P time-scale

Gary Shenk

CBPO

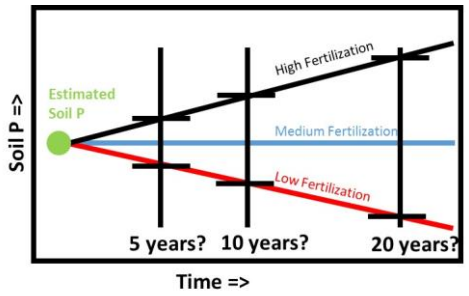
8/17/2017

Meaning of Scenarios

- If management was constant through time what would be the long term loading rate?

Meaning of the WIPs

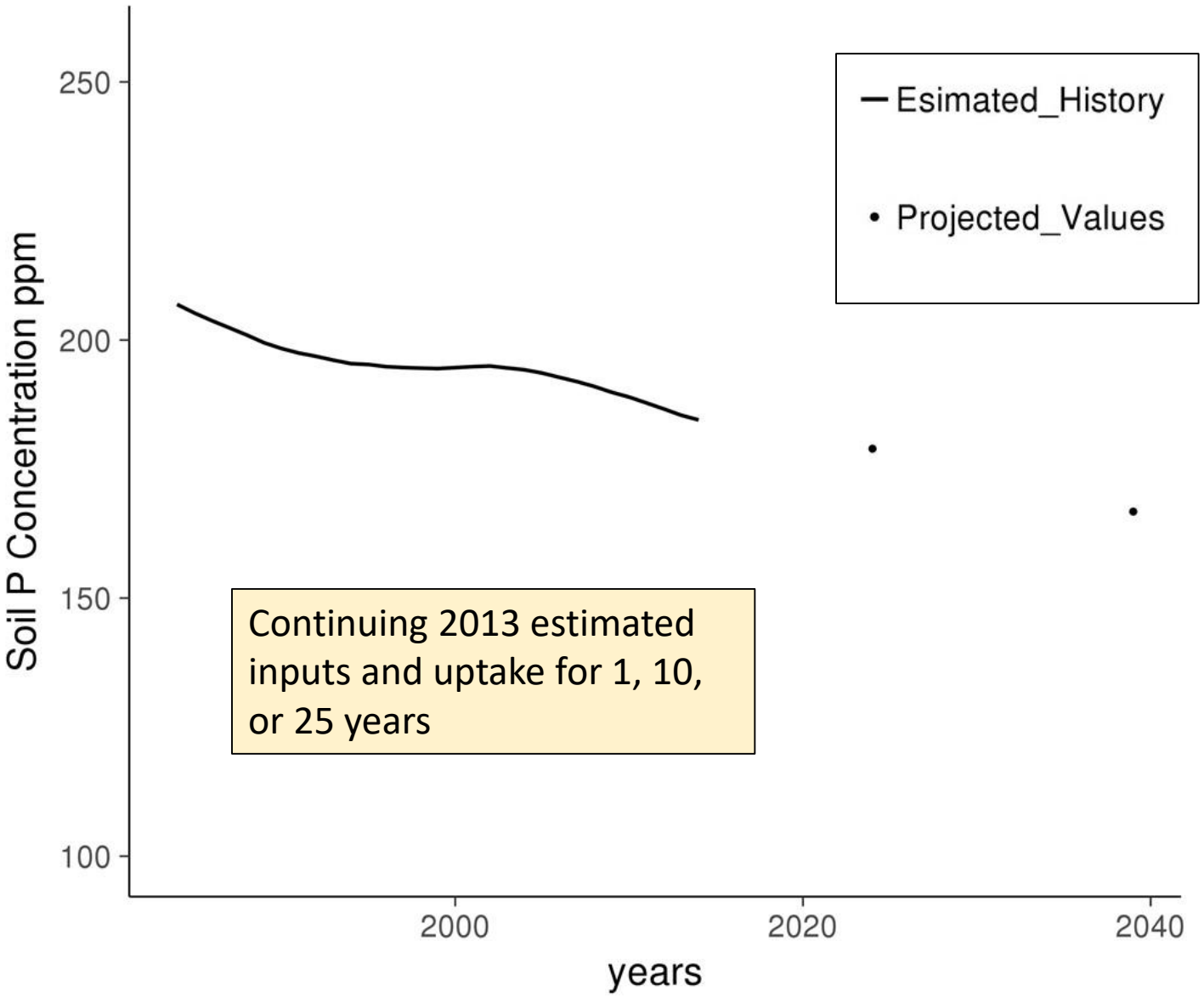
- Necessary implementation to ***eventually*** meet water quality standards



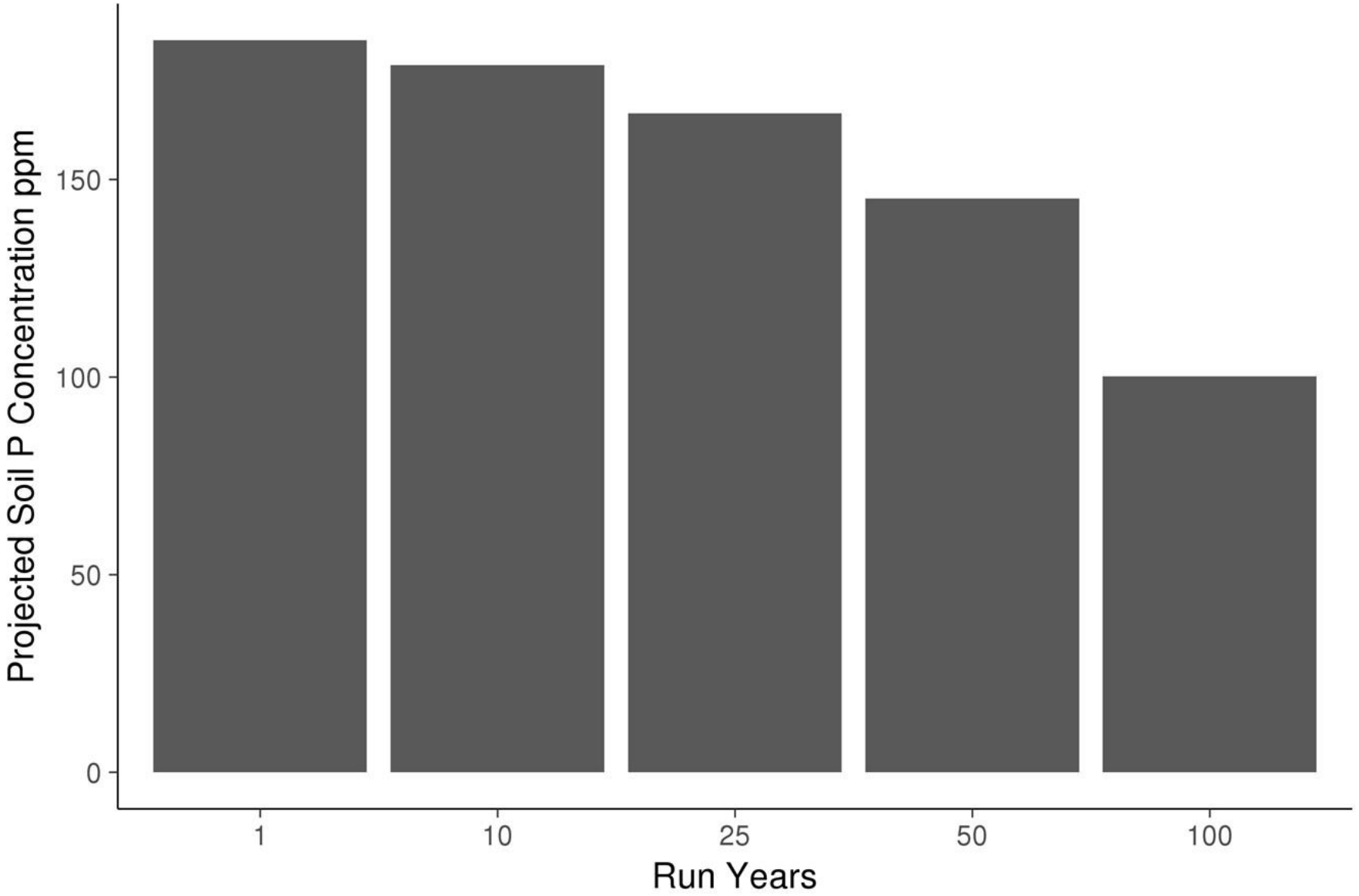
Options for Eventually

- 1 Year
  - Applications could change significantly with very, very minimal change in P soil, and thus P runoff.
  - Wastewater progress is measured in “current year” format.
  - Low uncertainty, low effect
- 10 Years
  - Most common credit duration for BMPs
  - Similar time period to nitrogen load.
- 25 Years
  - P drawdown study on Mid-Atlantic Coastal Plain estimated P could be drawn down from 200 ppm to 100 ppm Mehlich 3 in 25 years with zero additional inputs.
  - High effect, high uncertainty
- Something Else?

