Federal Agriculture in the Phase 6 Model

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Federal Facilities Workgroup Meeting
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Federal Agriculture in the Phase 6 Model

- Agencies that entered ag landuses as of 12/9/16 (23 total records)
  1) DOD
  2) NPS
     - Example = Gettysburg NMP w/ herbaceous area specified as 30% pasture, 40% crop, 30% is mixed open
  3) USDA
  4) USFS
  5) USFW

Federal Agriculture

What We Need for Data for Federal Agriculture

- We will have the acres of federal ag from Editor Tool or default
- We don’t have anything on the sources of the problem, how the sources have changed over time – in order to credit BMPs against those sources

Federal Agriculture

What We Need for Data for Federal Agriculture

- Specifically, for each federal facility w/ crop and/or pasture percentages in each of 200+ counties, we need for each year (1985-2016):
  - Crops and land uses
    - Types (up to 100 types in a county)
    - Acres for each type
  - Nutrient applications to crops for N and P
    - Chemical fertilizer
    - Manure = animal populations
    - Bio-solids
  - Nutrient excretions to pasture
    - Manure = animal populations
  - BMP implementation record
    - 50 agriculture BMP categories = hundreds of reported BMP names

Example 1
County Assumptions

Forest Service

Rockingham County, VA

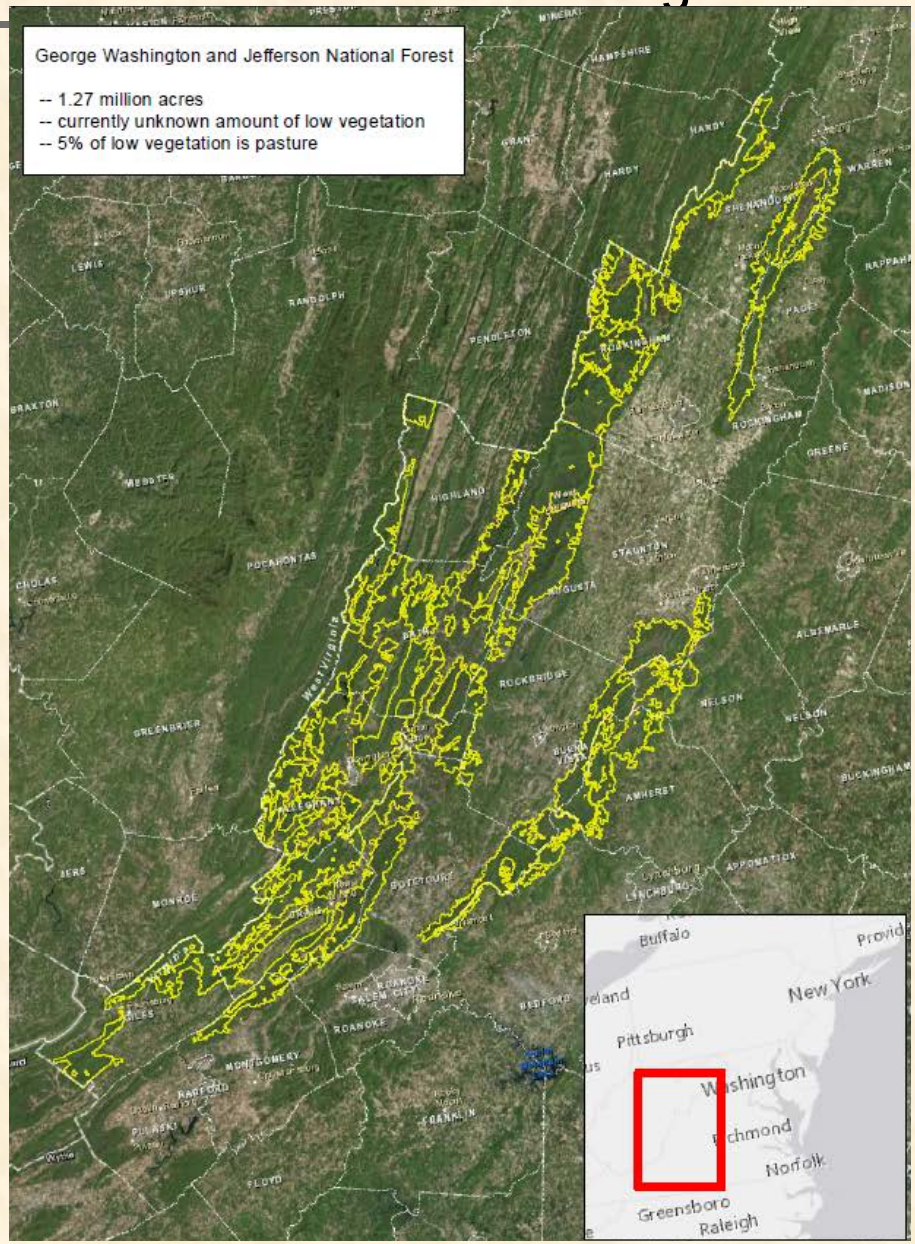
Federal Agriculture

Example = Forest Service Rockingham County, VA

- George Washington and Jefferson National Forests
  - USDA Forest Service
  - 1.8 million acres; one of the largest blocks of public land in the eastern United States
  - The forests include 1,664,110 acres in VA, 123,629 acres in West VA, and 961 acres in KY = spans many counties

