

Site Type Initiative

Initial Stocking and Productivity Analysis

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2011 IFTNC Annual Meeting



Outline

- Background on STI (brief)
 - For more details: www.cnr.uidaho.edu/iftnc
- Data Collection Progress
- Initial Database Analyses
- Future Tools for Cooperators
- Projected Work Order for 2011-2012

The Site Type Initiative

- Identify site factors driving carrying capacity and optimal productivity
- Develop models to estimate site quality based on these identified factors
- Create regional, geospatial tools that predict site quality

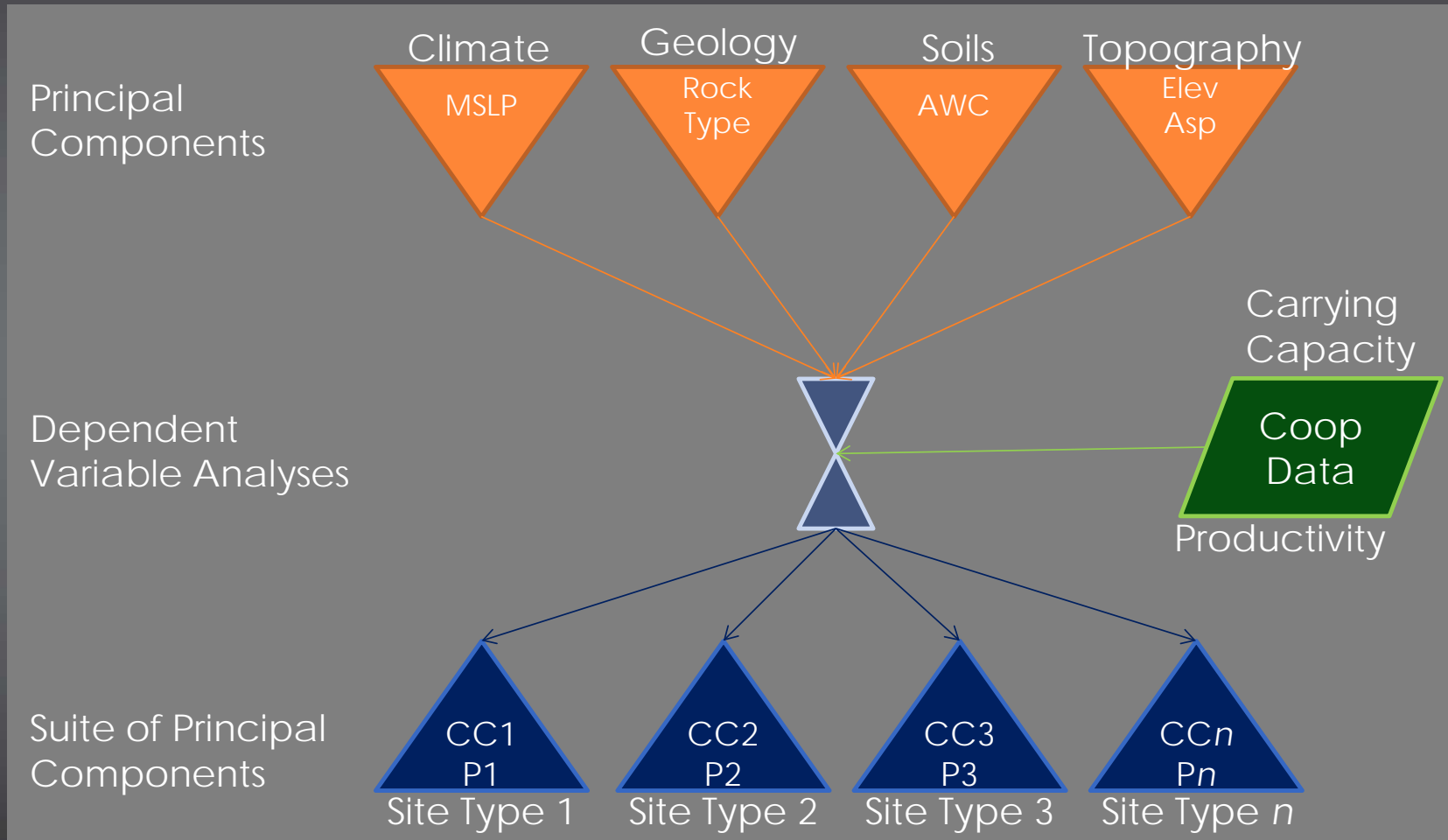
Drivers of Site Quality

- Principal factors:
 - Light
 - Aspect, latitude, cloudiness, slope
 - Moisture
 - Precipitation, soil available water
 - Temperature
 - Soil/air temperature, elevation, slope/aspect
 - Nutrients
 - Parent material elemental composition, rock weathering, organic matter
- Site quality is an expression of a complex interaction among these factors

Site Quality v. Site Type

- A site type is one realization of the many potential realizations of the concept of site quality
 - Site Type: *A geospatially definable suite of climatic and edaphic variables modified by landform that interact to form a plant community with distinct carrying capacity and productivity.*
 - Low carrying capacity/productivity = Low site quality
 - High carrying capacity/productivity = High site quality

Flow Chart View



Site Type Initiative Regions and Available Stand Data



Available Data:

37,000+ Stands
3.6 Million+ Tree Records

Consisting of:

