

PM_{2.5} Design Value and Headroom Maps

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Background

- The proposed reconsideration of the National Ambient Air Quality Standards (NAAQS) for particulate matter (PM) was published in the Federal Register on January 27th, 2023 (88 FR 5558)
- EPA proposes to revise the primary annual PM_{2.5} standard by lowering the level from 12.0 µg/m³ to within the range of 9.0 to 10.0 µg/m³ while taking comment on alternative annual standard levels down to 8.0 µg/m³ and up to 11.0 µg/m³
 - At these levels, the new standards will have significant and broad consequences for state regulatory agencies and for stakeholders across the US, potentially impacting many new groups
- The Agency proposes to retain the current primary 24-hour PM_{2.5} standard, the primary 24-hour PM₁₀ standard, the secondary 24-hour PM_{2.5} standard, secondary annual PM_{2.5} standard, and secondary 24-hour PM₁₀ standard
- Important to note that EPA has also committed to reviewing the ozone standard and that states may soon be faced with implementing two new significantly tighter NAAQS

American Petroleum Institute (API) Project Objective

- Two-phase project authorized by API to configure and execute a modeling analysis designed to support review of PM_{2.5} issues and potential comment on the NPR and RIA of a revised PM_{2.5} NAAQS
- Presented here is the first phase: review of existing nonattainment and alternate NAAQS thresholds using current design values

ANNUAL PM_{2.5} DESIGN VALUES AND MAPS

County and CBSA Values (Monitored)

- County-level maximum and CBSA values calculated from monitor-level 3-year design values (2019-2021) as published by EPA
 - <https://www.epa.gov/air-trends/air-quality-design-values>
- All counties within each CBSA are assigned maximum monitor values from any county within the CBSA
- Counties without CBSA association are individually identified and given maximum monitor value within that county

Census Tract Values (Monitoring/Modeling Blend)

- Census tract values obtained from EPA's Office of Air and Radiation (OAR) based on public monitoring data, CMAQ results, and a fusion model to combine them
 - Data represents 2018 annual average PM_{2.5} concentrations (µg/m³)
 - https://gaftp.epa.gov/EJSCREEN/2021/EJSCREEN_2021_USPR_Tracts.csv.zip

County/CBSA and Census Tract Overlay Maps

- Maps include overlay of monitored county/CBSA maximum annual average PM_{2.5} design values (2019-2021) and monitored/modeled blend 2018 annual average concentrations
 - Red = monitored county/CBSA exceeds threshold (e.g., > 8 µg/m³)
 - Orange = monitored/modeled blend census tract exceeds threshold

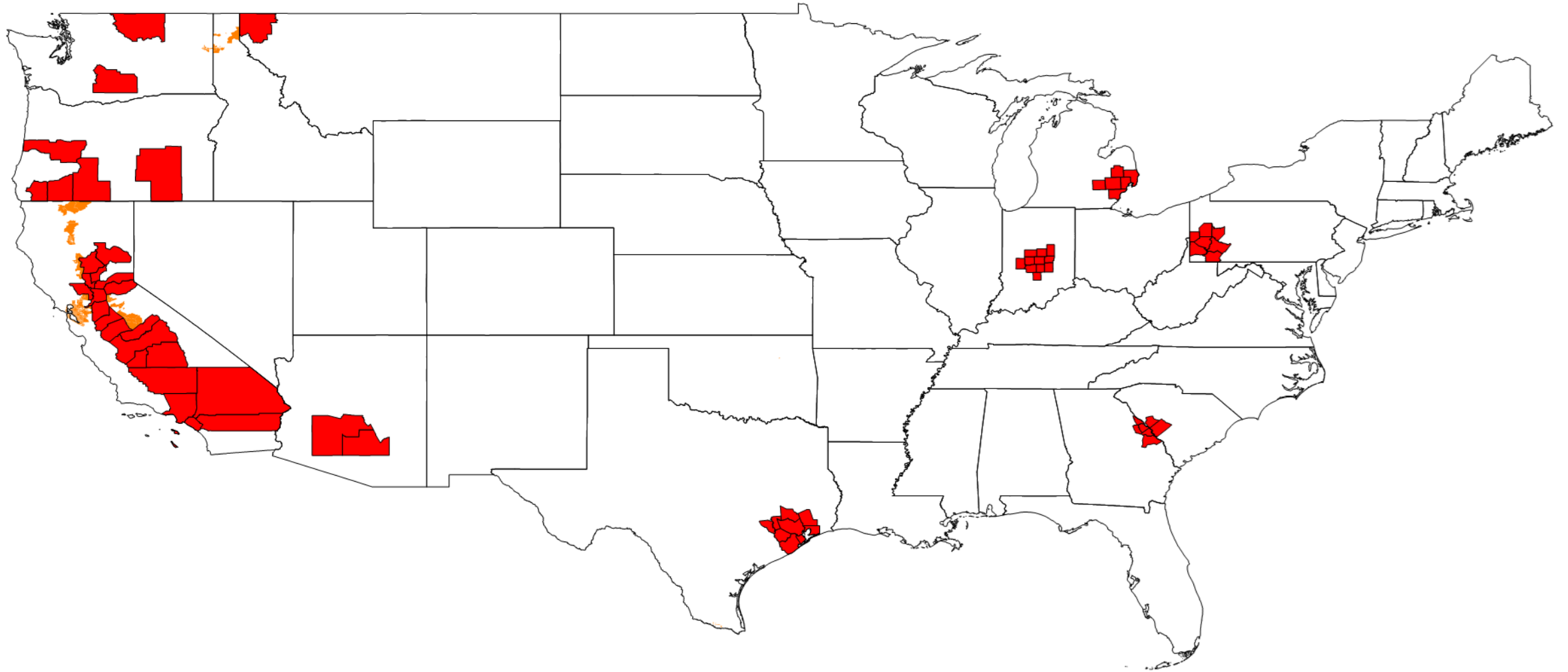
Annual Average PM_{2.5} Concentration > 12.0 µg/m³



