# Suborder Soil Surveys

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and

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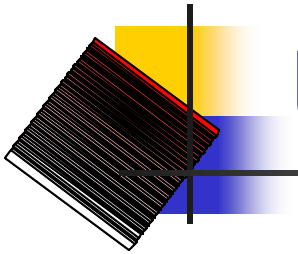
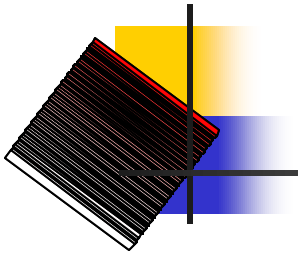


# Use of Suborder Soil Surveys

- On-site sewage disposal
- Spray irrigation
- Hydric soil delineations
- Mine reclamation
- Site-specific farming
- Other



# Definitions

**Map Scales**

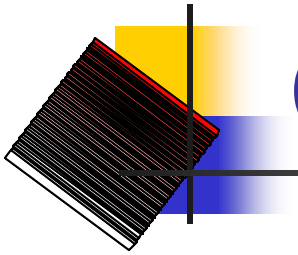
**Site Specific**

**Scale usually 1”=100’**

**Soil Mapping**

**Scale 1”=400’**

**Boundaries are observed and verified throughout their course.**

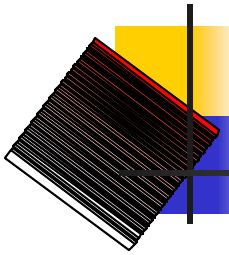


# Observations

- Site Specific
  - >2 observations within evaluation area
  - Located on a map, flagged and recorded
  - Supplementary observations are made but may or may not be reported

# Suborder Soil Maps

- Paradigms
  - Reliance on soil-landscape paradigm may not work at suborder level mapping. In the absence of a paradigm we have to rely on some form of systematic sampling to locate soil boundaries.



# Observations

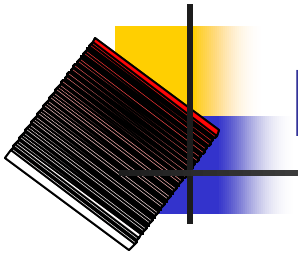
- Soil Maps
  - Suggested Grid Observation Intensity
    - **Suborder III**
      - **0.5 Observations per acre**
    - **Suborder II**
      - **1 Observation per acre**
    - **Suborder I**
      - **9 Observations per acre**
  - All will probably include supplemental borings

# Making Site Specific Investigations

- Morphology
  - NCSS Standards
- Guidelines
  - Soil Survey Manual
  - National Soils Handbook
  - Field Book for Describing and Sampling Soils

# Making Site Specific Investigations

- Application-based Morphology
  - Binomial
    - Hydric or Non-Hydric
    - Prime or Non-Prime
    - Suitable or Non-Suitable
  - Depth To Limiting Layers
    - Pans, Redox Features, R and Cr, etc.