Federal Agriculture

Example = Forest Service Rockingham County, VA



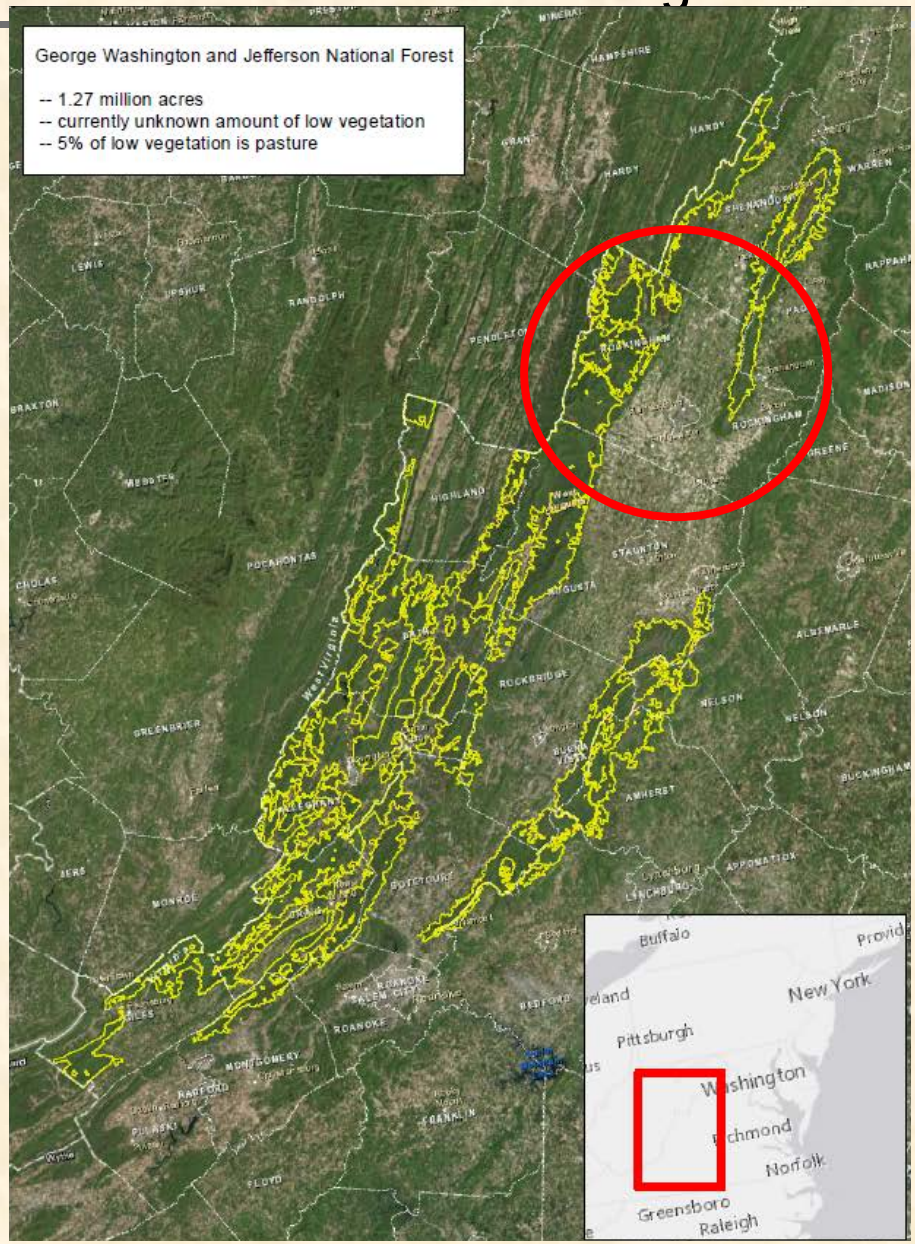
Federal Agriculture

Example = Forest Service Rockingham County, VA

- 5% of herbaceous cover specified as pasture via the Editor Tool
  - Don’t yet have herbaceous acreage numbers for each facility so don’t yet have acreage of pasture or crop for any individual facility
  - There would be crops as well but not identified by USDA NFS
- Default Fractions of Turf/Mixed Open on Federal Facilities for >1,000 acres
  - Turf = 30%
  - Mixed Open = 60%
  - Pasture = 5%
  - Crop = 5%

Federal Agriculture

