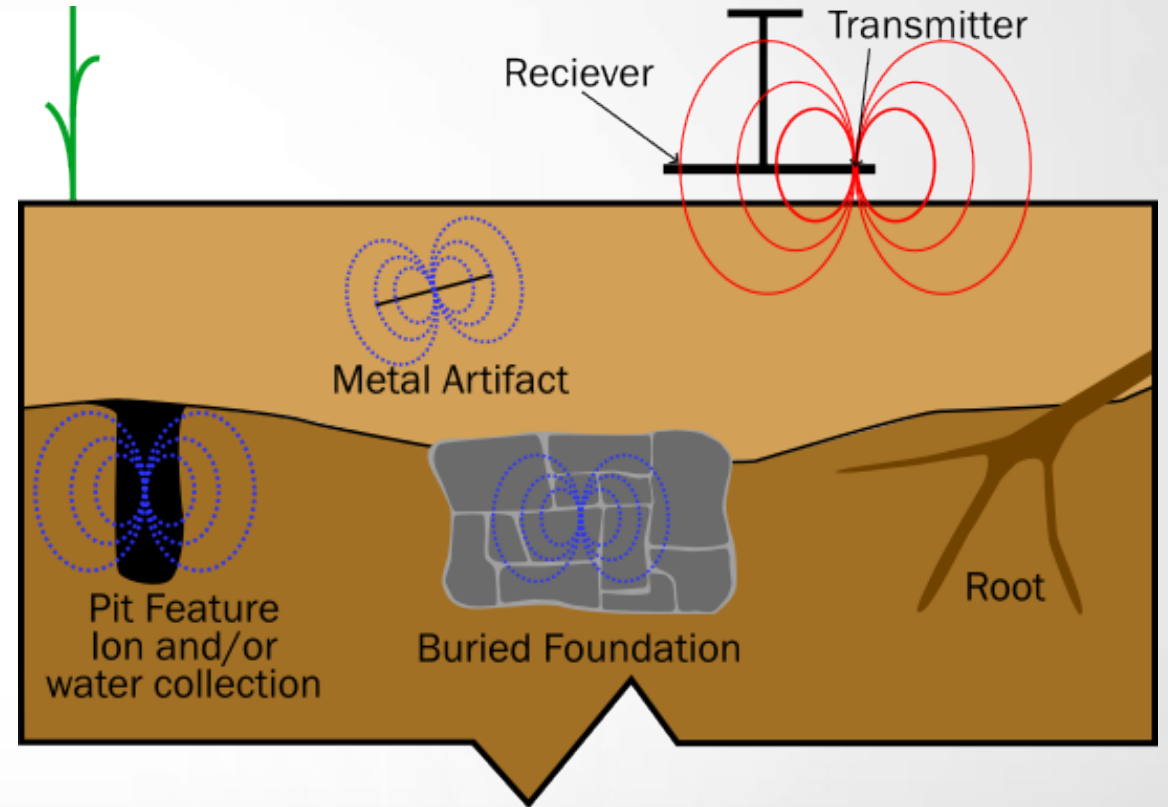


Magnetometry

Example Data Pending Client Release

Electromagnetic Conductivity

- Active Sensor
 - Apparent Conductivity
 - In-Phase Magnetic Susceptibility
- Induced magnetic fields
 - Proportional to conductivity
- Ion and Water density



