Data needs of a Climate Change, Animal Disease and Environmental Modeler

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General areas of endeavor

I will speak on data needs involved with modeling policy issues of

Greenhouse Gas Mitigation
Climate Change
Animal biosecurity

Needs for modeling such involves a mixture of

Population,
Practice data domestically & internationally
Dynamic alterations in some of these items

A position of ignorance

Data sources and availability is advancing and contracting all the time.

It is difficult to know what is available for use and while I would like to be closer to ERS I am not terribly so and in cases work on the dark side (with EPA)

Also I am the concept guy and my staff often are the data guys

So if I have missed or misjudged something let me know. I hope to learn from you how to do a better job than I have with available data.

Sorry for any ignorance based toe stomping

Greenhouse Gas Mitigation

Issues – data needs

- Soil sequestration
  - Tillage practice and history
  - Rotation and history
  - Land use and history
  - Tillage costs, input use and returns
  - Yield consequences of shifts

Greenhouse Gas Mitigation
Crop Emissions

Irrigation use and system type
Grain drying and system type
Fertilizer use
Yield penalties of altering fertilizer use
Pesticide use
Lime use
Practice energy use
Typical crop movement patterns and fossil fuel duties
Typical input movement patterns and fossil fuel duties
Input manufacture GHG assumptions
Production possibilities not only observed
EPIC/Century setups

Greenhouse Gas Mitigation
Livestock Emissions

Population at county or crop reporting district
Budgets at county or crop reporting district
Waste handling systems
Waste alternatives
Improved pasture
Feeding patters
What could be not what is
Pasture status
Manure use
Animal movement and GHG duties
Animal inputs and GHG duties
Feed movement

Greenhouse Gas Mitigation
Biofuel offsets

Residue production rates
Prospective crop yields
Energy crop budgets
Feed use patterns and DDG substituion
Cellulosic production
Pyrolysis and fluidized bed information
EPIC/Century setups
Plant locations
Co firing possibilities
Planting, harvesting fuel use an GHGs
Movement GHGs
Processing assumptions and GHGs

Greenhouse Gas Mitigation
Leakage

Overseas land use
Overseas commodities
Overseas deforestation
Overseas spatial land use
Overseas energy and yeild and GHG budgets

Greenhouse Gas Mitigation
Forest items

- Carbon retention
  - Soils
  - Trees
  - Products
- Energy use in establishment, maintainence and harvest
- Movement GHGs
- Processing assumptions and GHGs
- Rotation ages over time
- Land ownership
- Deforestation
- Afforestation
- CRP use
- Leakage to overseas

Climate Sensitivity

Extreme event items
- Hurricane paths
- Drought incidence
- Storm patterns
- Rain intensity
- Soil moisture
- El Nino /ENSO effects
- Yields

Sea level sensitivity
- Trade disruption
- Inland water ways
- Vulnerable infrastructure

Climate sensitivity

Effects of past and future changed climate

Time pattern of budgets on spatial basis
Irrigation use
Aquifer levels
Ground/surface water split
Pesticides
Pest incidence
Yields
Varieties
Livestock breeds and herds
Crop acreage shifts
Forest shifts
    land use
    species

Climate adaptation

Research investment related to climate
Extension efforts related to climate
Infrastructure investment – irrigation
Land use change
Patterns of crop adjustments
Patterns of herd adjustments
Stocking rate adjustments

Livestock biosecurity

Herd locations by herd type
Movement patterns
Feed and input movement
Biosecurity practices
Carcass disposal rules and sites
Carcass disposal costs
Livestock budgets
Compensation practices
Epidemic simulator setups
Water course risks
Wildlife populations