Example = Forest Service Rockingham County, VA



Federal Agriculture

Example = Forest Service Rockingham County, VA

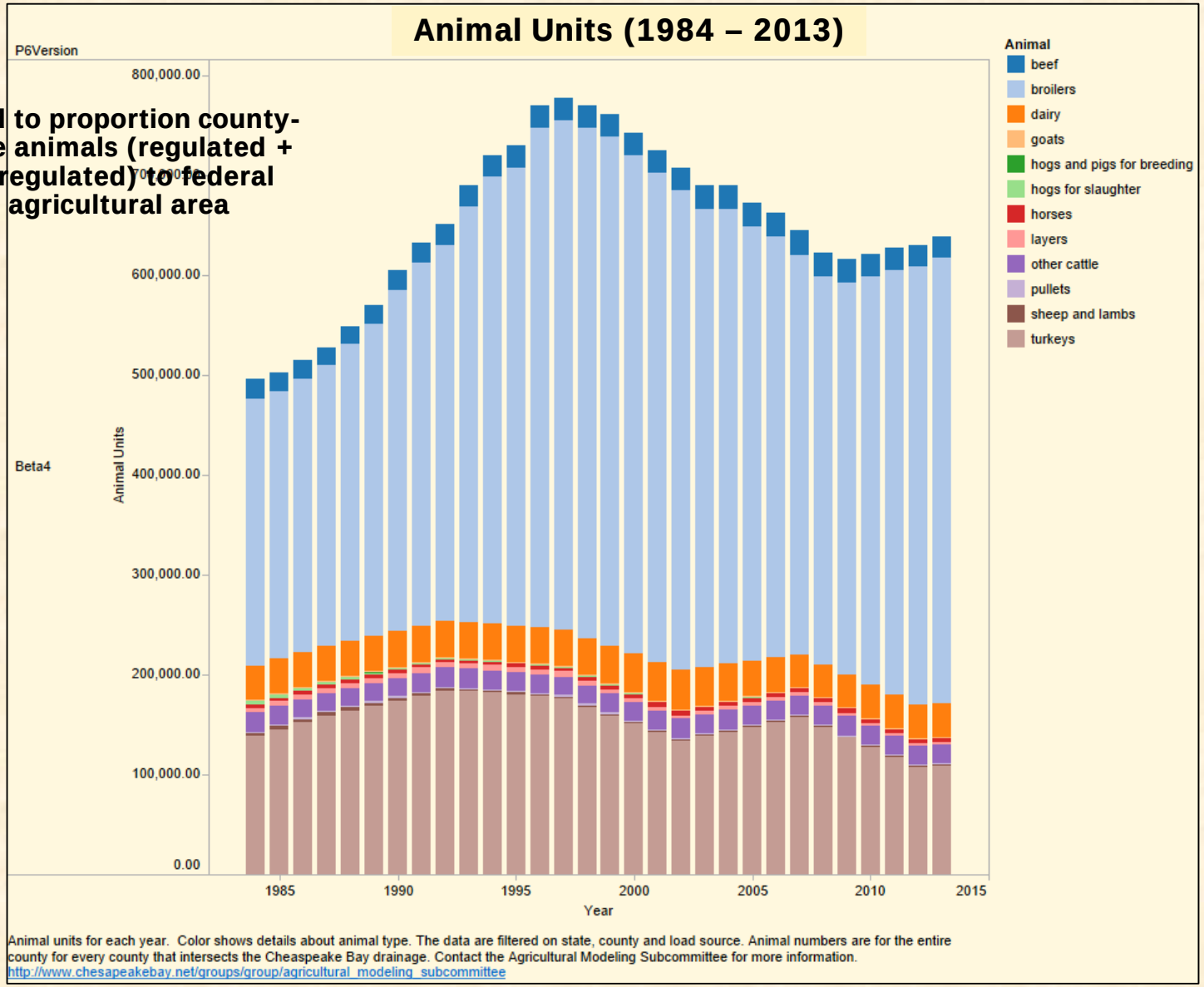
- For manure nutrients, each federal ag area would be assigned the following animal types where these appear in the associated county – in the relevant county's proportion
  - There are 12 animal types across 9 million^{+} acres of agricultural land for each of the 200^{+} counties with some portion in the CB for each of 31 years
- There would be divisions between regulated CAFO and unregulated AFO animals according to proportions in the relevant county