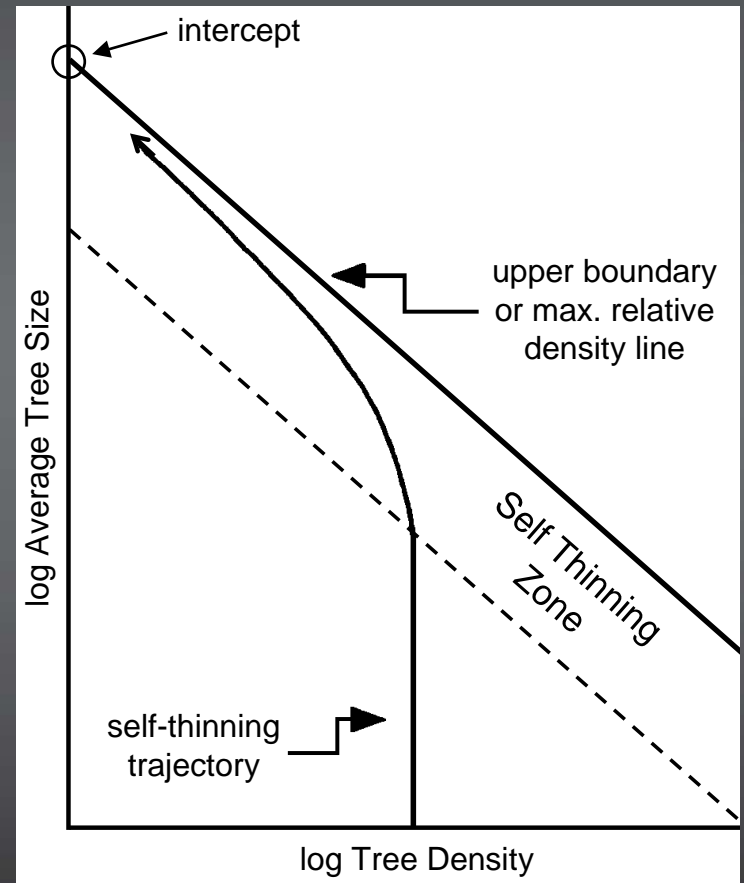
Single Entry Cruise Plots
Multiple Entry CFI Plots

**Datasets Remaining to Obtain
from Cooperators:**
1.5

Parent Material	
	Alluvium
	CaMetamorphic
	CaMetased
	CaSed
	Colluvium
	Extrusive
	Glacial
	Intrusive
	Lacustrine
	Loess
	Metamorphic
	Metasedimentary
	OldSeds
	Organic
	Residuum
	Sand
	Sedimentary
	
