Soil Erosion and Phosphorus

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Outline

Revised Universal Soil Loss Equation

- What is it?
- How do we use it?

Soil Phosphorus data

- How do we account for it?
- Where do we get data from?

Revised Universal Soil Loss Equation

Farm scale

- RUSLE equation
- RUSLE 2 software

Annual soil loss caused by rainfall and its associated overland flow

- R = climate erodibility
- K = soil erodibility measured under a standard condition
- L = slope length
- S = slope steepness
- **C = cover management**
- P = support practices

How do we use RUSLE2?

Land erosion

Bay wide application

Agriculture focus on Cover Management (C-factor)

What do we use for RUSLE2?

- **Several scenarios**
  - Reflect management of major crops across the watershed
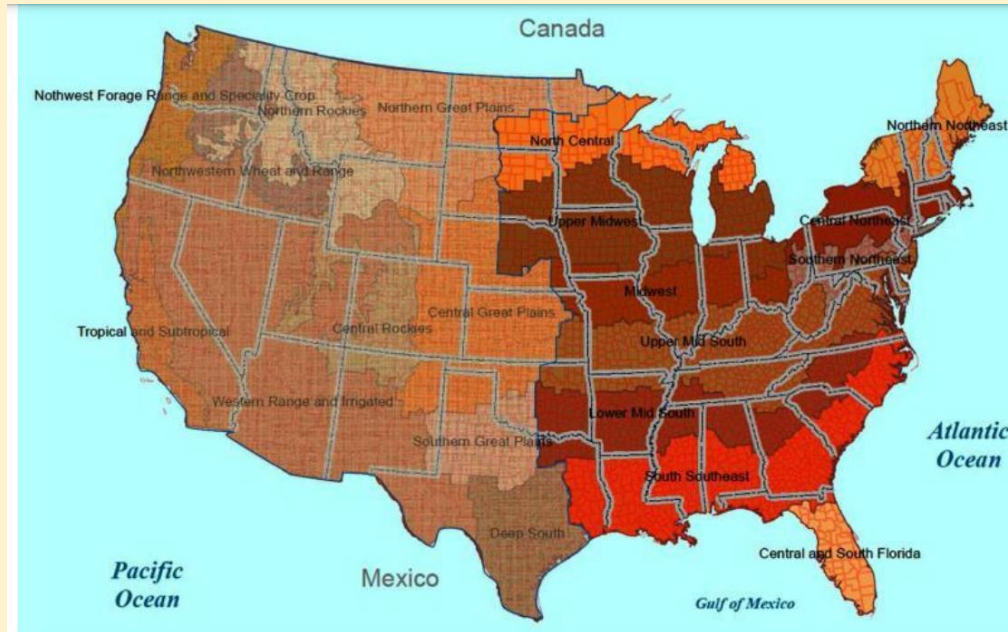 - Run for crop management zones and forage zones
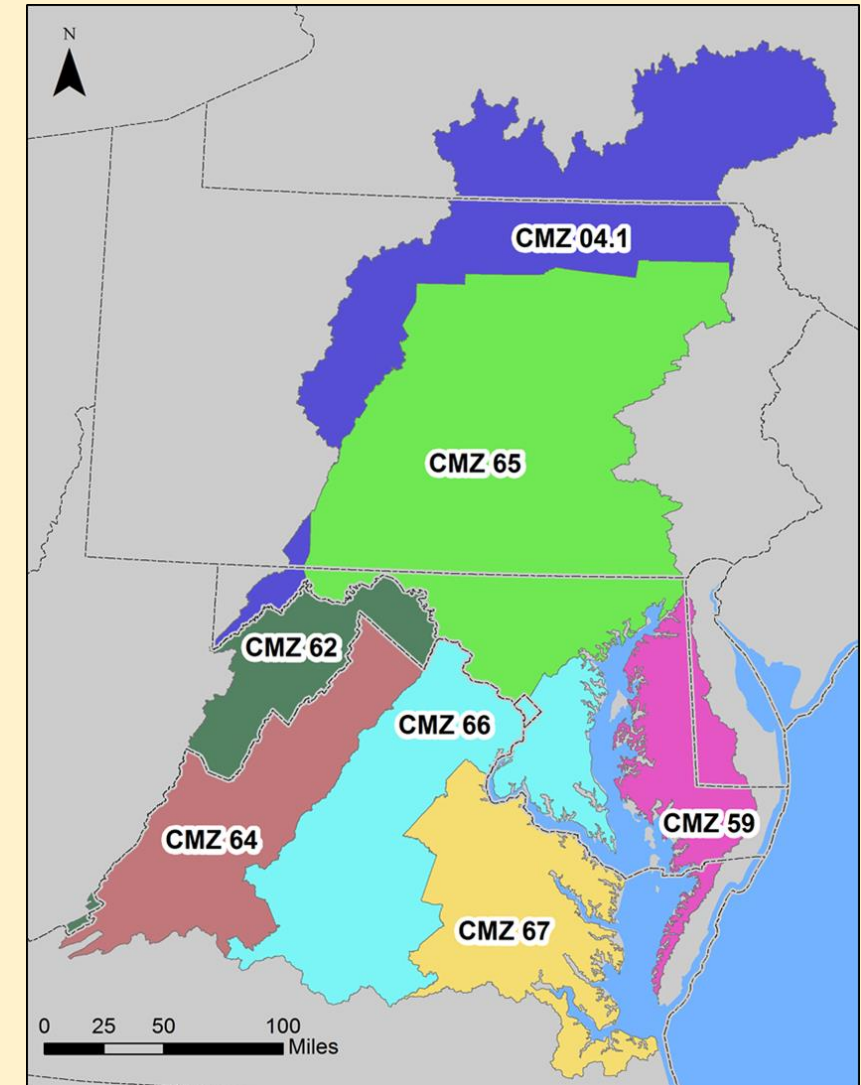

