



# Chesapeake Bay Restoration

## CAST-21 Urban Fertilizer Application Rates

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Urban Stormwater Workgroup Meeting

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# Turfgrass Nutrient Application Rates

## Phase 6 Model

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- Several jurisdictions commented about the change in turf grass fertilizer application rates between CAST19 and CAST21, especially those with large increases.
- This presentation describes the issue and proposes two changes to the current USWG-approved methods to consider.



# Turfgrass Nutrient Application Rates

## Phase 6 Model

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- AAPFCO non-farm fertilizer sales data by county
- Urban method uses mass of fertilizer nutrients for each state distributed to one “crop” type = turfgrass
- Additional credit for practices that make up nutrient management – depending on high-risk, low-risk, blended



# Turfgrass Nutrient Application Rates

## Phase 6 Model

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- Two components to turfgrass application rates:
  - Fertilizer mass data
  - Turfgrass acres – High-resolution land cover w/ approved change-product 2013-2017
- Non-farm fertilizer mass  $\div$  turfgrass acres = turfgrass application rate



# Turfgrass Nutrient Application Rates

## Three Methods

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### 1) Current Method

- Approved by USWG on 6/21/16, including varying applications by jurisdiction and through time

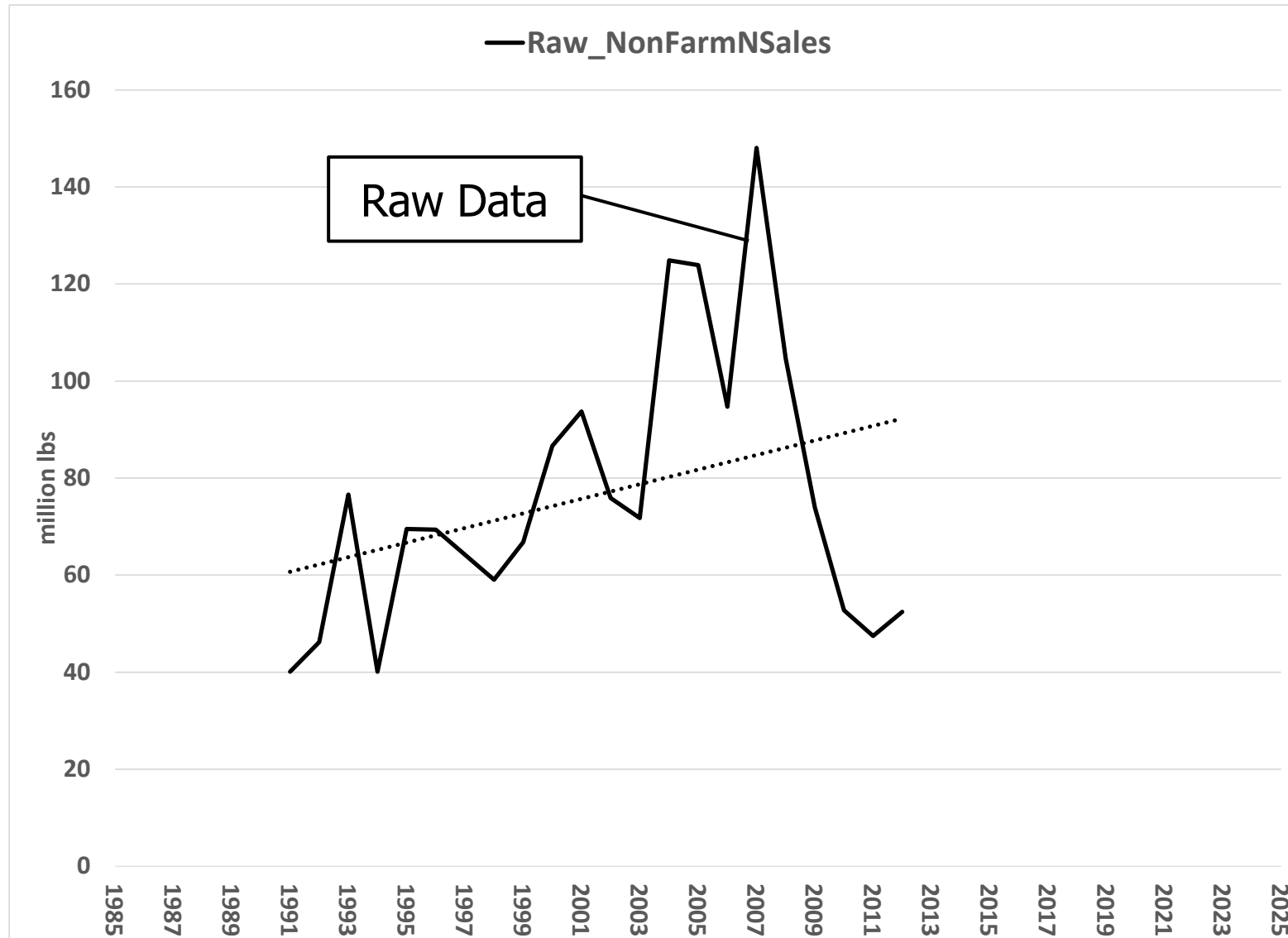
### 2) Proposed Method 1

- Linear regression through 2012-2016 smoothed data;  
Use slope to vary per-acre rates from 2012 to 2016

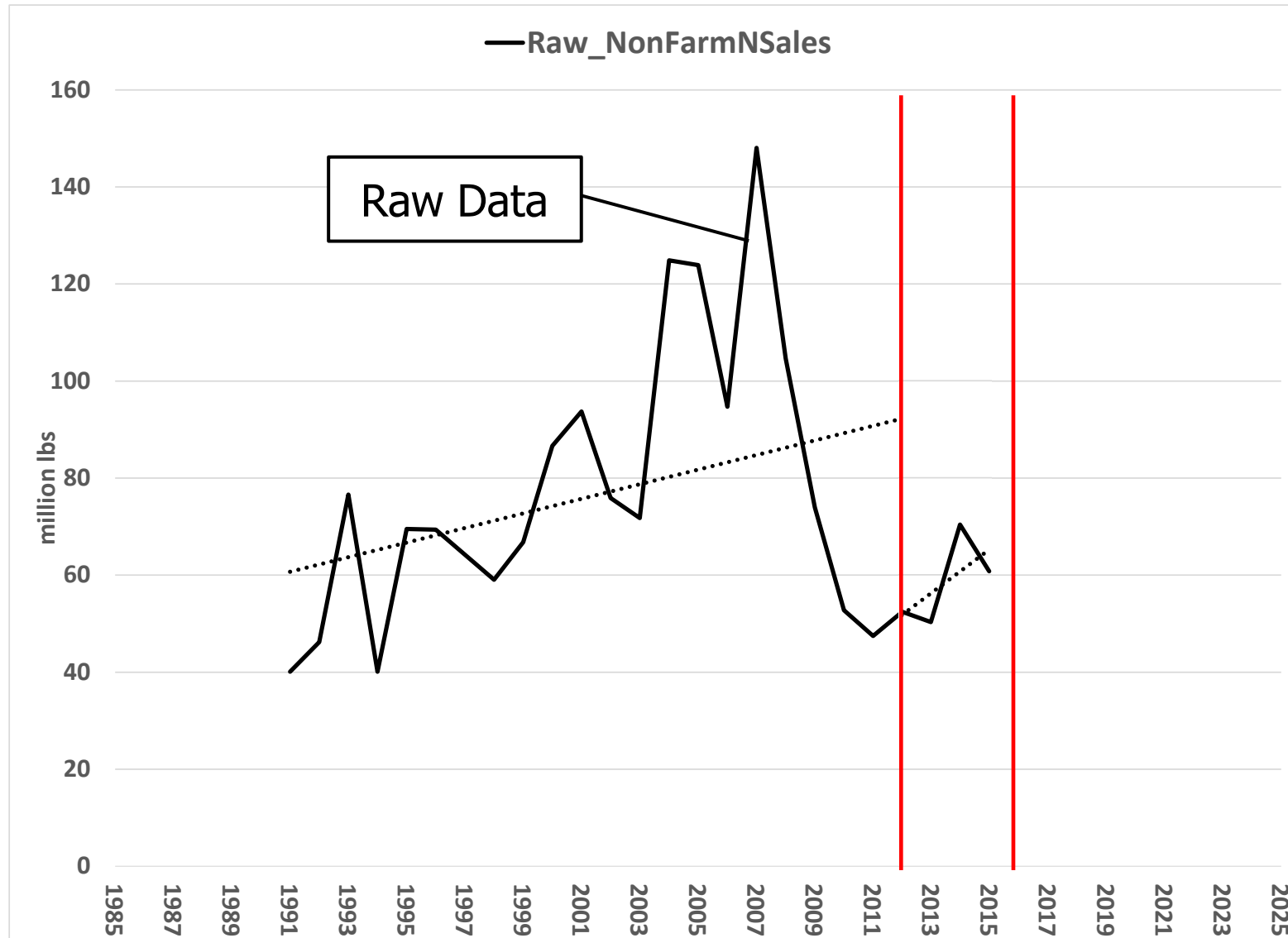
### 3) Proposed Method 2

- Linear regression through 2012-2016 smoothed data;  
Use annual percent change in per-acre rates from 2012 to 2016

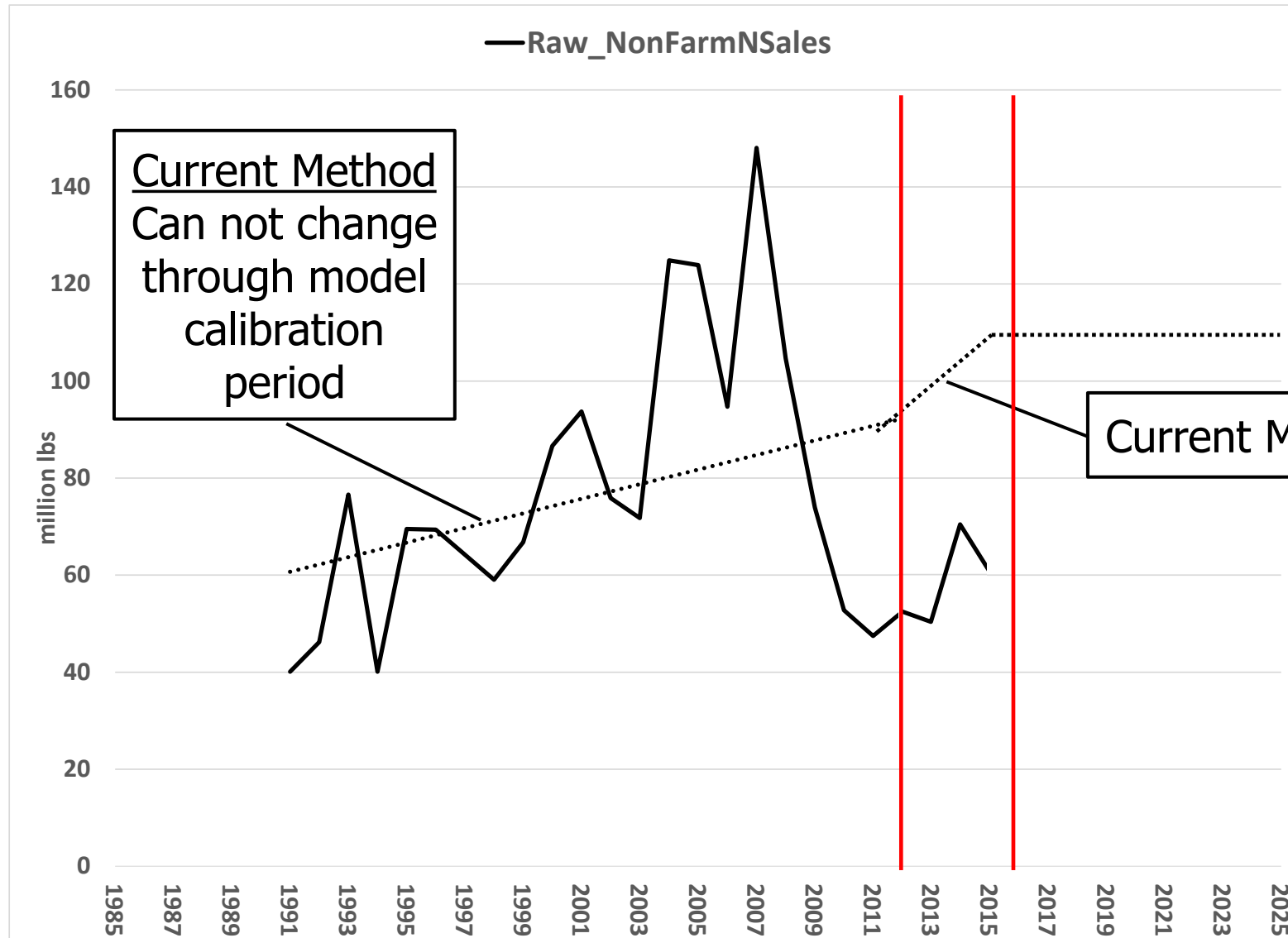
# CB Watershed Pounds of Nitrogen Applied (1991–2012)