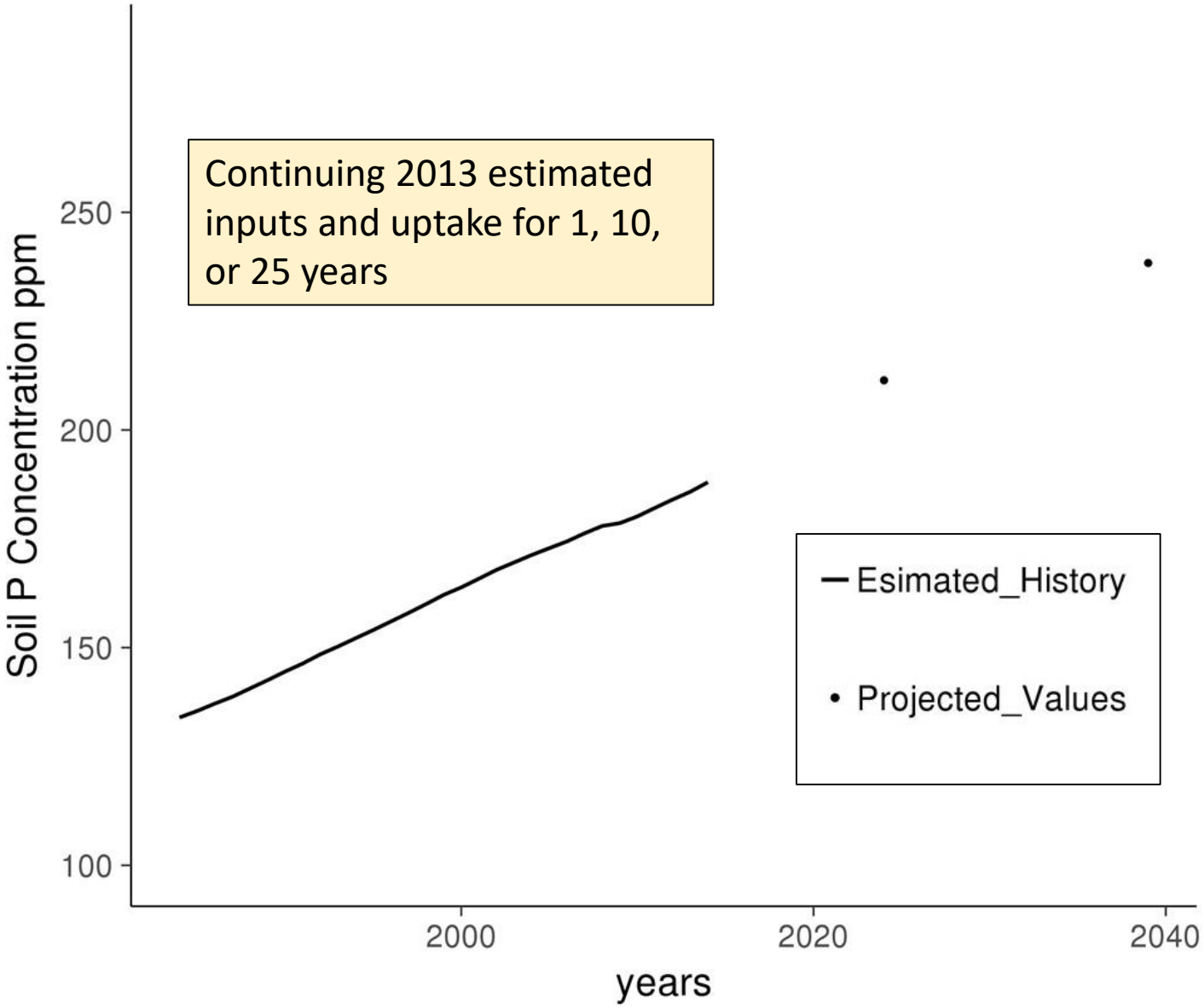
Sussex County, DE



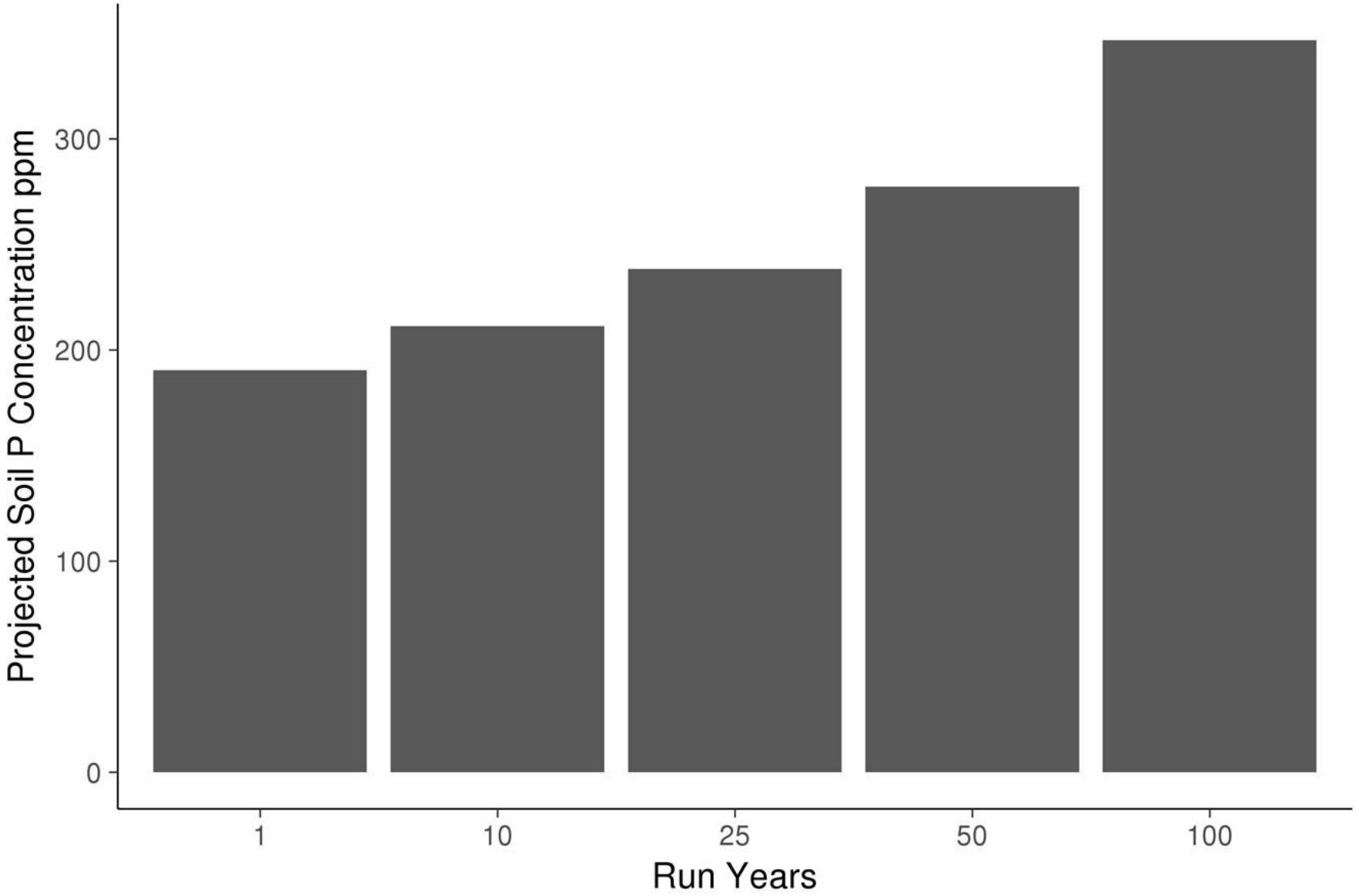
Sussex County, DE



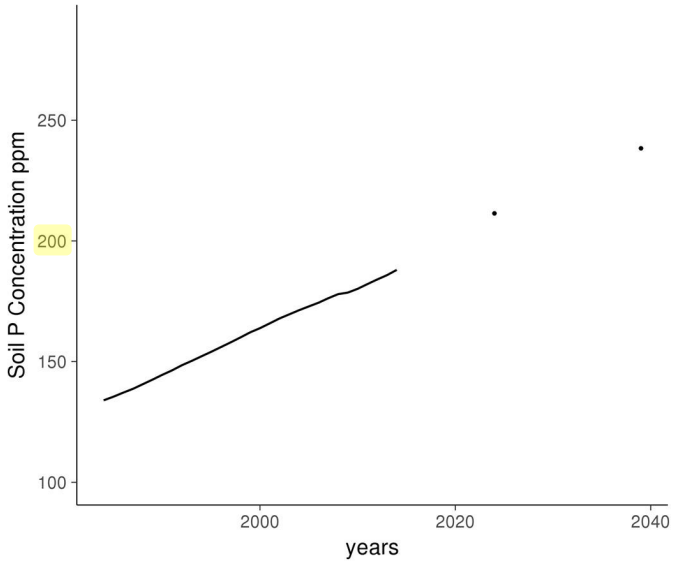
Somerset County, MD



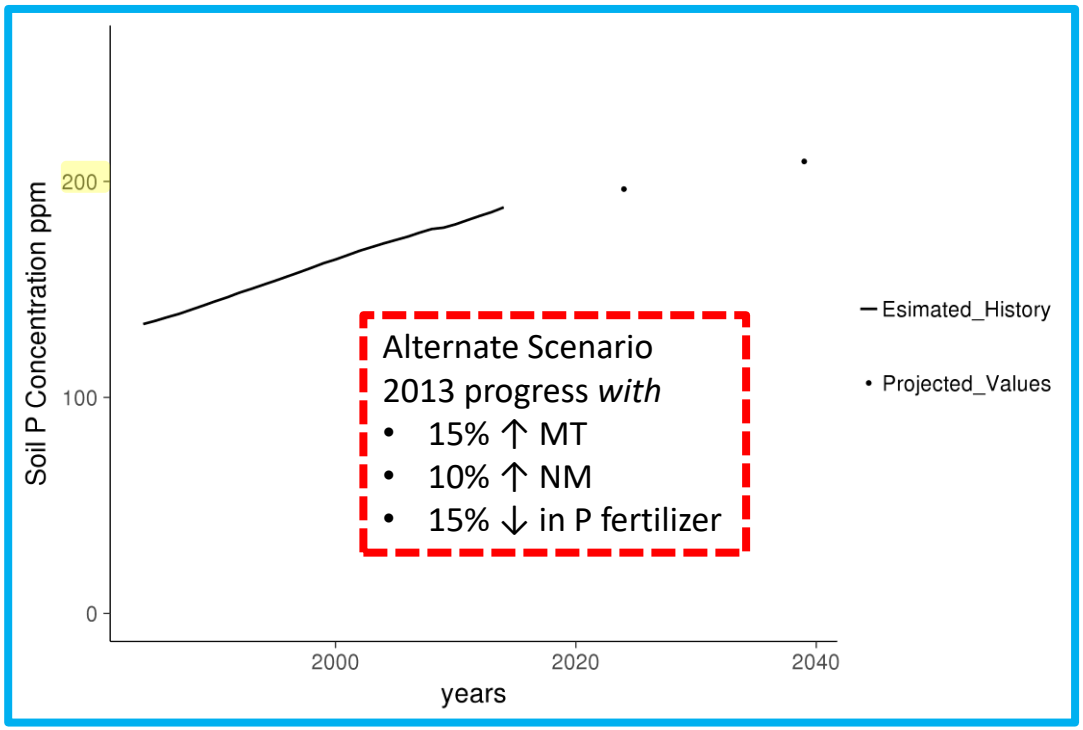
Somerset County, MD



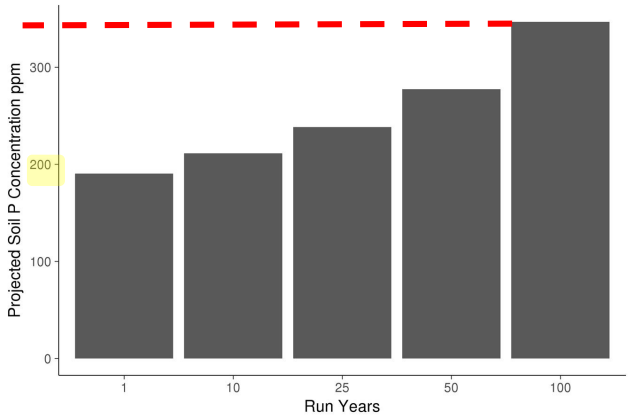
Somerset County, MD



Continuing 2013 estimated inputs and uptake for 1, 10, or 25 years