Red = Monitored County/CBSA Level (2019-2021 DV)

Orange = Monitored/Modeled Blended Census Tract Level (2018 Ann Avg)

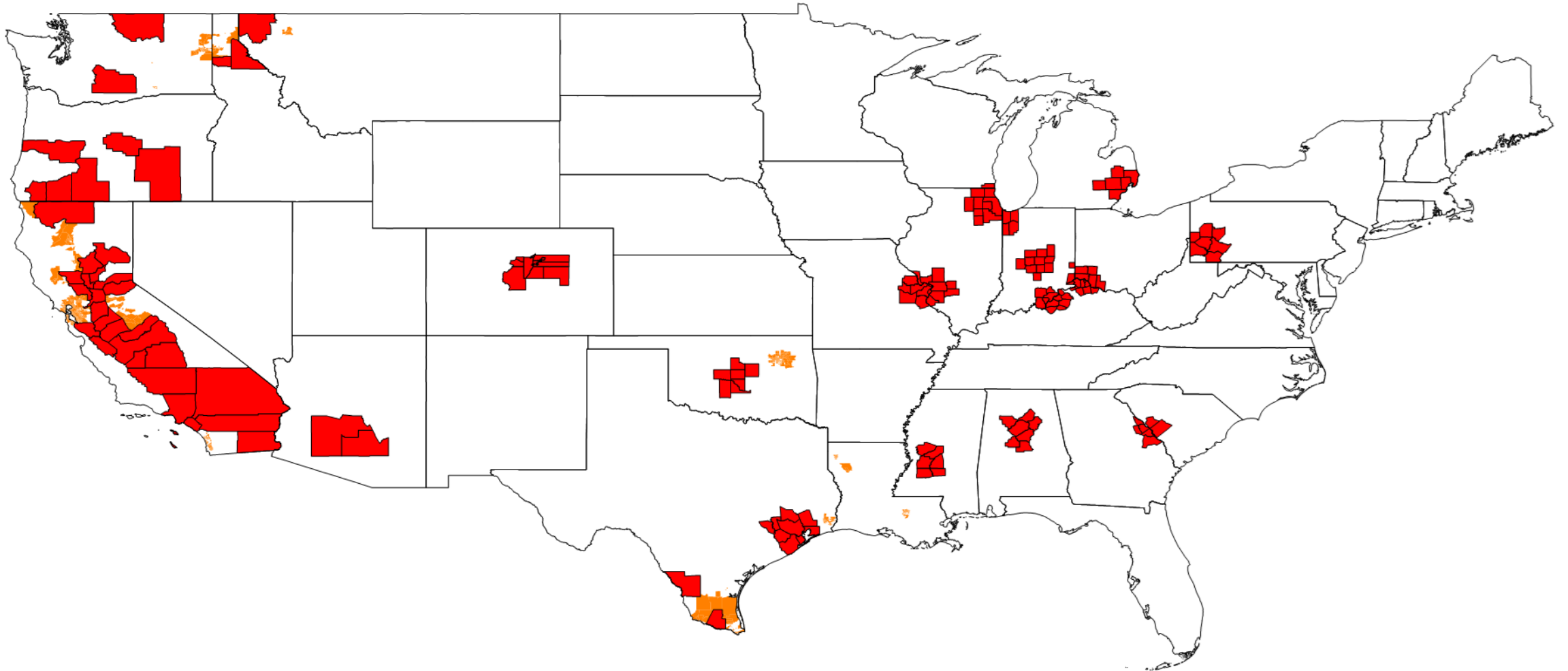
Annual Average PM_{2.5} Concentration > 11.0 µg/m³