beef
dairy
other cattle
hogs for slaughter
hogs and pigs for breeding
horses
sheep and lambs
goats
layers
pullets
broilers
turkeys

Federal Agriculture

Example = Forest Service Rockingham County, VA

Need to proportion county-wide animals (regulated + unregulated) to federal agricultural area



Federal Agriculture

Example = Forest Service Rockingham County, VA

- Each federal ag area would be proportionally assigned crop and pasture types and acres for each of the 31-year record
- There are 100+ crop types across 9 million+ acres of agricultural land for each of the 200+ counties with some portion in the CB for each of 31 years

Alfalfa Hay Harvested Area	Cropland on which all crops failed or were abandoned Area	Nursery stock Area
Alfalfa seed Harvested Area	Cropland used only for pasture or grazing Area	Oats for grain Harvested Area
Aquatic plants Area	Cucumbers and Pickles Harvested Area	Okra Area
Asparagus Harvested Area	Cut Christmas Trees Production Area	Orchardgrass seed Harvested Area
Barley for grain Harvested Area	Cut flowers and cut florist greens Area	Other field and grass seed crops Harvested Area
Bedding/garden plants Area	Dry edible beans, excluding limas Harvested Area	Other haylage, grass silage, and greenchop Harvested Area
Beets Harvested Area	Dry Onions Harvested Area	Other managed hay Harvested Area
Berries- all Harvested Area	Eggplant Harvested Area	Other nursery and greenhouse crops Area
Birdsfoot trefoil seed Harvested Area	Emmer and spelt Harvested Area	Parsley Harvested Area
Broccoli Harvested Area	Escarole and Endive Harvested Area	Pastureland and rangeland other than cropland and woodland pastured Area
Bromegrass seed Harvested Area	Fescue Seed Harvested Area	Peanuts for nuts Harvested Area
Brussels Sprouts Harvested Area	Foliage plants Area	Peas, Chinese (sugar and Snow) Harvested Area
Buckwheat Harvested Area	Garlic Harvested Area	Peas, Green (excluding southern) Harvested Area
Bulbs, corms, rhizomes, and tubers – dry Harvested Area	Green Lima Beans Harvested Area	Peas, Green Southern (cowpeas) – Black-eyed, Crowder, etc. Harvested Area
Canola Harvested Area	Green Onions Harvested Area	Peppers, Bell Harvested Area
Cantaloupe Harvested Area	Greenhouse vegetables Area	Peppers, Chile (all peppers – excluding bell) Harvested Area
Carrots Harvested Area	Haylage or greenchop from alfalfa or alfalfa mixtures Harvested Area	Popcorn Harvested Area
Cauliflower Harvested Area	Head Cabbage Harvested Area	Potatoes Harvested Area
Celery Harvested Area	Herbs, Fresh Cut Harvested Area	Potted flowering plants Area
Chinese Cabbage Harvested Area	Honeydew Melons Harvested Area	Pumpkins Harvested Area
Collards Harvested Area	Kale Harvested Area	Radishes Harvested Area
Corn for Grain Harvested Area	Land in Orchards Area	Red clover seed Harvested Area
Corn for silage or greenchop Harvested Area	Lettuce, All Harvested Area	Rhubarb Harvested Area
Cotton Harvested Area	Mushrooms Area	Rye for grain Harvested Area
Cropland idle or used for cover crops or soil improvement but not harvested and not pastured or grazed Area	Mustard Greens Harvested Area	Ryegrass seed Harvested Area

Federal Agriculture

Example = Forest Service Rockingham County, VA

- Need to determine application rates for manure, chemical fertilizer and bio-solid nutrients to the following composite agricultural crop sources for each federal ag area
- Need to determine excretion rates for manure nutrients to pasture

alfalfa
animal feeding operations
concentrated animal feeding operations
degraded riparian pasture
hay with nutrients
hay without nutrients
hightill with manure
hightill without manure
lowtill with manure
nursery
nutrient management alfalfa
nutrient management hay
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nutrient management hightill without manure
nutrient management lowtill
nutrient management pasture