# CB Watershed Pounds of Nitrogen Applied (1991–2015)

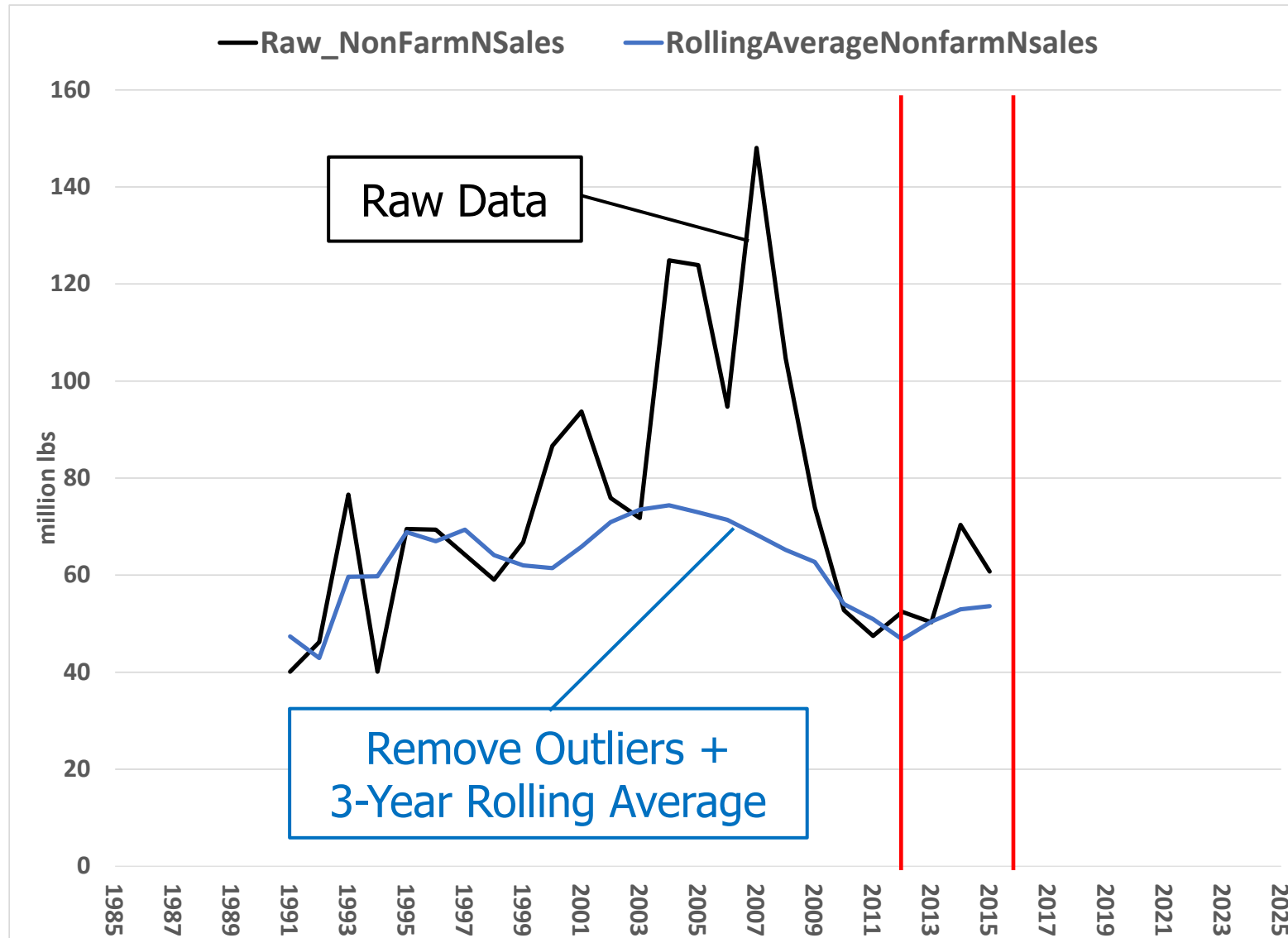


# CB Watershed Pounds of Nitrogen Applied (1991–2025)

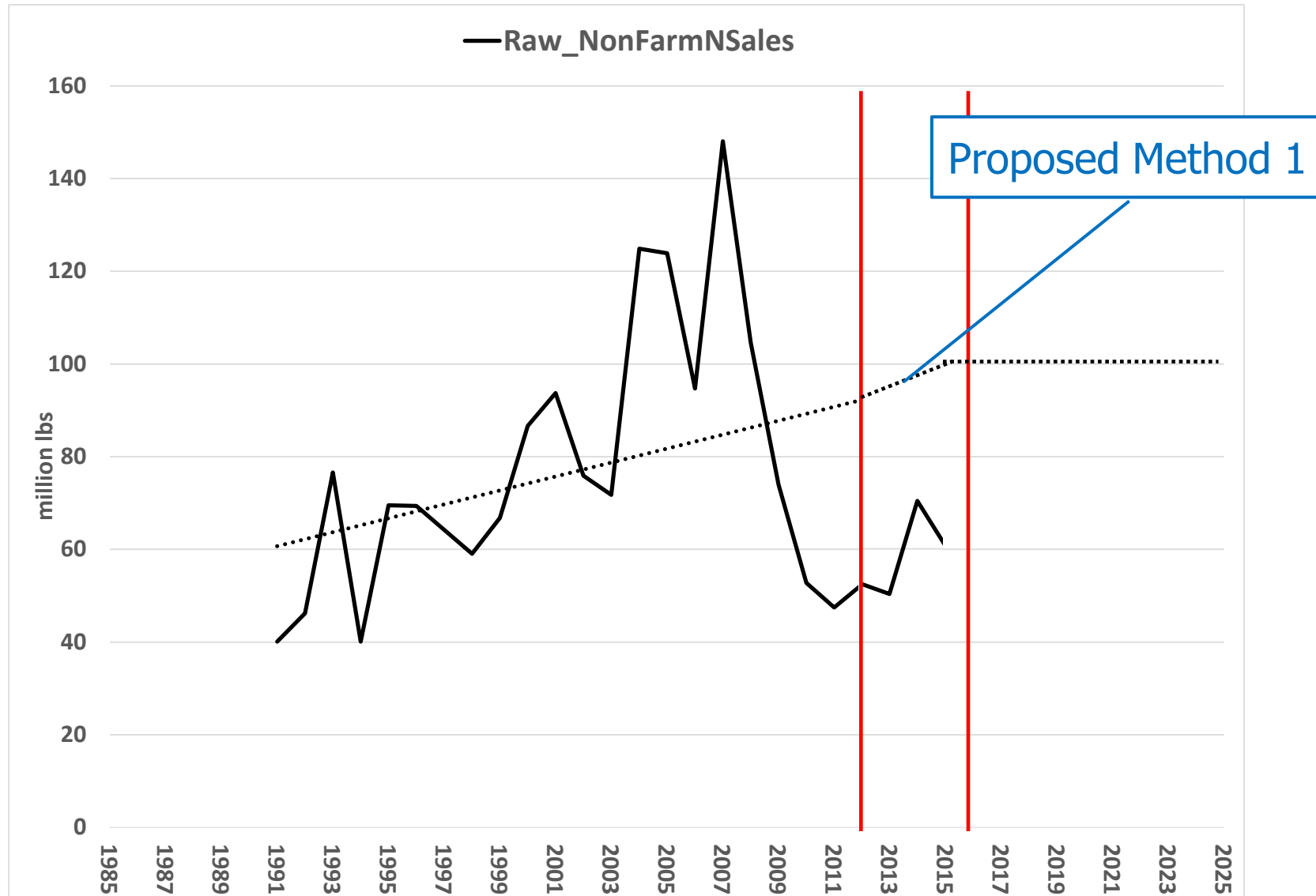




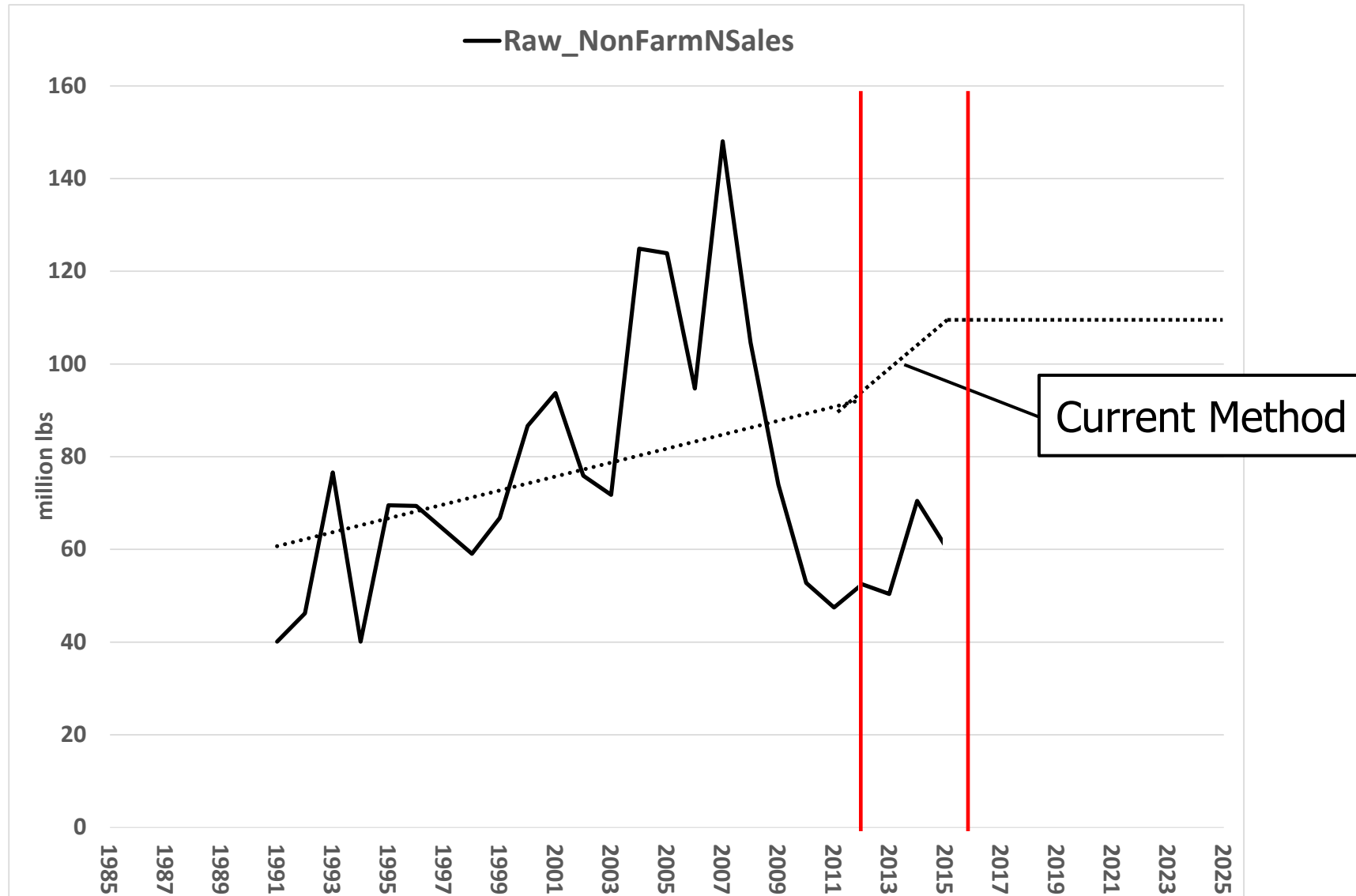
# CB Watershed Pounds of Nitrogen Applied (1991–2015)



# CB Watershed Pounds of Nitrogen Applied (1991–2025)



# CB Watershed Pounds of Nitrogen Applied (1991–2025)

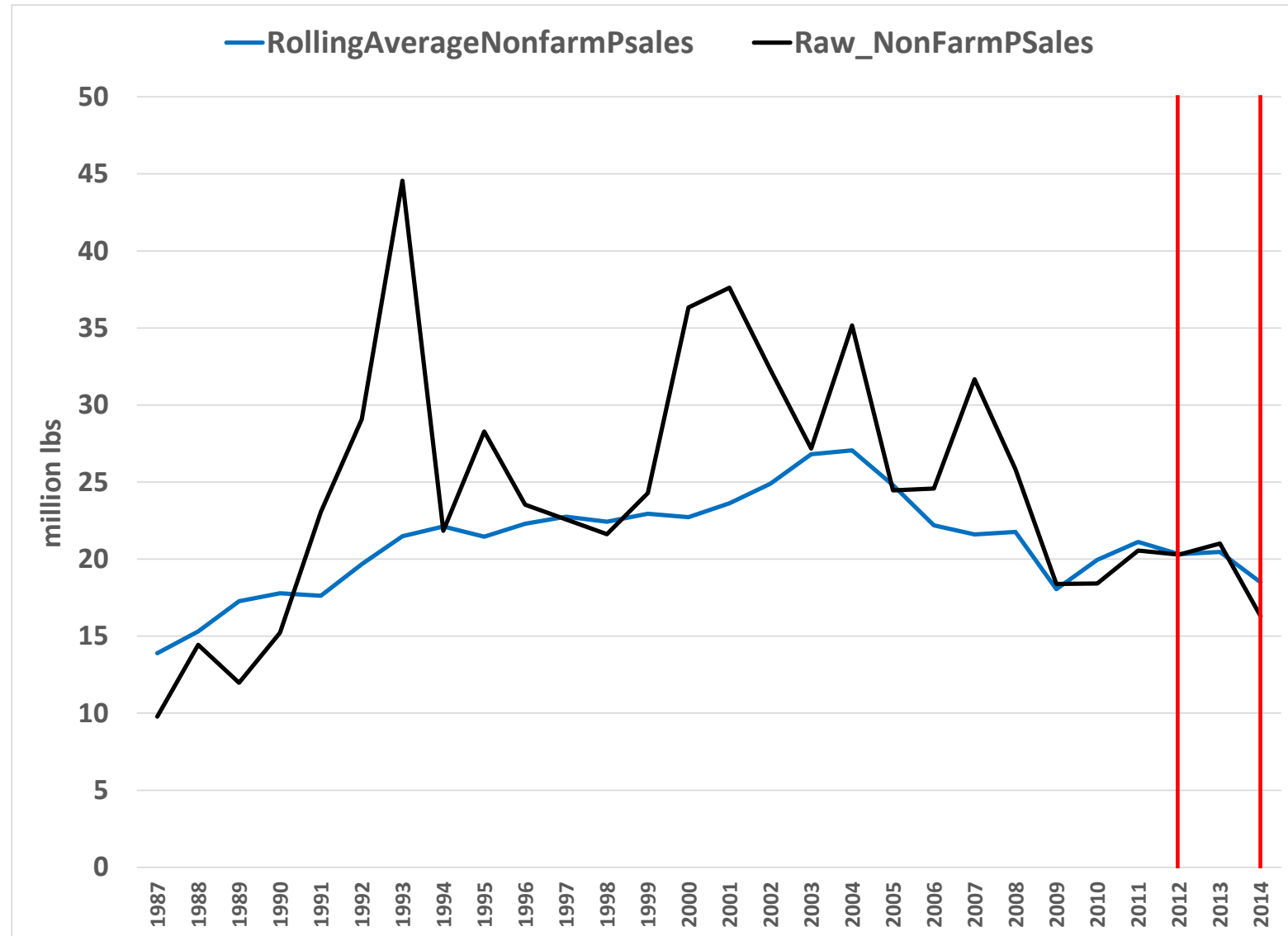


## Fertilizers: cost of Nitrogen per pound



Source: DTN Fertilizer Index, a weekly survey of U.S. retailer prices DTN®

# CB Watershed Pounds of Phosphorus Applied (1987–2014)





# Turfgrass Nutrient Application Rates

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- Con: Changes in 2012-2016 application rates can be large and in worst cases, illogical

### 2) Proposed Method 1

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- Cons: Does not follow currently agreed-to methods;  
May not capture short-term changes in fertilizer use