	Volcanic Ash
	Volcanic Pumice

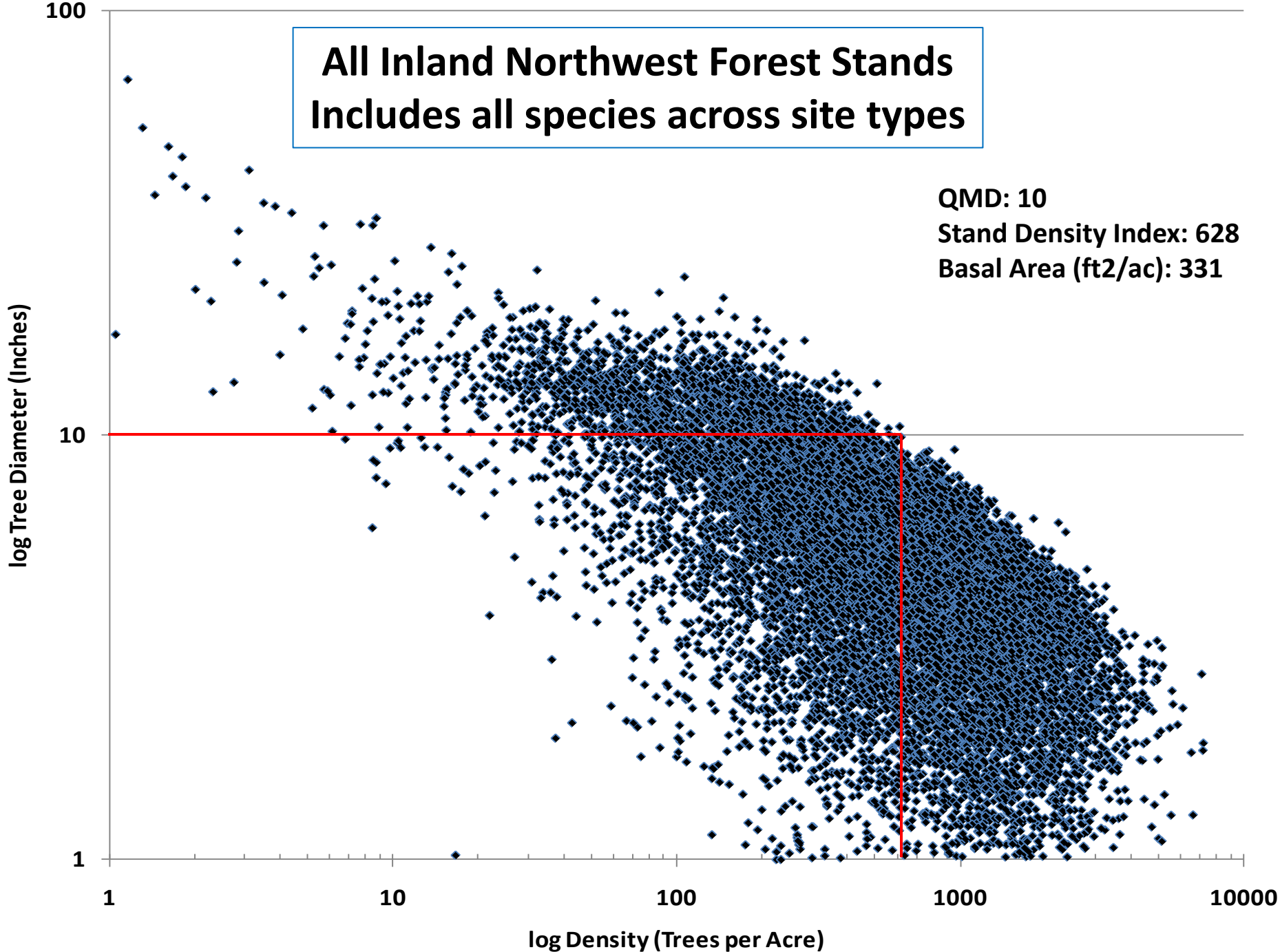
Preliminary Findings

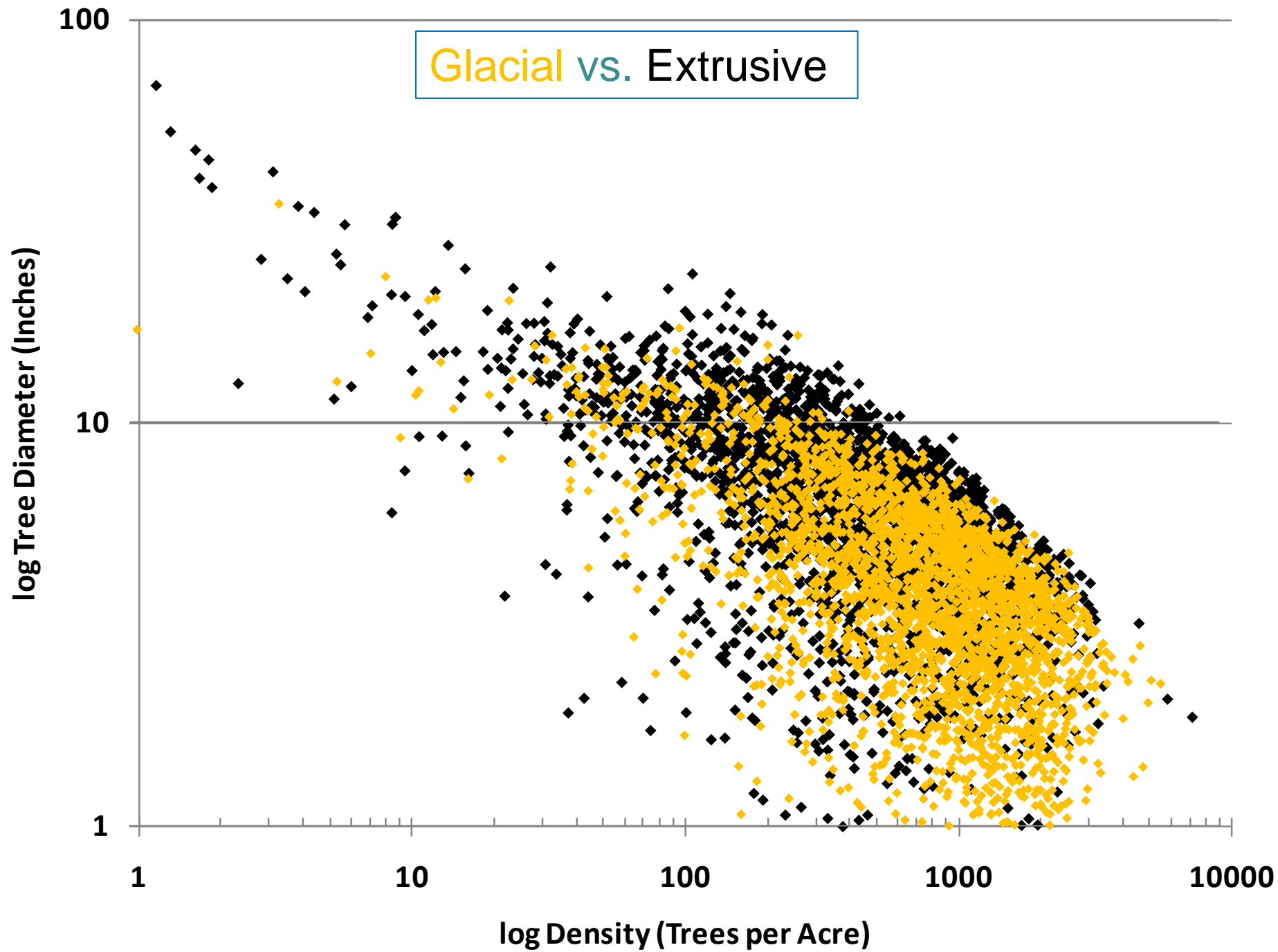
- Stand Density Index
- Basal Area (ft²/ac)
- Future Measures
 - Site Index
 - 2nd Log growth rate
 - Volume