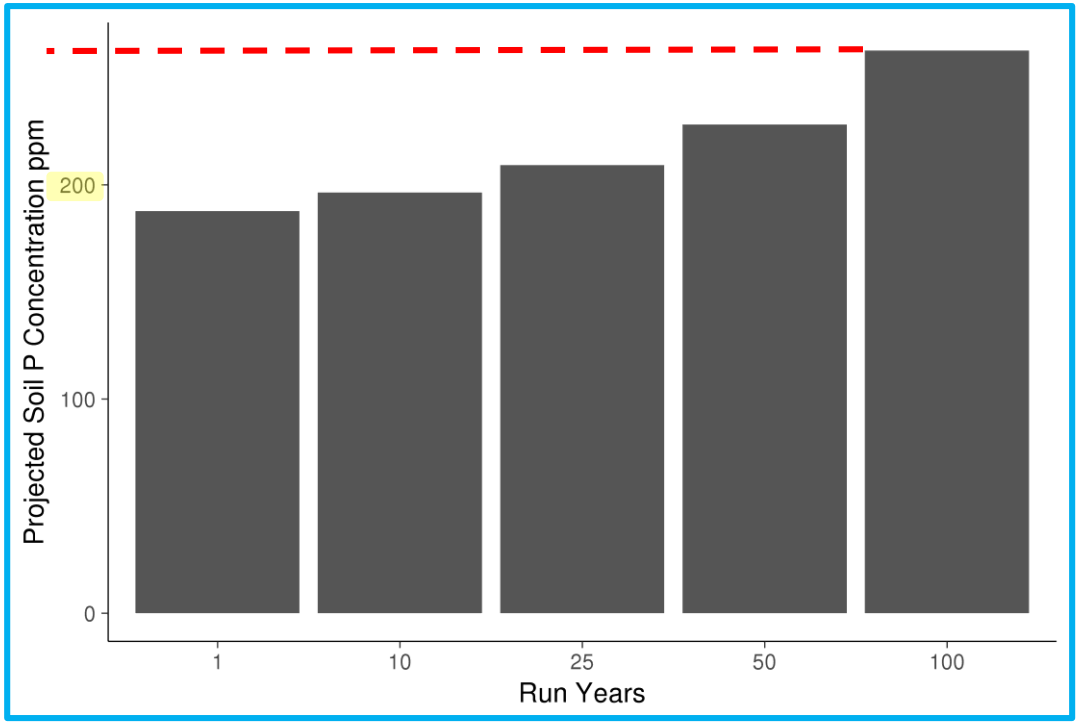


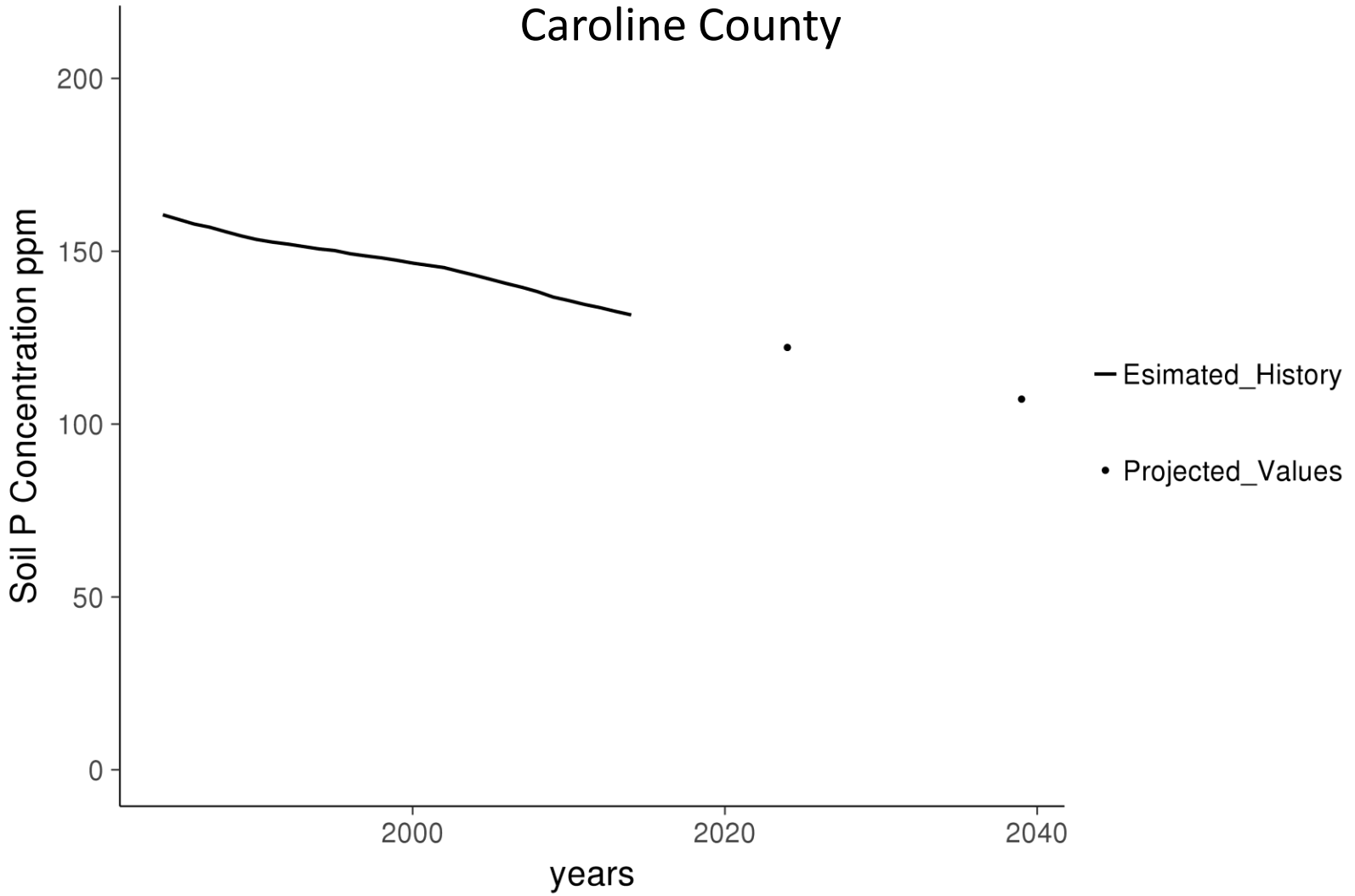
Somerset County, MD

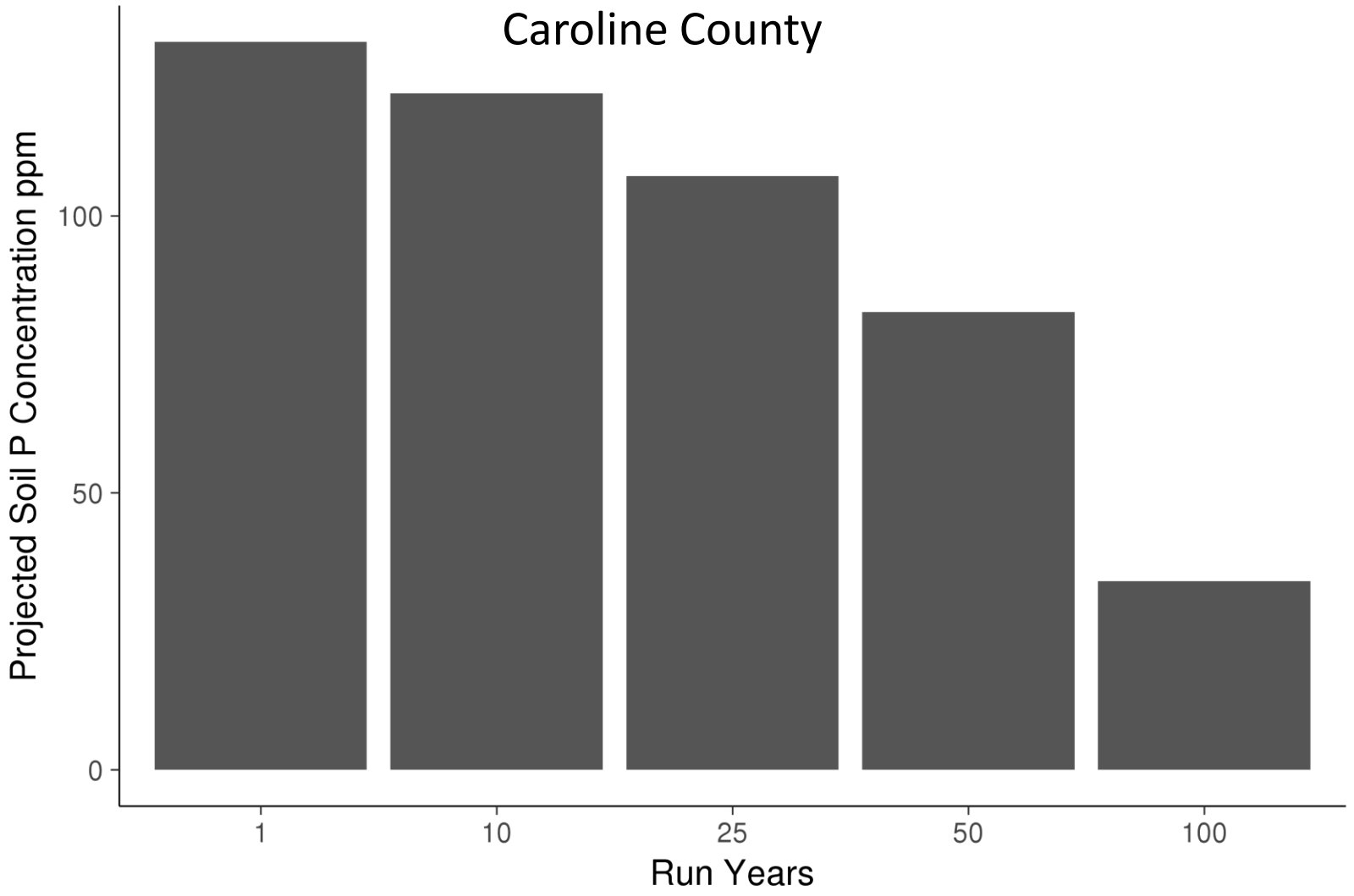


Alternate Scenario
2013 progress *with*

- 15% ↑ MT
- 10% ↑ NM
- 15% ↓ in P fertilizer




Caroline County
Soil P Concentration ppm
200
150
100
50
0
2000
2020
2040
years
Esimated_History
Projected_Values