Red = Monitored County/CBSA Level (2019-2021 DV)

Orange = Monitored/Modeled Blended Census Tract Level (2018 Ann Avg)

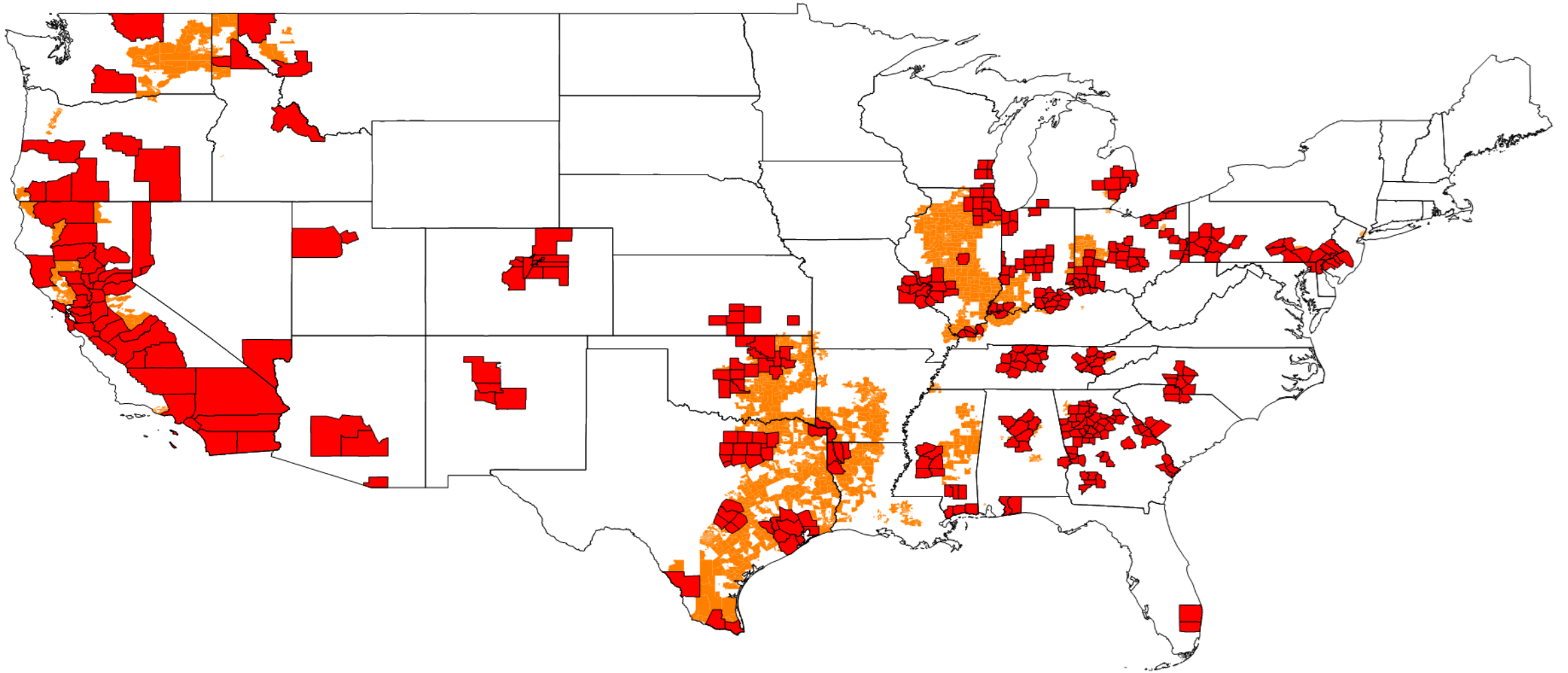
Annual Average PM_{2.5} Concentration > 10.0 µg/m³