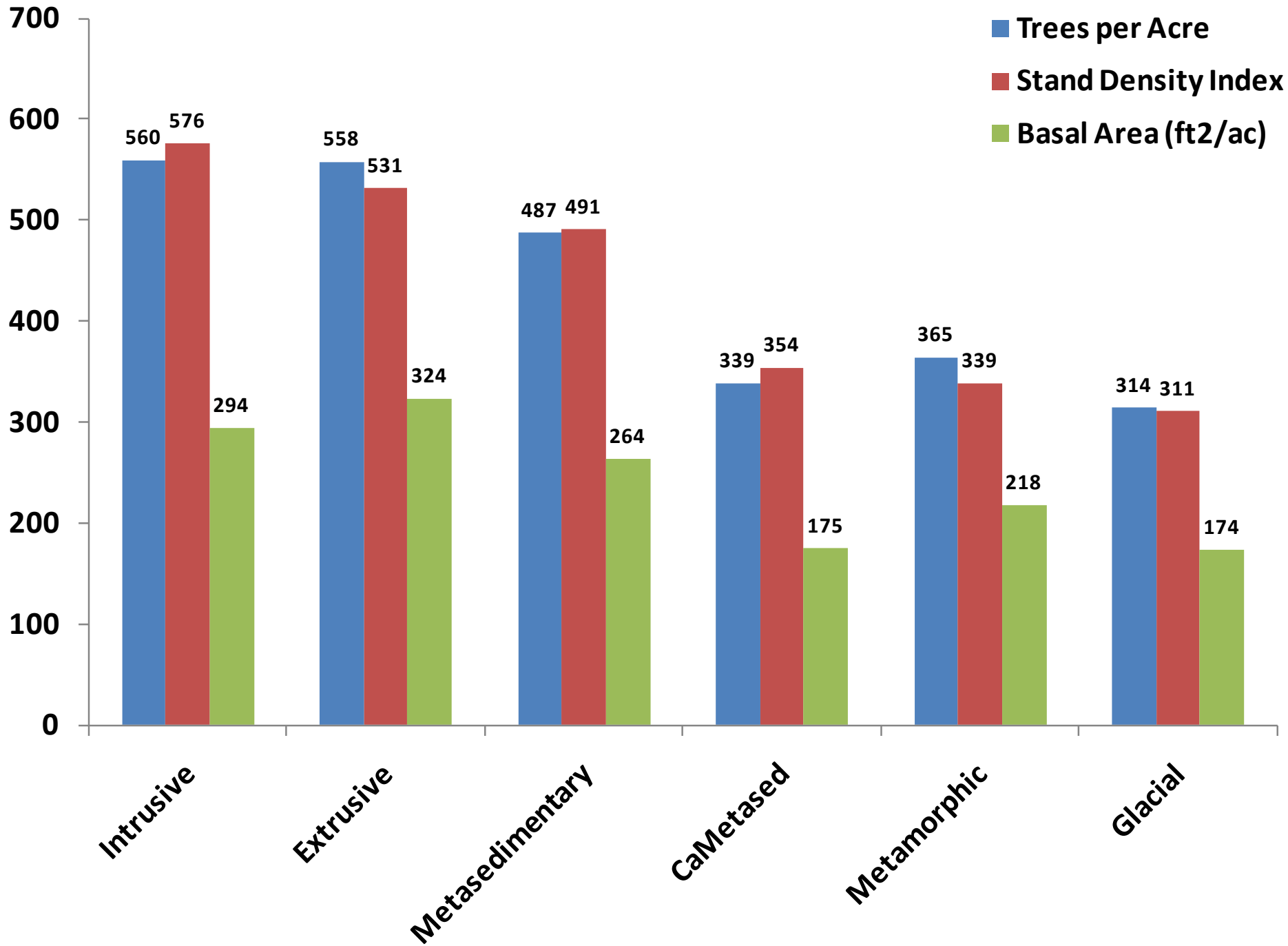


**All Inland Northwest Forest Stands
Includes all species across site types**

**QMD: 10
Stand Density Index: 628
Basal Area (ft²/ac): 331**

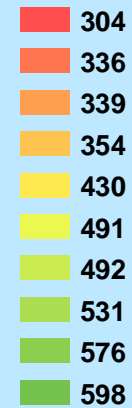






Stand Density Index Across NE WA and N ID

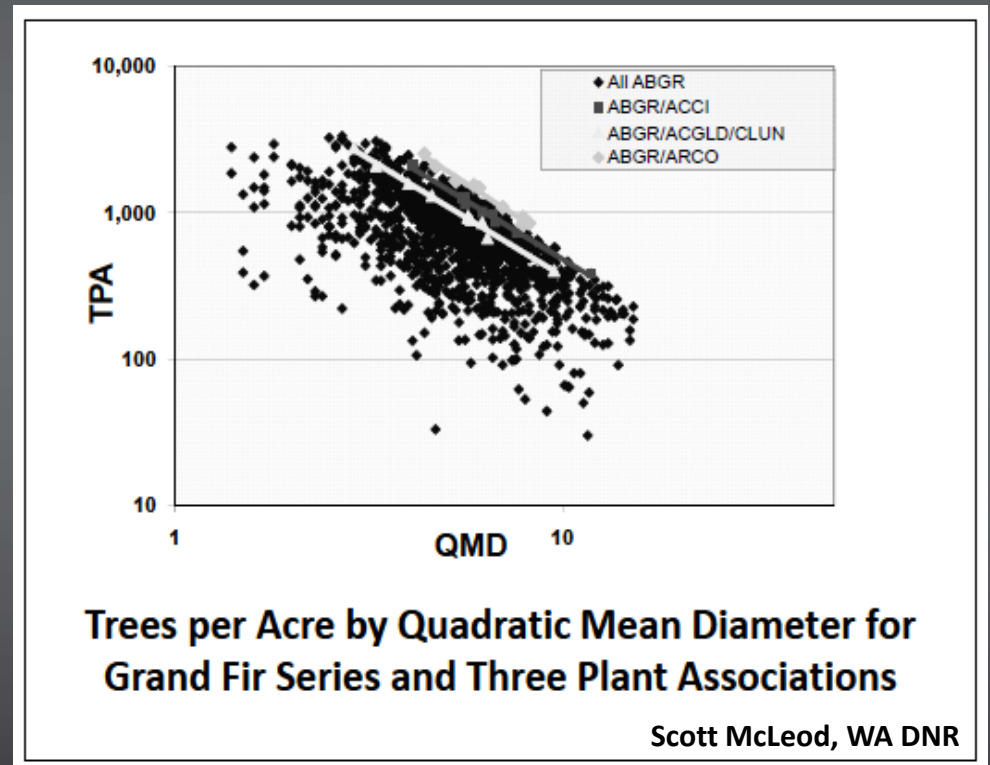
Stand Density Index



Stand Density Index as a function of geologic parent material. Does not account for variation due