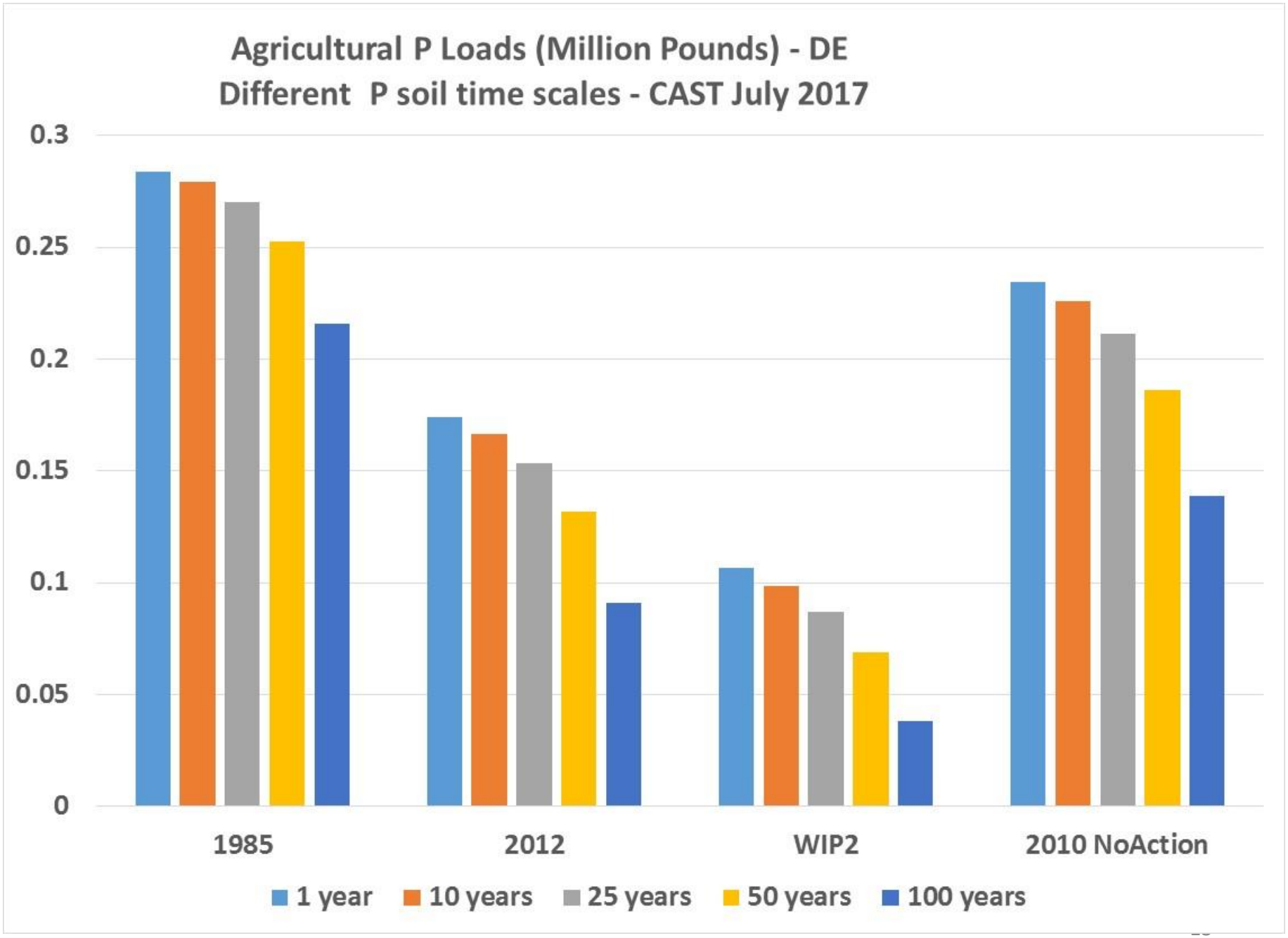

Caroline County
Projected Soil P Concentration ppm
100
50
0
1
10
25
50
100
Run Years

