

Geography 317

Scientific Mud Pies: Sedimentary Analysis of the Sag Pond at Fairfield Osborn Preserve



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Introduction

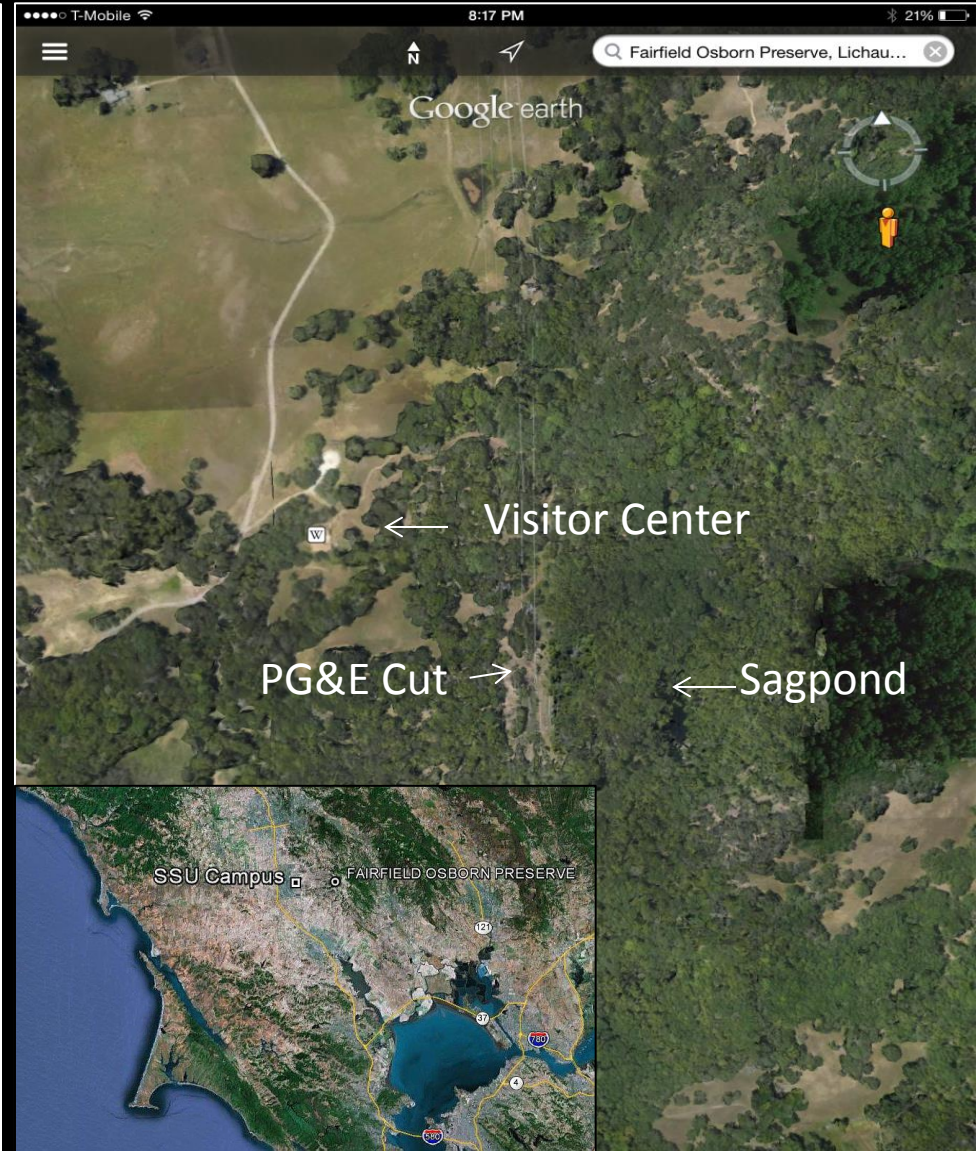
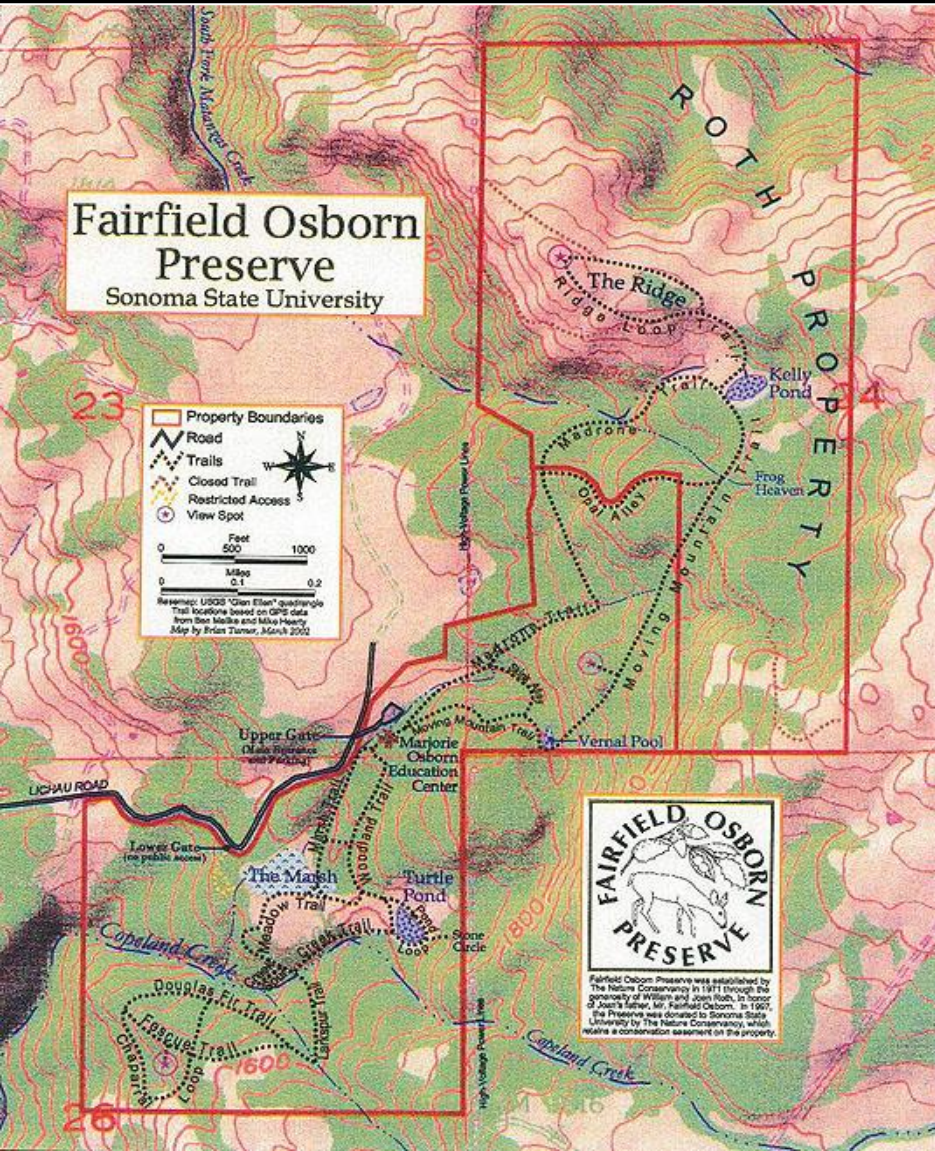
Fairfield Osborn Preserve