Red = Monitored County/CBSA Level (2019-2021 DV)

Orange = Monitored/Modeled Blended Census Tract Level (2018 Ann Avg)

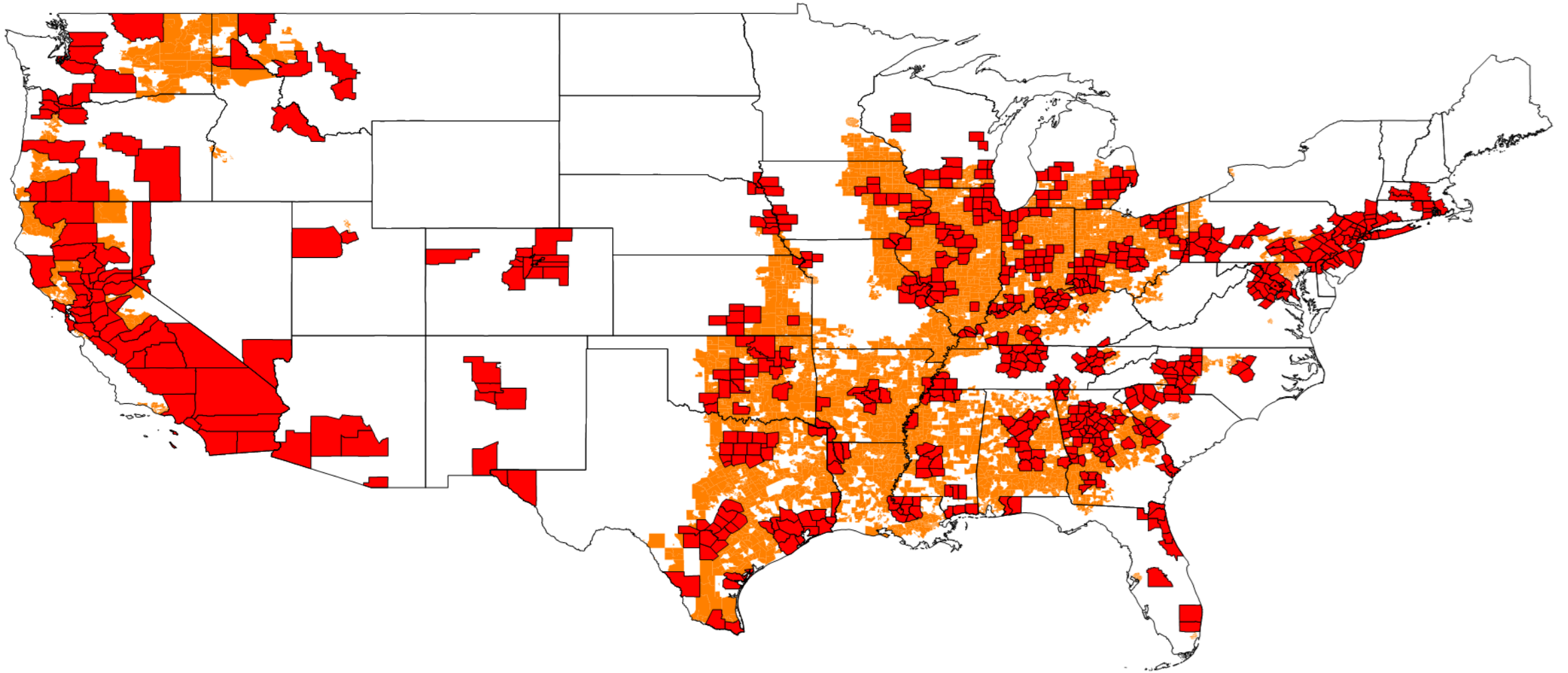
Annual Average PM_{2.5} Concentration > 9.0 µg/m³



Red = Monitored County/CBSA Level (2019-2021 DV)

Orange = Monitored/Modeled Blended Census Tract Level (2018 Ann Avg)

Annual Average PM_{2.5} Concentration > 8.0 µg/m³



Red = Monitored County/CBSA Level (2019-2021 DV)

Orange = Monitored/Modeled Blended Census Tract Level (2018 Ann Avg)

