AGENDA 2020 – PHASE II

Site & Soil Descriptions for Intensive Study Sites

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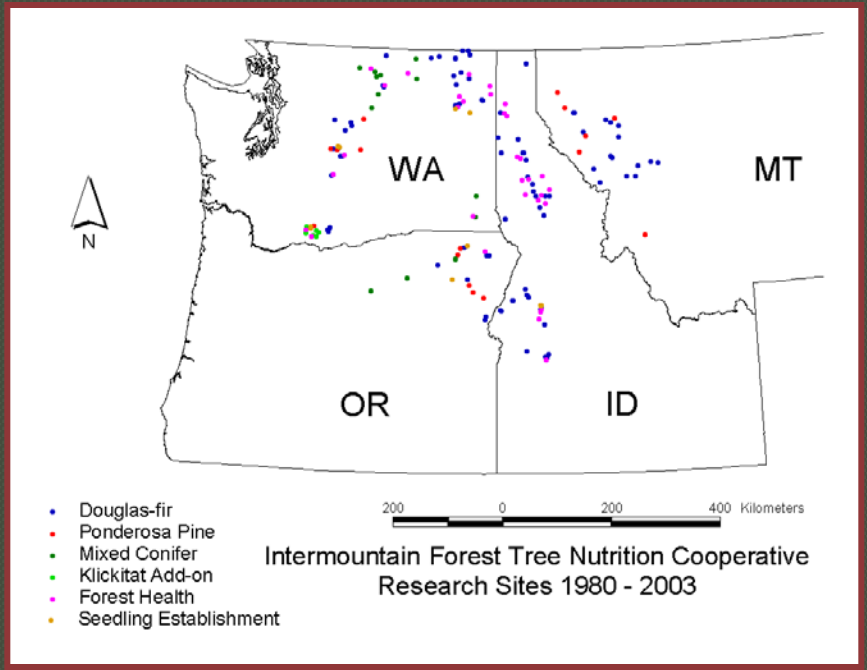
2007 IFTNC Annual Meeting

Agenda 2020 Project

- Phase I:
  - Compile and analyze existing IFTNC data for possible relationships between ash deposits and productivity, site fertility and fertilization response

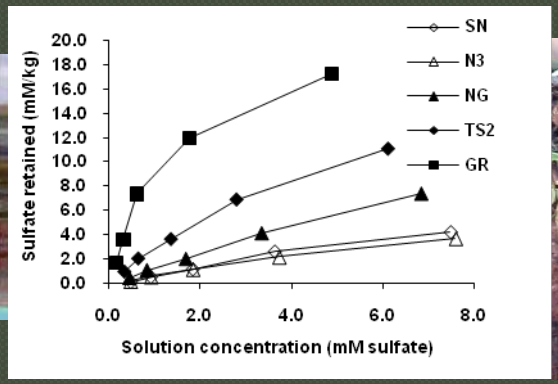


Summary: Phase I

- Ash presence was confounded with geographic location, vegetation series and somewhat with dominant rock type
- Productivity was greater on average when ash was present than when it was not, but increasing ash depth had no further effect
- Productivity increased with increasing potentially available soil water, which in turn increased with increasing ash depth
- Something besides moisture limits productivity with increasing ash depth (nutrition issue?)
- N-fertilizer response was greater on average when ash was present than when it was not, but increasing ash depth had no further effect