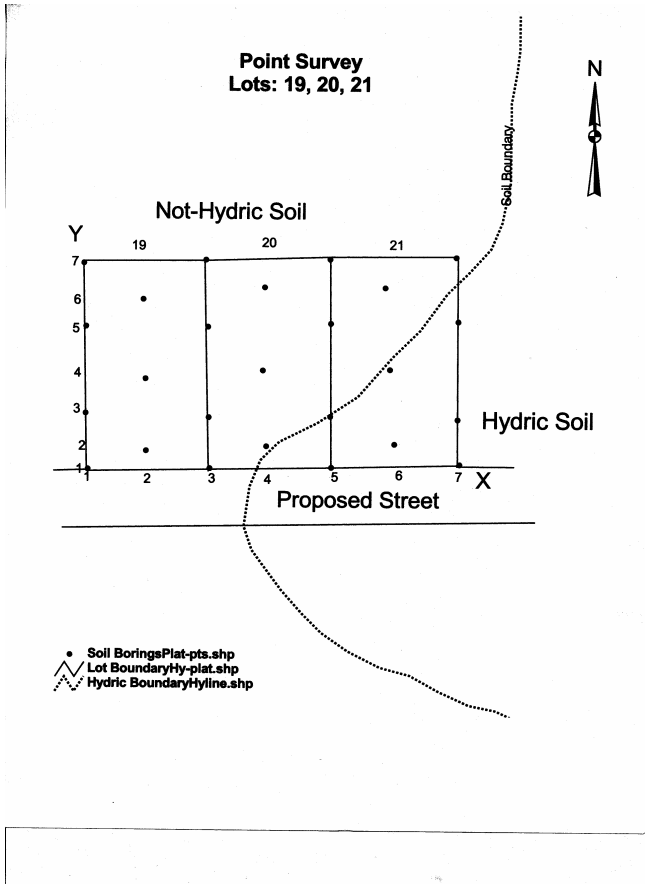
# Making Site Specific Investigations

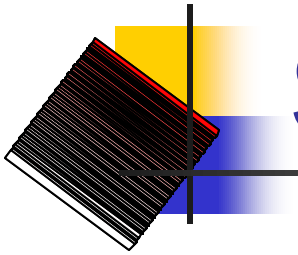
- Project Site Location
  - Often Client Supplied
  - Within Section, State Coordinates
  - Lat – Lon
  - UTM
- Site Description
  - Geomorphic
  - Surface Morphometry
  - Water Status

# Making Site Specific Investigations

- Tools
  - Standard Soil Survey Equipment
- Other
- 


# Three Lot Site Specific





# Suborder Soil Maps

- Base Maps
  - Absolute Accuracy
    - UTM, LAT – LON, State Coordinates
  - Relative Accuracy
    - Distance Between Points

# Suborder Soil Maps

- Error
  - Well defined control point on the ground may be plotted to an accuracy of 0.25 mm on a map of any scale.
  - Within one foot on a scale of 1”= 100’

# Suborder Soil Maps

- Minimum Legible Areas (MLA)

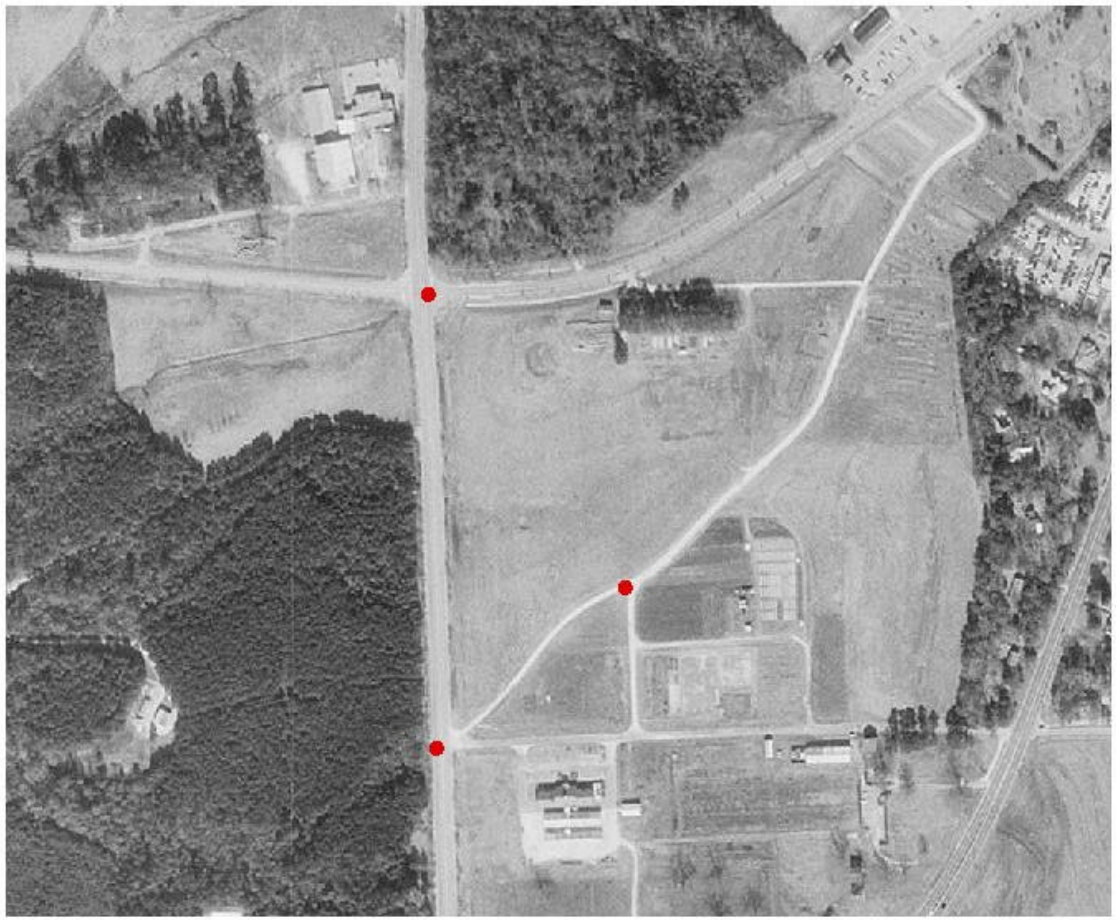
| Scale | MLA (acres) |
|---|---|
| 1”=100’ | 0.014 |
| 1”=200’ | 0.057 |
| 1”=300’ | 0.128 |
| 1”=400’ | 0.356 |