Figure 3-17: Forage zones

Crop Soil Cover Fractions

Estimate fraction of soil cover provided by canopy or crop residue

Expert decisions

- Map CAST land uses to RUSLE

Cover crops are NOT modeled

- BMPs are in the RUSLE BUT they are modeled differently in CAST

Things to think about

Are the current C factors still valid?

Will land uses stay the same?

Soil Phosphorus
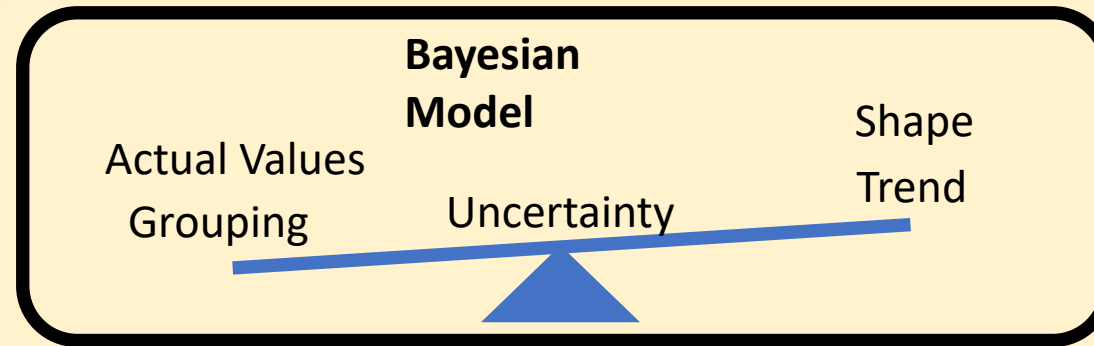
County level data necessary