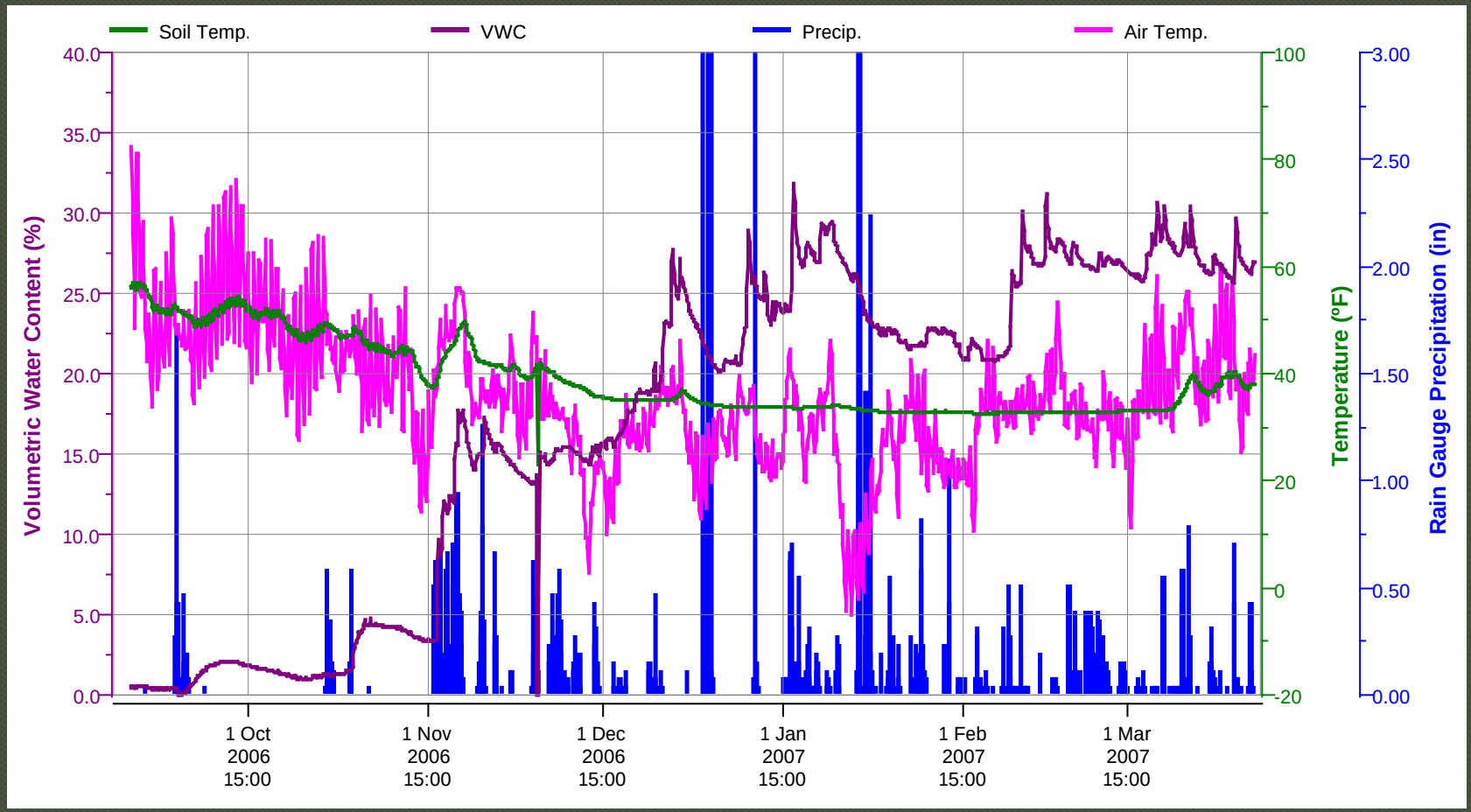
Agenda 2020: Phase II (2006-2007)

- Six field sites were established to characterize:
  - Foliar Nutrients
  - Soil Nutrients
  - Plant available nutrients – Ion Exchange Resin Capsules
  - Soil Nutrient Adsorption/Desorption Isotherms
  - Soil Physical Characteristics
  - Soil Mineralogy