HEADROOM

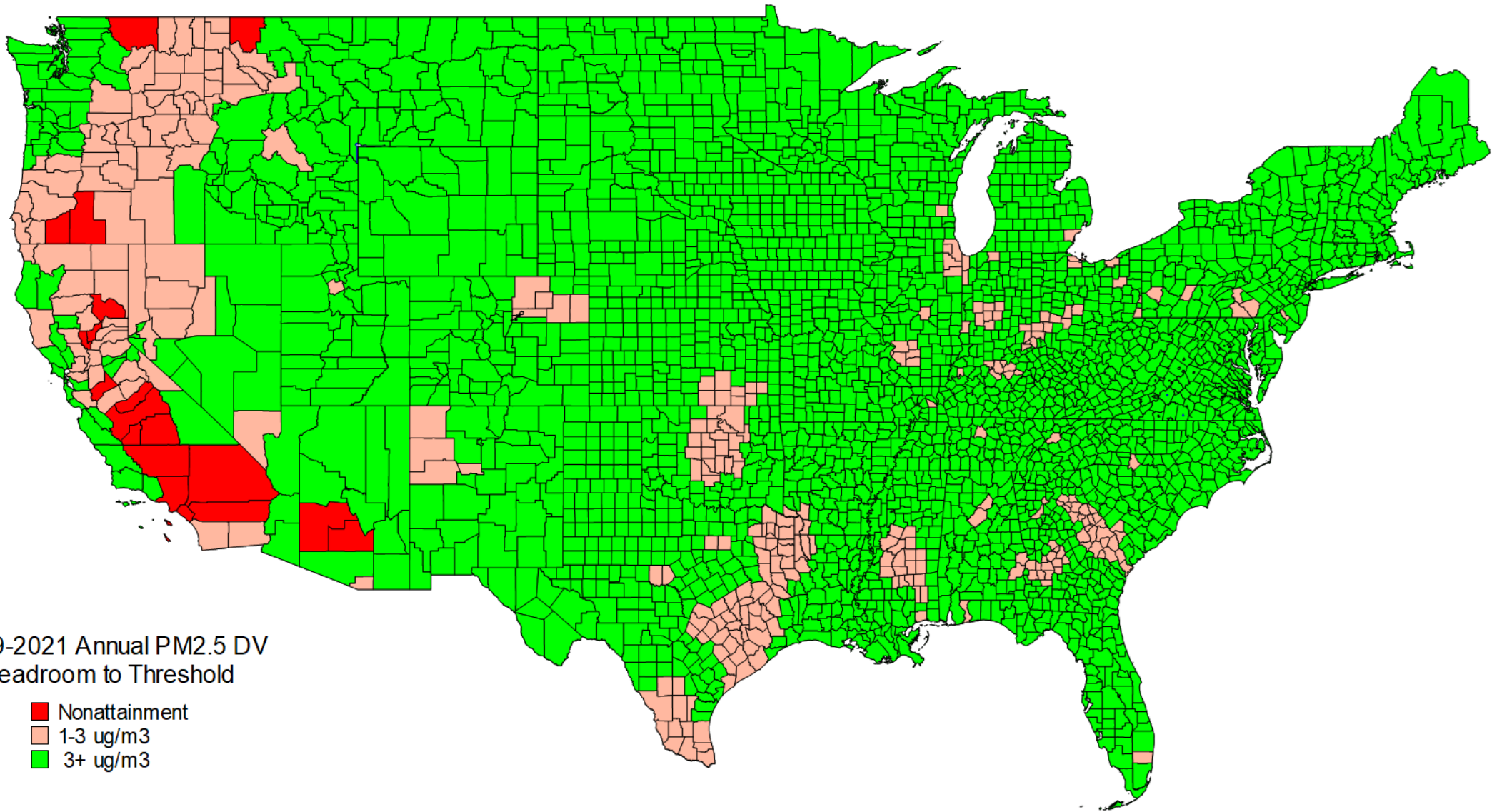
Impact on Industry

- Industry will need to consider how close their area is to the new NAAQS
- Prevention of Significant Deterioration (PSD) applies to new major sources or major modifications at existing sources for pollutants where the area the source is located is in attainment or unclassifiable with the NAAQS
 - It requires installation of BACT, an air quality analysis, an additional impacts analysis, and public involvement
 - Modeled project impacts are added to “background” and compared to standard