### 3) Proposed Method 2

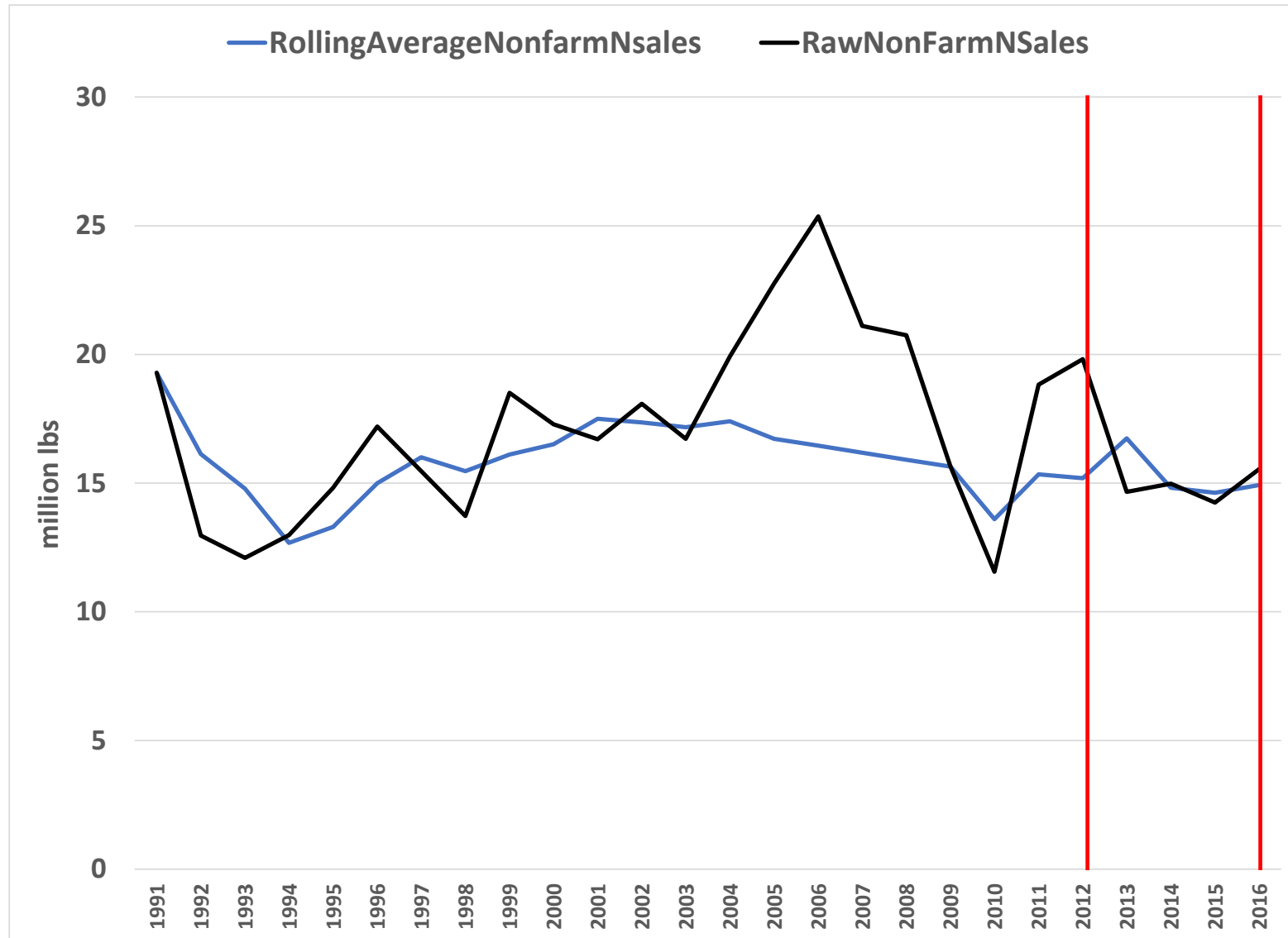
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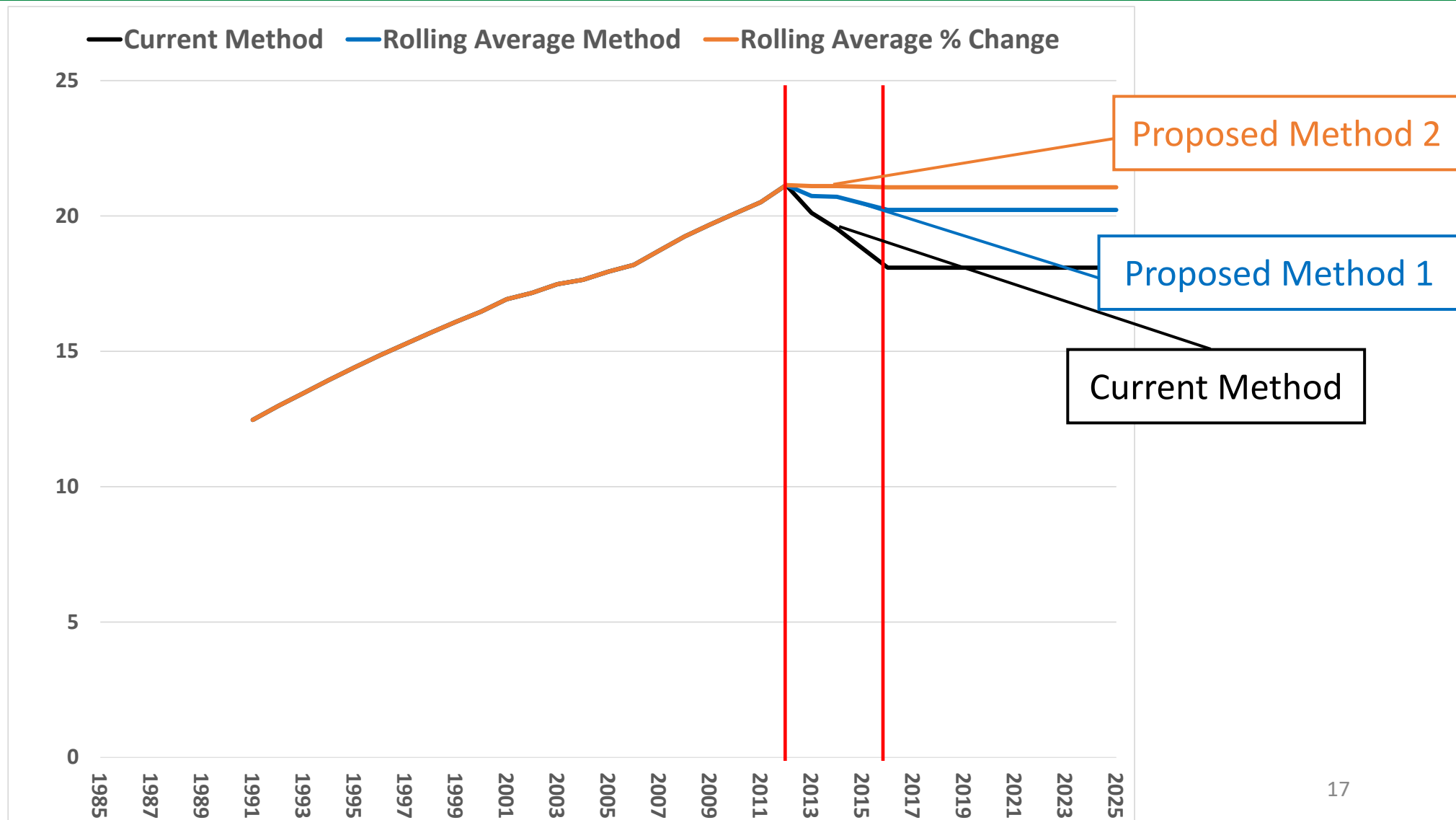
VIRGINIA

# VA Pounds of Nitrogen Applied (1991–2016)

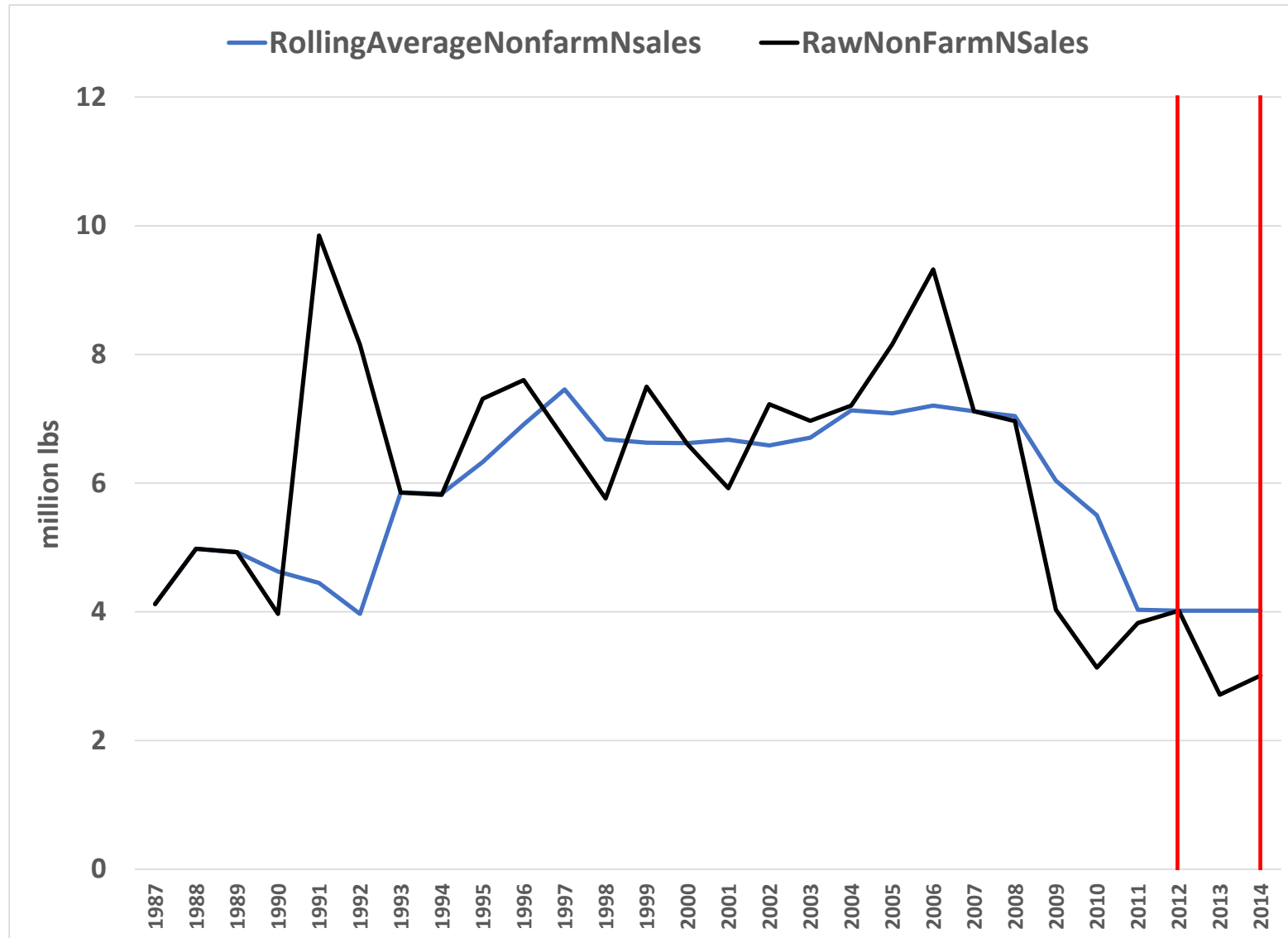




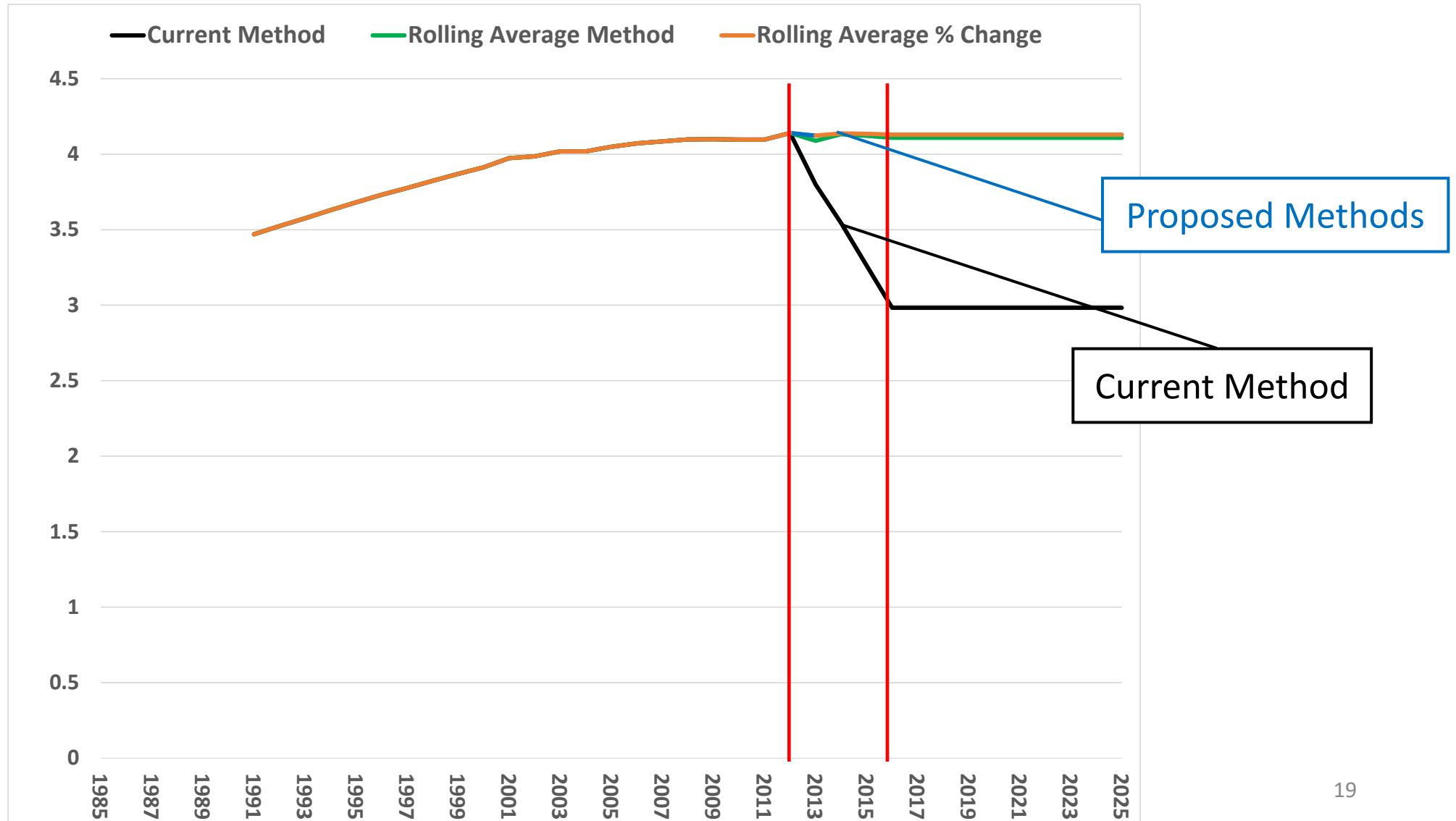
# VA Turf Grass Pound/Acre Nitrogen Applications (1991–2025)



# VA Pounds of Phosphorus Applied (1987–2014)



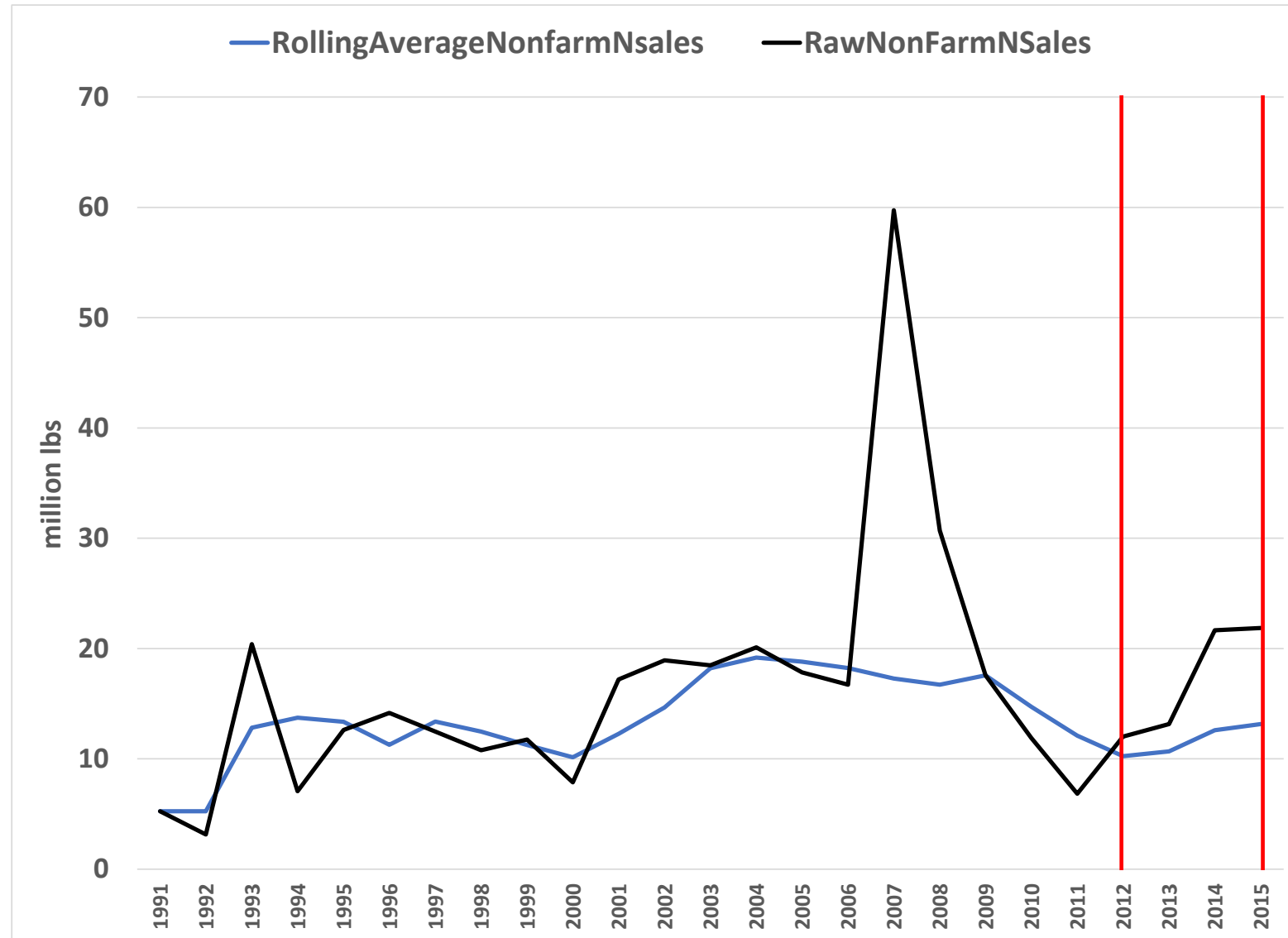
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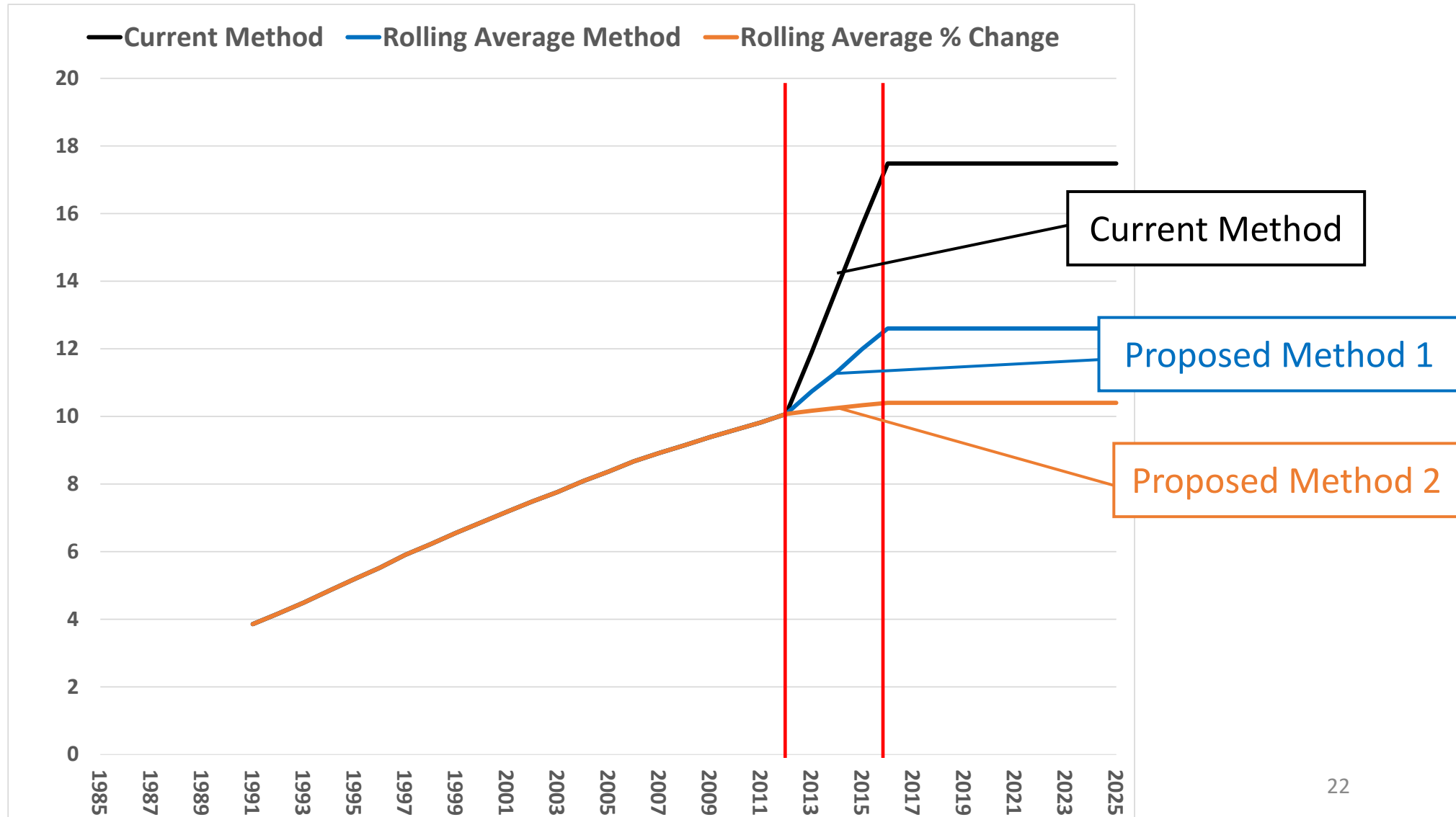


