Urban Fertilizer Application Rates

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Turf Grass Application Rates

Phase 5.3.2 Watershed Model

Turf application rates and timing highly variable:

- Landowner behavior
  - Residential, Business (i.e., golf courses), Institutional
  - Do-it-yourself, Lawn care service, Do nothing
  - Socio-economic status, home age, home market value
  - Fertilizer cost
- Product recommendations
  - Grass Species
    - Warm-season, Cool-season
  - Soil characteristics – type and quality, tested?
  - Time of application – frost date, month
  - Condition of established grass
  - Slow-release fertilizer?
  - Clippings returned?
  - Irrigated?

Turf Grass Application Rates

Phase 5.3.2 Watershed Model

Model Pervious Urban Application Rate =

43 lbs. TN/acre/year, 1.3 lbs. TP/acre/year:

- Fertilizer sales data
  - Association of American Plant Food Control Officials (AAPFCO)
    - Fertilizer consumption information submitted by state fertilizer control offices – by county.
    - Total fertilizer sales or shipments for farm and non-farm use.
- Pervious urban area data
  - Determined from land cover databases and analyses.
- For Chesapeake Bay watershed counties as a whole:

$$\frac{\text{Non-farm fertilizer N}}{\text{Pervious urban (grass) acres}}$$

= ~43 lbs. TN/acre

(with NO_3, NH_3 speciation and timing)

Turf Grass Application Rates

Phase 5.3.2 Watershed Model

Model Turf Application Rate = 43 lbs. TN/acre/year:

- Validation of fertilizer total nutrient mass
  - Scotts
    - Fertilizer sales in the Chesapeake Bay watershed
    - Fraction of the do-it-yourself market
    - Number of home lawns with 0-4 applications/year + lawn service
- Validation of fertilizer application rate and timing
  - Scotts, TruGreen, etc.
  - Lbs. nutrient/visit * visits/year
    - Do-it-yourself
    - Lawn care service
  - Weighted average with do-nothing
- Since the model is calibrated to nutrient targets, the pervious urban application rate is not as important as the change in application rate through scenarios.

Turf Grass Application Rates

Current Fertilizer Data Use

- Phosphorus applications are now 70% lower in states with legislation and 60% lower in states without legislation.
- By 2016, states must show fertilizer sales/use statistics that substantiate these reductions in phosphorus applications.

Turf Grass Application Rates

Fertilizer Data

- Data are provided to AAPFCO each year by state chemists in the state tonnage sales reports.
- Data include location of sale, type of fertilizer sold and pounds of nutrients associated with each type.
- Data are split between farm and non-farm sales.

- Data do not represent fertilizer use – which must be estimated in the absence of direct use information.