to climate, topography or species differences. Those analyses yet to come.

Moisture/Temp Modifiers on SDI

- Datasets typically stratified by Vegetation Series / Habitat type



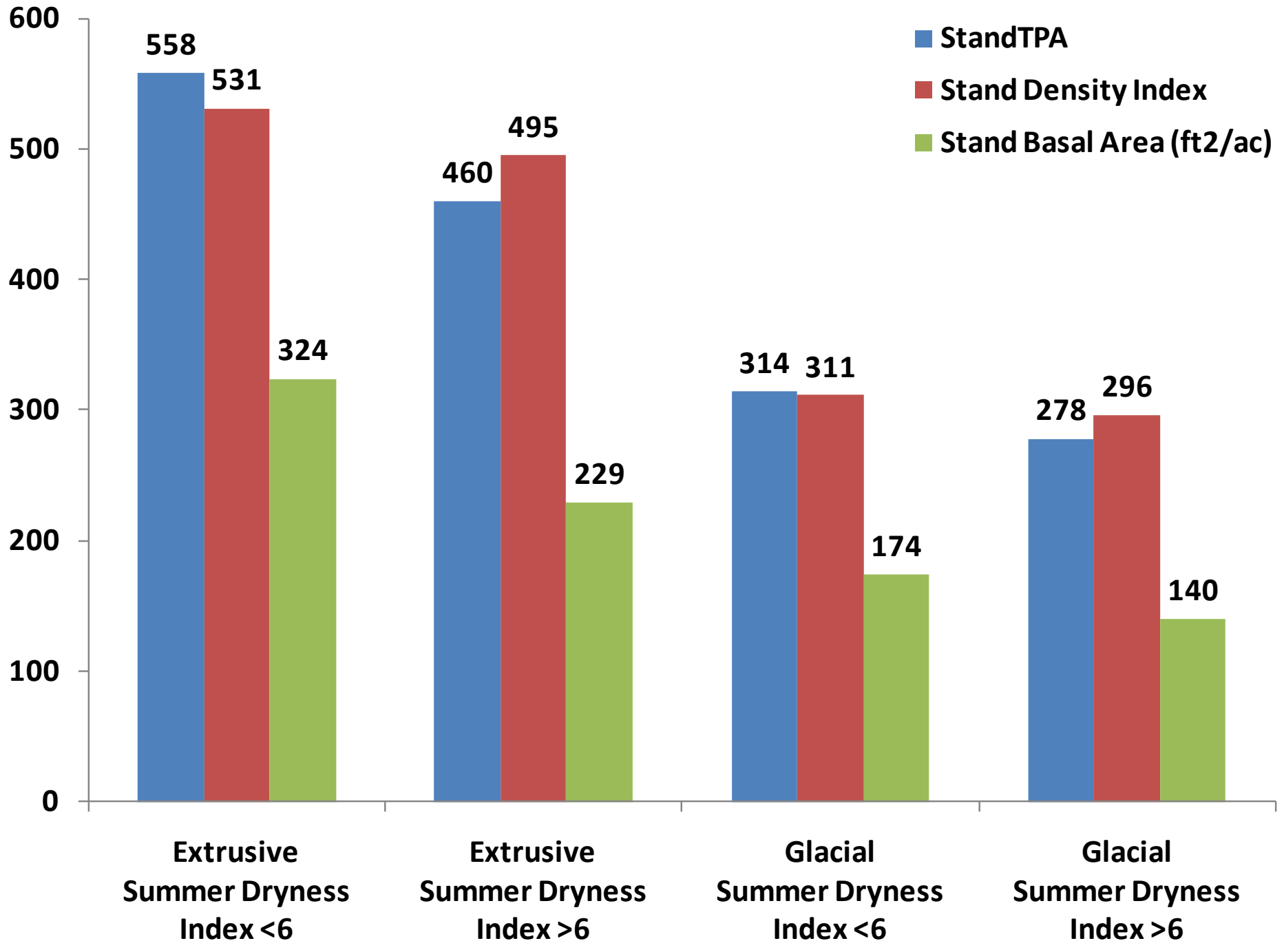
Challenges of VS/HT

- Accurate stand level geospatial maps hard to obtain
- For those available – when were the calls made and by whom?
 - Pre- or post-harvest?
 - Trained botanist?
- What about climate change?