Federal Agriculture

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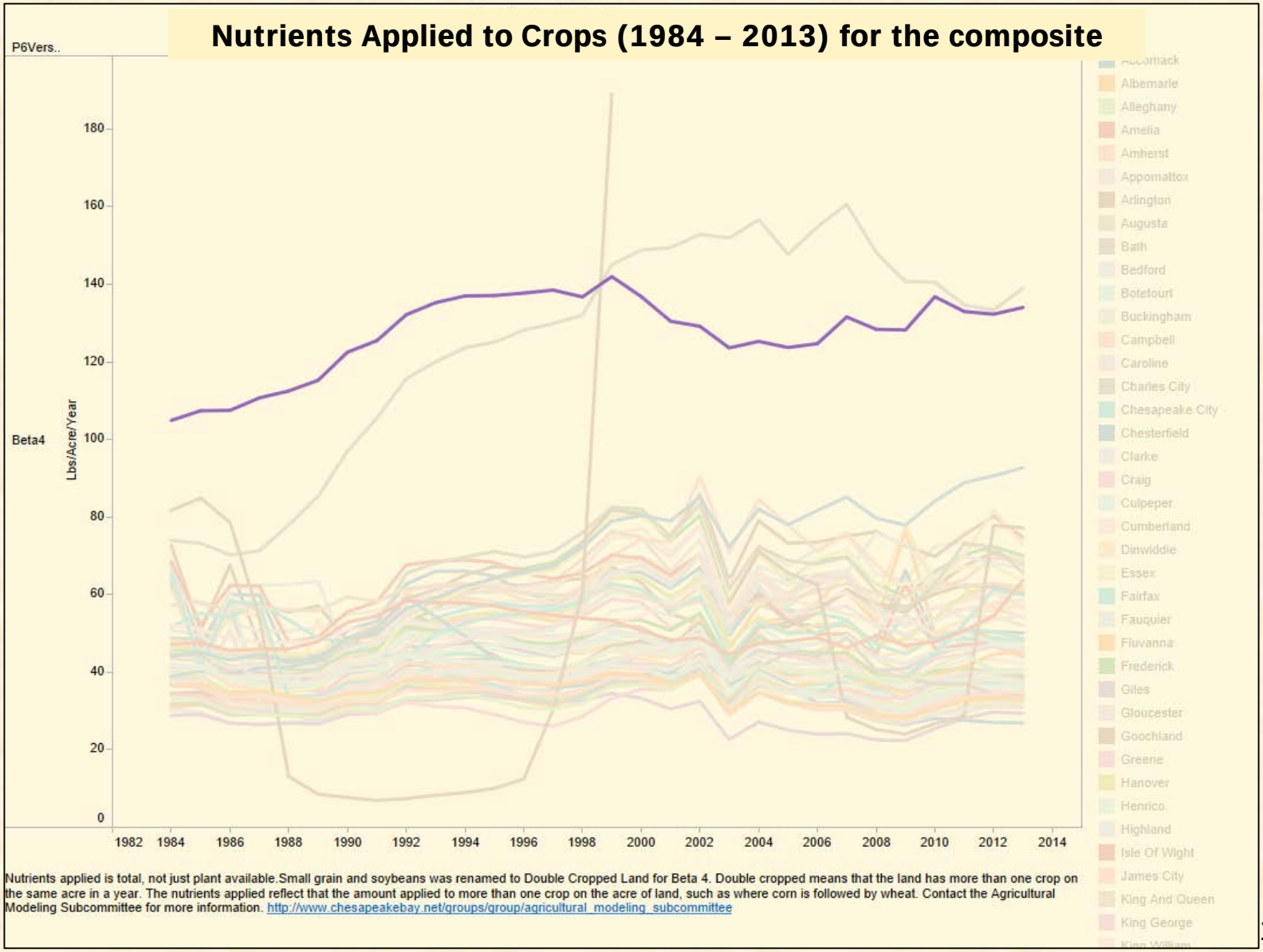

Nutrients applied is total, not just plant available.Small grain and soybeans was renamed to Double Cropped Land for Beta 4. Double cropped means that the land has more than one crop on the same acre in a year. The nutrients applied reflect that the amount applied to more than one crop on the acre of land, such as where corn is followed by wheat. Contact the Agricultural Modeling Subcommittee for more information. http://www.chesapeakebay.net/groups/group/agricultural_modeling_subcommittee