Turf Grass Application Rates

Fertilizer Data

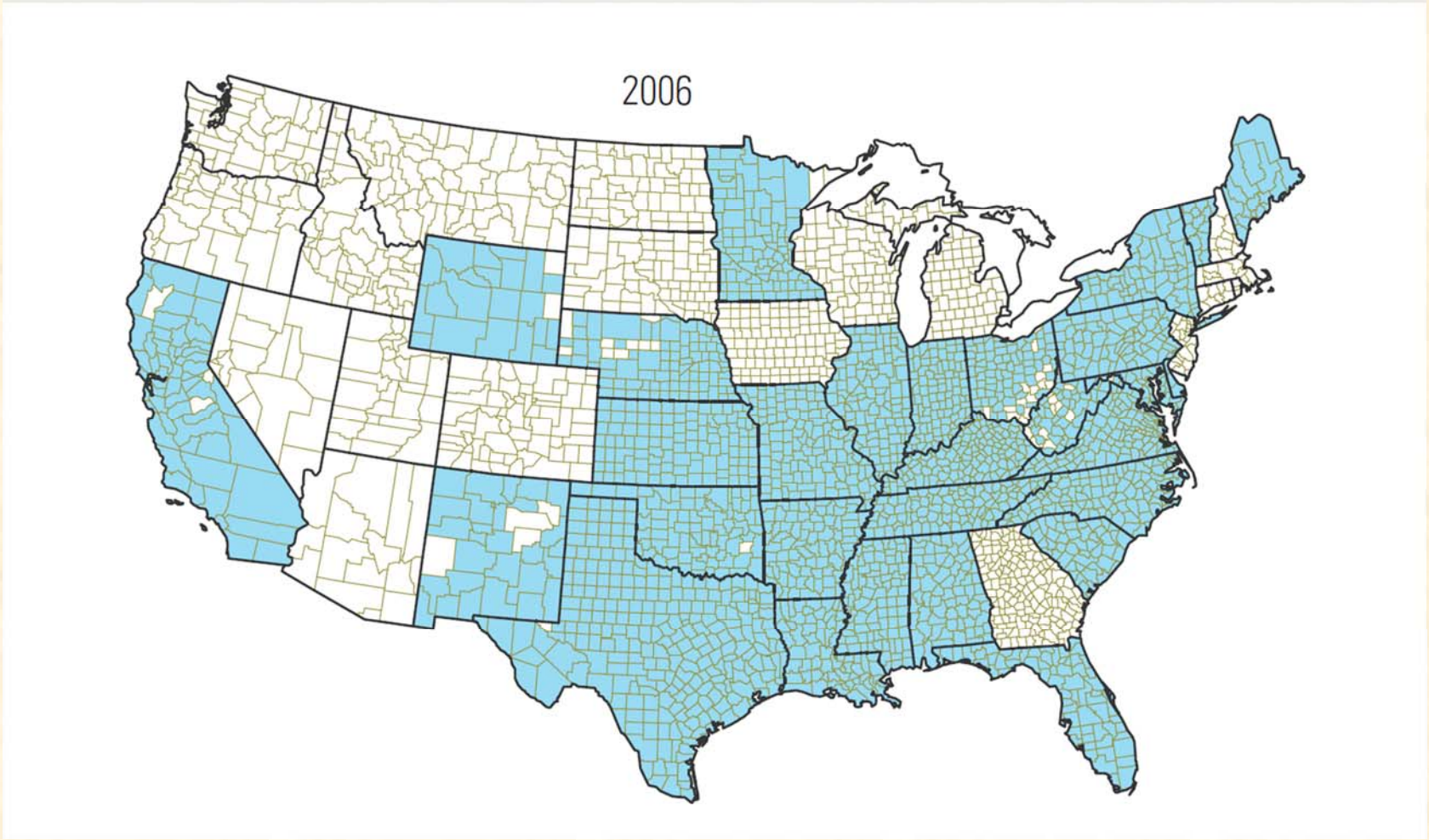
- The U.S. Geological Survey's National Water-Quality Assessment program requires nutrient input for analysis of the national and regional assessment of water quality.
- The USGS report updates estimated county-level farm and nonfarm N and P input from commercial fertilizer sales for the U.S. for 1987 – 2006.
- Estimates were calculated from the AAPFCO fertilizer sales data, Census of Agriculture fertilizer expenditures, and U.S. Census Bureau county population.
- A national approach was used to estimate farm and nonfarm fertilizer inputs because not all states distinguish between farm and nonfarm use, and the quality of fertilizer reporting varies from year to year.
- With a few exceptions, nonfarm nitrogen estimates were found to be reasonable when compared to the amounts that would result if the lawn application rates recommended by state and university agricultural agencies were used.
- Peer-reviewed methodology at http://pubs.usgs.gov/sir/2012/5207/

- Distributes raw AAPFCO data down to the county level based upon each county's population and a relationship between population density and sales found across the entire nation.