Can Climate/Soil Models Replace VS/HT?

Climate Variable	Stand Density Index	Basal Area (ft ² /ac)
MAT	0.0368	0.0025
MAP	<0.0001	<0.0001
GSP	0.1721	<0.0001
MMIN	0.2455	<0.0001
FFP	0.3367	0.0126
MMINDD0	0.8874	<0.0001
ADI	0.0742	<0.0001
SDI (formerly SMI)	<0.0001	<0.0001
PRATIO	0.0049	<0.0001

Future Data Layer: Available soil water capacity (AWC)

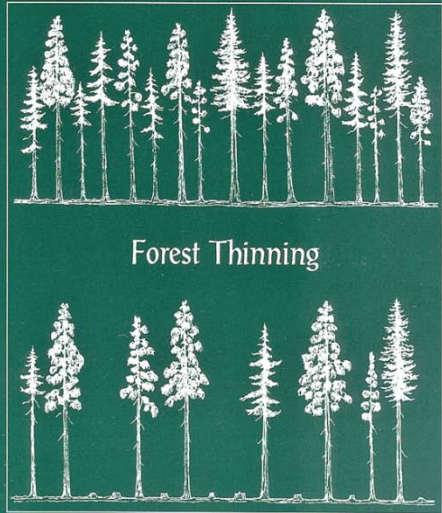


VS/HT → Climate Based Guidelines


 United States Department of Agriculture
 Forest Service
 Pacific Northwest Region
 Umatilla National Forest
 F14-SQ-TP-03-99
 April 1999


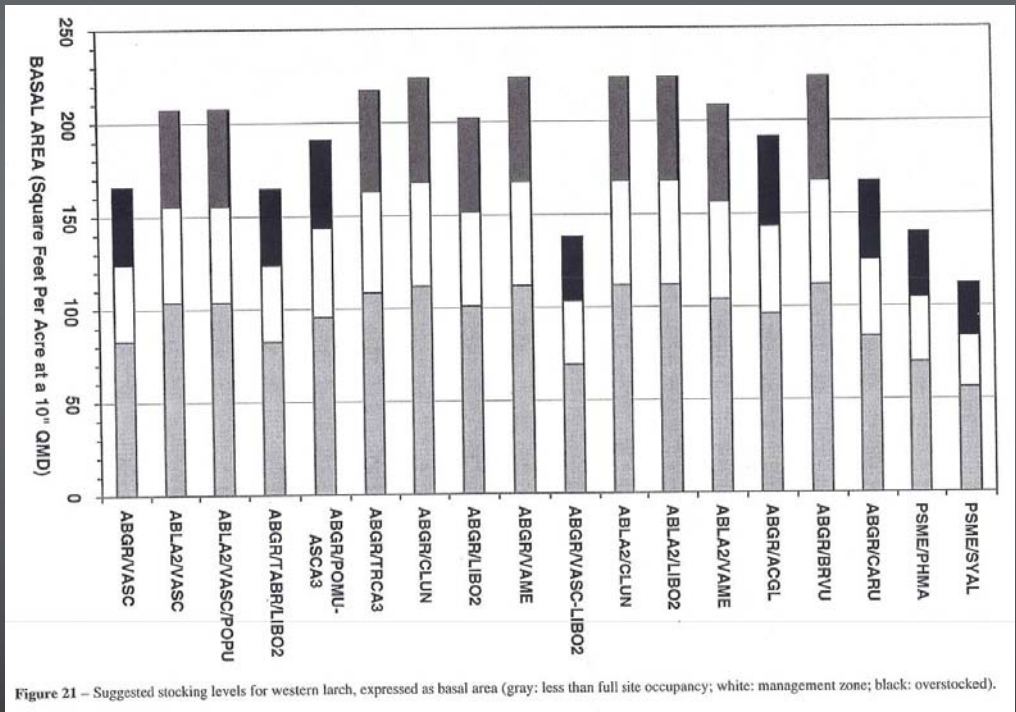
Suggested Stocking Levels for Forest Stands in Northeastern Oregon and Southeastern Washington: An Implementation Guide for the Umatilla National Forest