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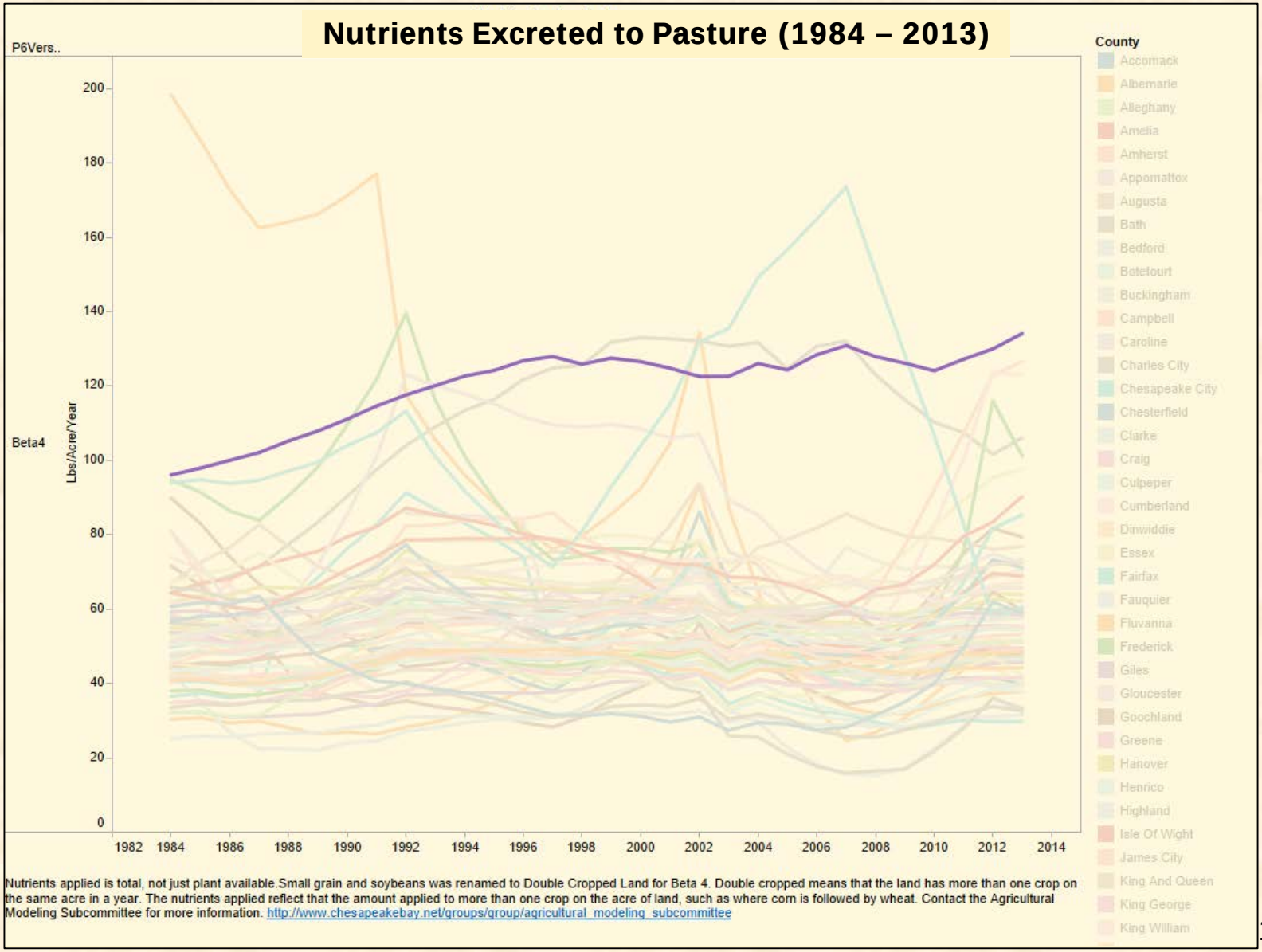

Example 2
County Assumptions
Naval Air Station Patuxent River

Federal Agriculture

Example II = Naval Air Station Patuxent River

- 14,500-acre complex includes:
  - St. Mary's County, MD = main station and Webster Outlying Field
  - Calvert County, MD = Navy Recreation Center Solomons
  - Bloodsworth Island Range in the Chesapeake Bay
- Submitted to CBPO
  - 463.76 acres of cropland
  - Crops around air fields use bird-resistant crops such as sorghum to discourage avian populations; no-till or minimum tillage practices are implemented where possible