Turf Grass Application Rates

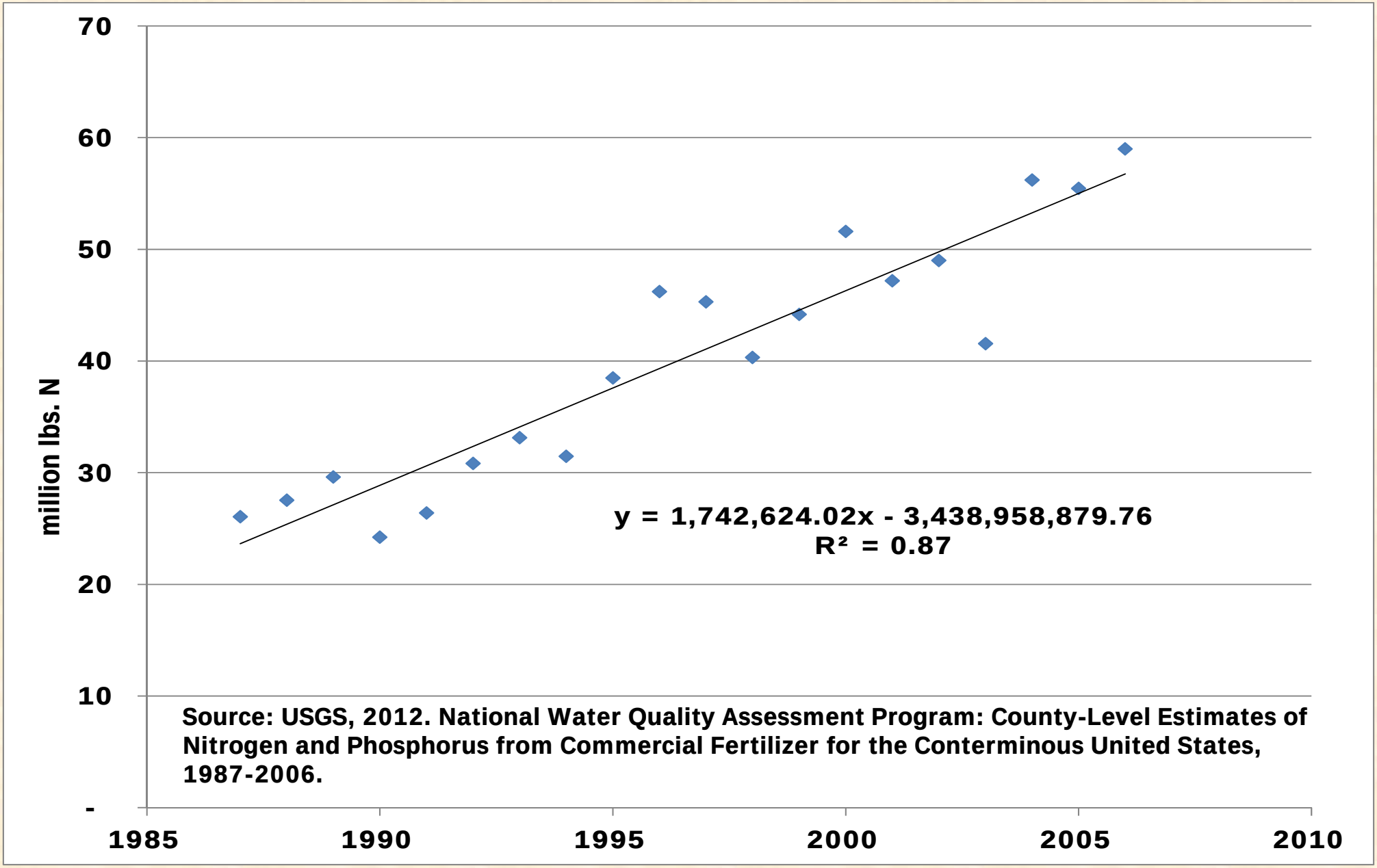
Fertilizer Data

- Location of counties with AAPFCO fertilizer product tonnage data reported at the county level, 1987–2006