PENNSYLVANIA

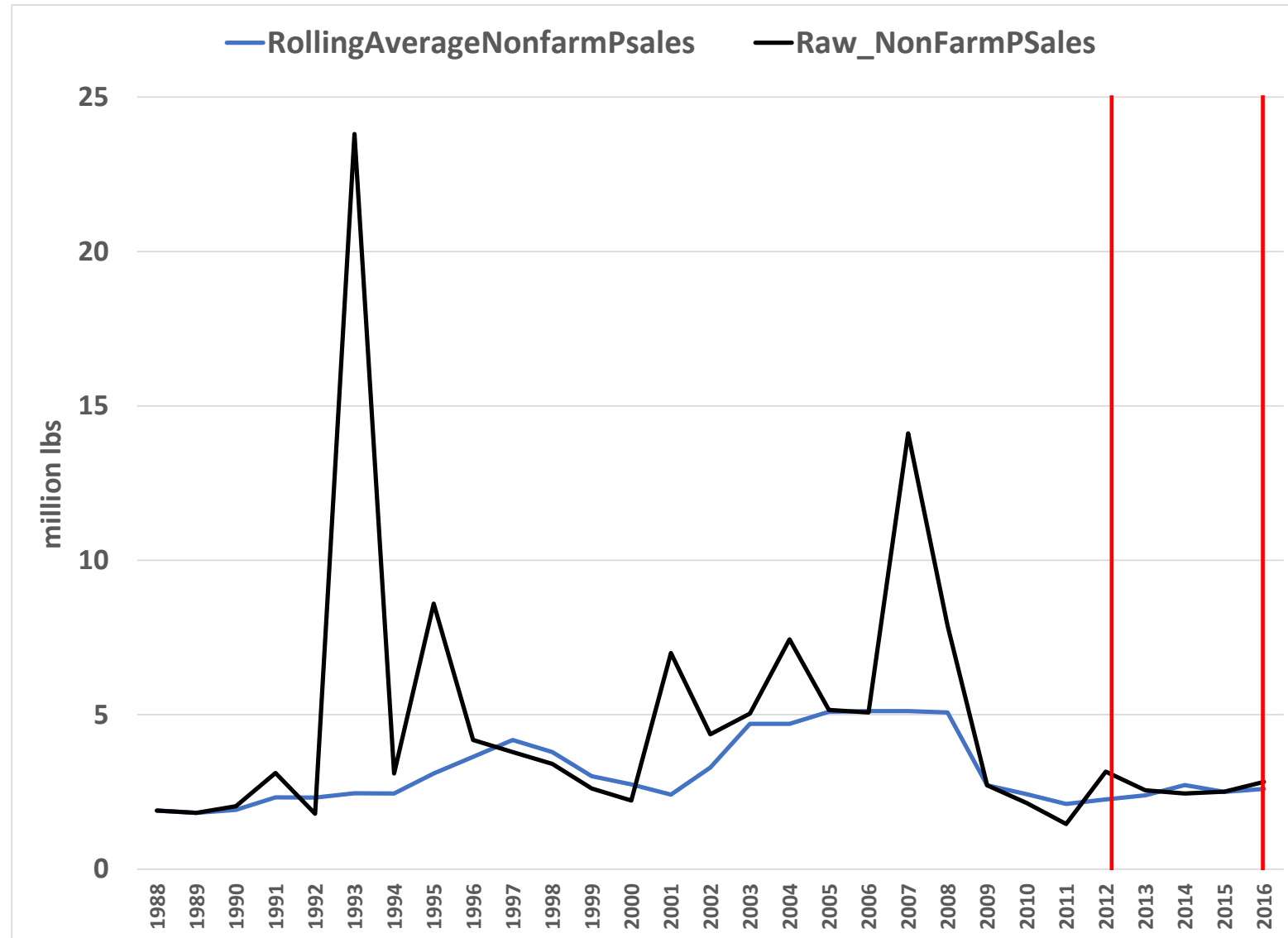
# PA Pounds of Nitrogen Applied (1991–2015)



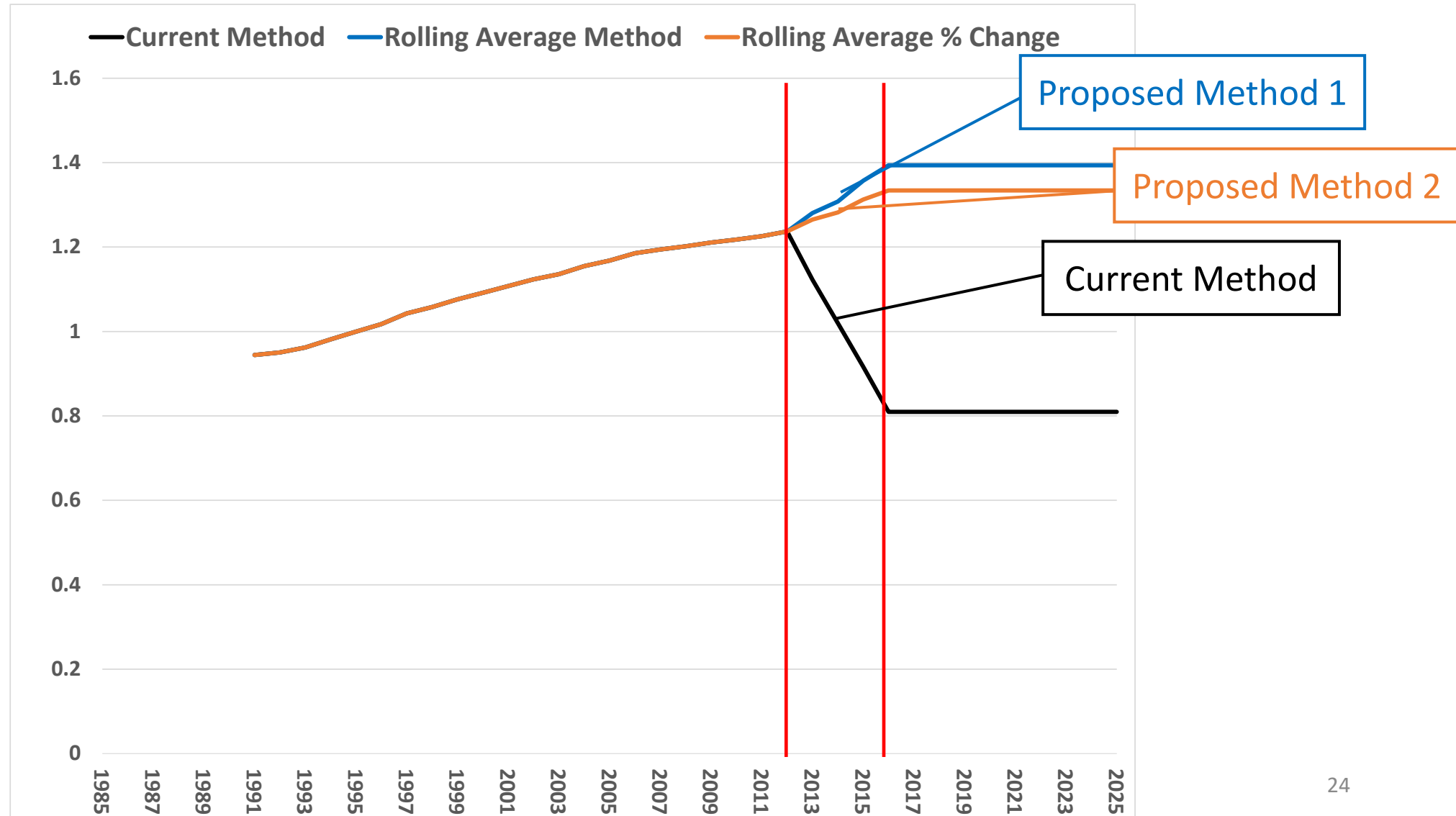
# PA Turf Grass Pound/Acre Nitrogen Applications (1991–2025)



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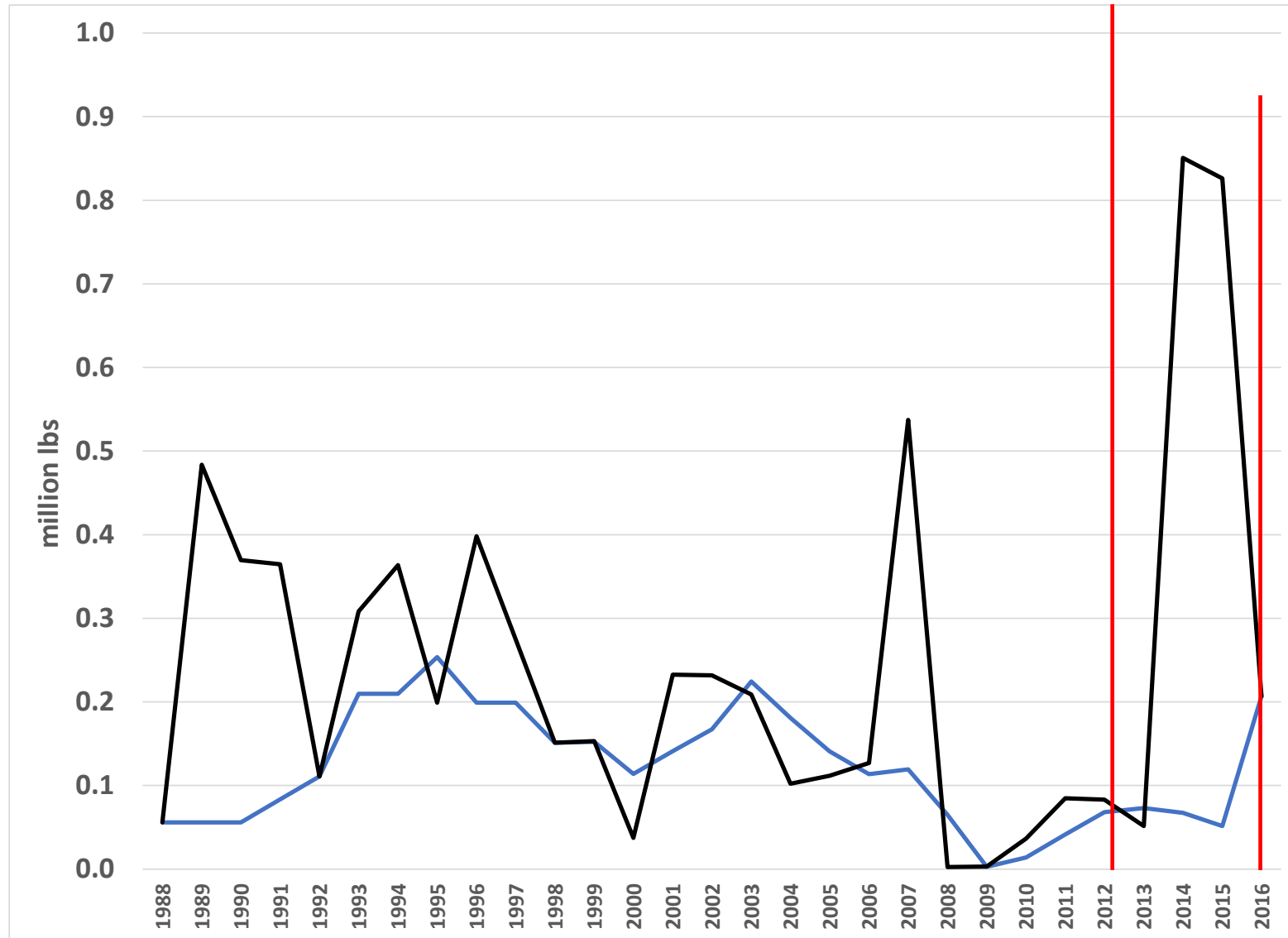