Federal Agriculture

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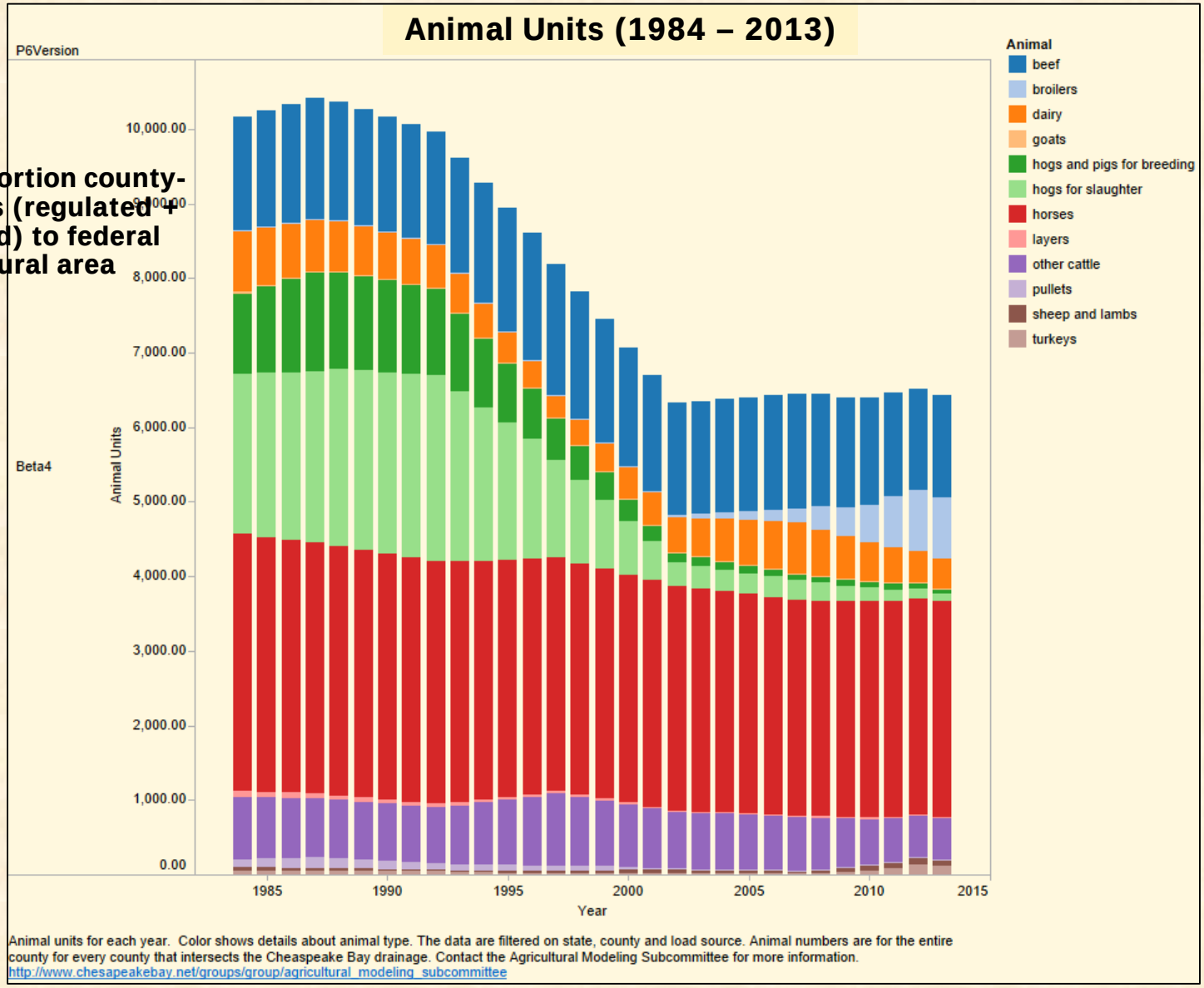
Need to proportion county-wide animals (regulated + unregulated) to federal agricultural area