On-Site Weather Station

Real-Time Weather Data

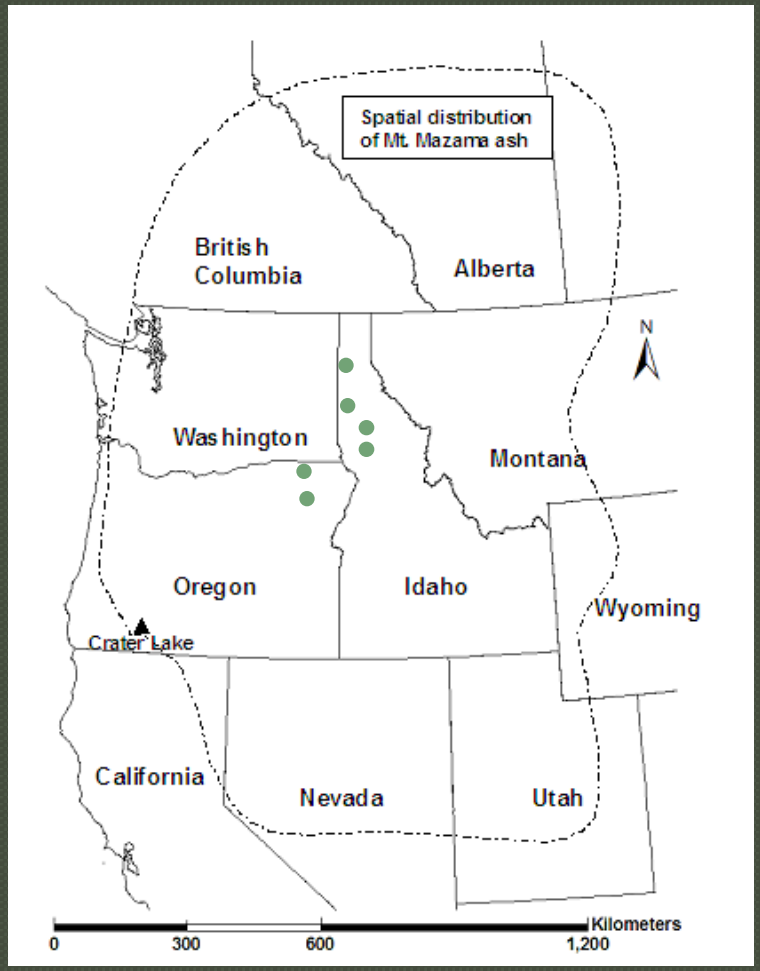


Site Selection & Location

Three paired sites will include one pair without ash and two pairs with ash. Each pair will represent two rock types. Each of the two 'with ash' pairs will represent different vegetation series.

	Basalt
Dry GF (no ash)	Catherine Ck. (NE OR)
Moist GF (ash)	Tollgate II (NE OR)
WRC (ash)	Cranberry Ck. (N ID)

	Metasedimentary
Dry GF (no ash)	Lovell Valley (N ID)
Moist GF (ash)	Birch Ck. (N ID)
WRC (ash)	Renfro Pk. (N ID)



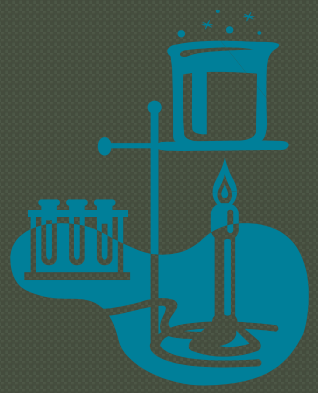
Basalt Rocks

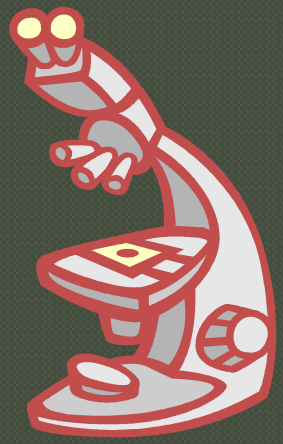
- Productivity
  - Relatively high productivity in absence of ash
  - No real change in productivity in presence of ash
- N-Fertilization Response
  - Sites respond well in absence of ash
  - Higher response in presence of ash
- Recommendations
  - Should respond to N fertilization regardless, but even better when ash is present
  - Should respond to S fertilization
  - Conservative nutrient management strategies recommended but maybe not as crucial

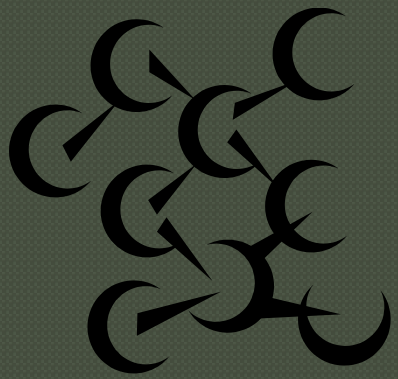
Metasedimentary Rocks

- Productivity
  - Low to moderate productivity in absence of ash
  - Increased productivity in presence of ash
- N-Fertilization Response
  - Sites respond well in absence of ash
  - No change in response in presence of ash
- Recommendations
  - Sites should respond to N fertilization; ash presence will not affect response
  - Fertilization with NKSB may be a better strategy for ash on metasedimentary sites based on experience
  - Conservative nutrient management strategies recommended