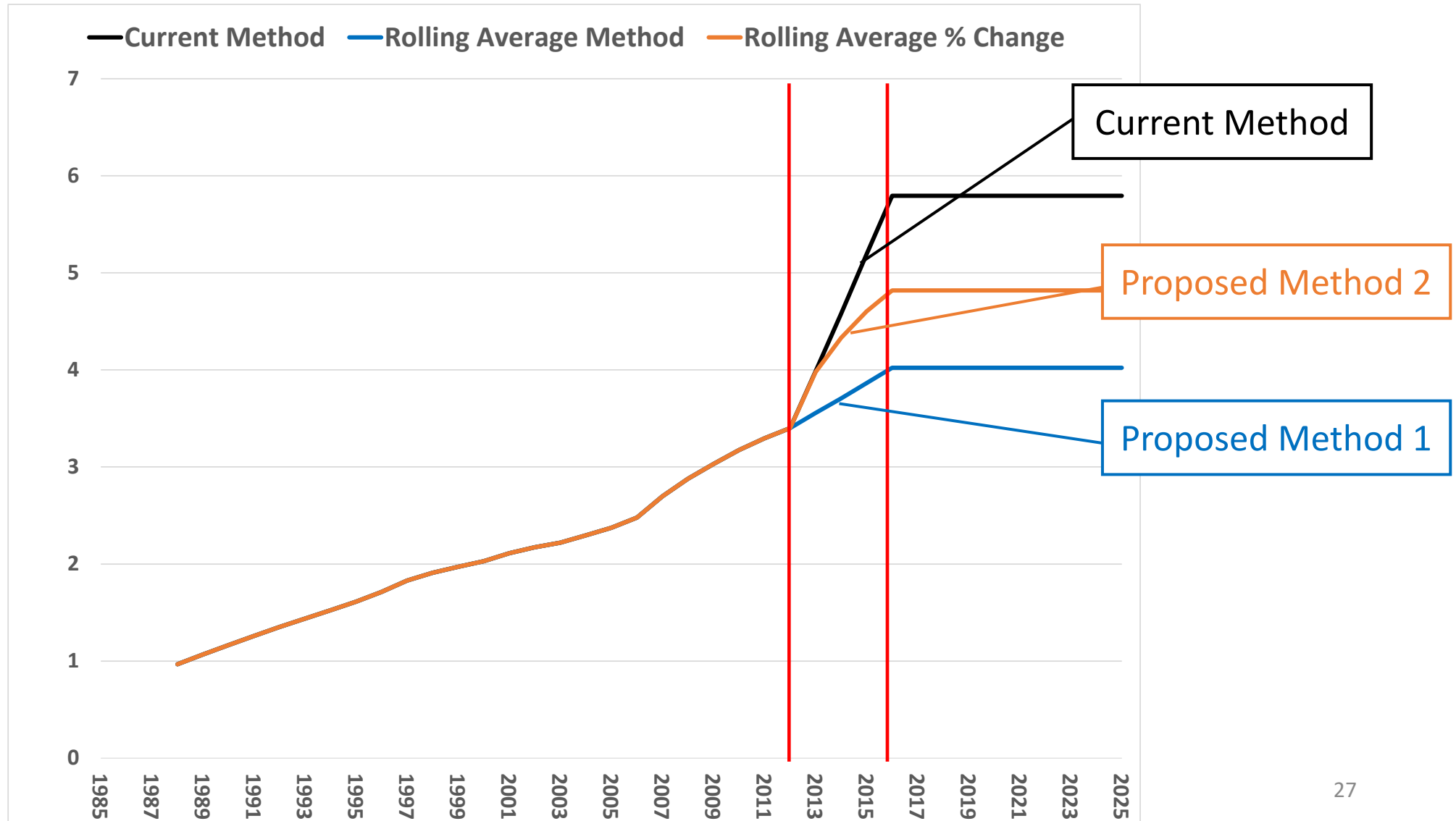


# WEST VIRGINIA

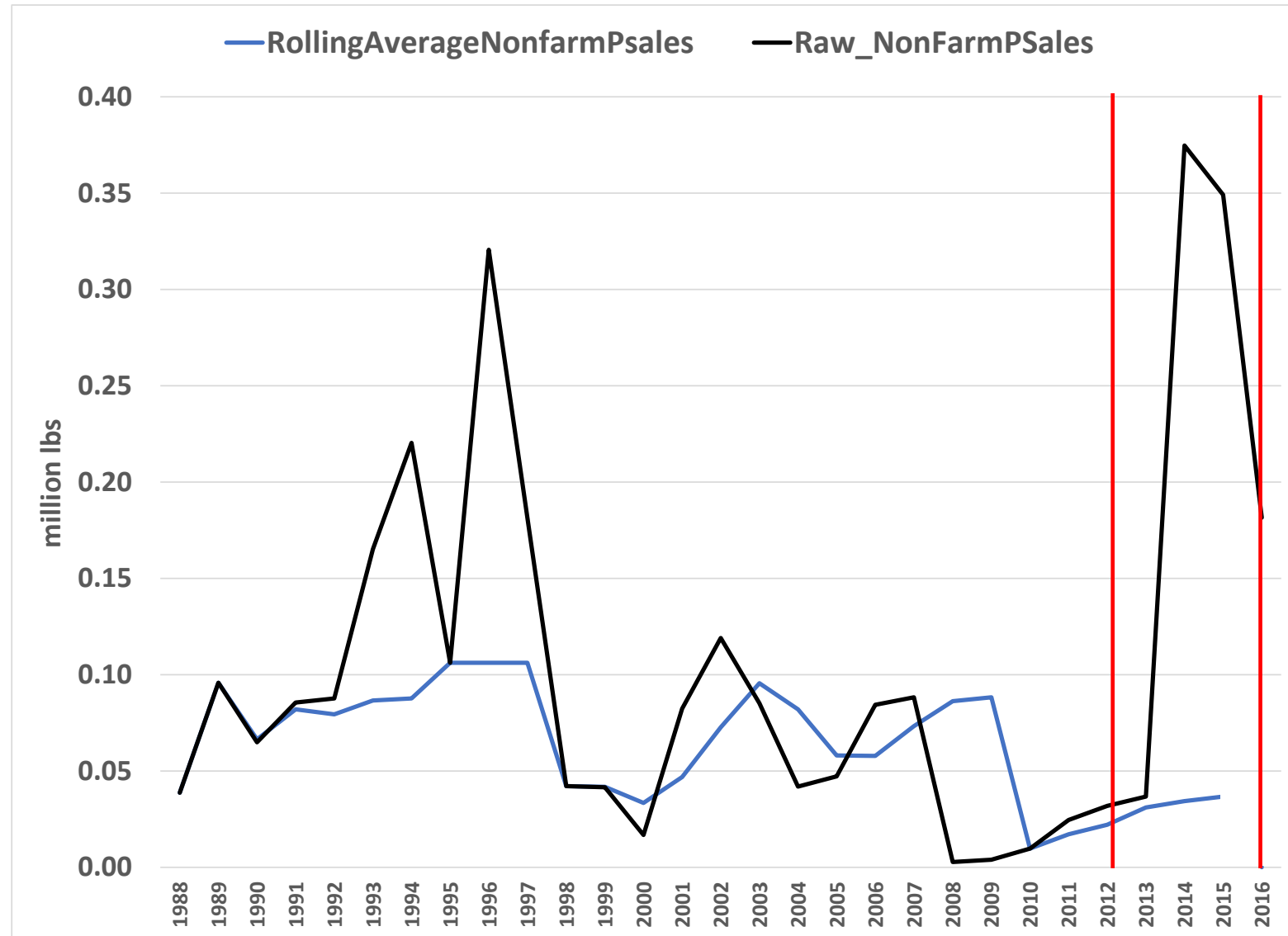
# WV Pounds of Nitrogen Applied (1988–2016)



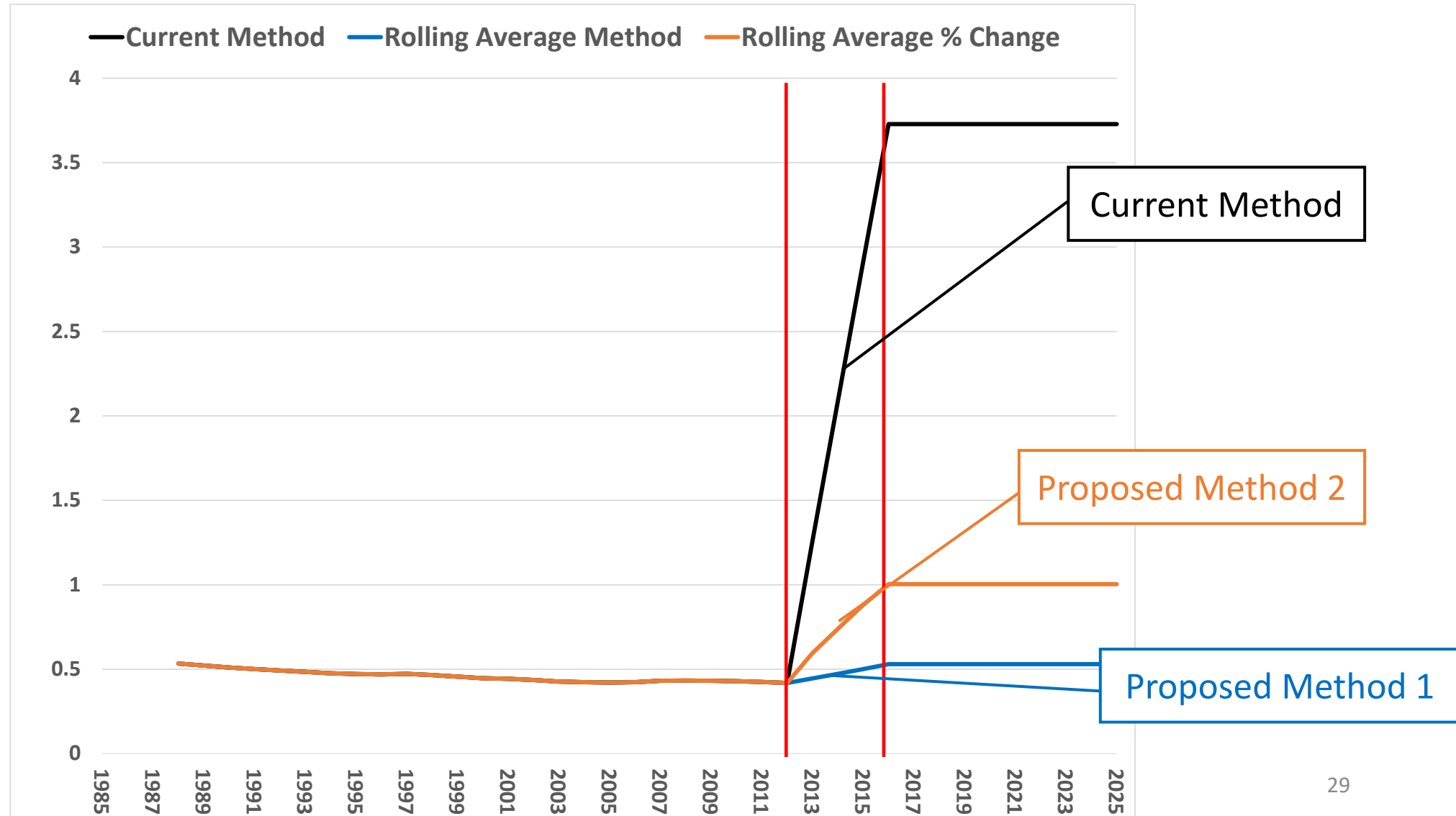
# WV Turf Grass Pound/Acre Nitrogen Applications (1988–2025)