David C. Powell



Forest Thinning

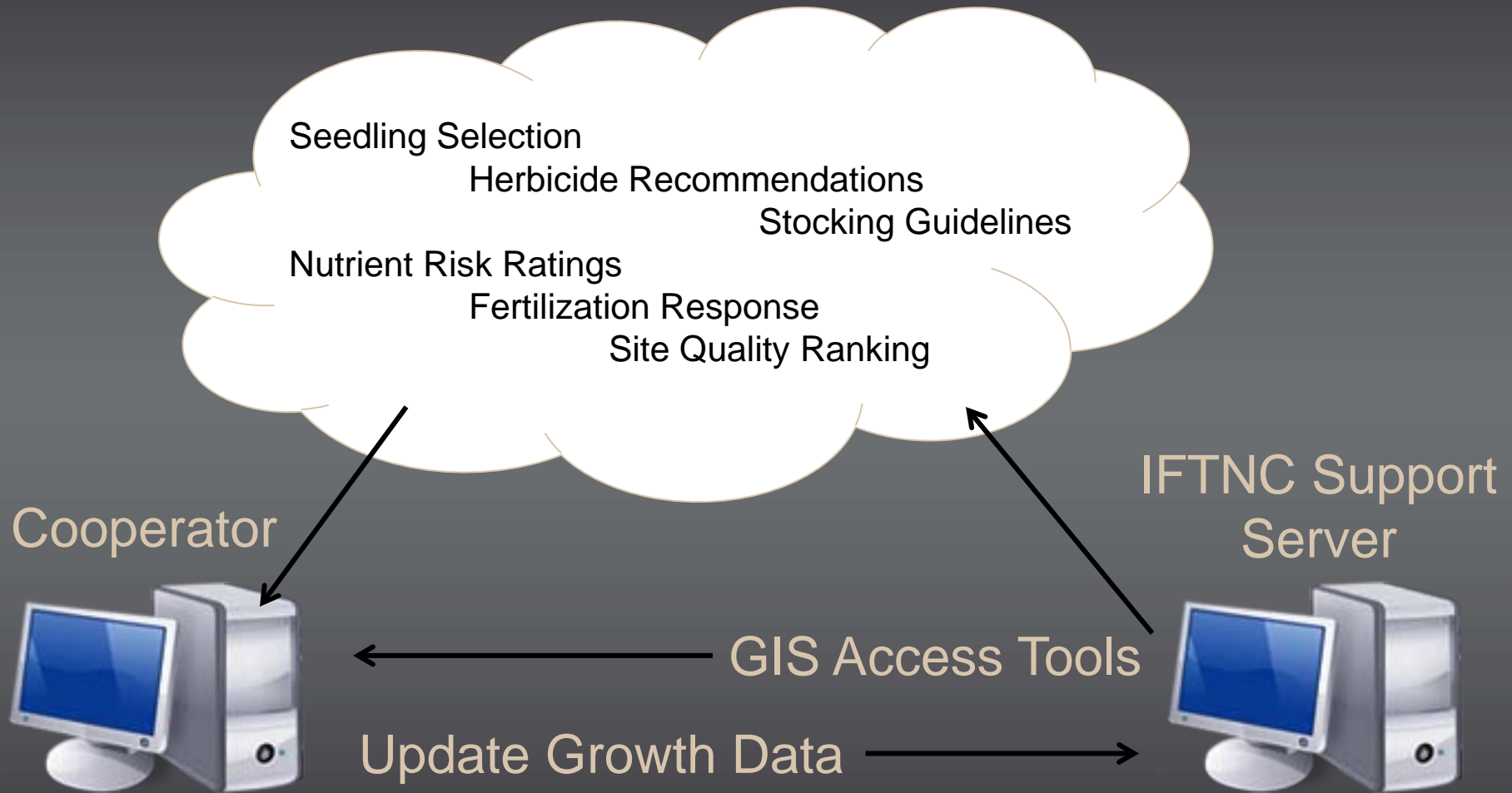
- *Geospatially model PA by climate/soils, then bin PA guidelines into appropriate site type*