Electromagnetic Conductivity

Example Data Pending Client Release



Geoarchaeology

The Study of Human Beings through Landforms and Soil Analysis

Presented by: Matt Oliver

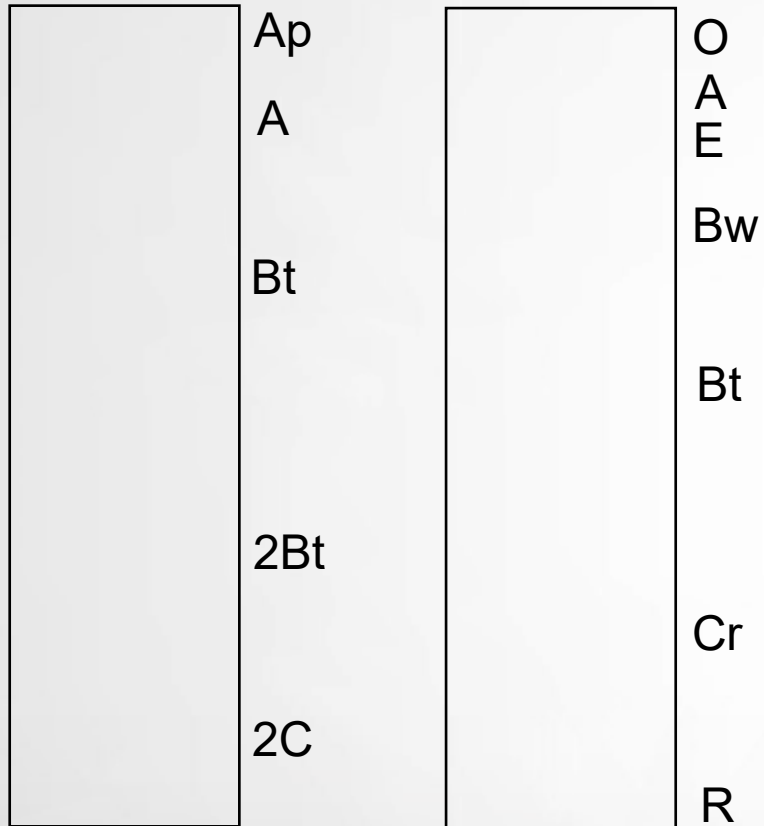


Landforms



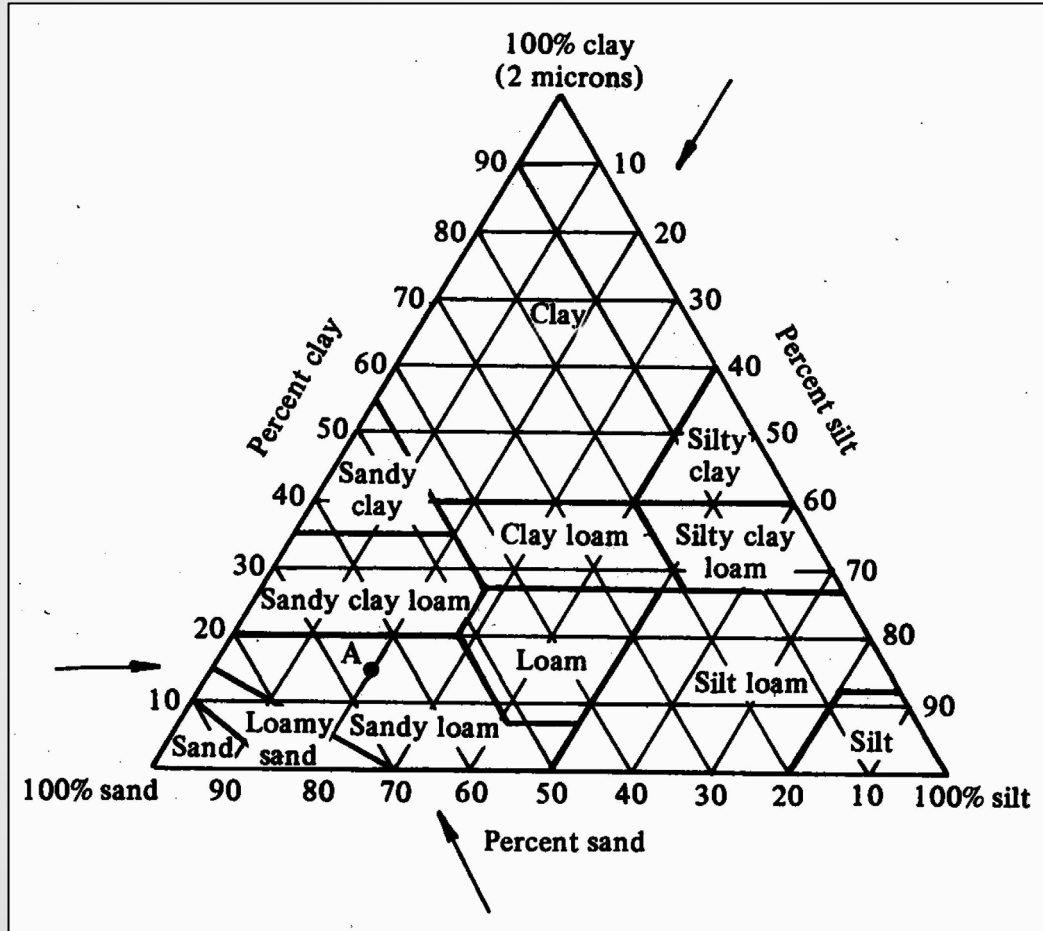
- The Late Pleistocene (130,000--12,000 years ago)
 - Terrace Deposits
 - Fluvial/Alluvial Deposits
- The Holocene (12,000 years ago to Present)
 - Alluvium