- Educational Resource
- Community Partner since 1997

Service Learning Class:

- Hands-on learning while providing a service to FOP

Fairfield Osborn Preserve



Sag Pond

- A Sag Pond is a depression that forms between two strike-slip faults
- Goal for sag pond research: Characterize the subsurface stratigraphy, to see prior Earthquake activity, history of fire, and past mass movements.



Sag Pond Field methods

- Current weather conditions
- Latitude and Longitude



- Slope and Aspect
- Vegetation

Sag Pond Field methods

- Soil Auger
- 50 cm in depth
- 10 cm increments



Sag Pond Field methods

- Describe Soil
 - Organics
 - *Munsell Color Chart*



Sag Pond Lab Methods



←Texture By Feel



Munsell Color System →



←Loss on Ignition

Sag Pond Lab Methods



← Pipette to Establish
Grain Size (Clay & Silt)

Seeds Found During
Macrofossil Analysis →

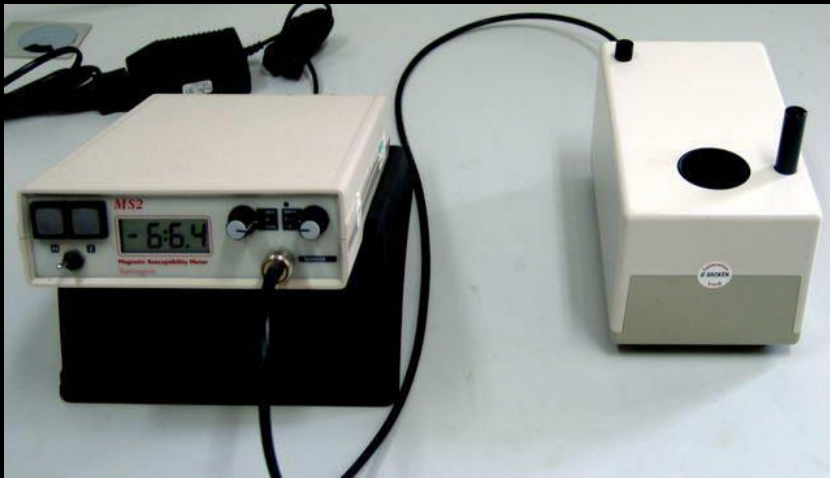


Shell Found During
Macrofossil Analysis →



Sag Pond Lab Method

Measuring Soil pH →



← Bartington Magnetic Susceptibility System

Sag Pond Results



Iron rich sediment increased with depth and along the transect from north to south

Composition of sand increased with depth

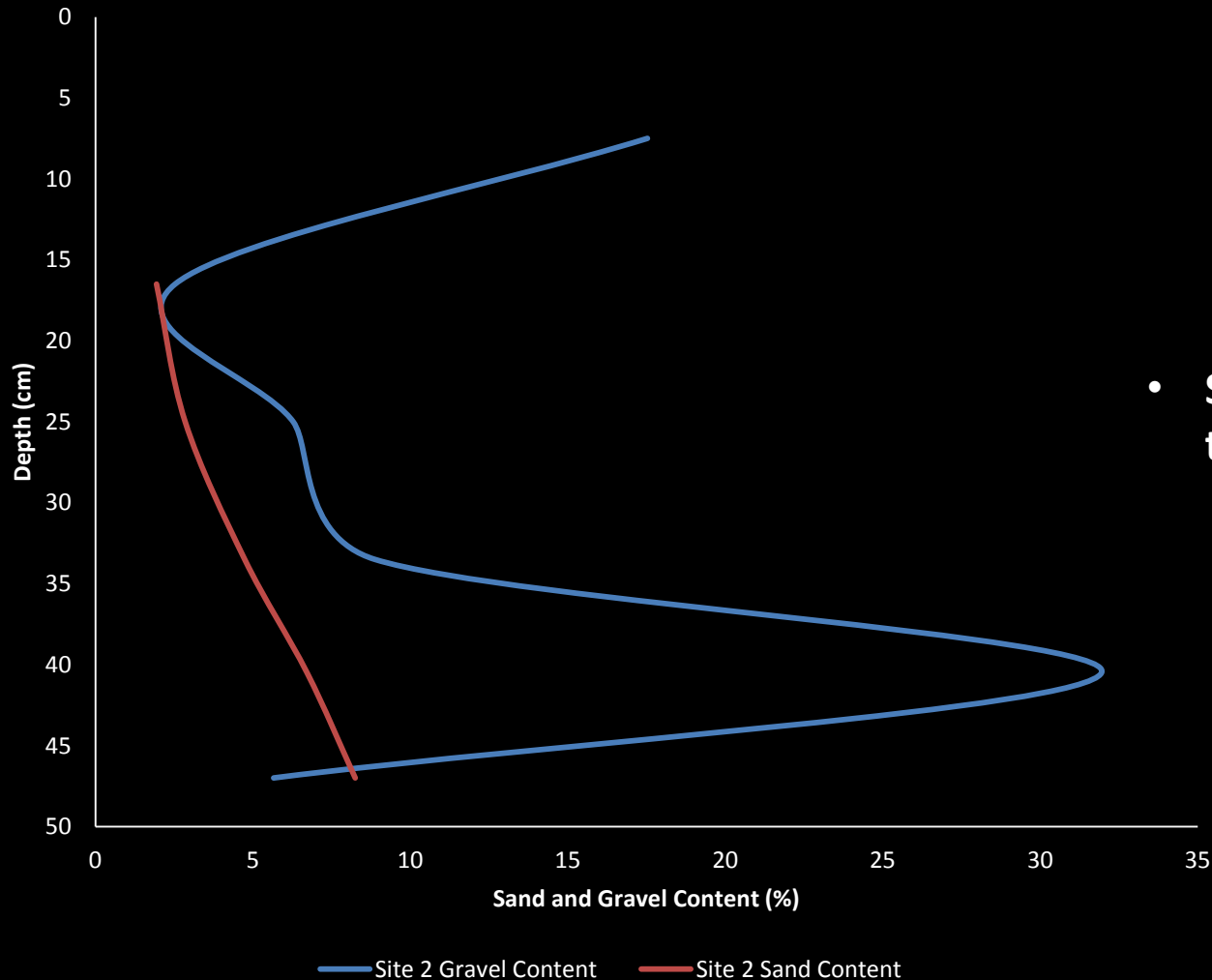
Relative pH seems to fluctuate from slightly acidic to neutral depending on depth