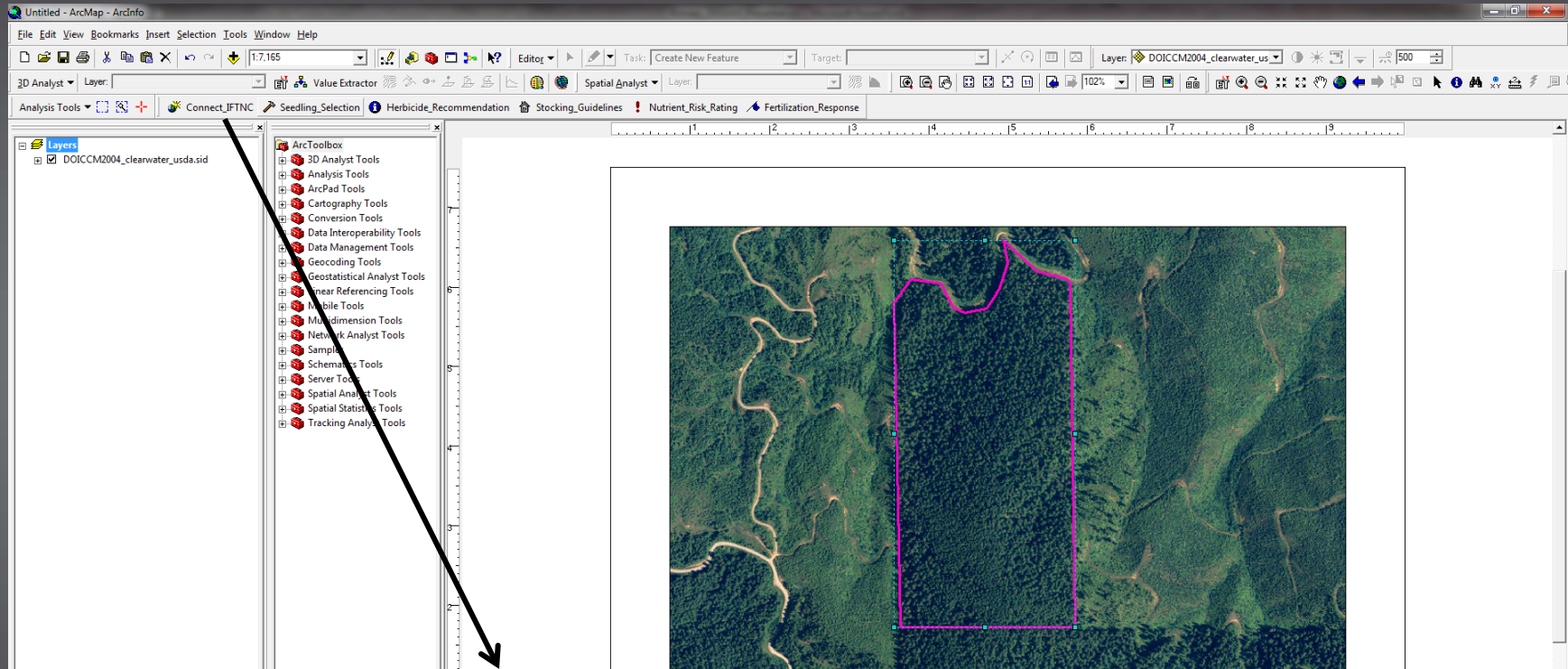
USFS Doc F14-SOTP-03-99

The Future of the Site Type Initiative

Cloud Computing & GeoTools



ArcGIS Based



IFTNC SYLVICS

Connect_IFTNC Seedling_Selection Herbicide_Recommendation Stocking_Guidelines Nutrient_Risk_Rating Fertilization_Response

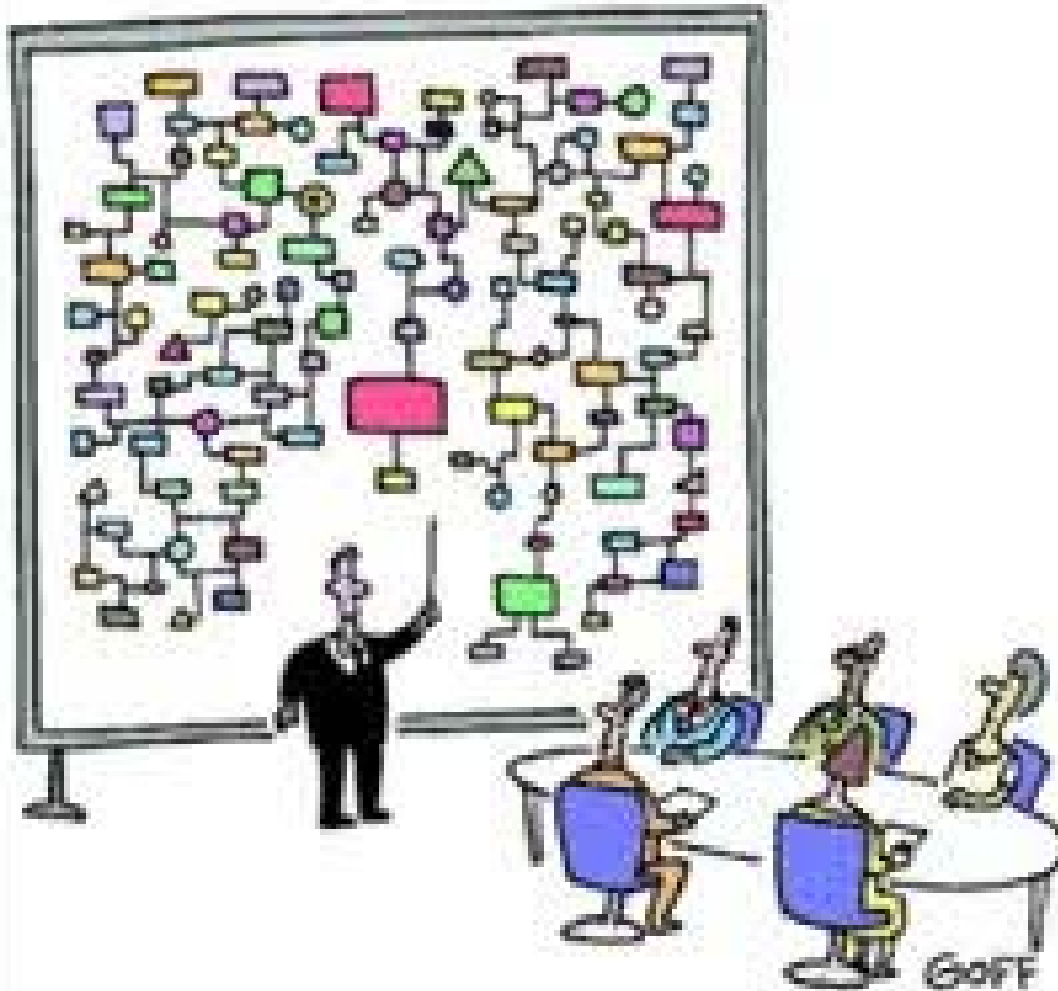
Drawing Anal

587144.771 5183136.606 Meters

1.84 5.71 Inches

Work Order for 2011-2012

- Complete Cooperator Data Acquisition
- Hire Biometrician Post-Doc (June 1, 2011)
- Develop PA-Climate-Soil Models
- Stratify Final Dataset by Climate, Topography, Geology, Soil Features
- Density/Productivity Modelling
- Model Validation



“And that’s why we need a biometrician.”