Soil Descriptions I



- O Horizon
- A Horizon
 - Ap Horizon
- E Horizon
- B Horizon
 - Bw Horizon
 - Bt Horizon
- C Horizon
 - Cr Horizon
- R Horizon

Soil Descriptions II

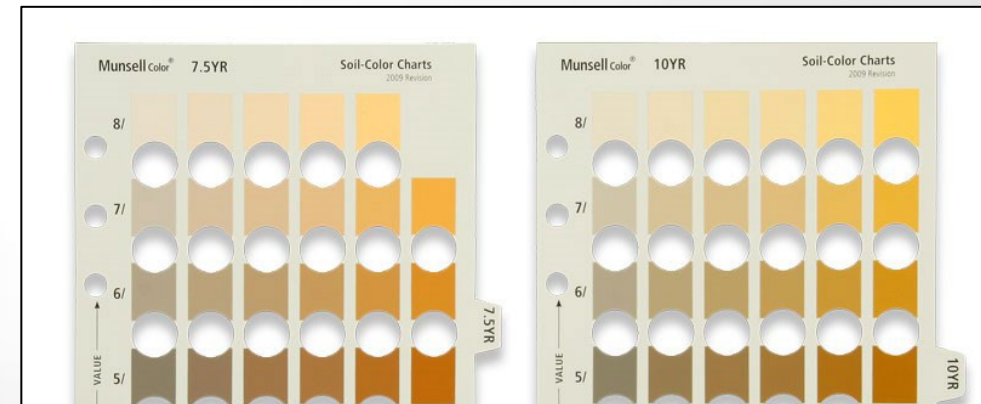


Soil Texture

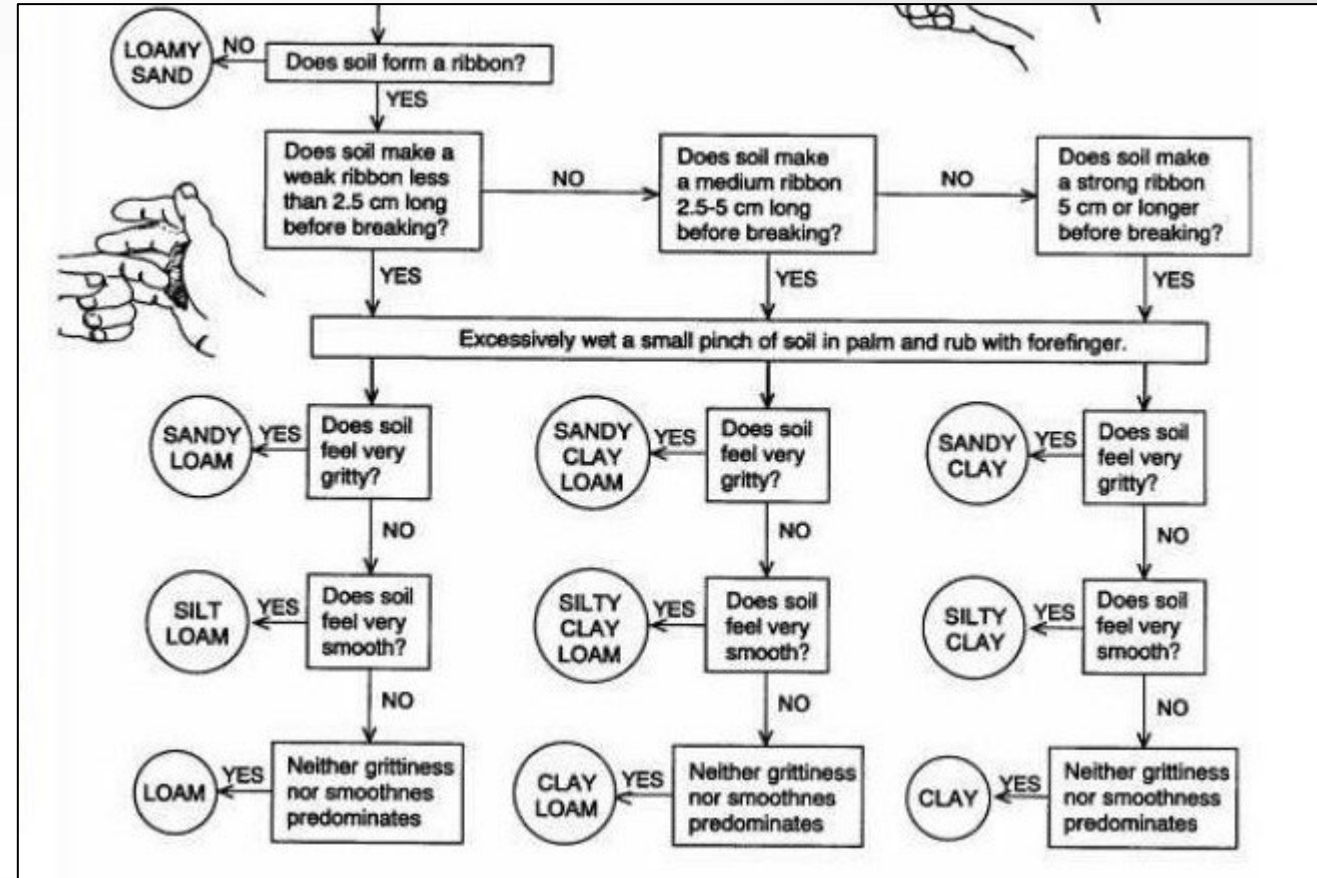
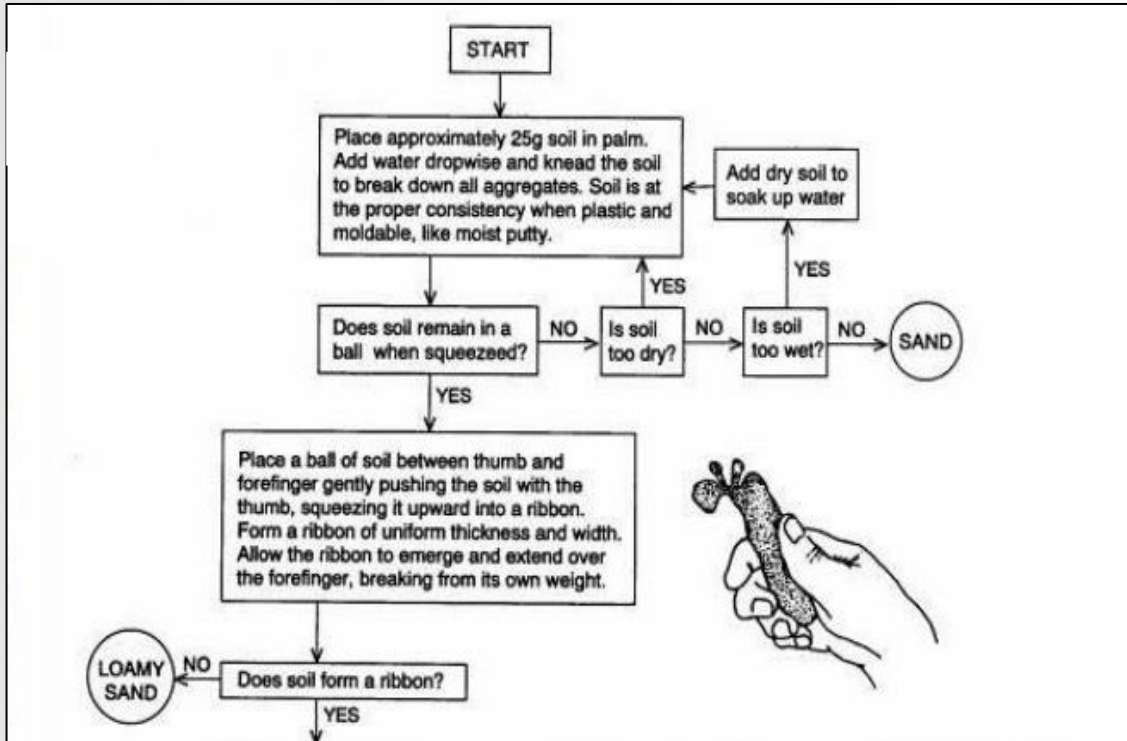
- Sand
- Silt
- Clay
- Loam