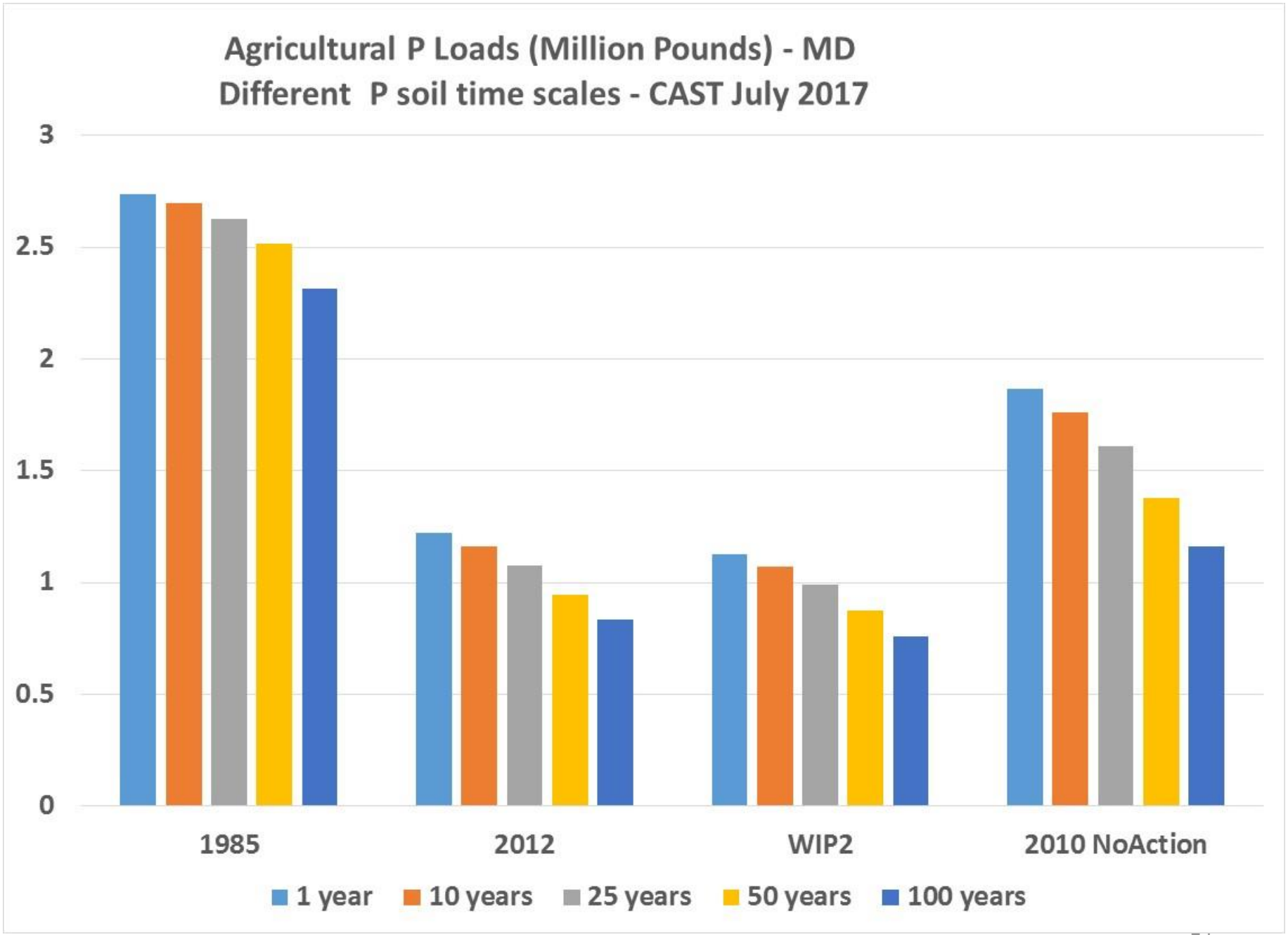
Average Load + ∆Inputs * Sensitivity

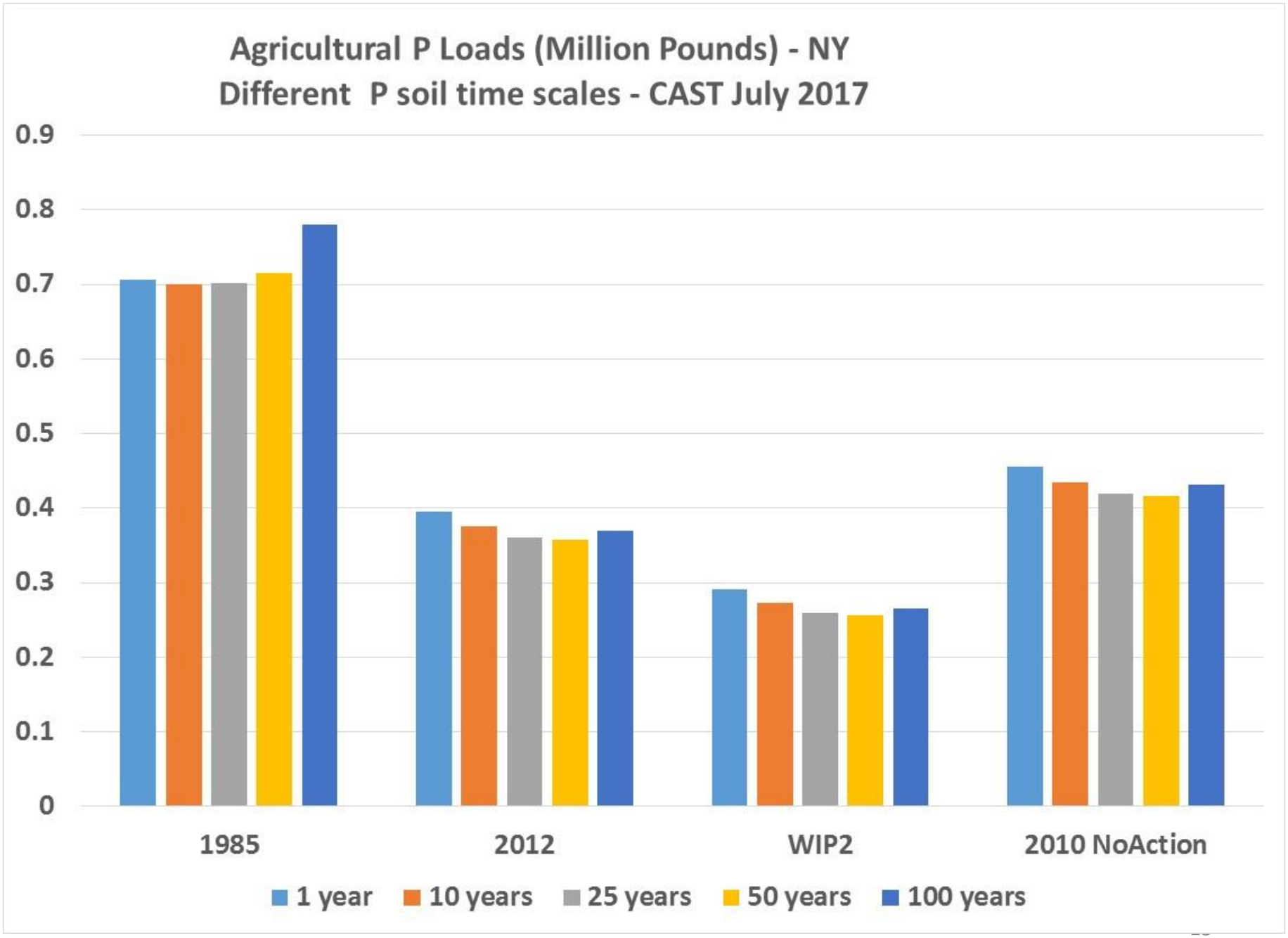
P Load from grain without manure =

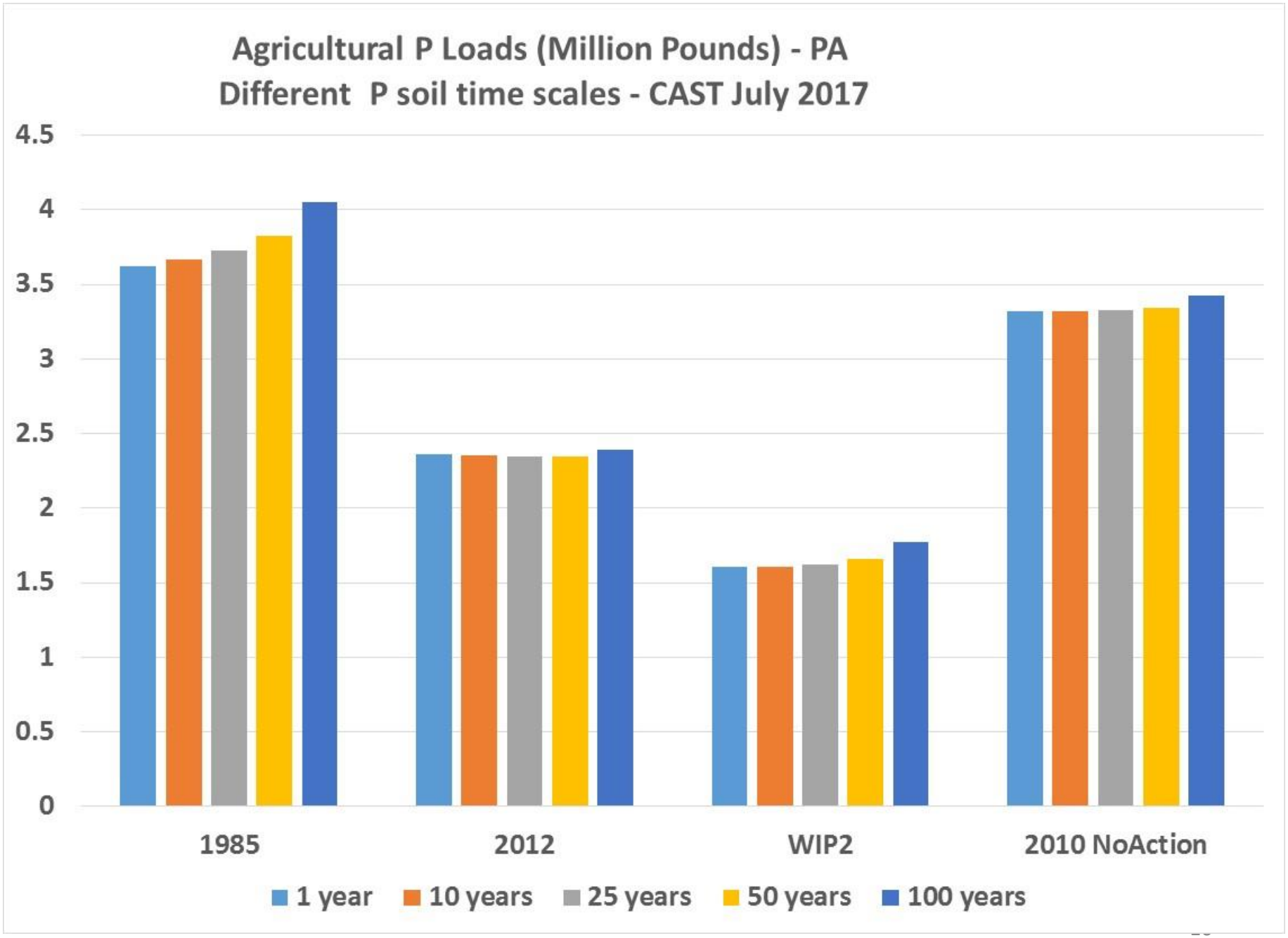
1.87 + 0.013 * (Mehlich – 98.2) ppm
+ 0.144 * (storm runoff - 6.73) inches
+ 0.049 * (sediment loss - 4.75) tons
+ 0.015 * (WEP – 14.3) lbs

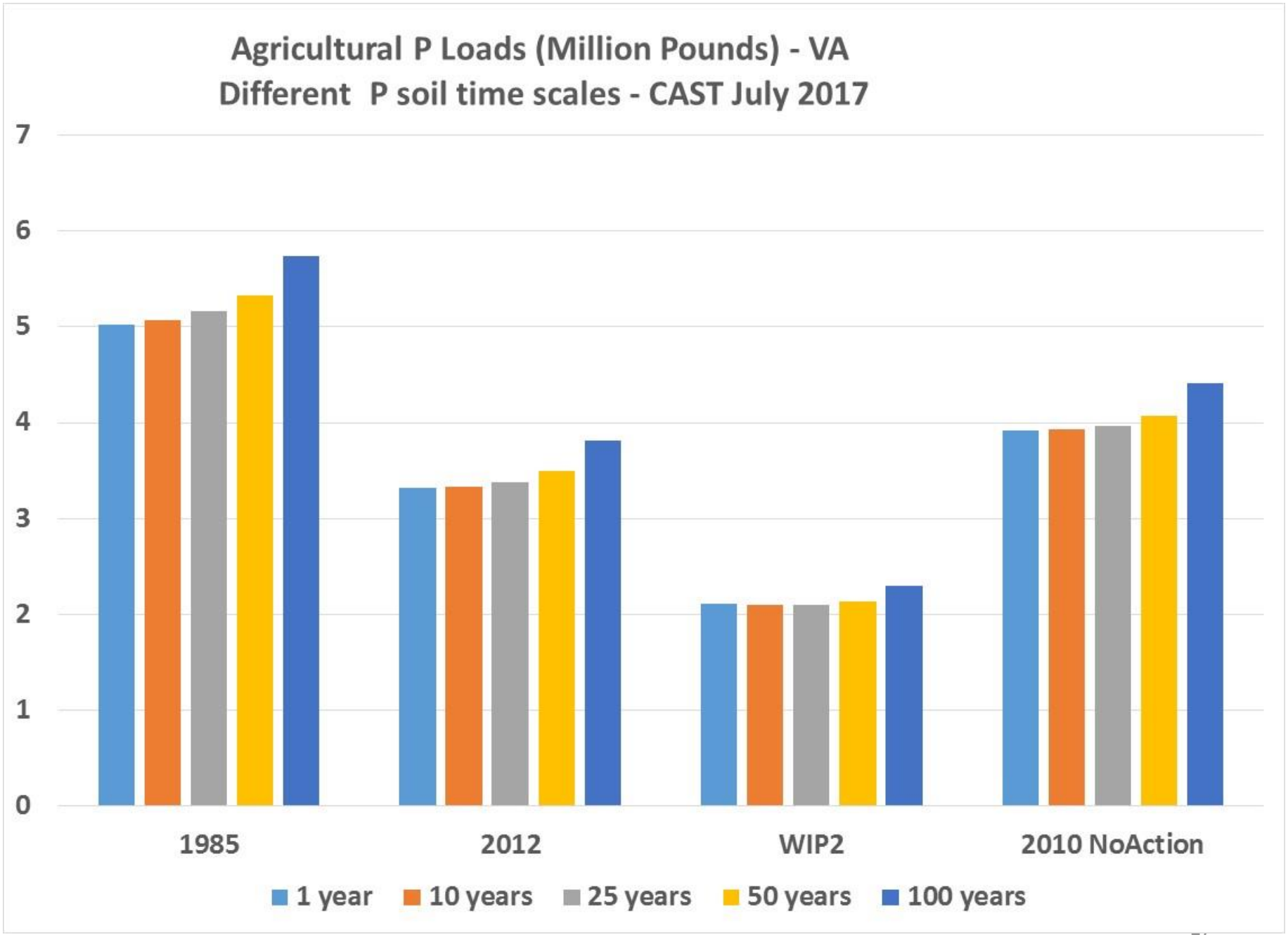
Source: http://www.androidauthority.com/best-android-calculator-apps-577878/