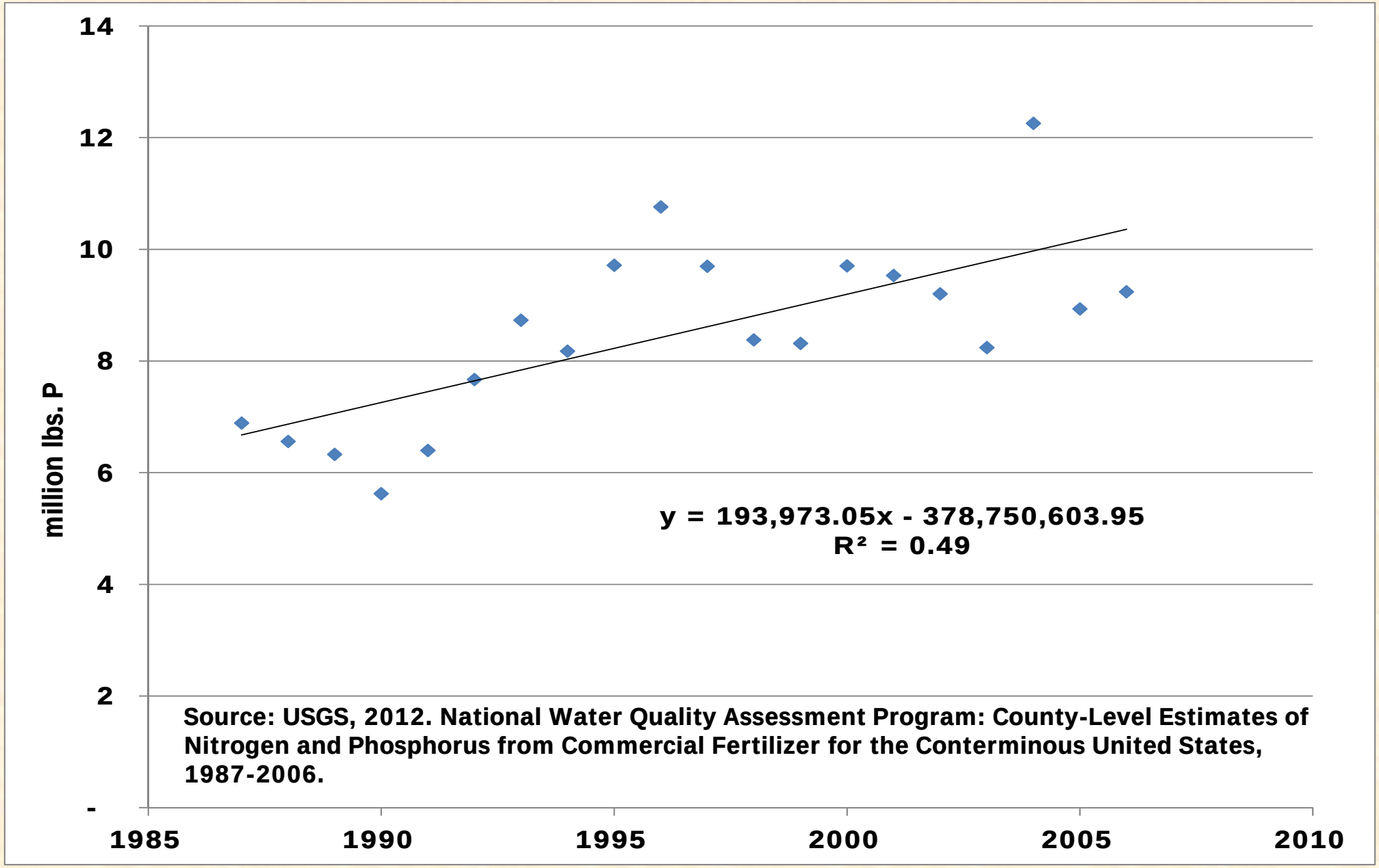
Nitrogen Fertilizer Use

Million Pounds Annually for CB Watershed

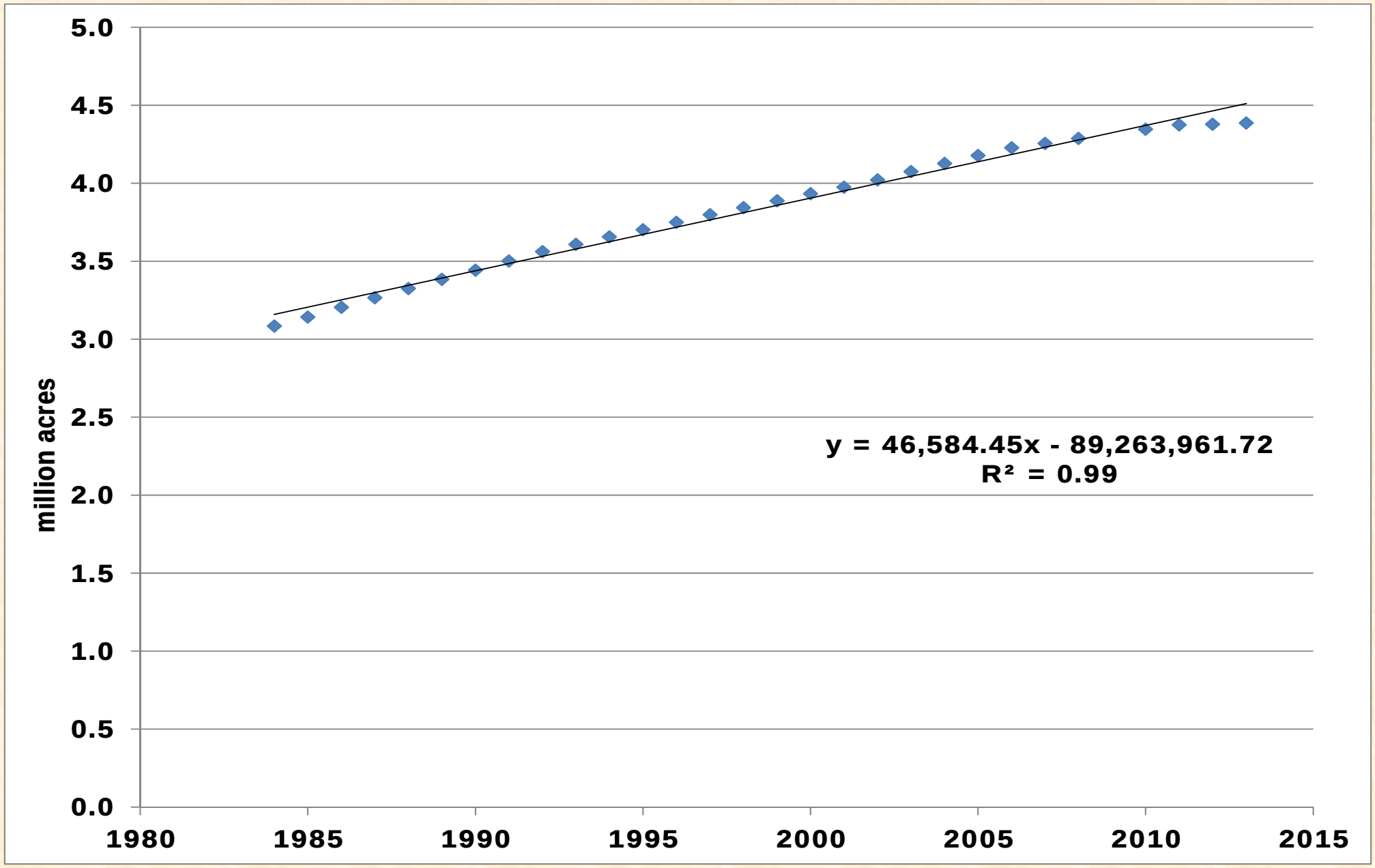


Phosphorus Fertilizer Use

Million Pounds Annually for CB Watershed