Soil Color (Munsell)

- Gray (horizontal)
- Light to dark (Vertical)
- Hue (pages)



Soil Descriptions III



Buried Soil Horizons



A

- bA

Bw

- Formation

- Floods

- Landslides

bA

- USDA-NRCS Soil Surveys

Bt

- Deeply Buried Culture

C

Testing for Buried Horizons

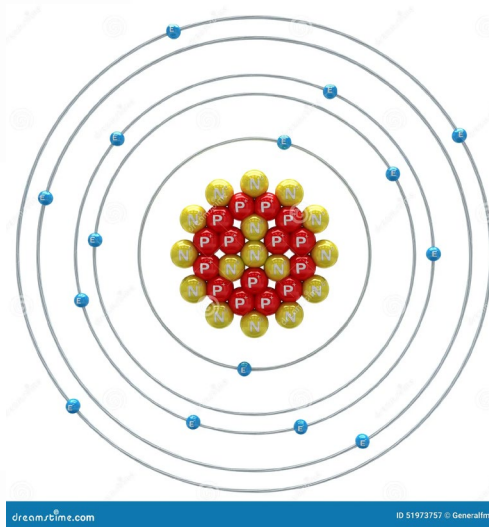
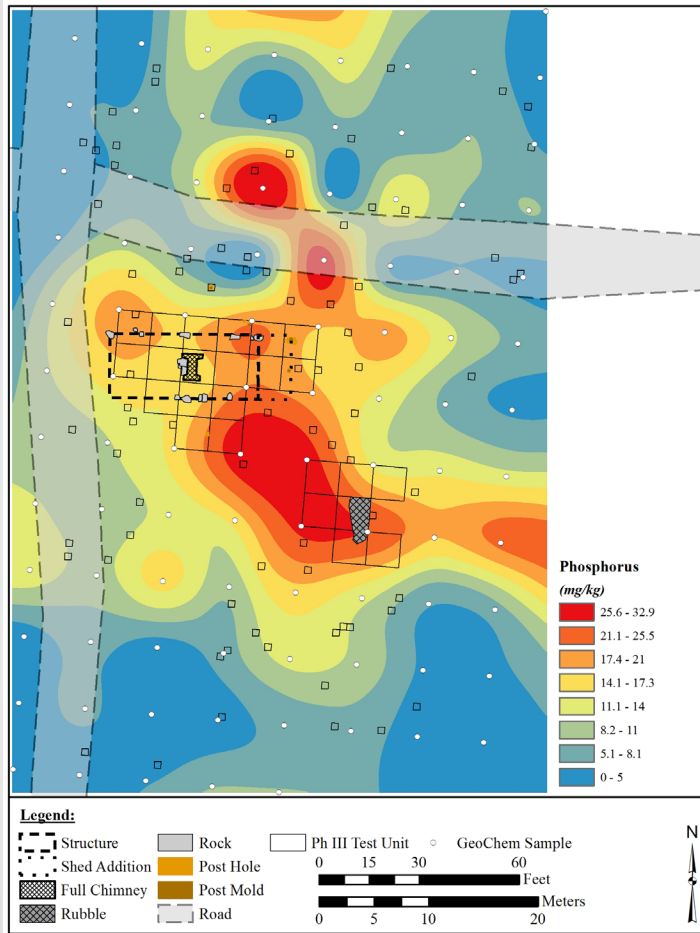


“Deep Testing” Methods

- Trenching
- Hand Auger
- Mechanical Auger



Geoarchaeology and Phosphorus



- Phosphorus in the soil
- What does this tell us?
 - Why is it important?



Regulatory Agencies and Relationships



- Why it is important to establish strong relationships with regulatory reviewers?
 - Archaeology Colleagues
- Why is this important for our clients?
 - Anticipating Regulatory Demands
 - Passing Reports

Cyrus Hulen



- Cultural Resources
- Field Archaeologist
- Indianapolis, IN

Matt Oliver



- Cultural Resources
- Staff Scientist
- Oklahoma City, OK

QUESTIONS?