# WV Turfgrass Phosphorus Applied w/ Smoothing (1988–2016)



# WV Turf Grass Pound/Acre Phosphorus Applications (1988–2025)

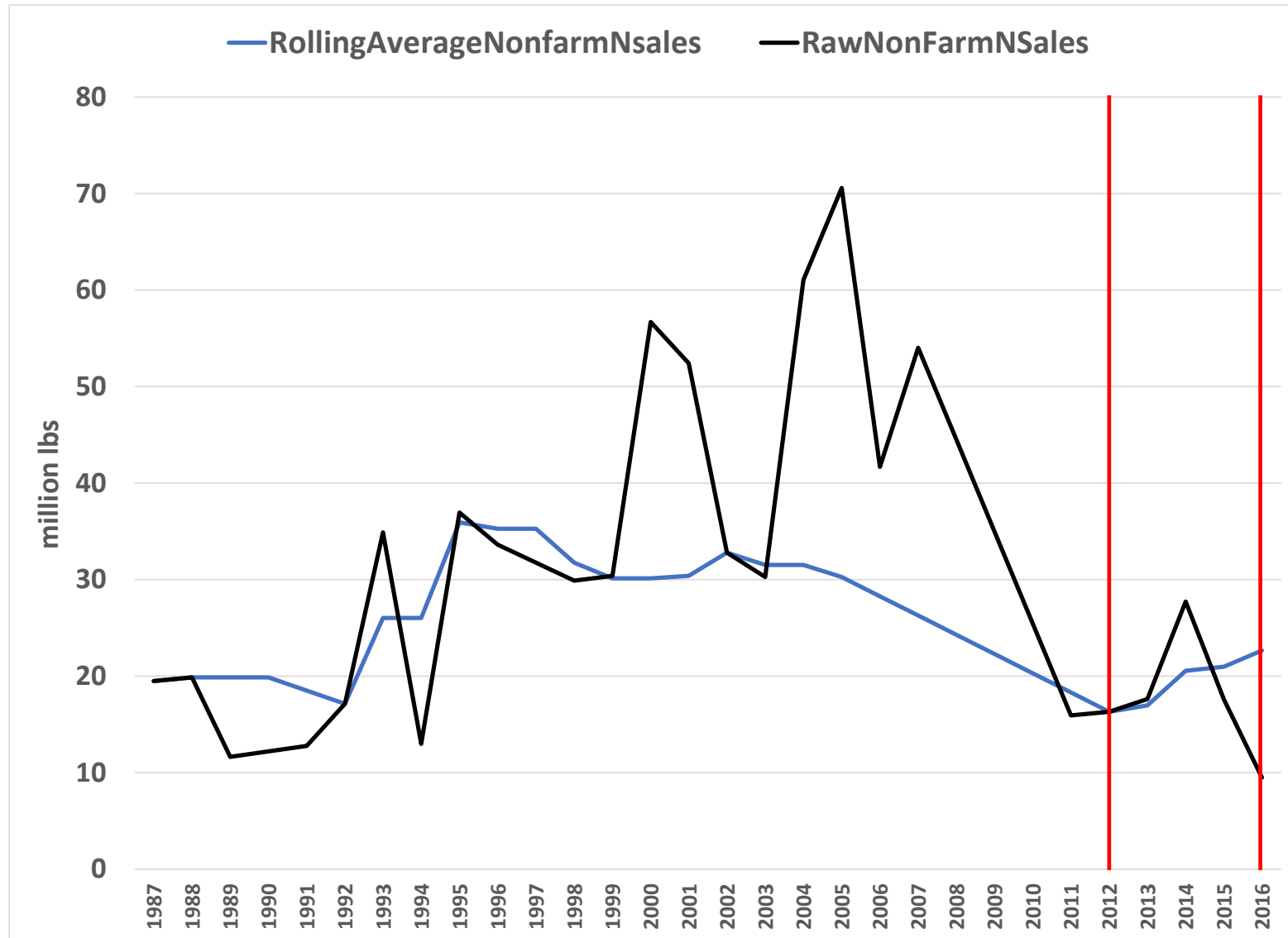




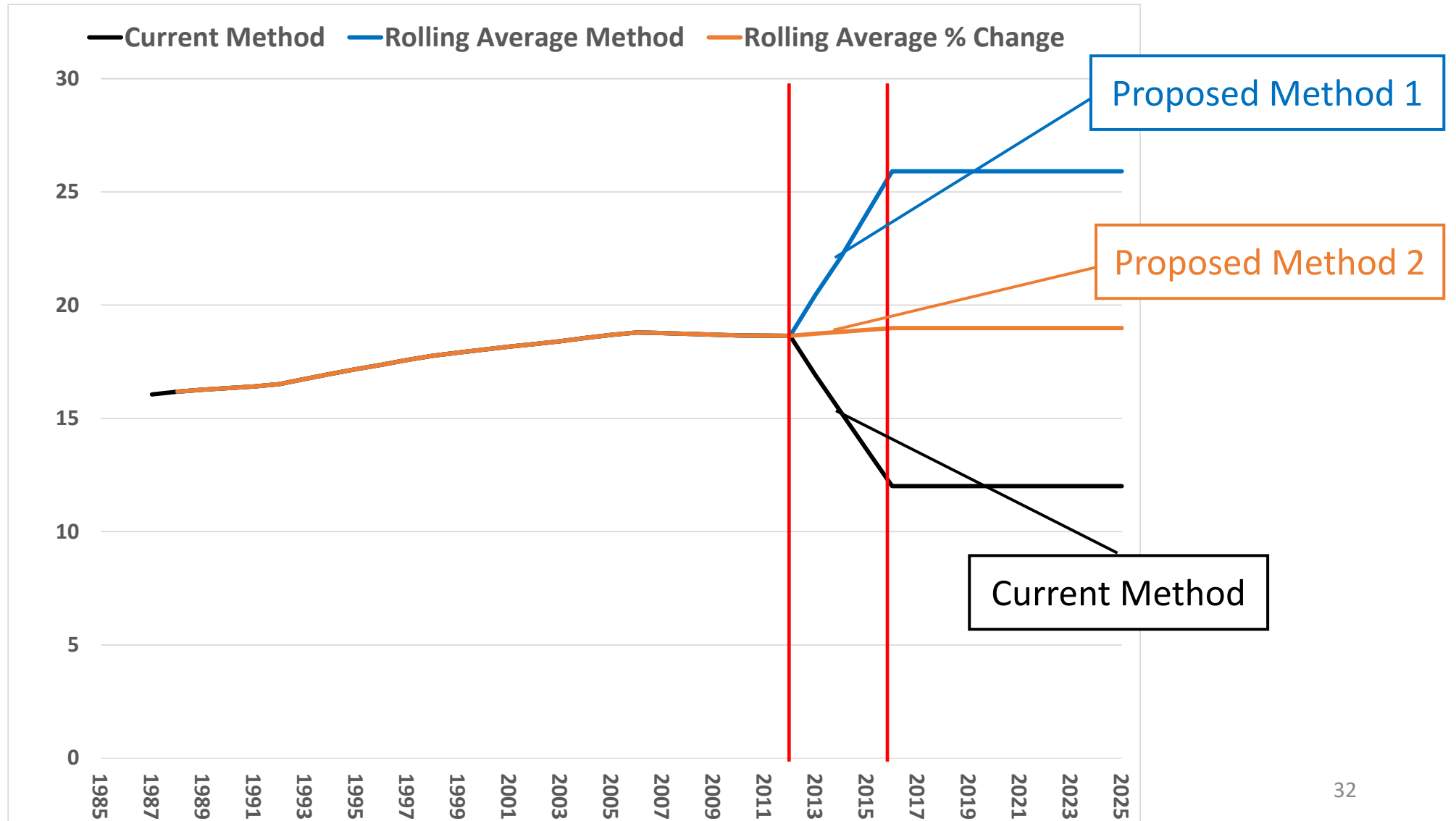


MARYLAND

# MD Pounds of Nitrogen Applied (1987–2016)

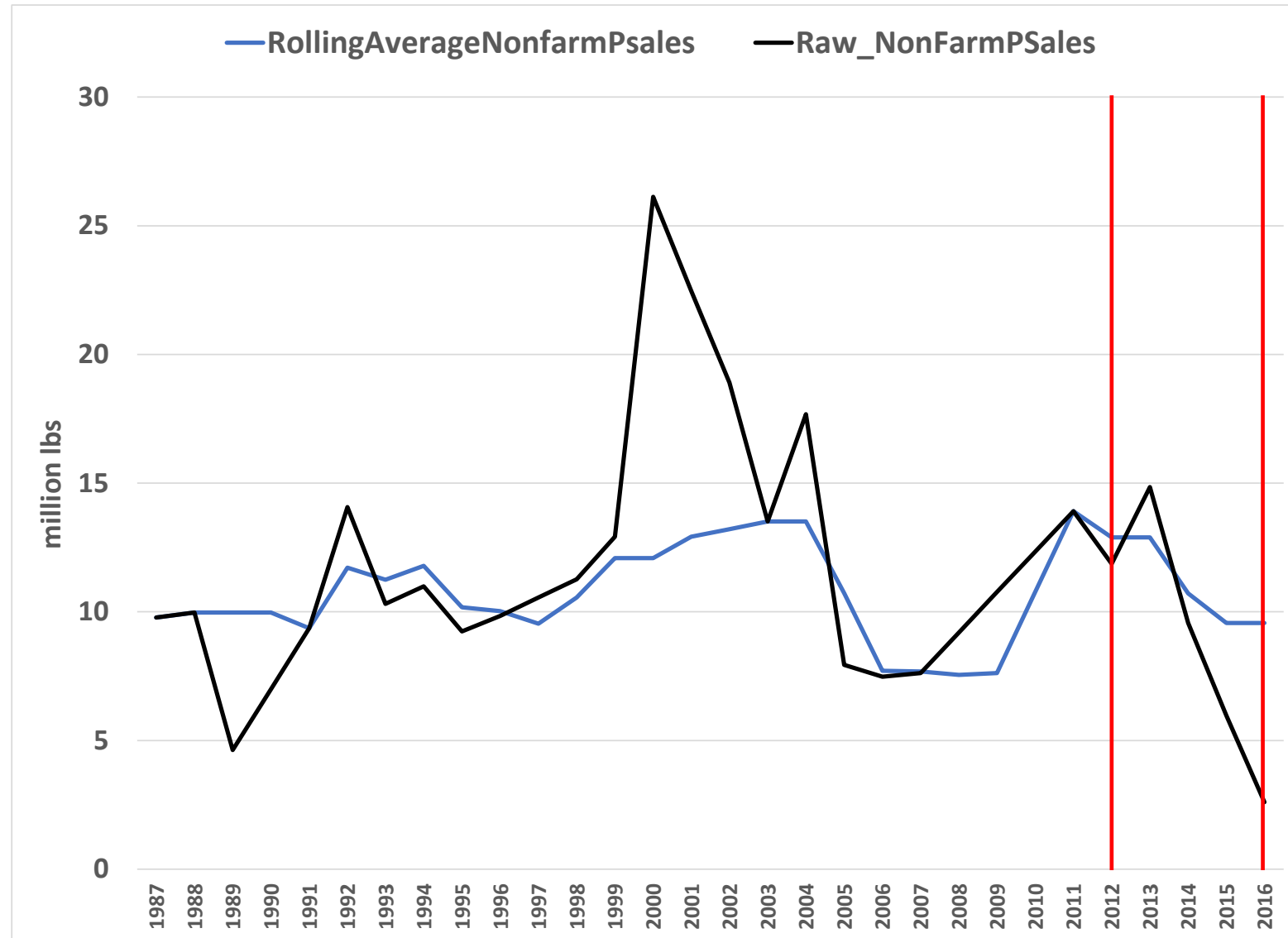


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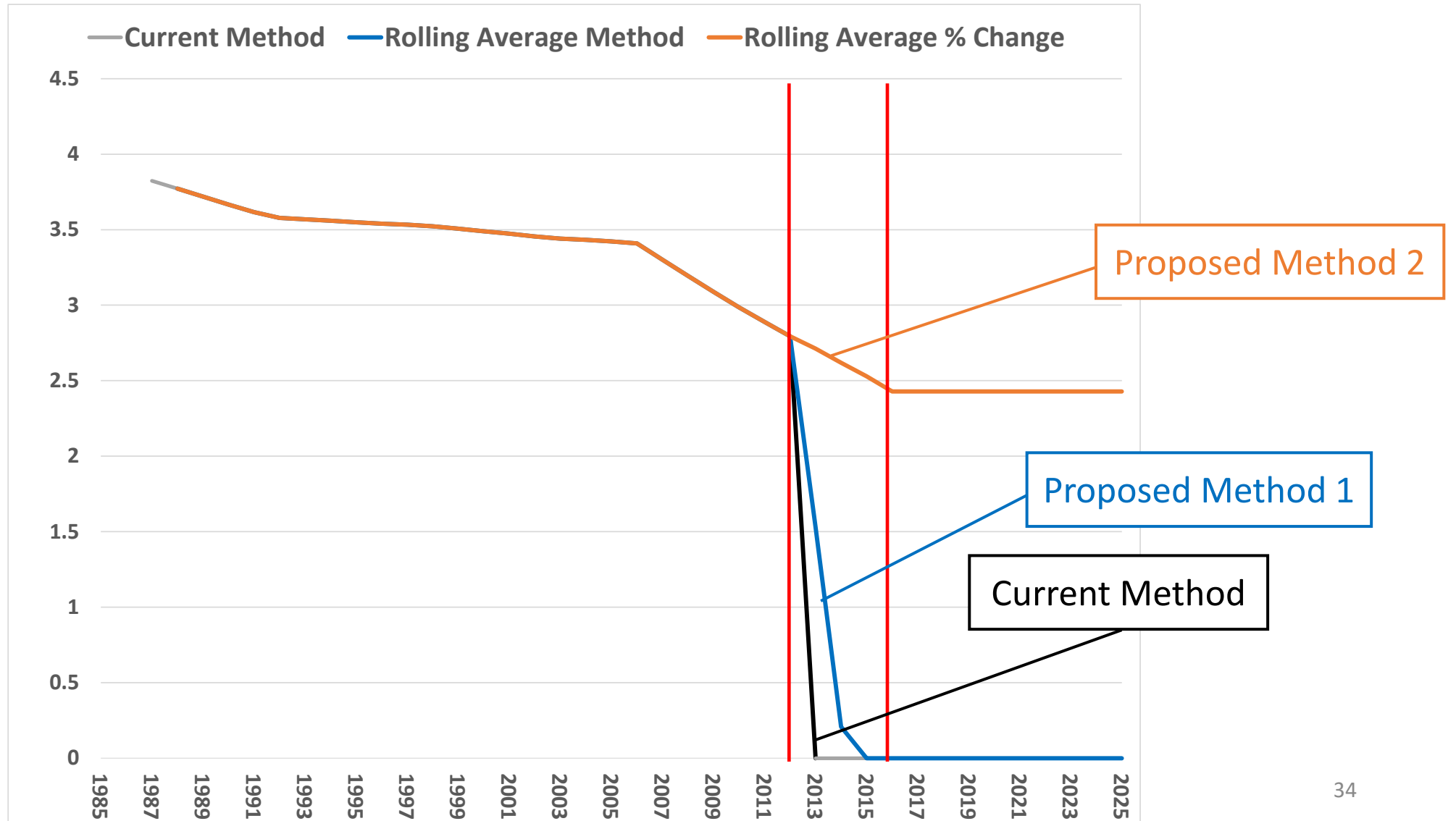




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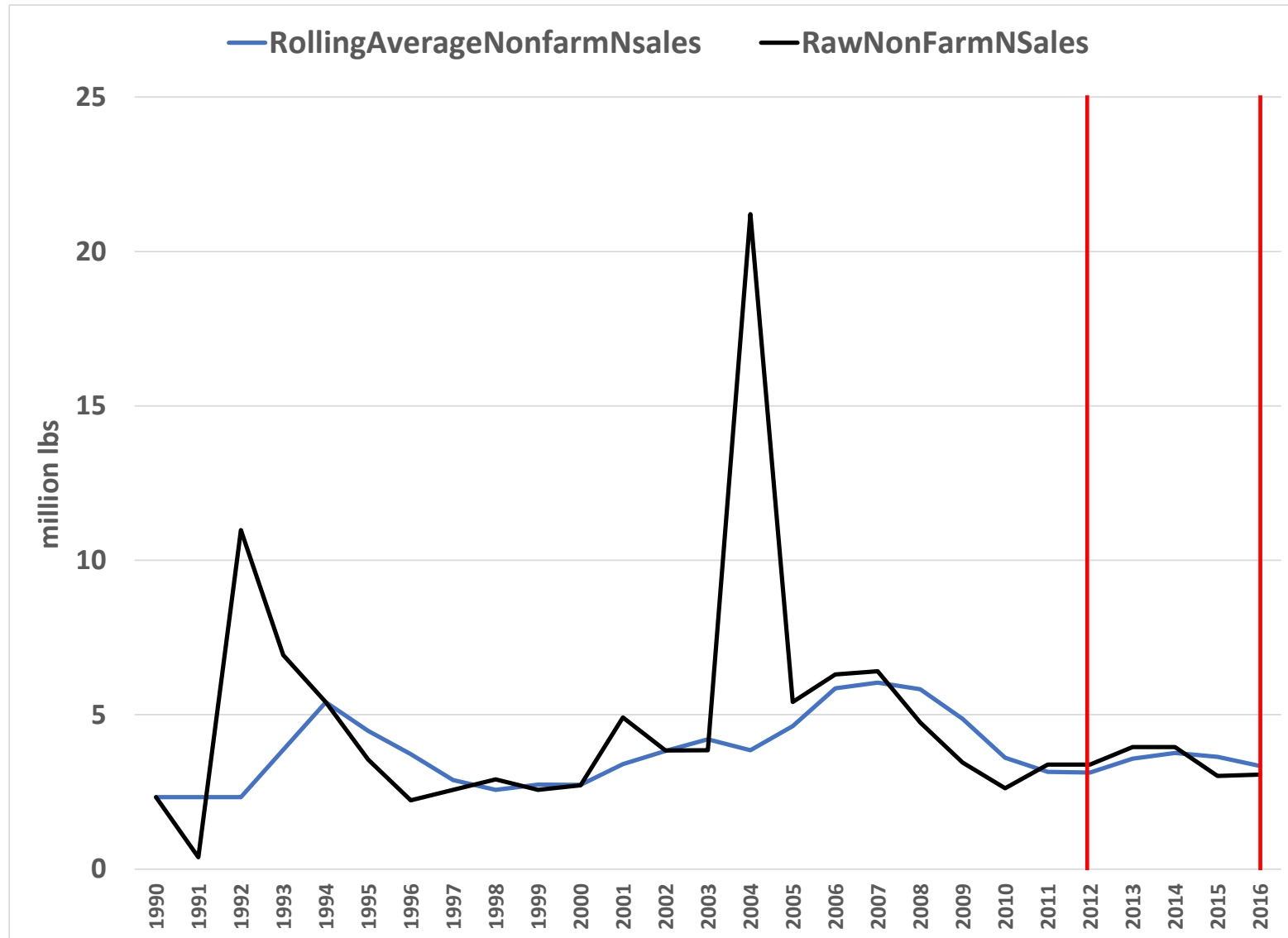
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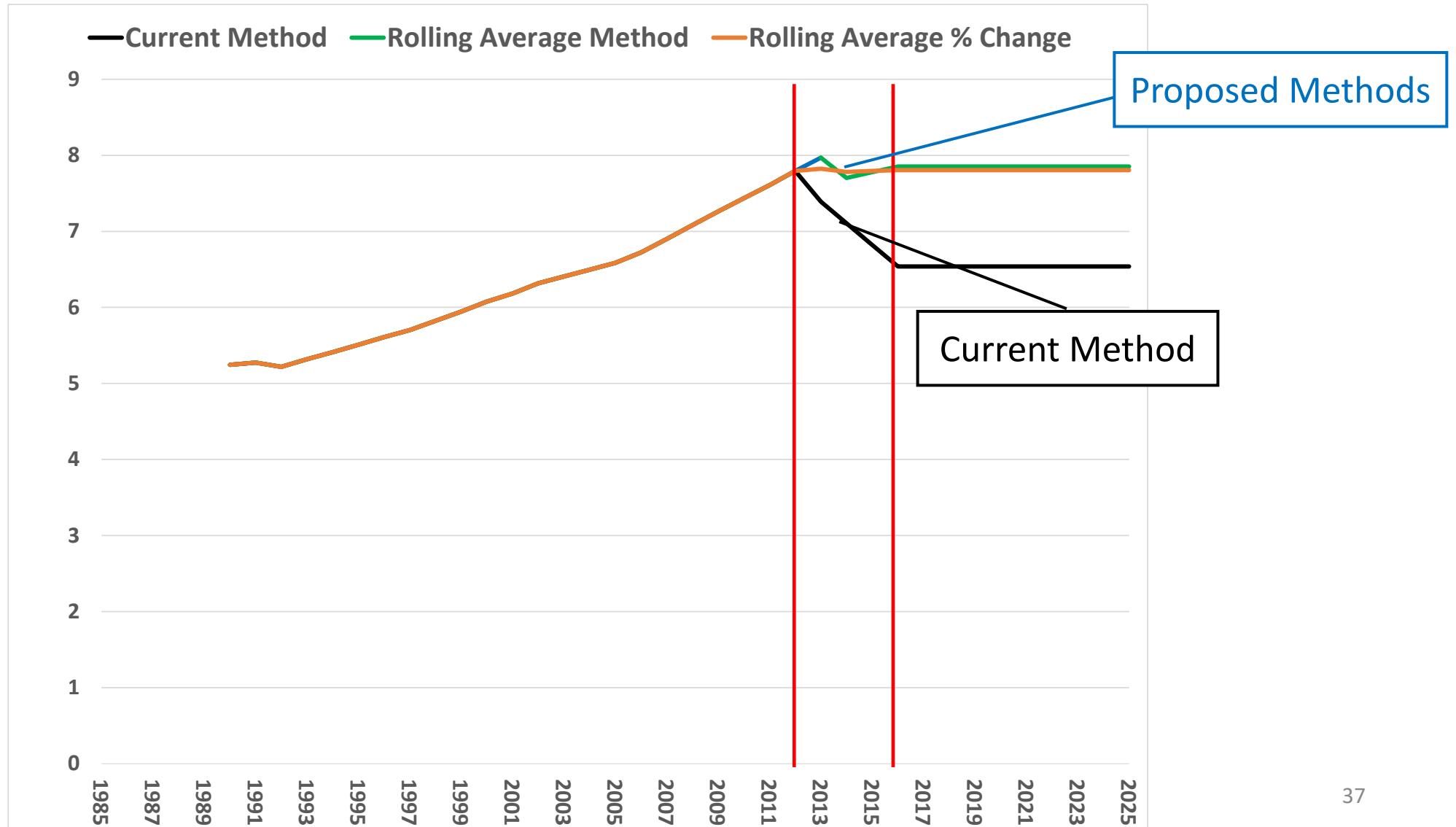