# Order 2 (1:24,000)

N

0.9 0 0.9 1.8 Miles

# Upper Limit of Suborder Survey (1:4800)



N

0.2 0 0.2 0.4 Miles

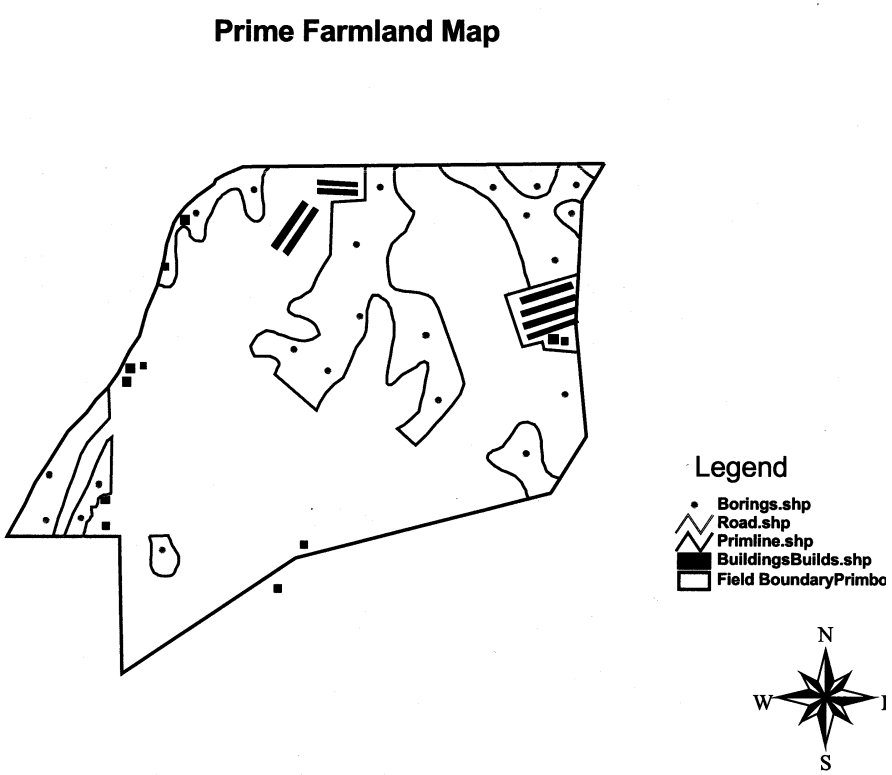
# Lower Limit of Suborder Survey (1:1200)

# Suborder Soil Maps

- Legend Design
  - Essential that basis for differentiation of map units are “mappable”. They should form some kind of continuum on the landscape.
  - Mapping holes instead of planar distributions.