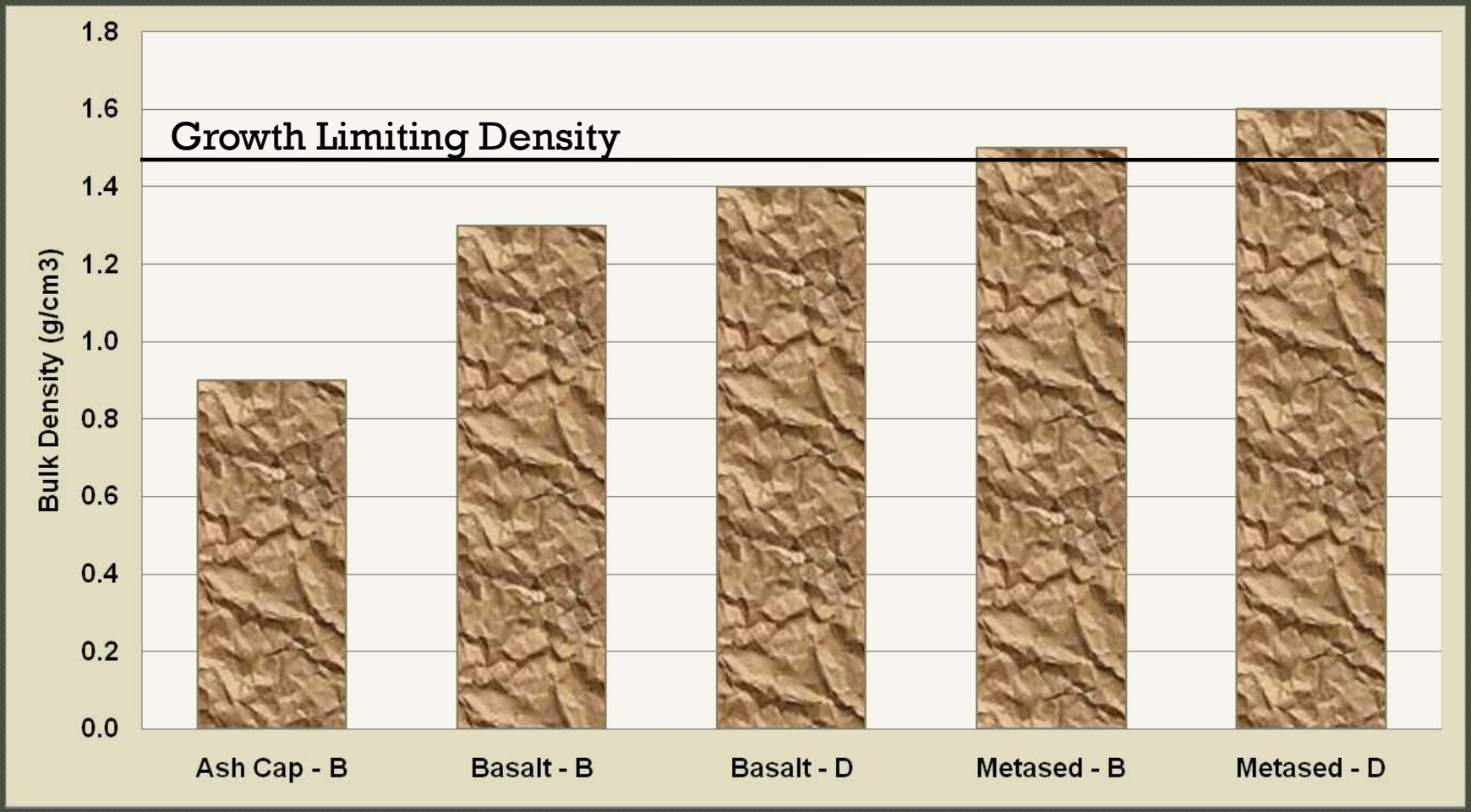
Preliminary Data



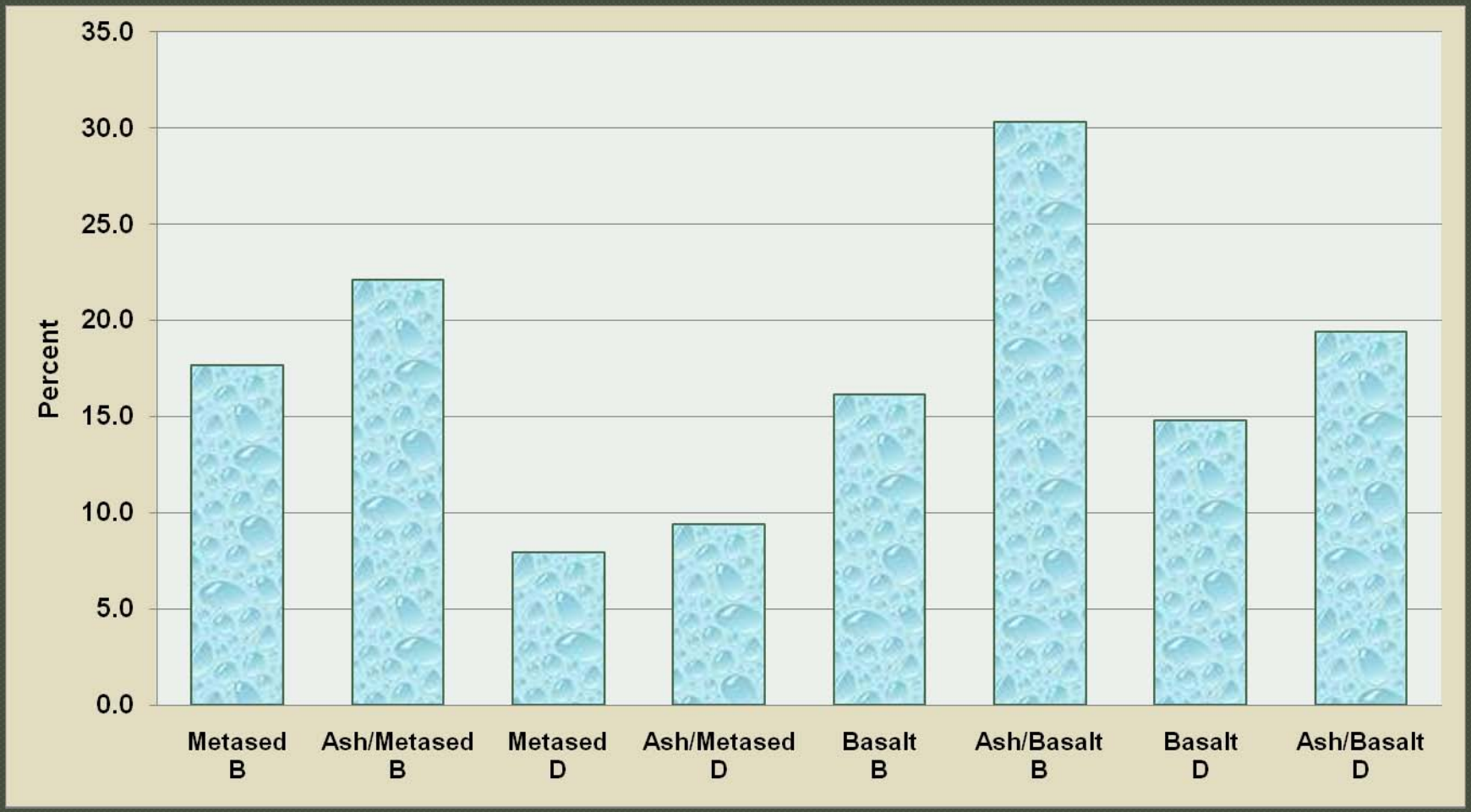




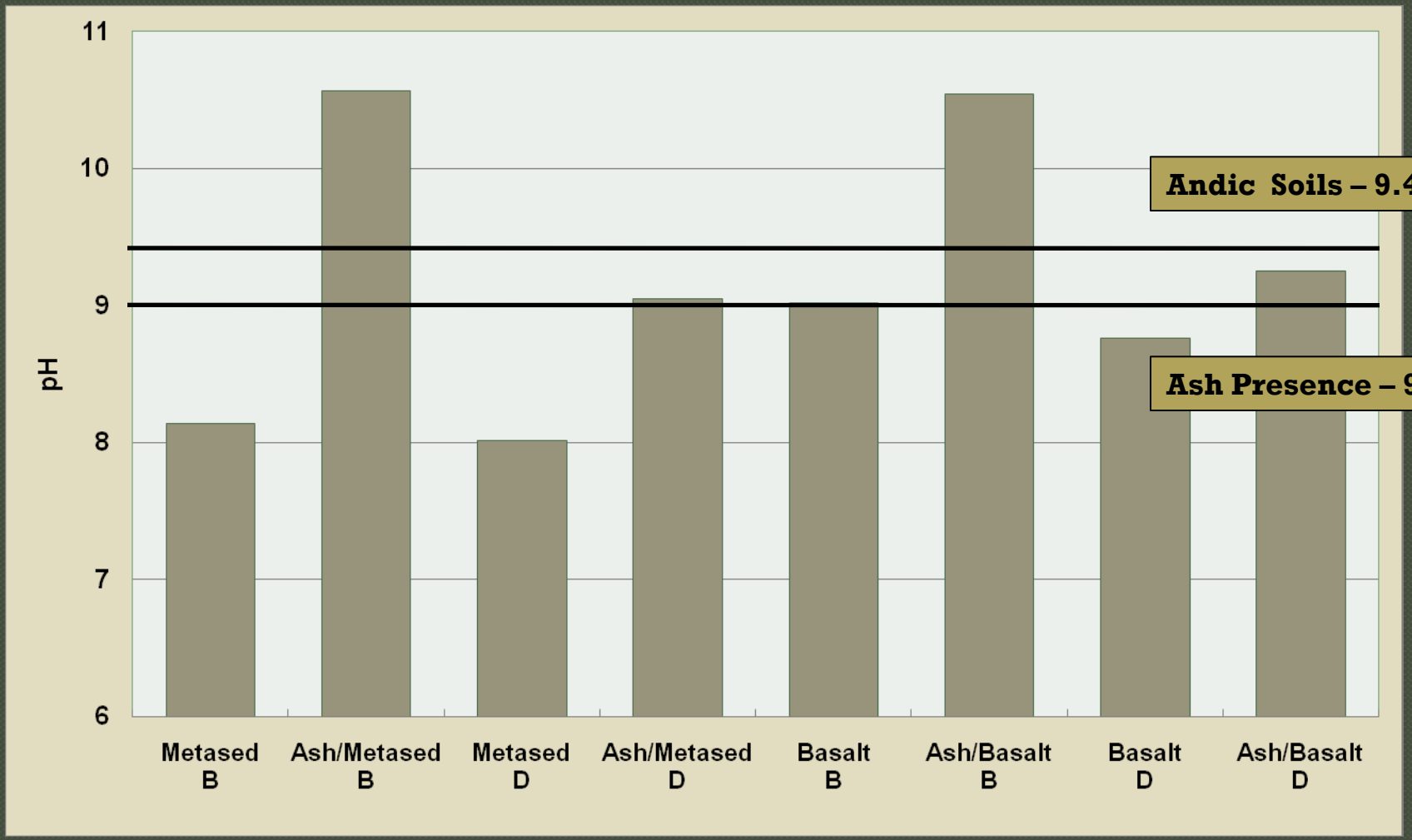
Soil Bulk Density



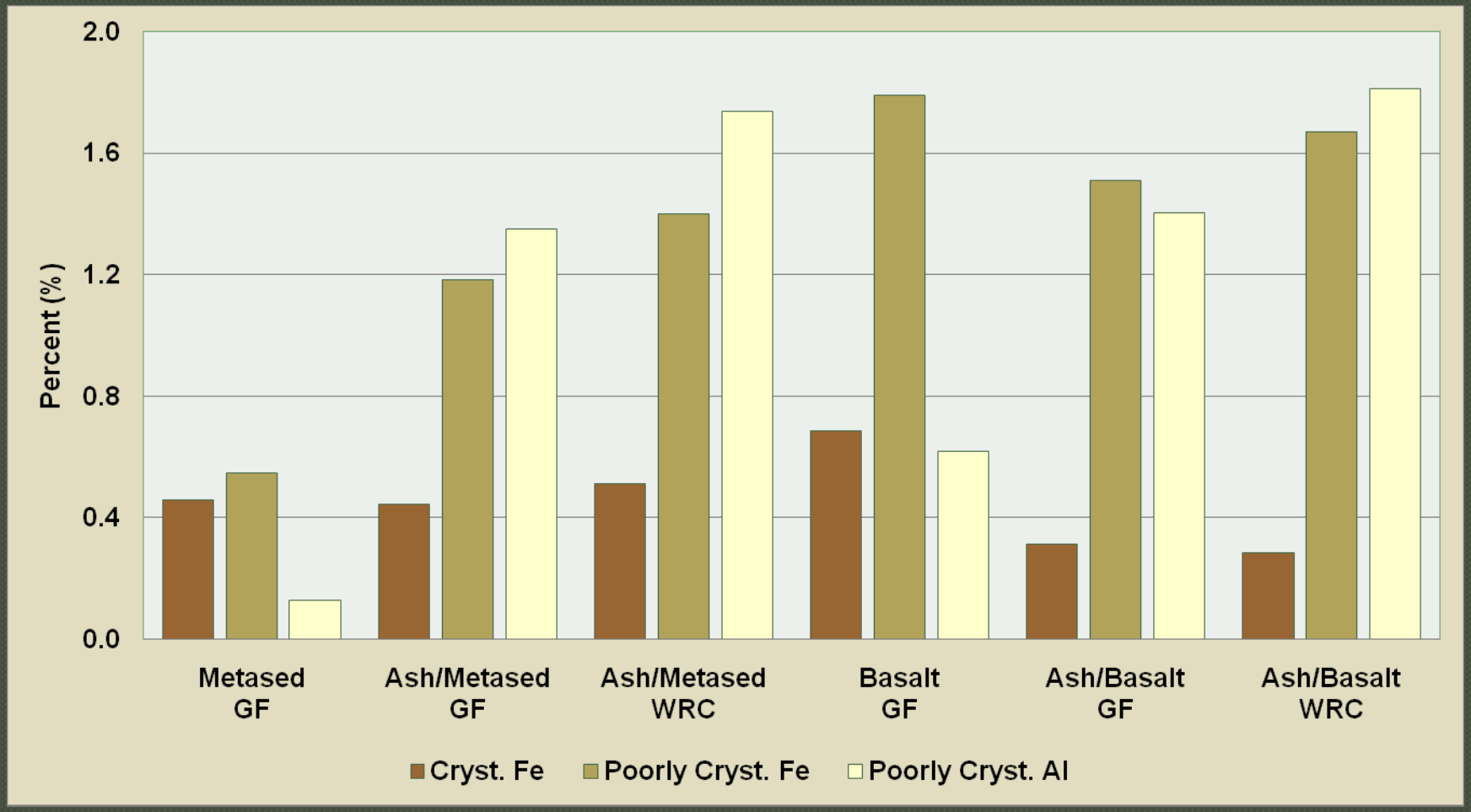
Plant Available Water



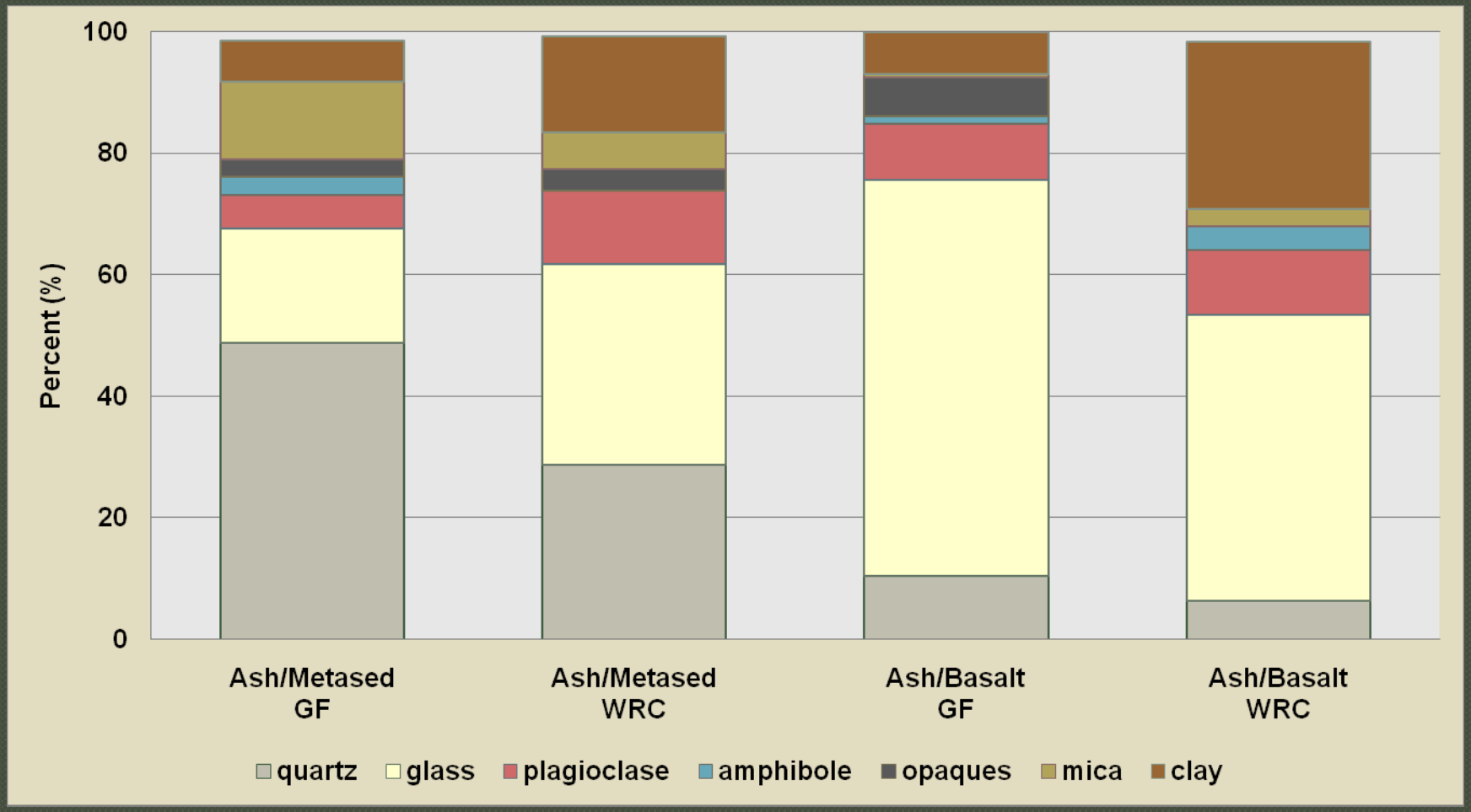