NEW YORK

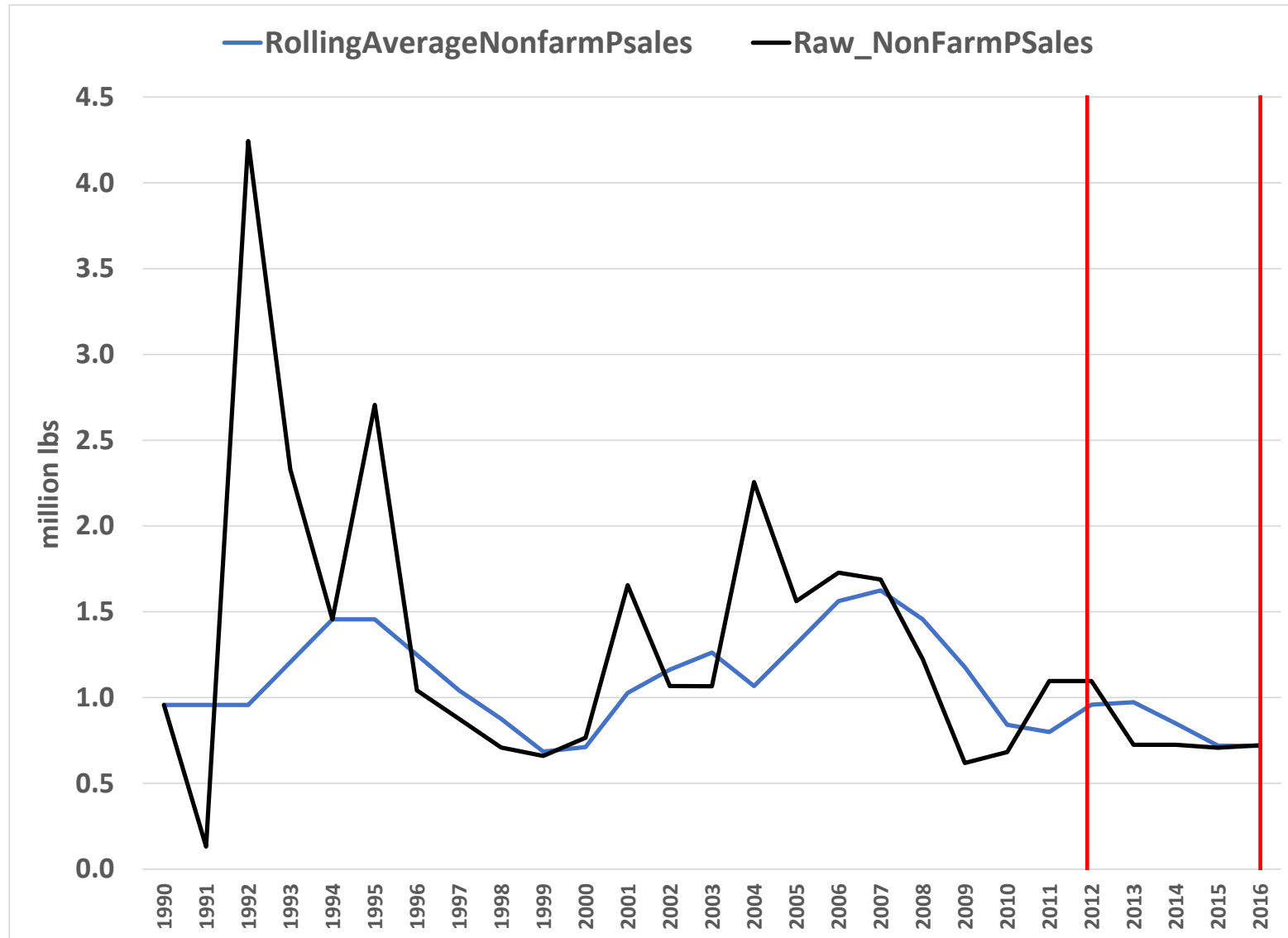
# NY Pounds of Nitrogen Applied (1990–2016)



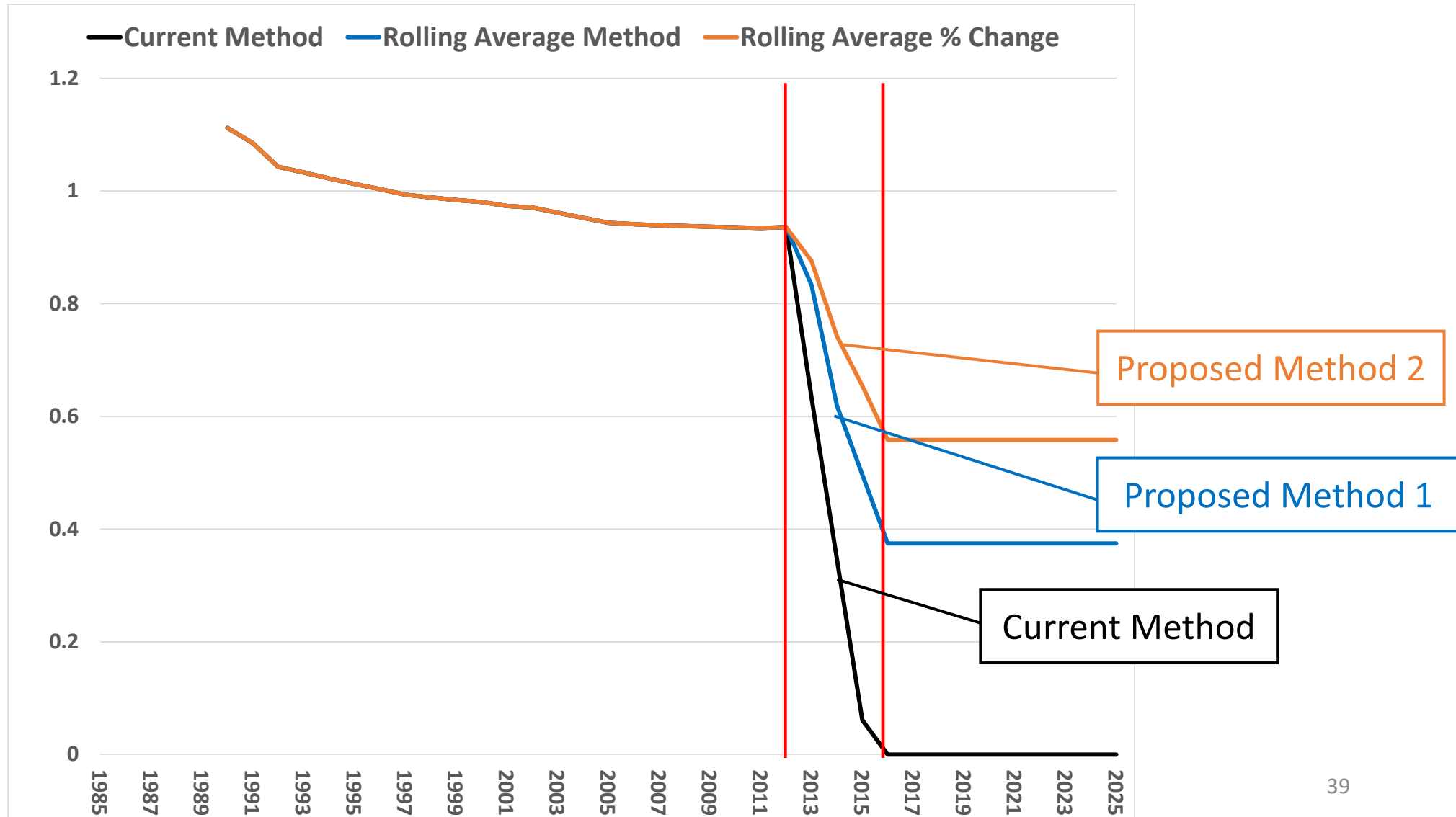
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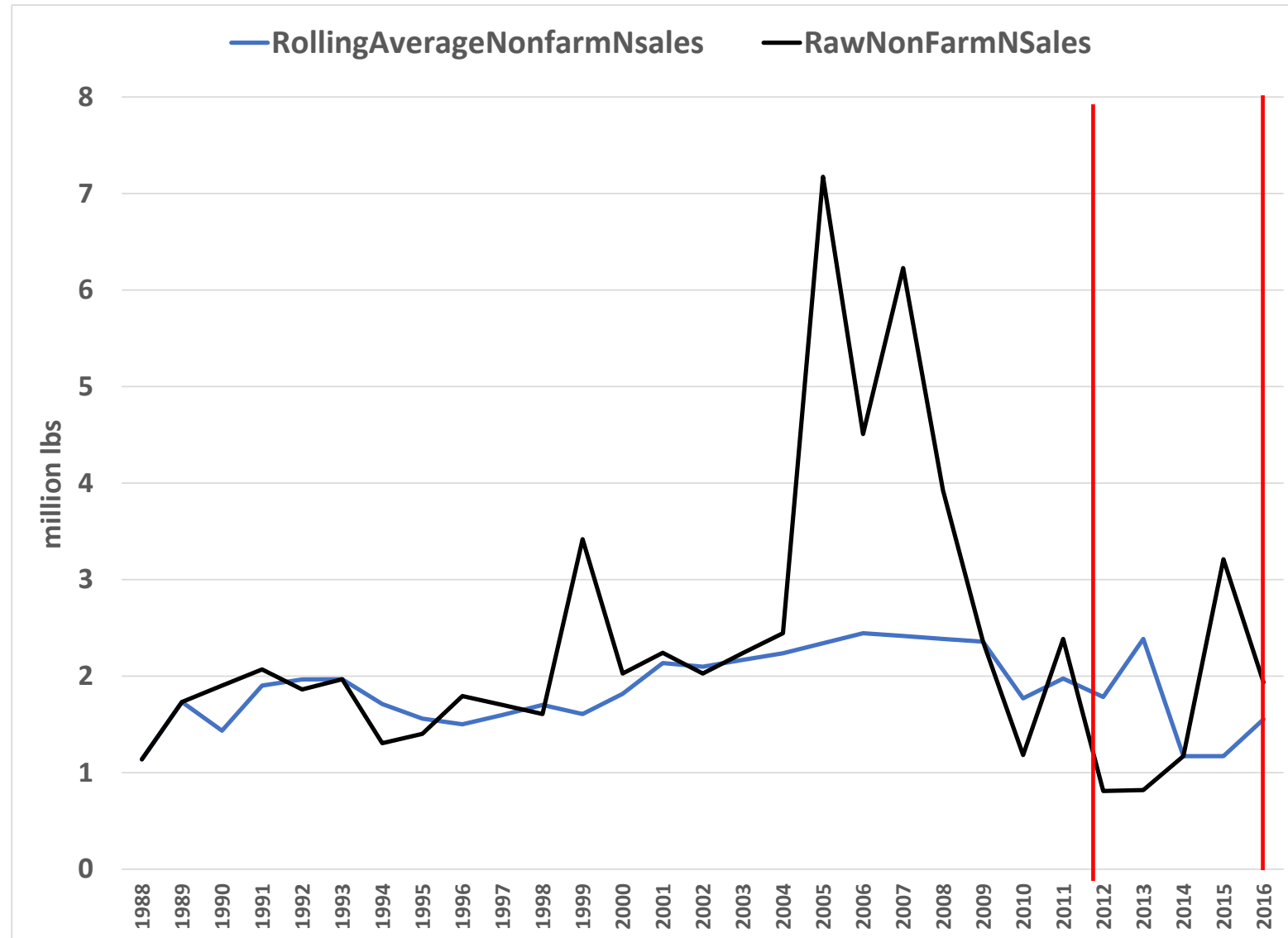