Federal Agriculture

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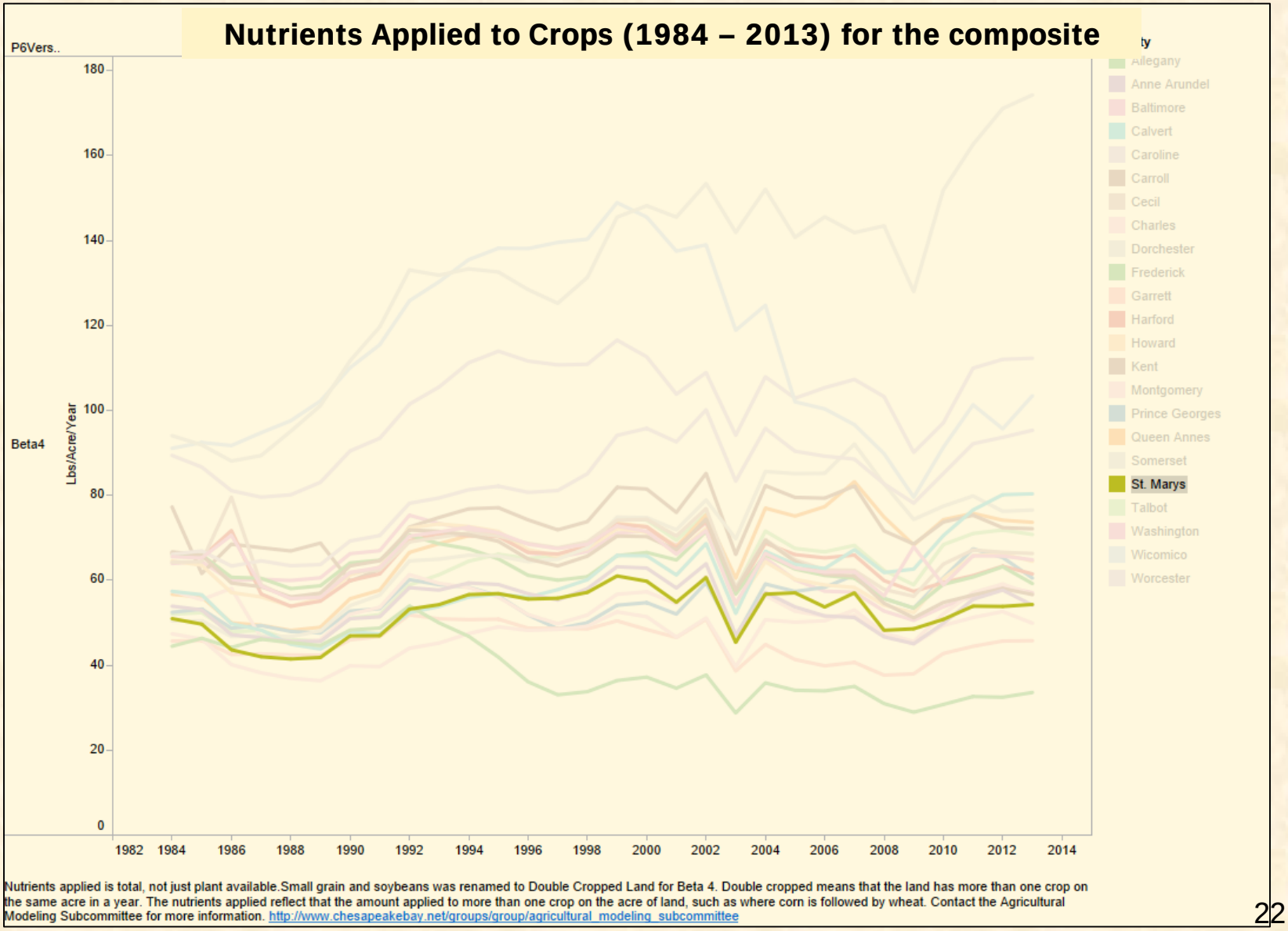

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  - BMP implementation record
    - 50 agriculture BMP categories = 100s of reported unique BMP names
    - Or assume nothing?
    - Cost-shared BMPs would likely have been tracked so they would need to be pulled from the state's non-fed records

Federal Agriculture

What We Need for Data for Federal Agriculture

- Cons
  - What we end up with would not represent what's on the ground on the farms – and how that has changed through time.
    - Feds are responsible for the assigned loads, plans for load reductions, AND the reductions.
  - Processing time for optimizing BMPs for Milestones and WIPs increases from a shift to days
- Pros
  - There's something in the tools that assigns loads to agriculture on federal facilities that could be numerically reduced through BMP reporting

Federal Agriculture
Options

1. Simulate as federal ag (with or without adjustments to the assumptions)
2. Simulate as county ag
3. Simulate as federal turf