Landuse 4.0

Goal: support of approach from Ag Modeling Subcommittee

Approach

On a calendar year (annual) basis Ag Census crops (1985-2002) were grouped based on

Primarily

- Relative **nutrient input** pre-BMP
  - High
  - Med
  - Low
- Relative **soil cover** or bare soil time pre-BMP
  - High
  - Low

Secondarily

- Acreage/Tracking concerns
- Geography, NY-VA problem

2007 Only crops were excluded

Context

- All Ag Census crops are simulated in Scenario Builder
  - Crop-specific information includes:
    - Yields
    - Application Rates (manure and fertilizer)
    - Soil Cover
  - This information is currently lumped and averaged for Watershed Model.
  - Watershed Model then calculates a typical nutrient loading rate for a group of crops lumped into one land use.
    - Example: Corn, soybeans, wheat are lumped into "High-Till with Manure" or "Low-Till with Manure."
    - Should this be the case?
      - AMS would prefer to limit the "lumping."

- BMP Type and location (NEIEN/State supplied)
- Land acres
- Remote Sensing, NASS Crop land Data layer
- Crop acres
- Yield
- Animal Numbers (Ag Census or state supplied)
- Land applied biolsolids
- Septic system (#s)

Inputs

Parameters

(Changeable by user)

- BMP types and efficiencies
- Land use change (BMPs, others)
- RUSLE2 Data: % Leaf area and residue cover
- Plant and Harvest dates
- Best potential yield
- Animal factors (weight, phytase feed, manure amount and composition)
- Crop application rates and timing
- Plant nutrient uptake
- Time in pasture
- Storage loss
- Volatilization
- Animal manure to crops
- N fixation
- Septic delivery factors

- BMPs, # and location
- Land use
- % Bare soil, available to erode
- Nutrient uptake
- Manure and chemical fertilizer (lb/segment)
- N fixation (lb/segment)
- Septic loads

Outputs

Commodity

Proposed Crop Land Use Group	Acres
Corn, grain - fall fallow	1,314,145
Corn, silage - fall fallow	240,932
Corn, grain - fall small grain	647,266
Corn, silage - fall small grain	489,165
Soybean (full season) - fall fallow	659,337
Soybean (full season) - fall small grain	324,748
Small Grain (Wht, Bar, Canola, Rye, Triticale, Oats, Spelt, Emmer)- Sb dbl crop - fall fallow	680,034
Small Grain (Wht, Bar, Canola, Rye, Triticale, Oats, Spelt, Emmer)- forage established	113,339

Forage and Hay

Proposed Crop Land Use Group	Acres
Forages Legume (Alfalfa and other legumes) for hay and greenchop	1,129,372
Forage, non-legumes (Orchardgrass, Ryegrass, Triticale, Small Grains, Sorghum, Wild Hay)	2,370,152
Pastured cropland and Pastureland	3,333,819

Specialty & Other

Proposed Crop Land Use Group	Acres
Specialty High Input, Low Cover (peppers, flowers, potted plants, etc.)	6,700
Specialty Medium Input, Low Cover (onions and garlic)	984
Specialty Low Input, Low cover (peas, beans, sunflowers, etc.)	92,474
Specialty High Input, High Cover (tomatoes, brassicas, celery, etc.)	113,199
Specialty Medium Input, High Cover (beets, carrots, okra, herbs)	1,096
Specialty Low Input, High Cover (spec. legumes, asparagus, aquatics, etc.)	95,634
Specialty Vines, High Input (melons, potatoes)	43,421
Specialty Vine, Medium Input (cucumbers)	9,450
Specialty Vine, Low Input (snap beans)	29,608
Pervious Farmstead	609,289
Impervious Farmstead	4,336

Pros and Cons (you decide)

- 23 landuses – can be grouped for reporting; should be in near term
- Explicitly models heavy feeding crops for better target loads
  - Same concept for cover fractions
- Many dedicated specialty landuses:
  - Protects low impact specialty farmers
  - Rewards high impact farmers for practices
- Improves landuse names for communication, but still contains model-ese for specialty crops
- Does not address manure and fertilizer "only" acres
- Does not include any BMP landuses (NM or CT)
- No degraded stream corridor

Future

- Small grain splits, using specific data or BPJ will be used to parse out acres of small grain double crops between corn, soy and fallow
- Recommendations on degraded areas and manure impacted acres
- Tetra Tech specs out loading targets (and gaps in loading targets)