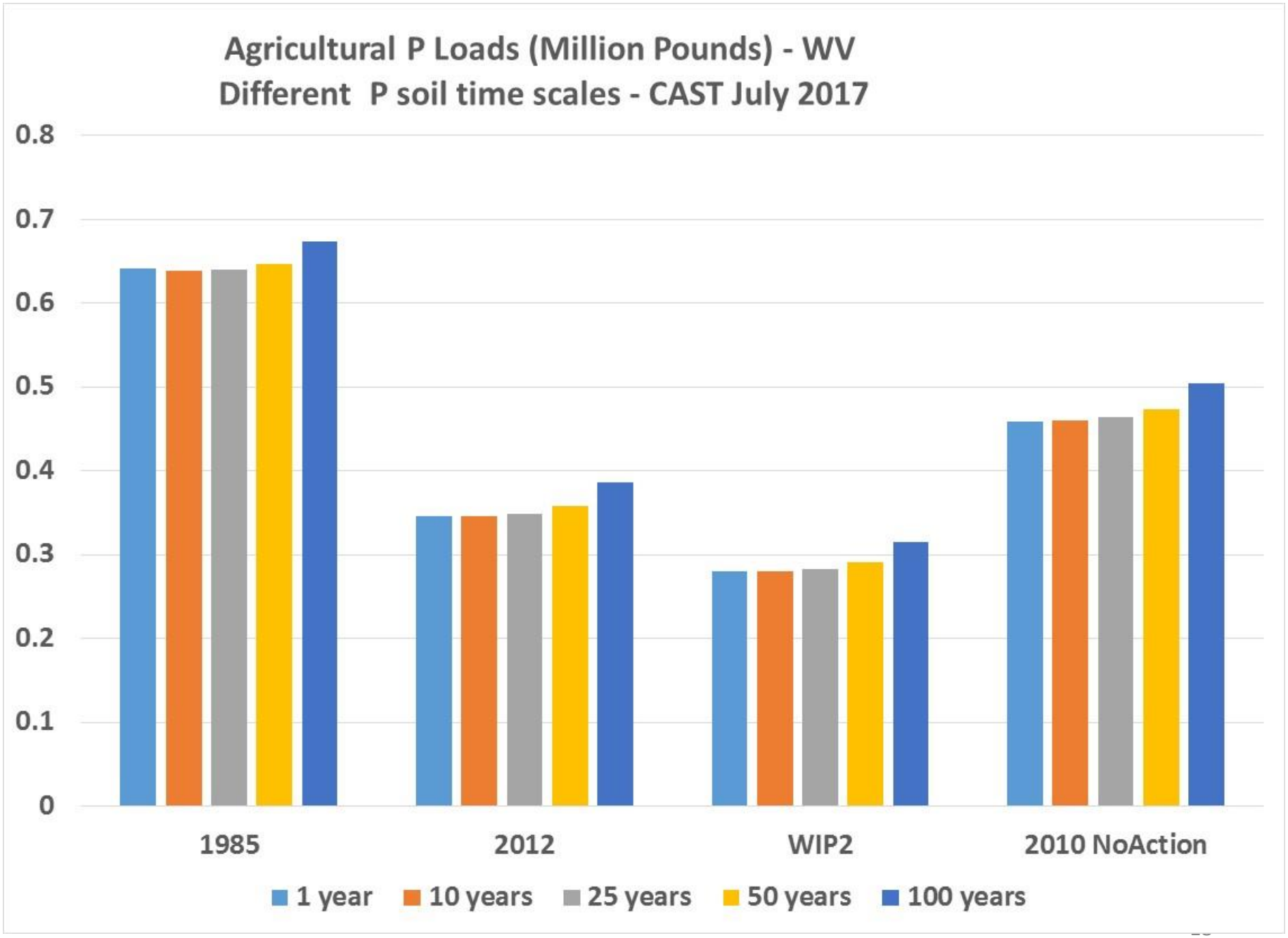

Agricultural P Loads (Million Pounds) - DE
Different P soil time scales - CAST July 2017
0.3
0.25
0.2
0.15
0.1
0.05
0
1985
2012
WIP2
2010 NoAction
1 year
10 years
25 years
50 years
100 years

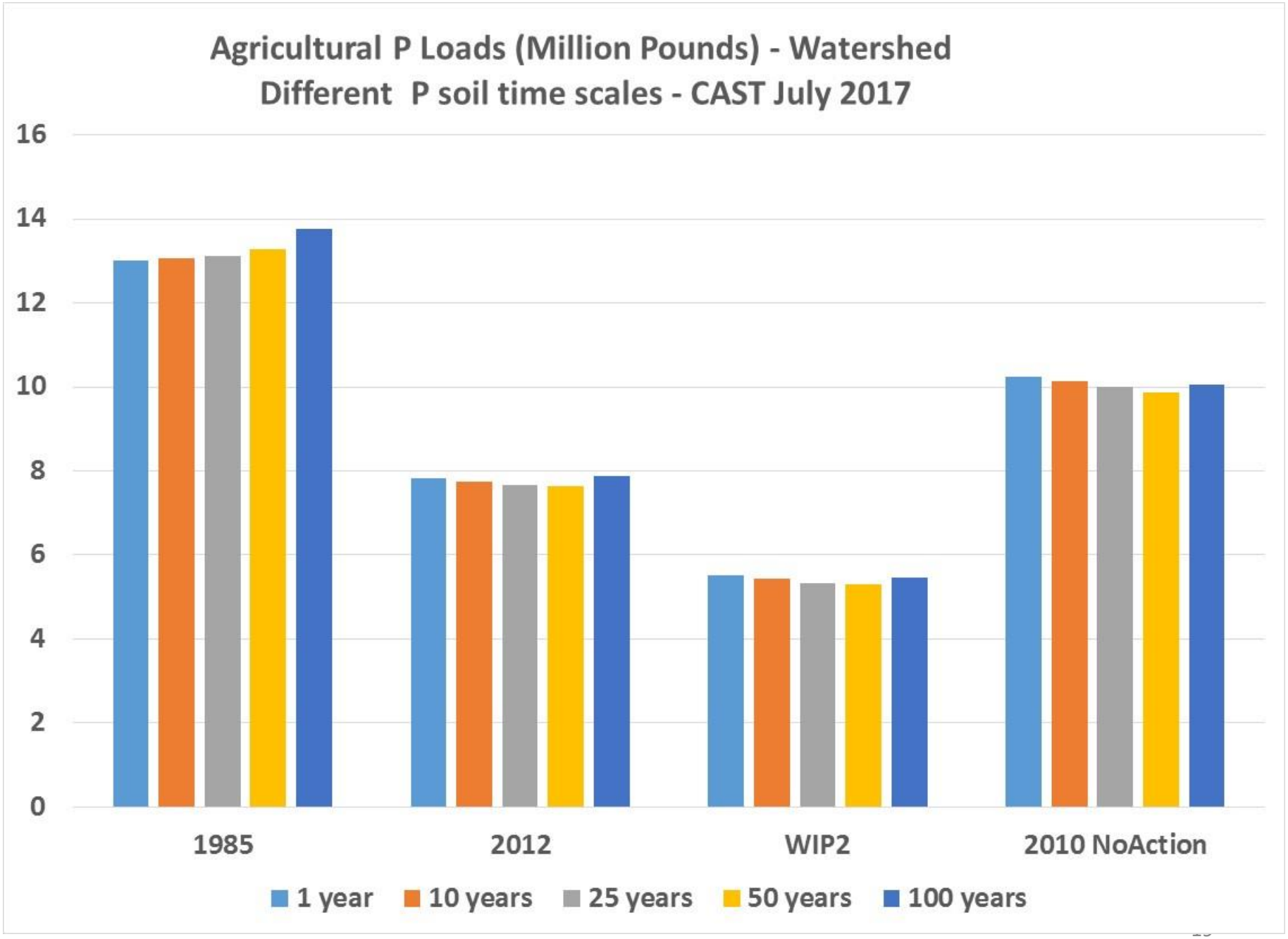

Agricultural P Loads (Million Pounds) - MD
Different P soil time scales - CAST July 2017
3
2.5
2
1.5
1
0.5
0
1985
2012
WIP2
2010 NoAction
1 year
10 years
25 years
50 years
100 years

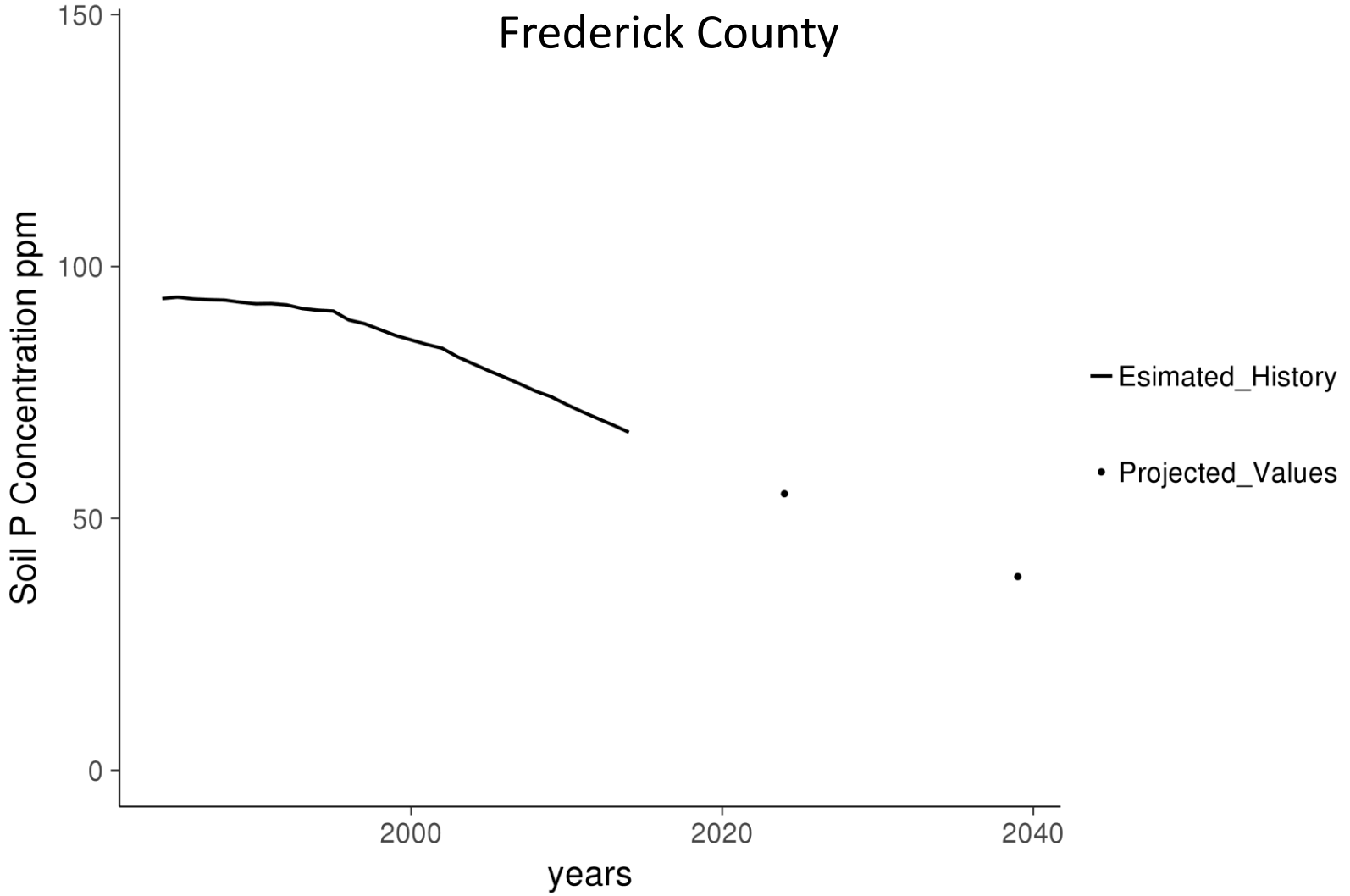

Agricultural P Loads (Million Pounds) - NY
Different P soil time scales - CAST July 2017
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1985
2012
WIP2
2010 NoAction
1 year
10 years
25 years
50 years
100 years

