

Model for field-scale analysis of nutrient management in potato production systems in Tiraque, Bolivia

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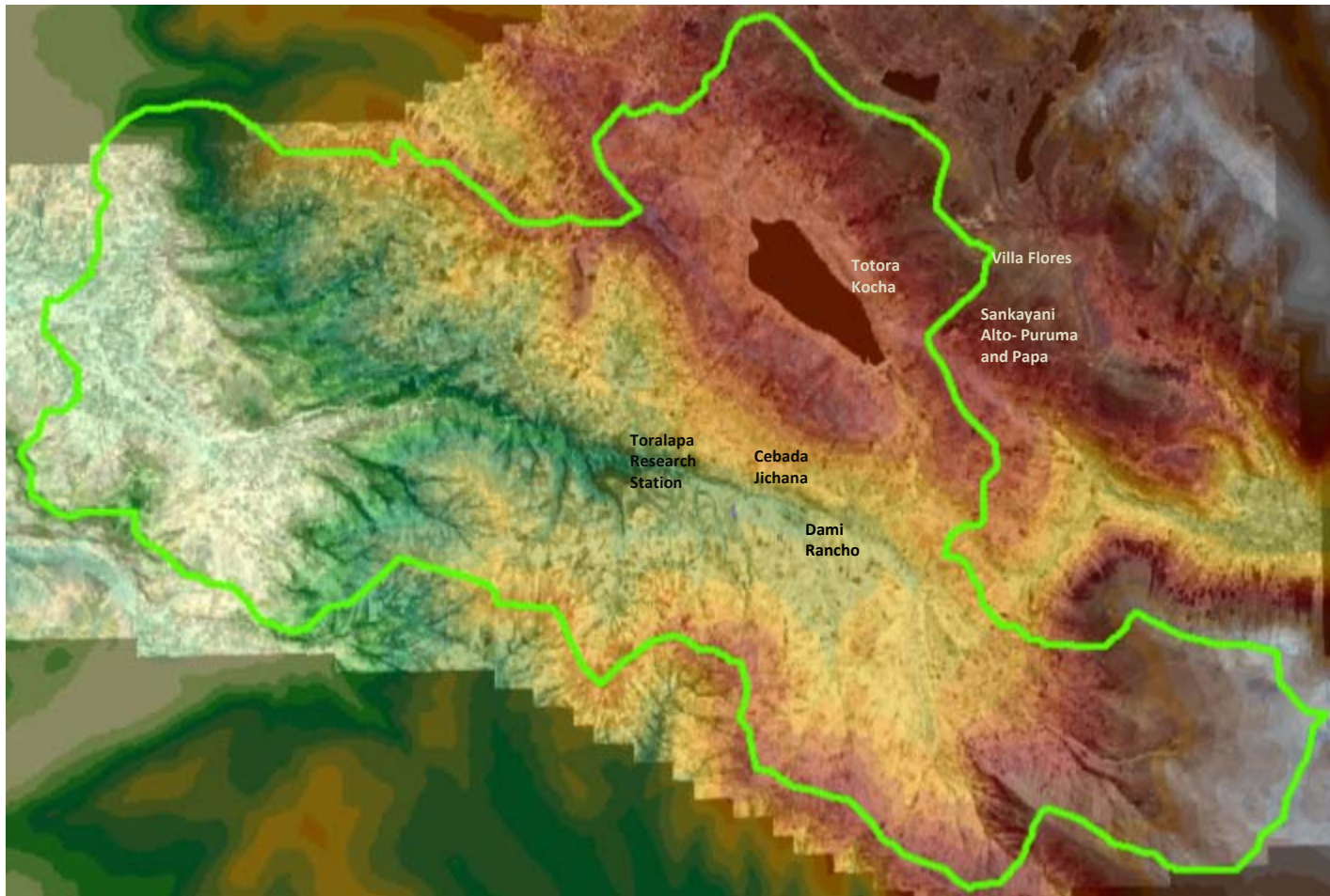
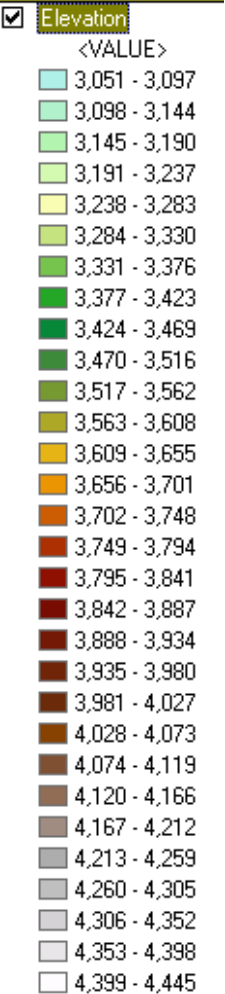
Modeling Framework