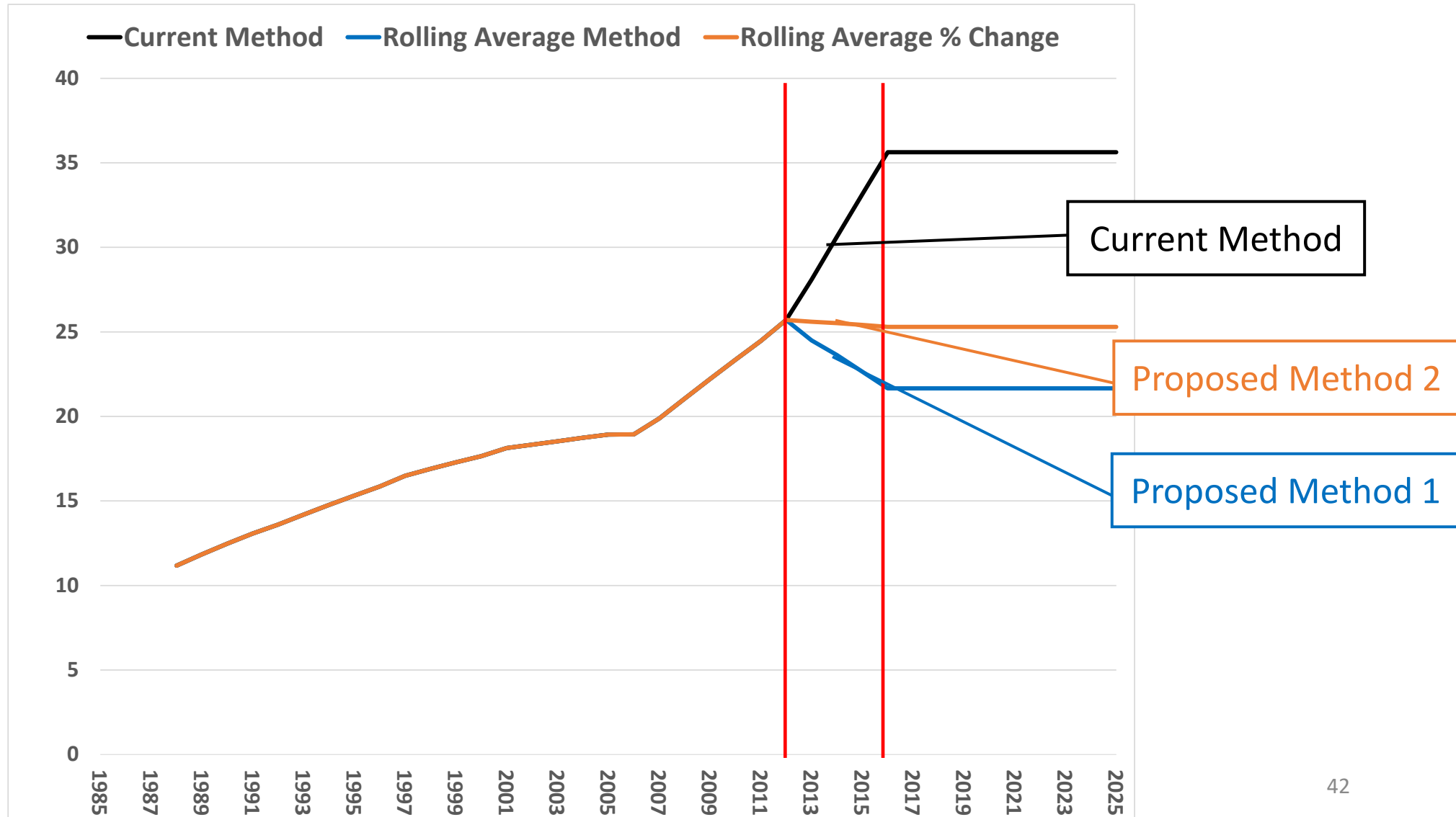
DELAWARE



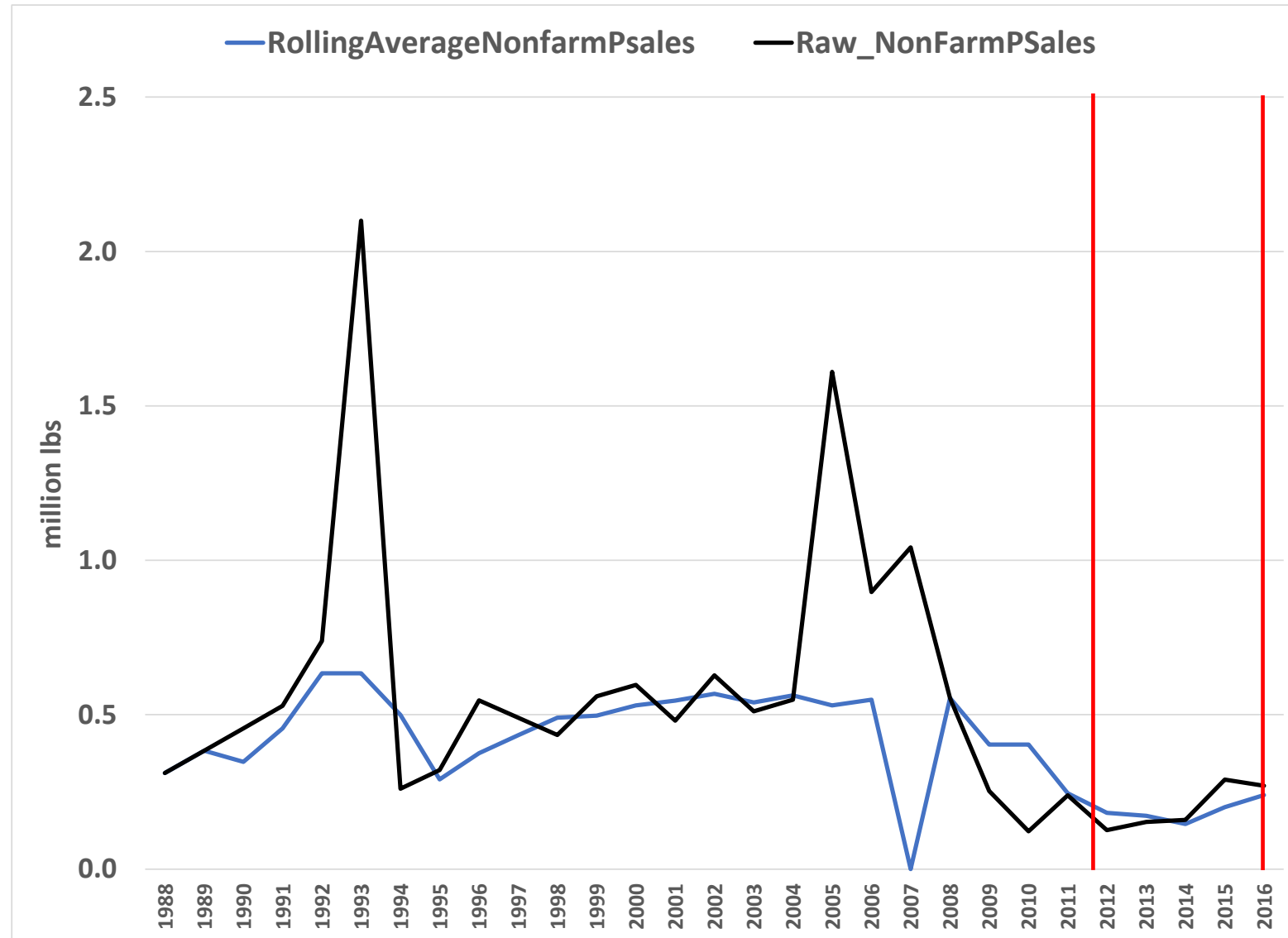
# DE Pounds of Nitrogen Applied (1988–2016)



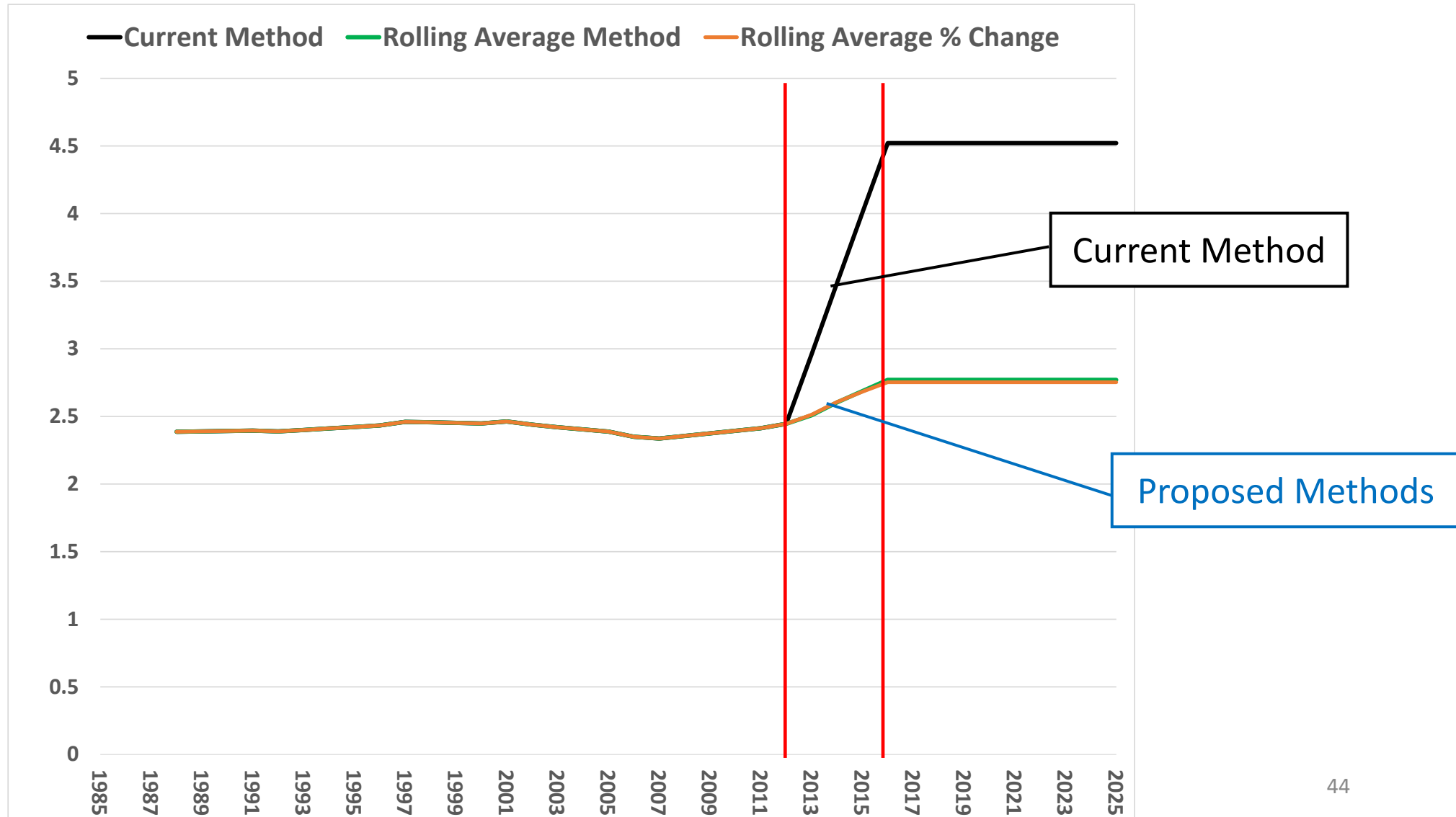
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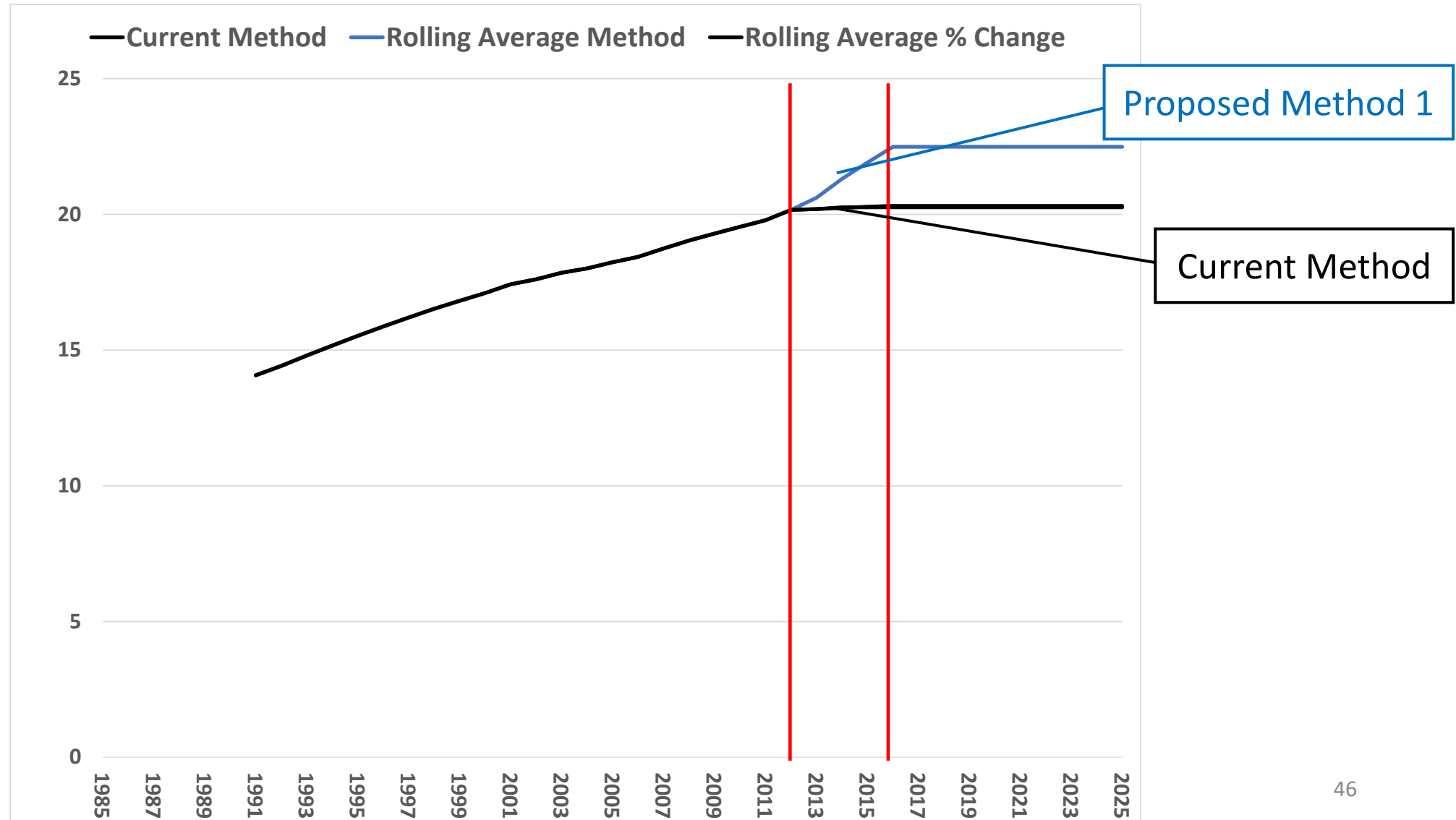
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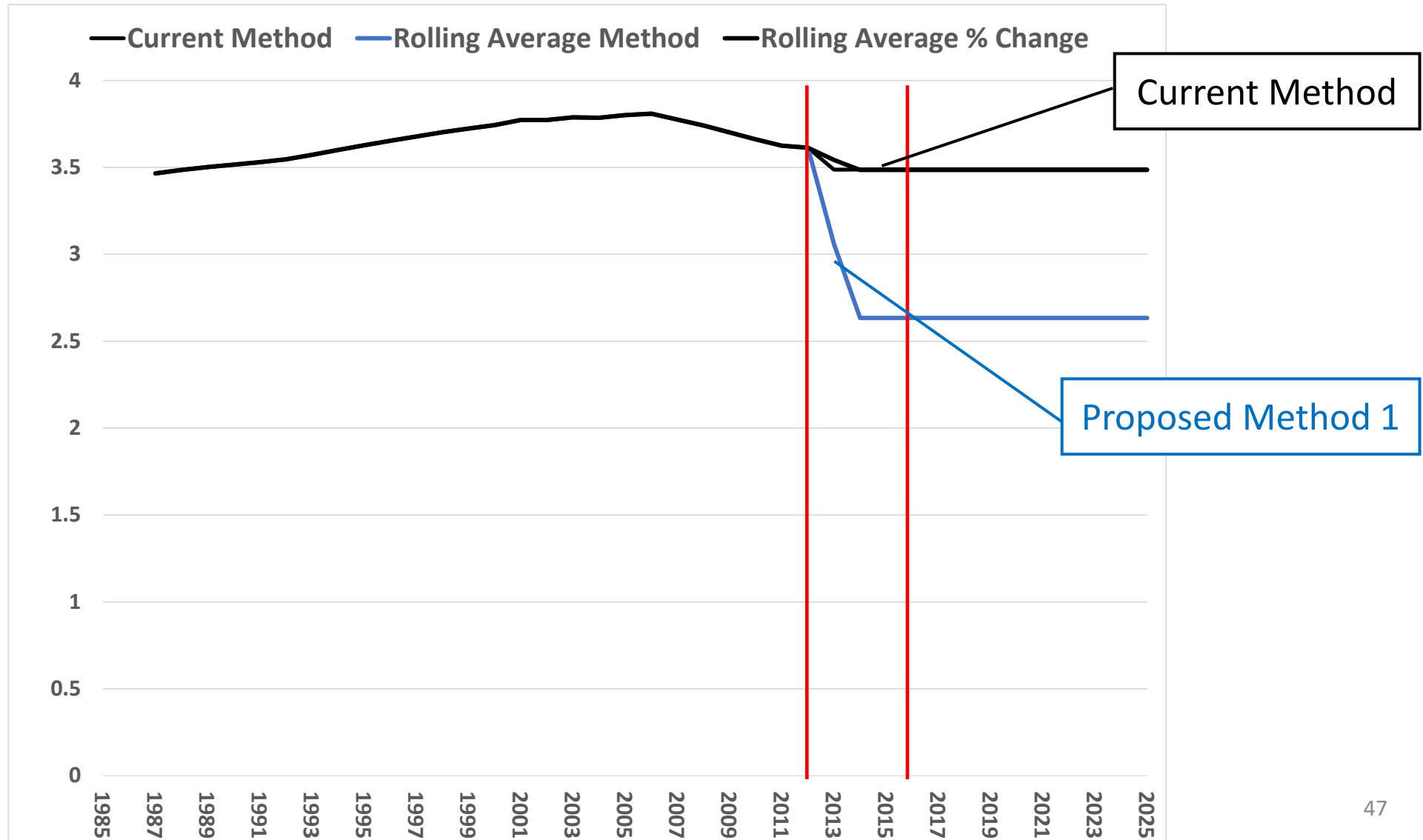


# DISTRICT OF COLUMBIA

# DC Turf Grass Pound/Acre Nitrogen Applications (1988–2025)



# DC Turf Grass Pound/Acre Phosphorus Applications (1988–2025)







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