No complete annual history

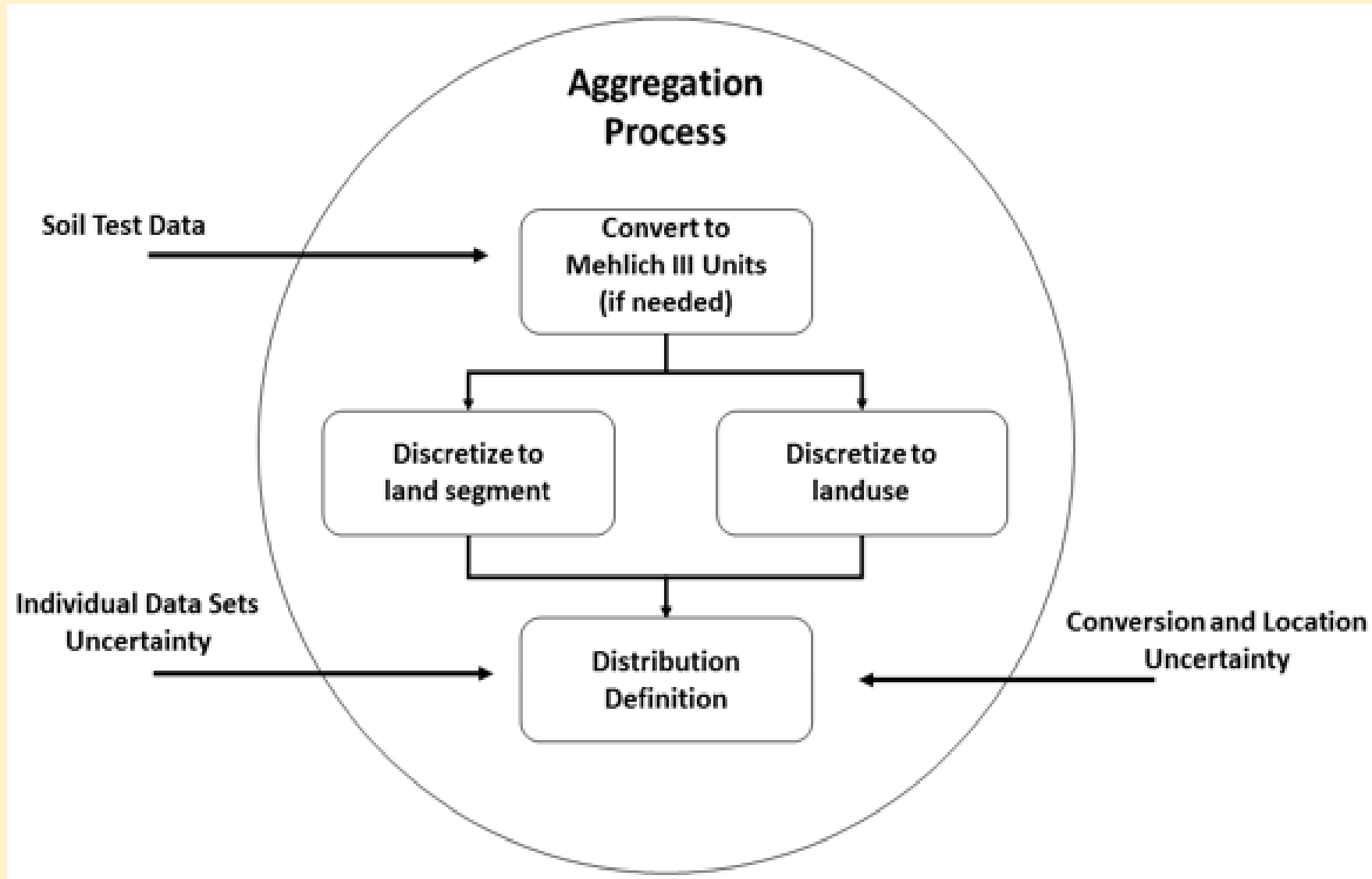Multiple data sets

Bayesian Model

- Combine data sets
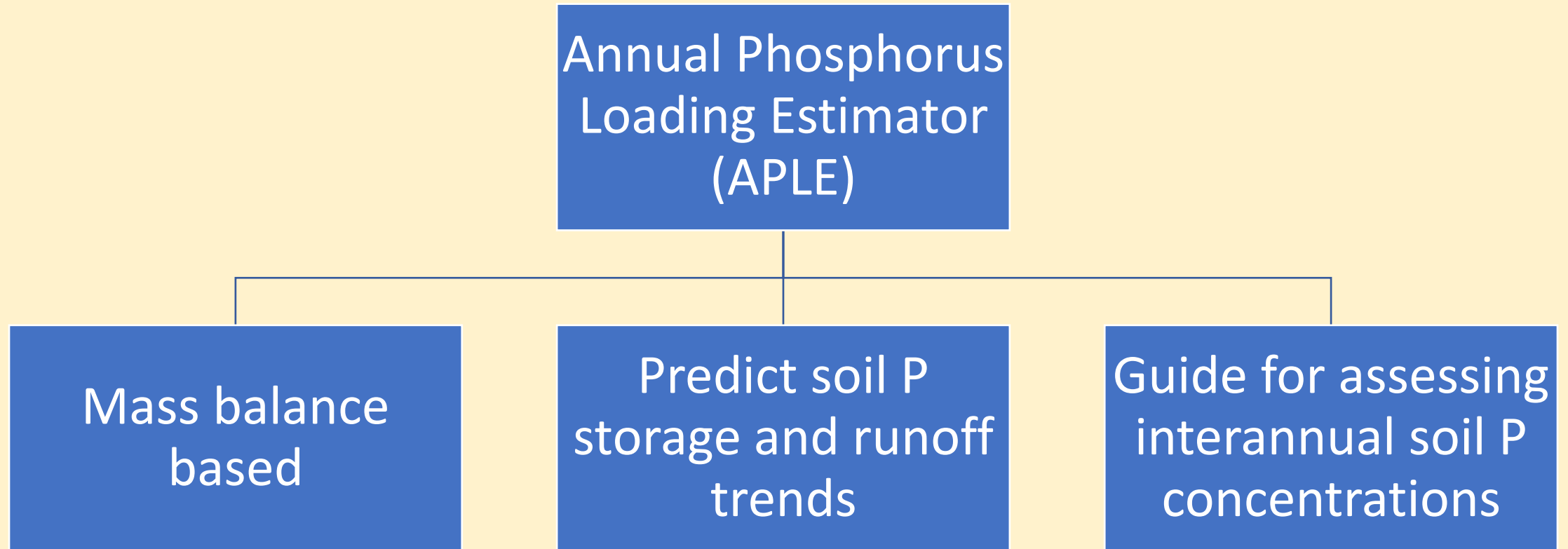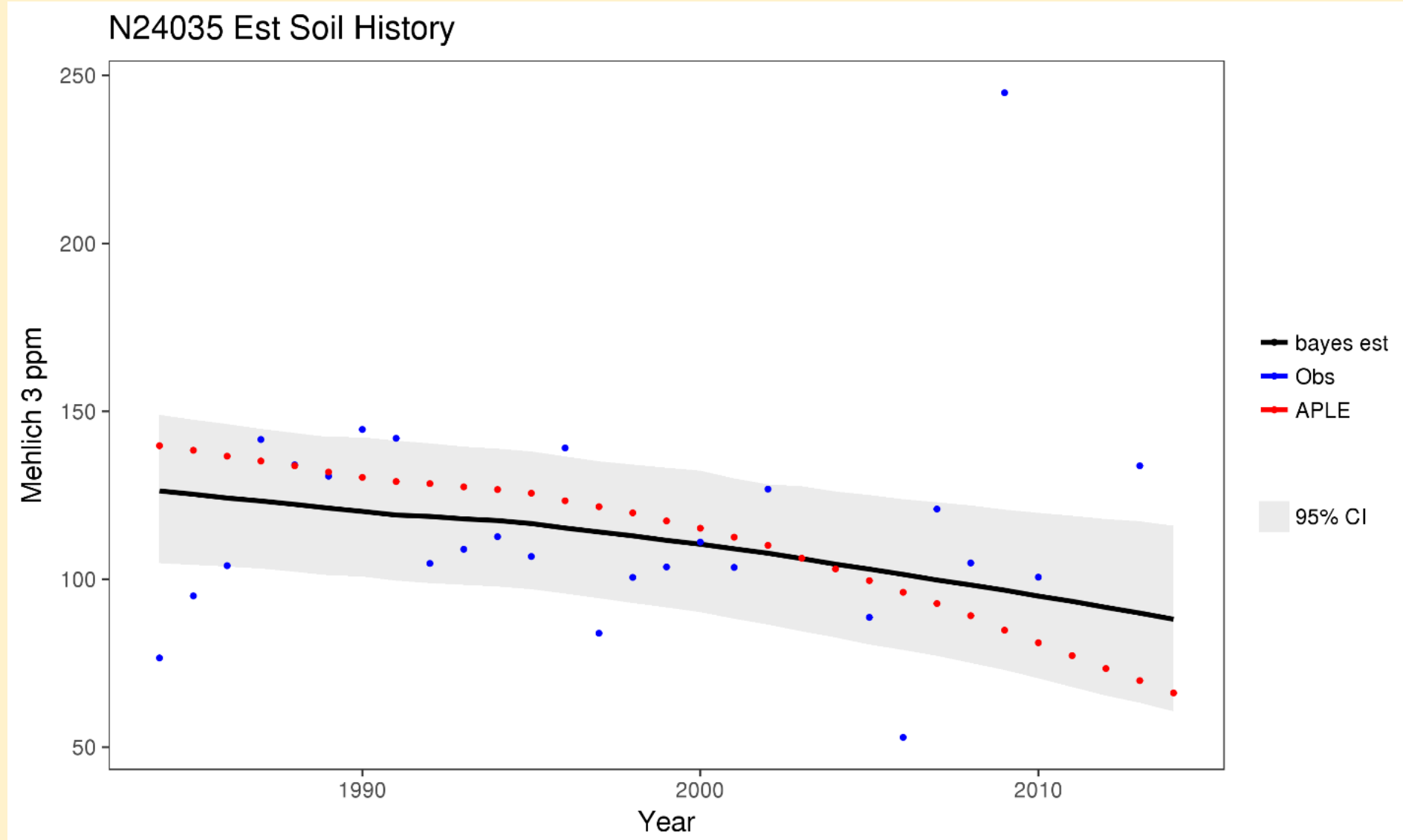
Soil Tests

Model Estimates

The Result

N24035 Est Soil History

Water Extractable Phosphorus

- Expressed as a percentage of total P

- Inorganic fertilizer

- Biosolids

- Manure
  - Predicted value by animal type
  - Literature review

Table 3-45: WEP for different animal types

Animal Name	Fraction WEP In Manure
pullets	0.19
turkeys	0.34
hogs and pigs for breeding	0.37
beef	0.43
broilers	0.2
dairy	0.6
hogs for slaughter	0.37
horses	0.515
layers	0.19
other cattle	0.515
biosolids/spray irrigation	0.025
fertilizer	0.85
sheep and lambs	0.515
goats	0.515

Questions?