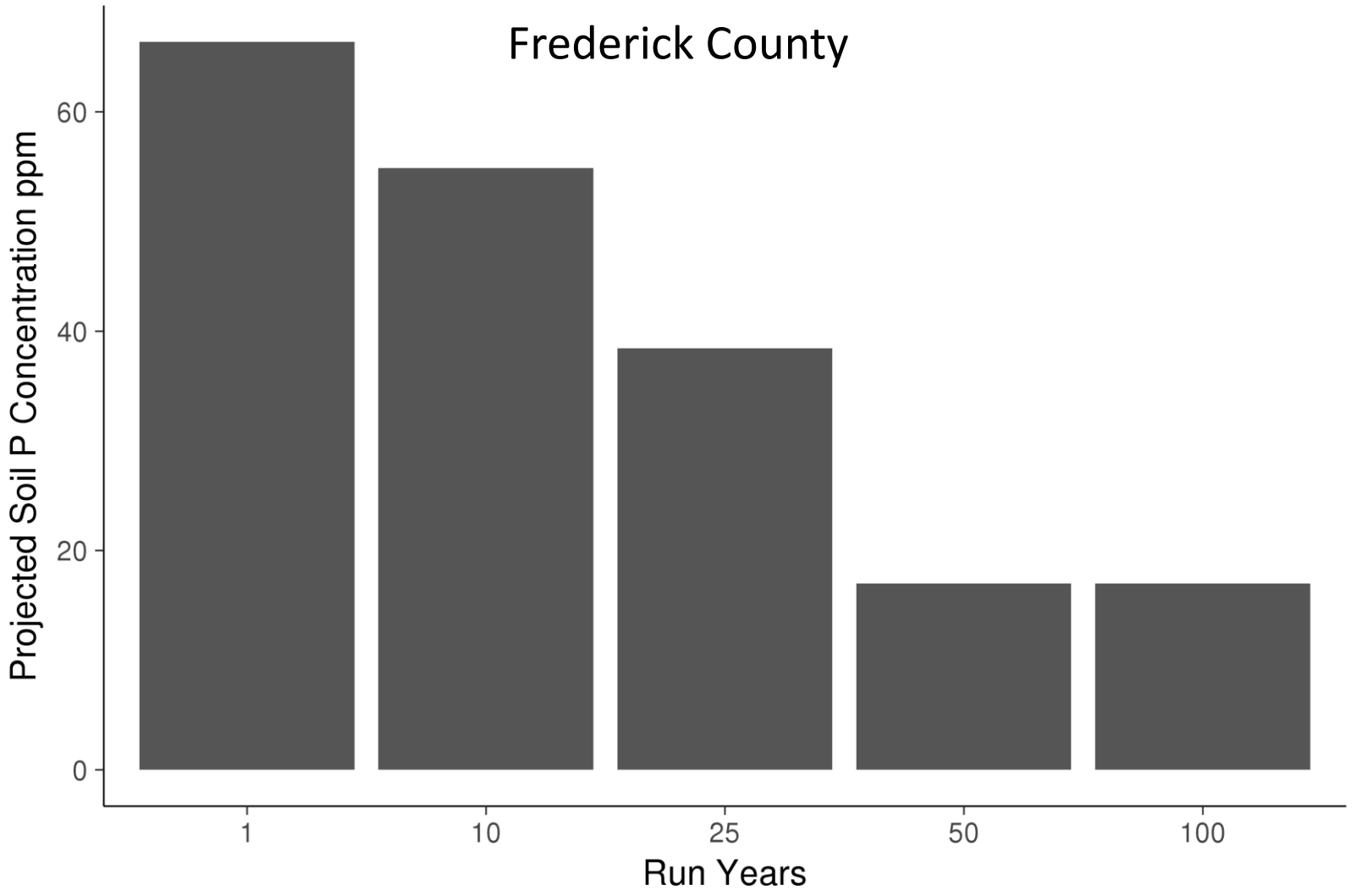

Agricultural P Loads (Million Pounds) - PA
Different P soil time scales - CAST July 2017
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1985
2012
WIP2
2010 NoAction
1 year
10 years
25 years
50 years
100 years

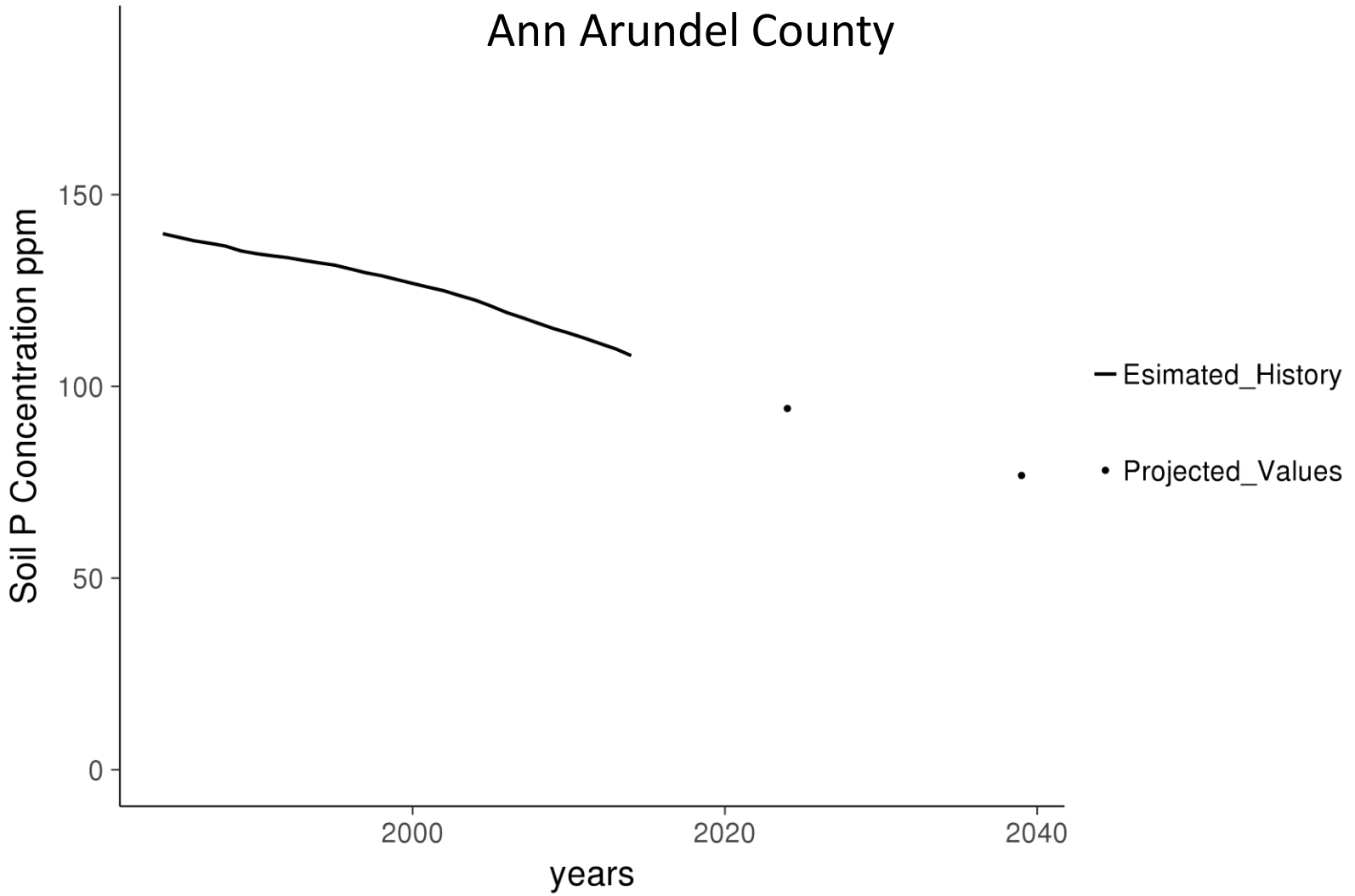

Agricultural P Loads (Million Pounds) - VA
Different P soil time scales - CAST July 2017
7
6
5
4
3
2
1
0
1985
2012
WIP2
2010 NoAction
1 year
10 years
25 years
50 years
100 years