•A combination of shells, insects, small amounts of charcoal and a variety of seeds were found in the top 25 cm.

Sag Pond Results

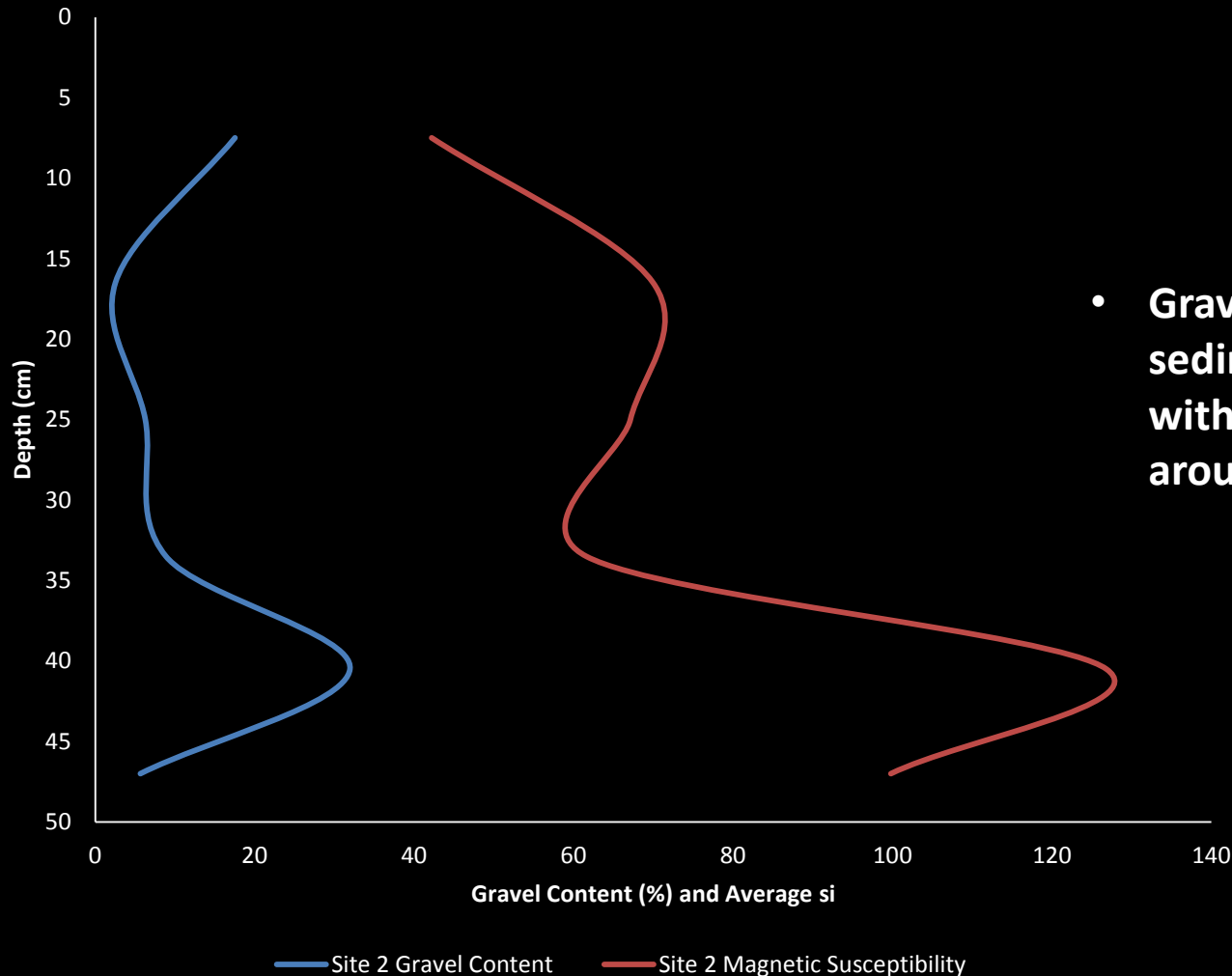
Gravel and Sand Content Comparison



- Sand content not relative to gravel