NaF pH


11
10
9
8
7
6
pH
Andic Soils – 9.4
Ash Presence – 9.0
Metased B
Ash/Metased B
Metased D
Ash/Metased D
Basalt B
Ash/Basalt B
Basalt D
Ash/Basalt D

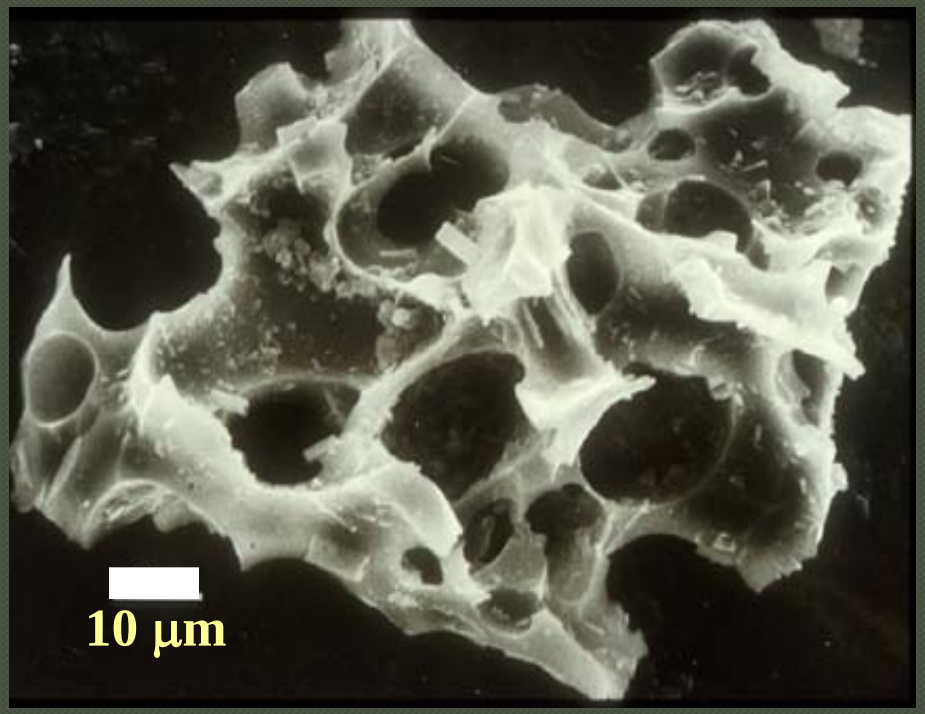
Poorly Crystalline Minerals B-level



Ash-Cap Mineralogy B-level



Ash-Cap Nutrient Status



Element	%
SiO_2	72.0
Al_2O_3	14.4
Na_2O	5.1
Fe_2O_3	2.1
K_2O	2.7
CaO	1.6
MgO	0.5
TiO_2	0.4

(UI Soil Characterization Laboratory)

Early Ash-Cap Assessment

- Volcanic ash bulk density does not vary by underlying rock type
- Soil water holding capacity is higher in basalt ash-caps
- WRC vegetation series ash-caps show greater amounts of poorly crystalline Al than GF series
- Basalt ash-caps contain less quartz and greater amounts of volcanic glass
- Less plant available nutrients on metasedimentary sites due to larger quantities of quartz

Project Schedule

- Complete detailed foliar, soil and environmental analyses by July
- Analyze data and report by December
- Present findings at April ‘08 annual meeting