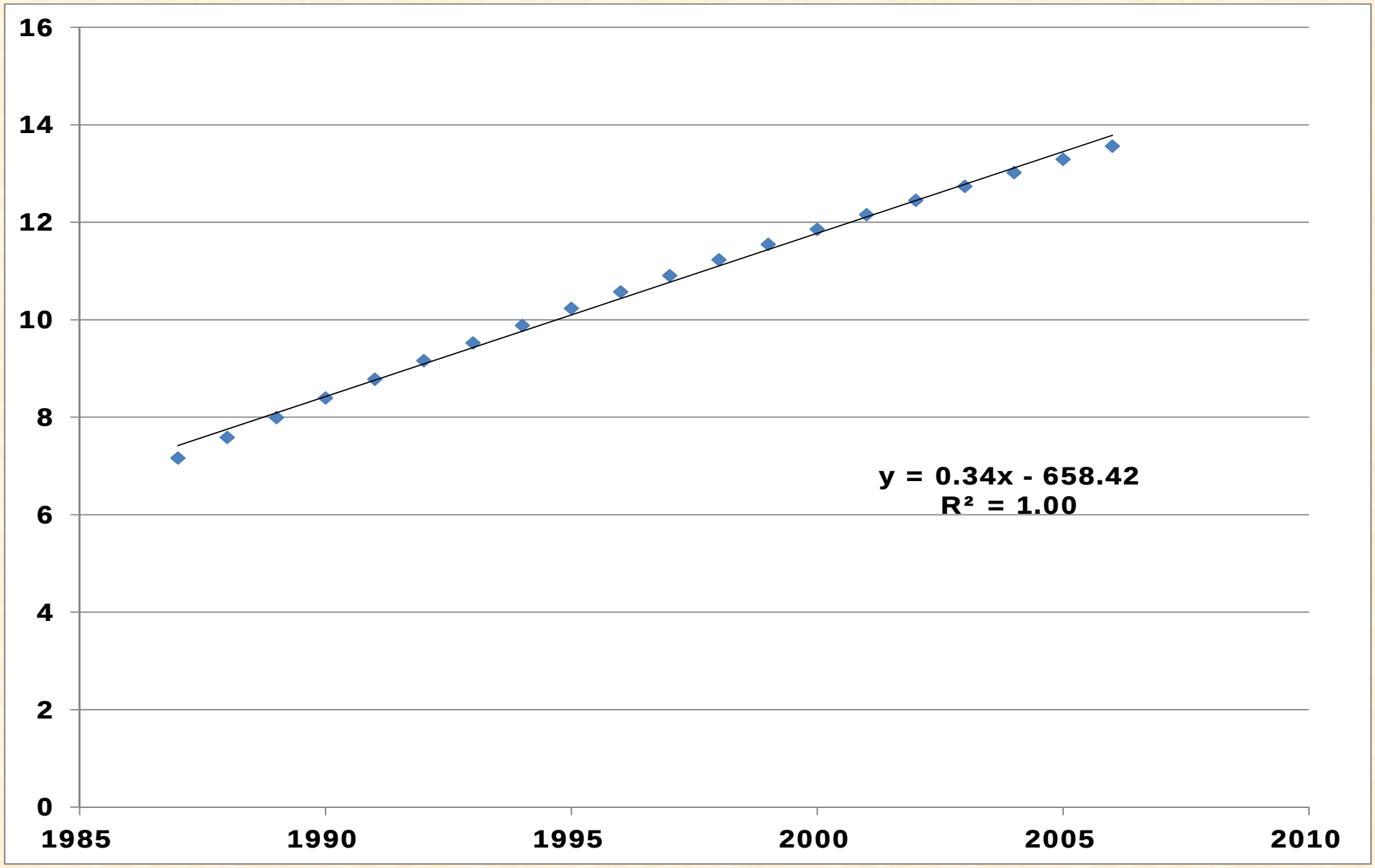


Turfgrass Acres
Chesapeake Bay Watershed



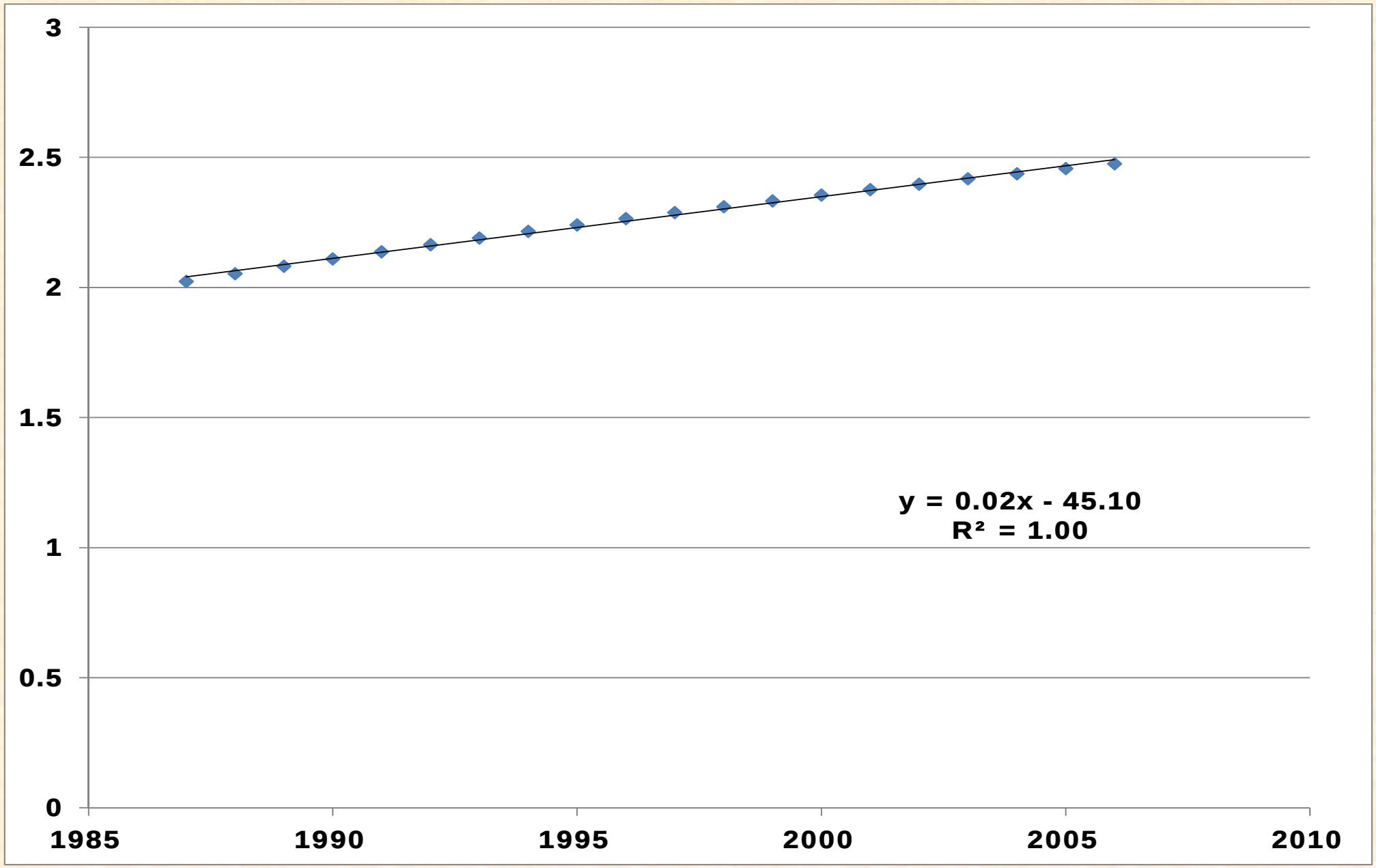
Nitrogen Fertilizer Application Rate

Pounds/Acre from Linear Trends



Phosphorus Fertilizer Application Rate

Pounds/Acre from Linear Trends



Turf Grass Application Rates

Current Fertilizer Data Use

- By 2016, states must show fertilizer sales/use statistics that substantiate these reductions in phosphorus applications.
- May want to consider this source of fertilizer use information by state.
  - Results may not align with what's expected or hope for.
  - Should you be considering Nitrogen changes through time as well?
- Questions and Comments?