# Prime Ag Land

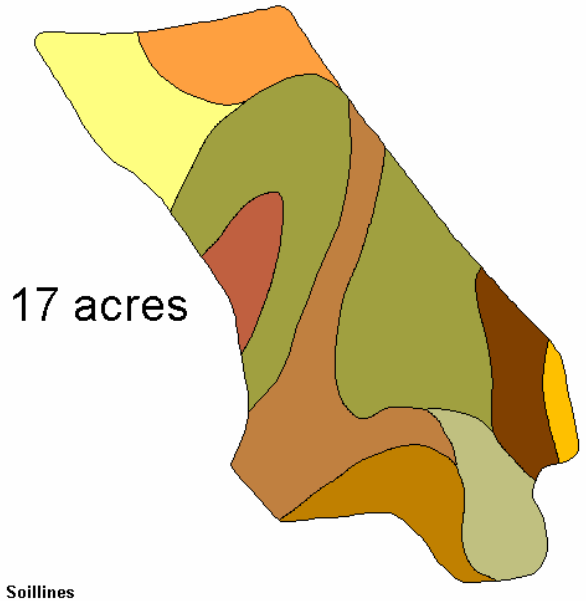
- Yes-No



# Suborder Soil Maps

- Basis of Differentia
  - Phases of Soil taxa (Soil Taxonomy)
  - Interpretations Based on Phases of Soil Series (Slight, Moderate, Severe)
  - Single Property Differentia, such as, hydric soils