- Scope: Field-scale water and nutrient dynamics
- Goal: tool to evaluate nutrient, water management, and climate effects on crop productivity and production efficiency
- Steps:
 - Evaluate model algorithms and data based on existing literature
 - Evaluate model performance compared with field data
 - Modify / adapt model as needed for Andean soils, crops, and climate

Field Studies

- Runoff/erosion plots – 3 reps, 3 treatments
 - Potato
 - Fallow
 - Native vegetation
- Yield plots: 6 fields in 3 elevation zones
 - Soil nutrients, inputs
 - Whole plant and tuber biomass and nutrient content

Jatun Mayu Watershed

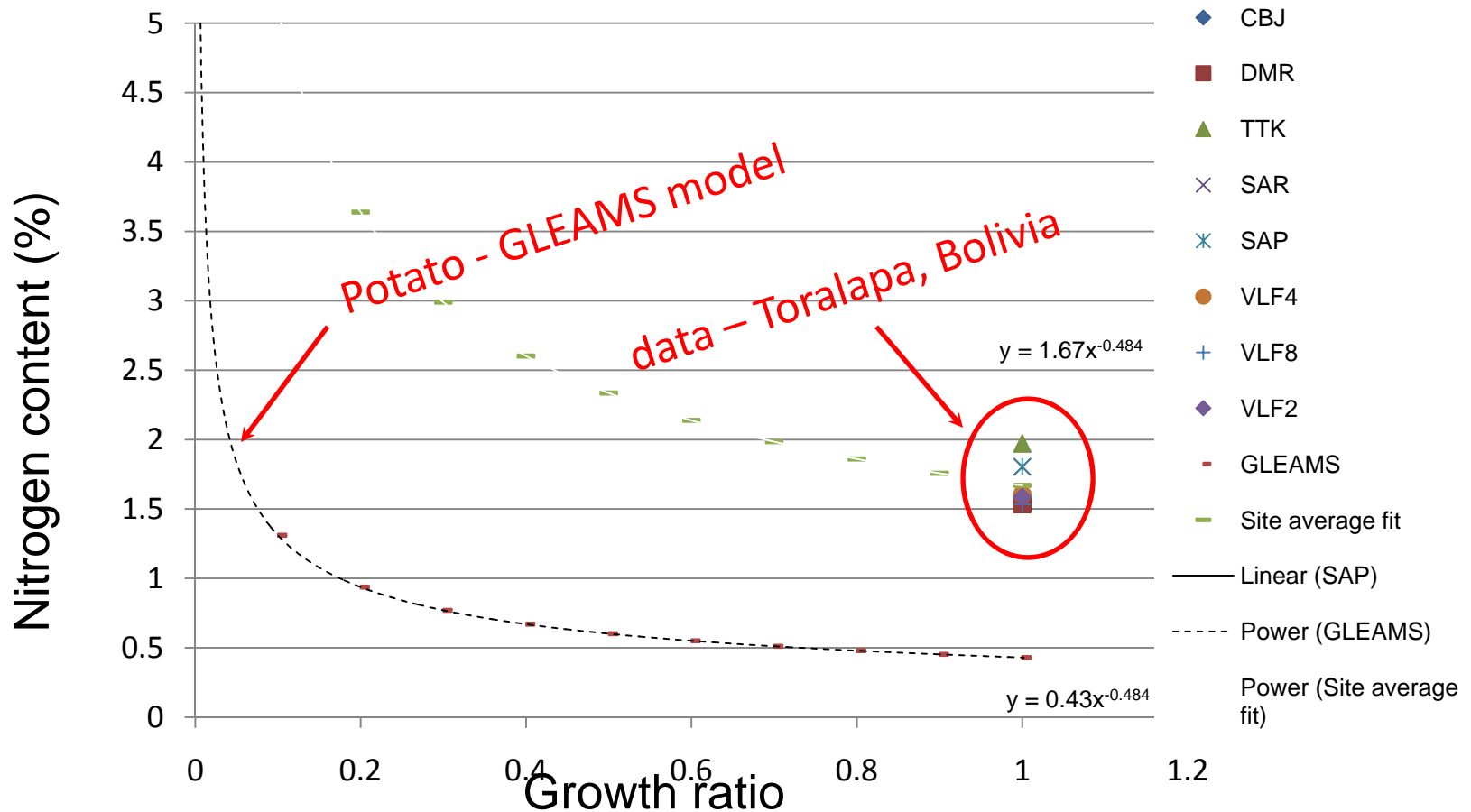






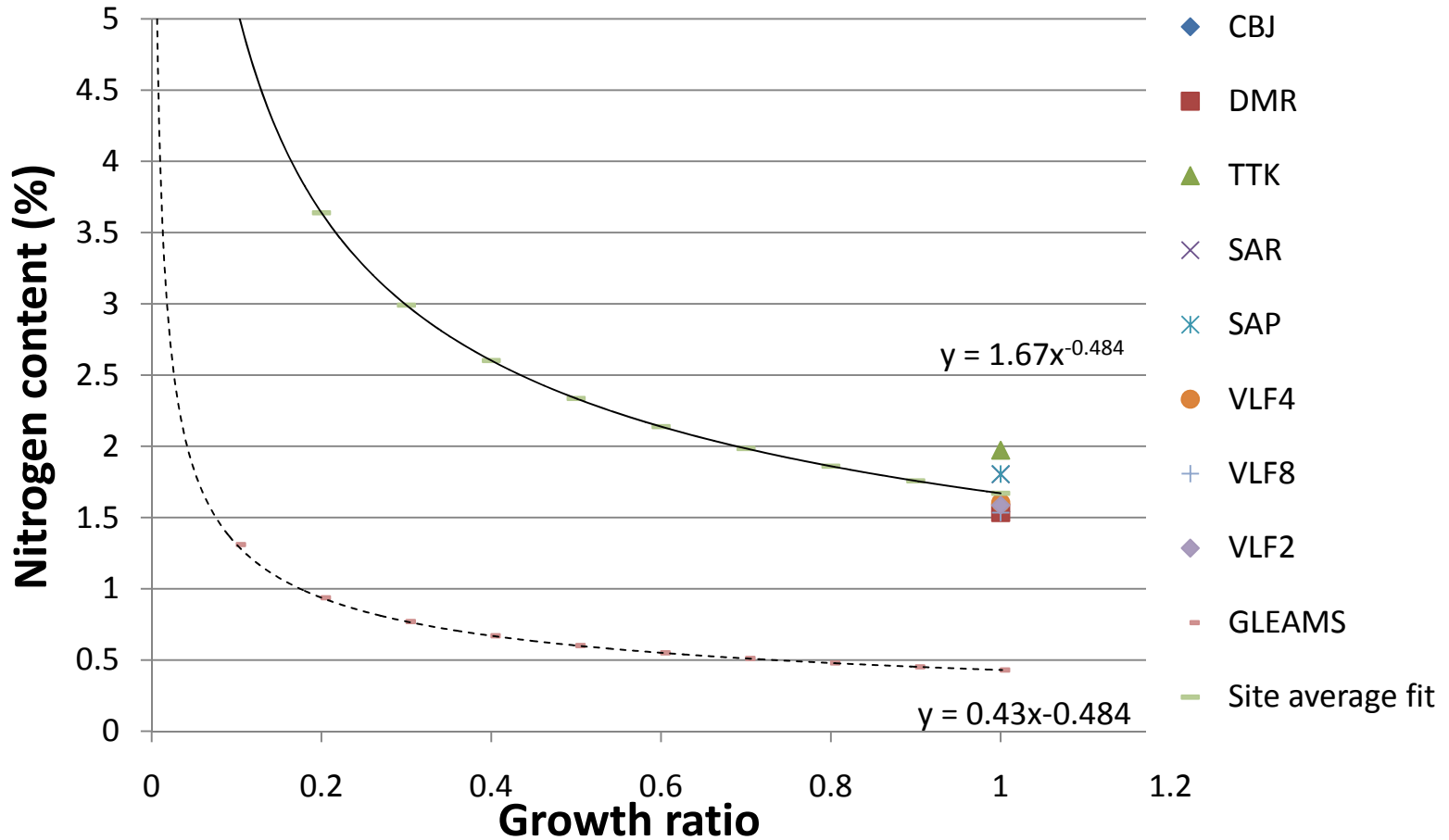
N Extraction Curves for Potato

GLEAMS model default and data from Toralapa, Bolivia

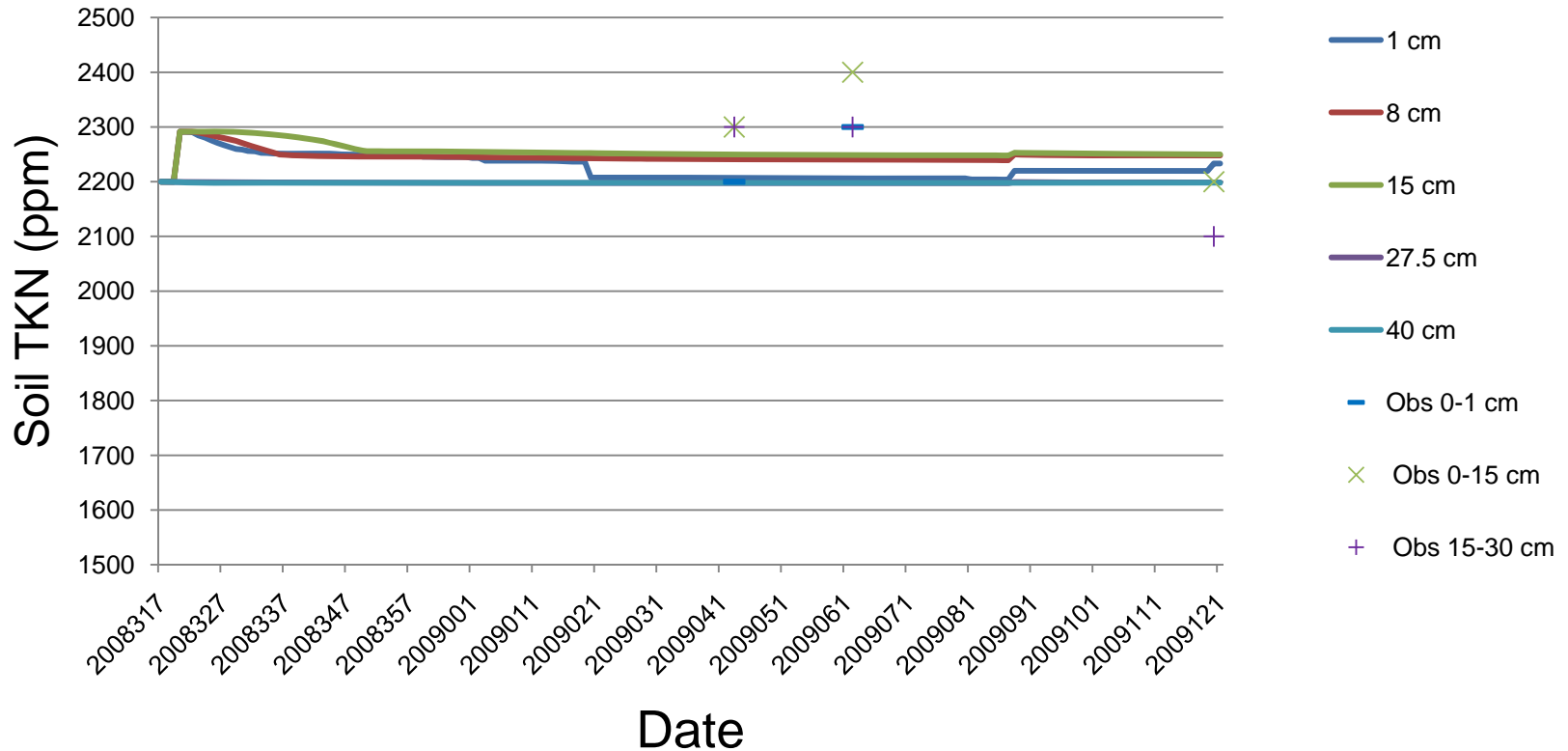


N Extraction Curves for Potato