Sag Pond Results

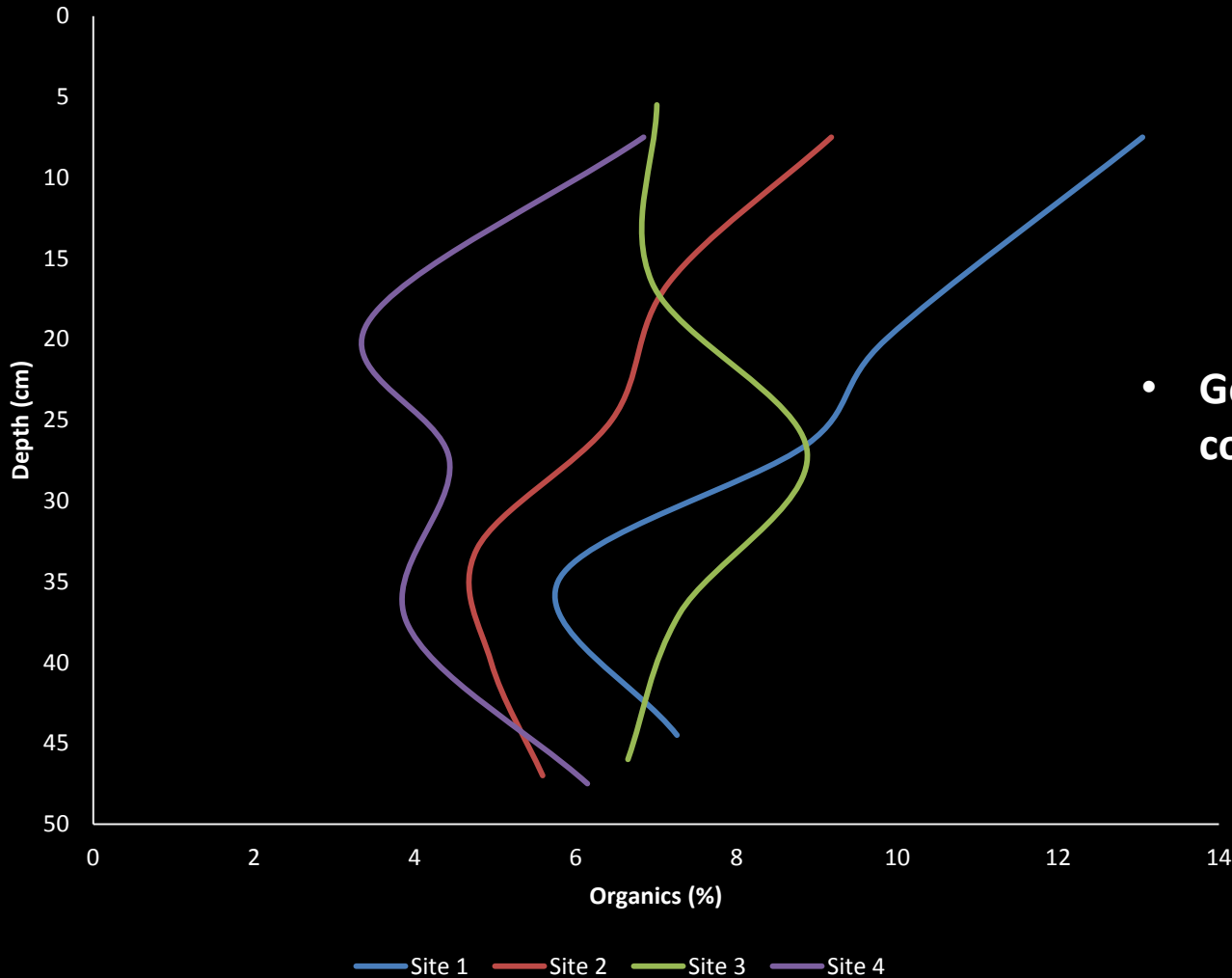
Gravel and Magnetic Susceptibility Comparison



- Gravel content and iron-rich sediment content is relative, with noticeable increase of both around 40 cmbs