# Precision Agriculture Applications

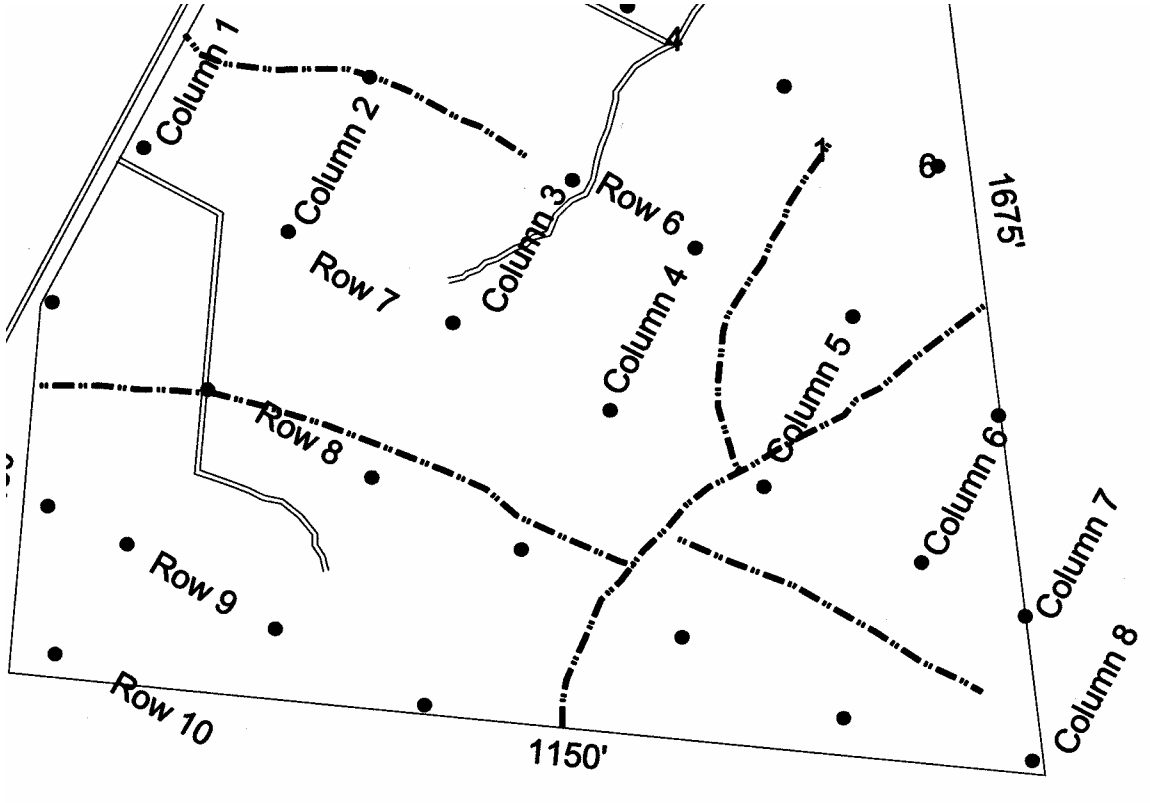



Soillines
- Aquic Paleudults
- Aquic Paleudults; 0-2 % slope
- Aquic Paleudults; fine-loamy, siliceous, subactive, thermic 2-4 % slope
- Oxyaquic Paleudults; 0-2 % slope
- Oxyaquic Paleudults; fine-loamy, siliceous, subactive, thermic 0-2 % slopes
- Oxyaquic Paleudults; fine-loamy, siliceous, subactive, thermic 2-4 % slopes
- Oxyaquic and Aquic Paleudults; 0-2 % slope
- Typic Paleudults, fine-loamy, siliceous, subactive, thermic 0-2 % slope
- Typic Paleudults; fine-loamy, siliceous, subactive, thermic - moderately eroded 2-6 % slope
- Typic Paleudults; severely eroded 4-6 % slope

# Grid Layout

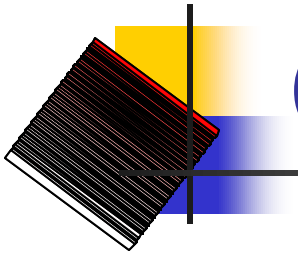

Soil Boring Locations
Streams and local roads
Location: DeKalb County, Alabama adjacent to State HWY 35, 9.5 miles south of Centre.
Sec. 5,T.11S.,R9E.
313'
Row 1
Row 2
Row 3
Row 4
Row 5
Row 6
Row 7
Row 8
Row 9
Row 10
Column 1
Column 2
Column 3
Column 4
Column 5
Column 6
Column 7
Column 8
1269'
400'
1315'
1150'
200'
N
Gray Oak Subdivision
Chas. Gray, Developer
Porter & Hart, Design Engineers
contour line
blue lines - streams

# Grid Layout (Zoom)



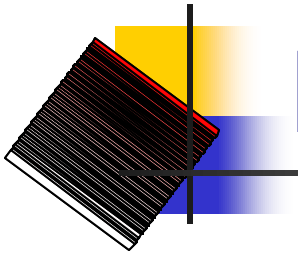
# Statistical Analysis

- By definition suborder soil surveys require closely spaced borings and entire boundary observation, increasing confidence limits. Can use 90-95% confidence limits.
- There is a place for binomial confidence limits and geostatistics.



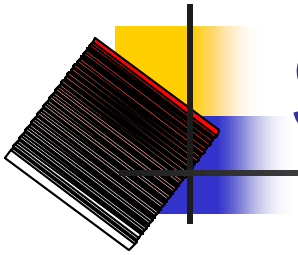
# Geostatistics

- Soil properties are spatially correlated
- Predict unknown data from known geo-referenced data for making contour maps.
- Many interpolation techniques:
  - Nearest neighbor
  - Inverse Distance Weighting



# Kriging

- Uses variance of data as a function of distance to give weights to adjacent values
- Often best technique if at least 30 known values



# Summary

- Characteristics of Suborder Soil Survey Investigations
  - Large Scale Base Maps
  - Number of Observations per Area
  - Location and Marking Test Holes
  - Written Record of Test Hole Data
  - Map Unit Criteria
  - Increased Confidence Intervals