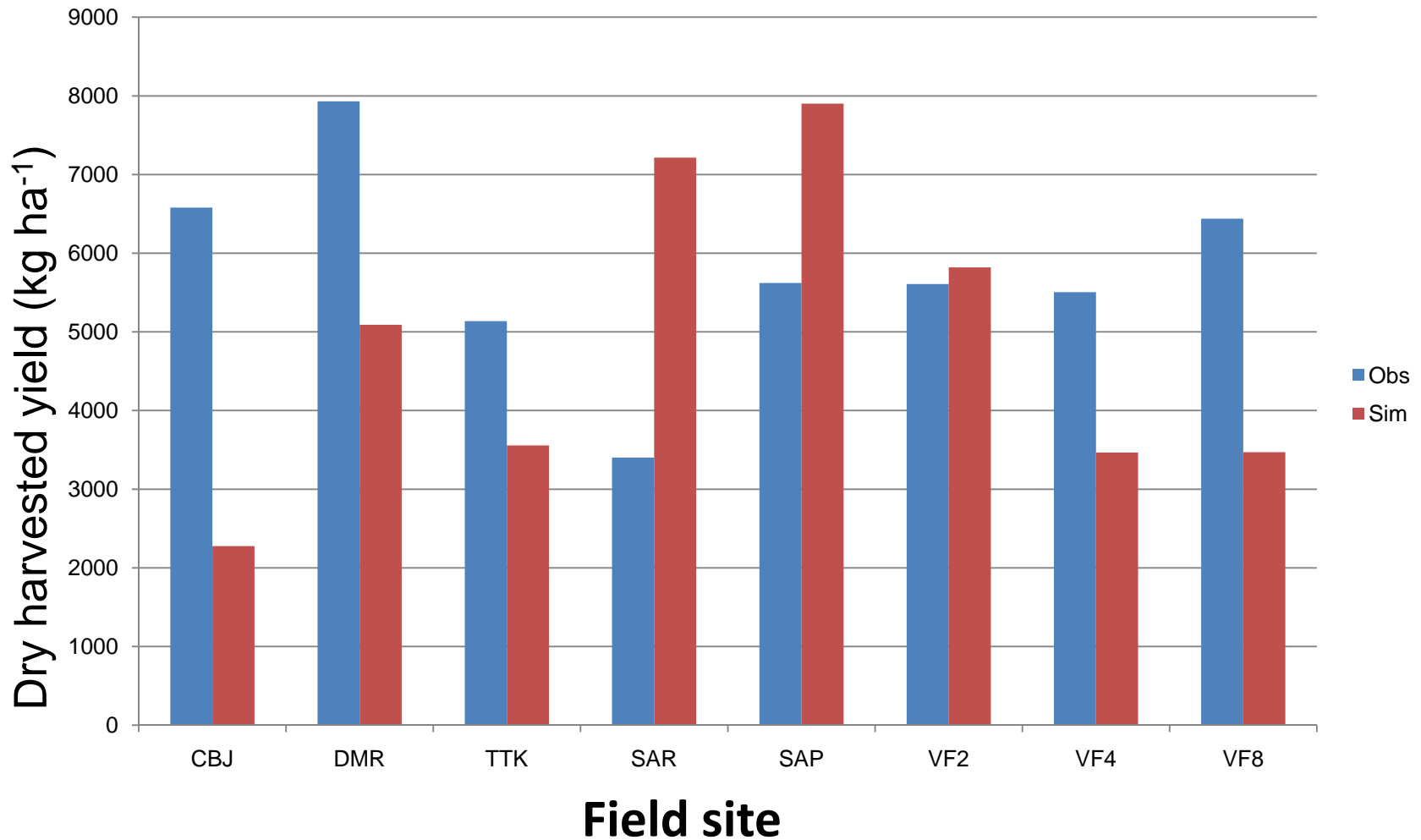
GLEAMS model default and data from Toralapa, Bolivia



Villa Flores (VF8) plot soil TKN at three dates and GLEAMS predictions by depth



Dry harvested potato yield from field plots in Jatun Mayu Watershed, 2008-09 season, and Predicted yields from GLEAMS simulations



GLEAMS model evaluation...

- Preliminary assessment...
 - Looks promising
 - Still questions about organic N mineralization dynamics and rates
- Next steps...
 - Look at additional field data
 - Check out other models



Modeling analysis – Jatun Mayu Watershed

- Application of field-scale model:
 - Evaluate nutrient and management alternatives to improve productivity and economics
 - Assumes the model is sensitive to water and nutrients
 - Evaluate climate scenarios
 - Changed weather patterns and trends
 - Input to watershed-scale evaluation using a different model