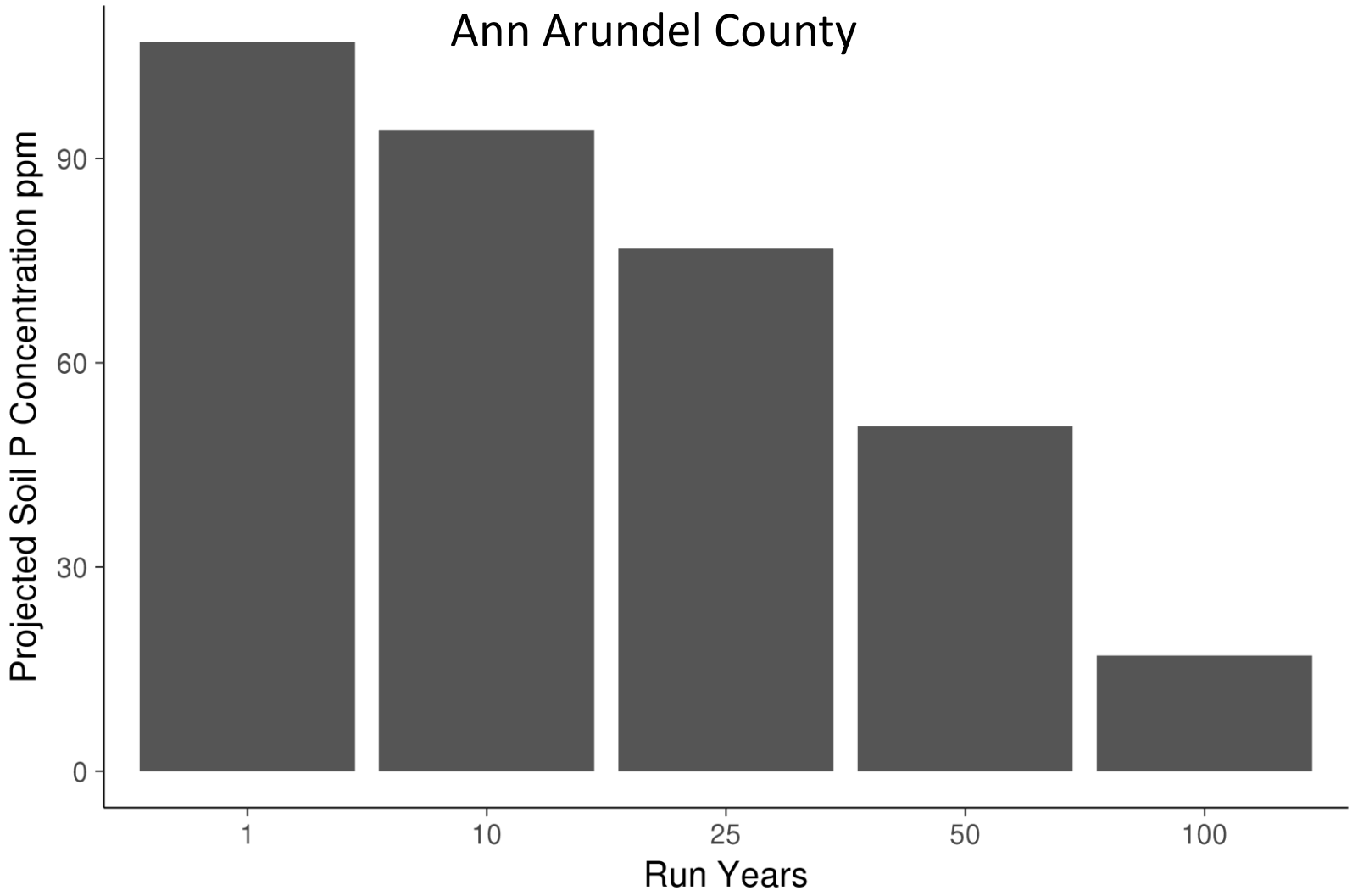

Agricultural P Loads (Million Pounds) - WV
Different P soil time scales - CAST July 2017
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1985
2012
WIP2
2010 NoAction
1 year
10 years
25 years
50 years
100 years

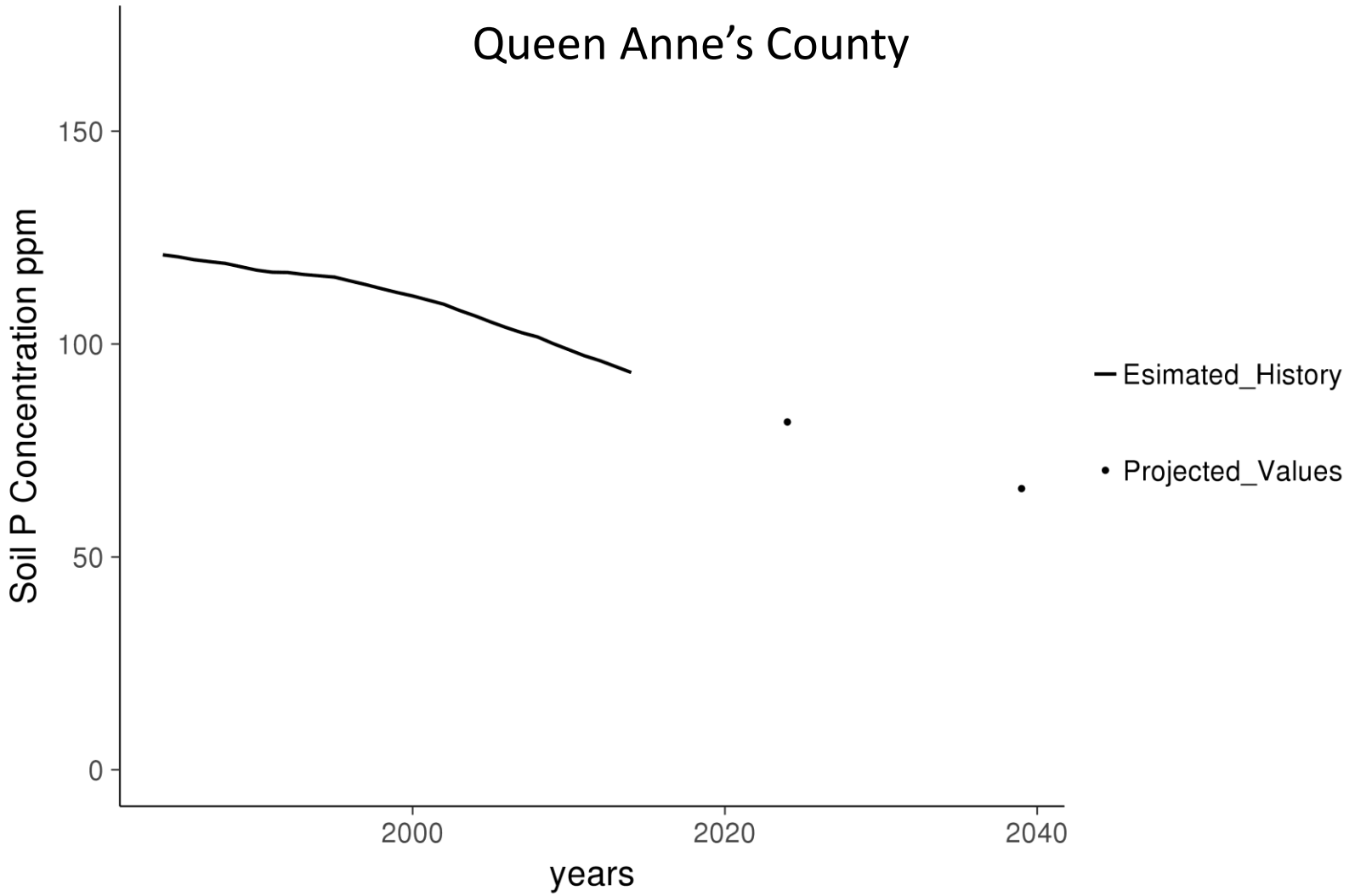

Agricultural P Loads (Million Pounds) - Watershed
Different P soil time scales - CAST July 2017
16
14
12
10
8
6
4
2
0
1985
2012
WIP2
2010 NoAction
1 year
10 years
25 years
50 years
100 years

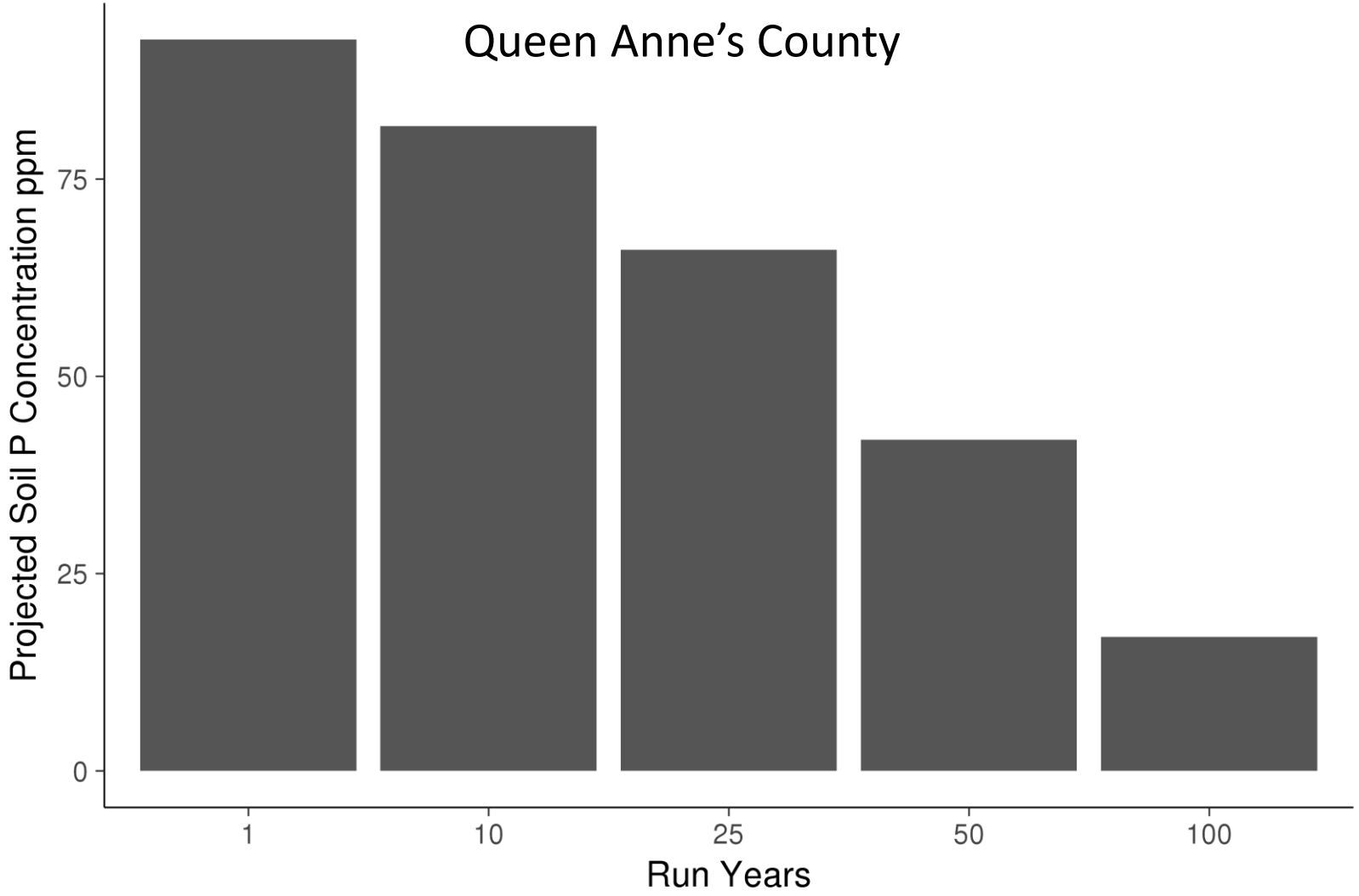

Frederick County
150
100
50
0
Soil P Concentration ppm
2000
2020
2040
years
Esimated_History
Projected_Values


Frederick County
Projected Soil P Concentration ppm
60
40
20
0
1
10
25
50
100
Run Years


Ann Arundel County
Soil P Concentration ppm
150
100
50
0
2000
2020
2040
years
Esimated_History
Projected_Values


Ann Arundel County
Projected Soil P Concentration ppm
90
60
30
0
1
10
25
50
100
Run Years


Queen Anne's County
Soil P Concentration ppm
150
100
50
0
2000
2020
2040
years
Esimated_History
Projected_Values


Queen Anne's County
Projected Soil P Concentration ppm
75
50
25
0
1
10
25
50
100
Run Years