Sag Pond Results

Organic Content by Depth

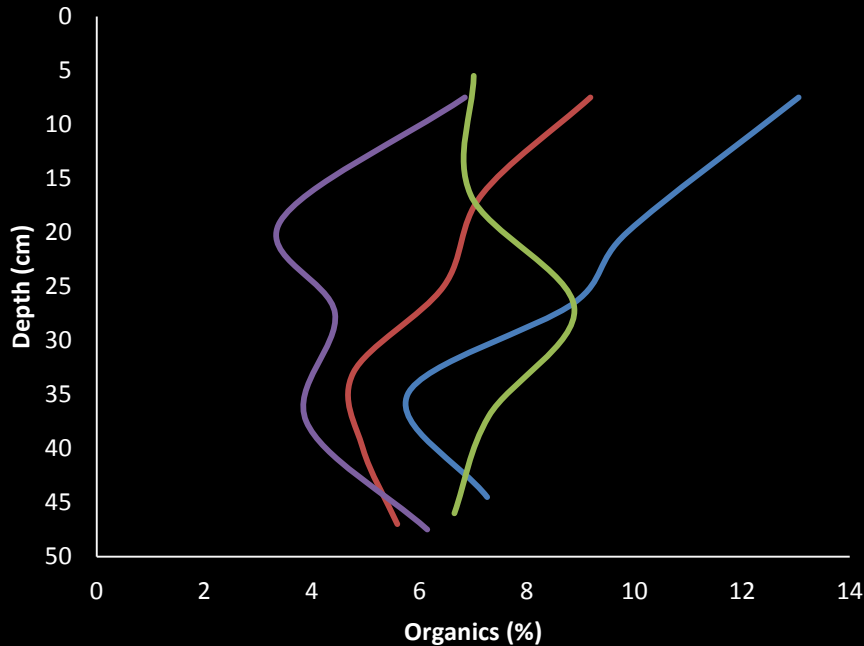


- **General decrease in organic content until app. 40 cmbs**

Sag Pond Results

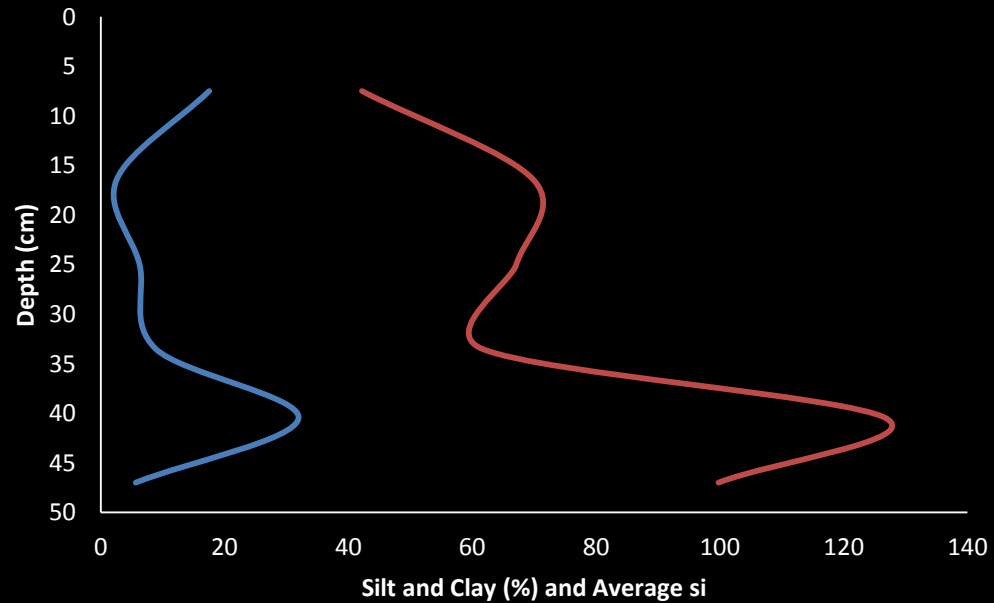
Organic and Gravel Content with Magnetic Susceptibility

Organic Content by Depth



— Site 1 — Site 2 — Site 3 — Site 4

Gravel Content and Magnetic Susceptibility Comparison



— Site 2 Gravel Content — Site 2 Magnetic Susceptibility

- Comparison suggests possible climatic event on Moving Mountain Trail causing increased deposition of gravel and iron-rich sediments into sag pond
- May correspond to period identified by dendrochronological data

Conclusion

- Fire
 - Charcoal only found in the top 25cm
 - Plus no evidence of fire in the tree samples
 - suggests that fire may not play a large role in the preserve.
- Mass movement
 - Gravel found at 40cm
 - evidence of mass movement event >100 years



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