Proximity to Nonattainment

- Not only will areas be in nonattainment of the NAAQS, but the “Headroom” between projected levels and proposed NAAQS will be limited
 - “Headroom” is remaining $\mu\text{g}/\text{m}^3$ to reach noted threshold (i.e., how large a modeled project impact can be before exceeding NAAQS)
- Following maps generated used maximum $\text{PM}_{2.5}$ DVs to represent each monitored county with calculated non-monitored counties using geospatial statistical interpolation
 - Five closest monitored values used to estimate non-monitored county values using this inverse-distance weighted averaging method

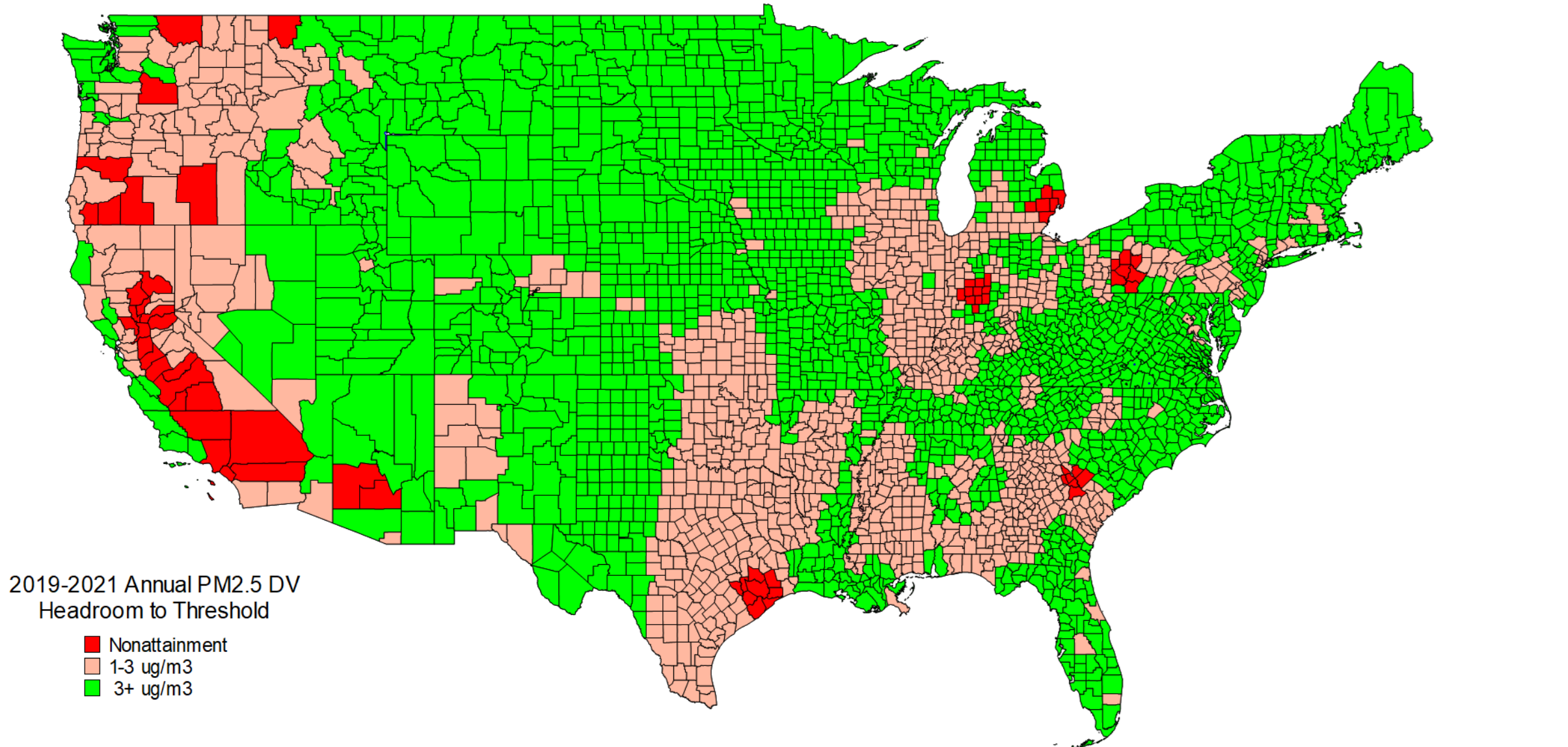
Headroom to 12 $\mu\text{g}/\text{m}^3$ with Current 2019-2021 DVs



2019-2021 Annual PM2.5 DV
Headroom to Threshold

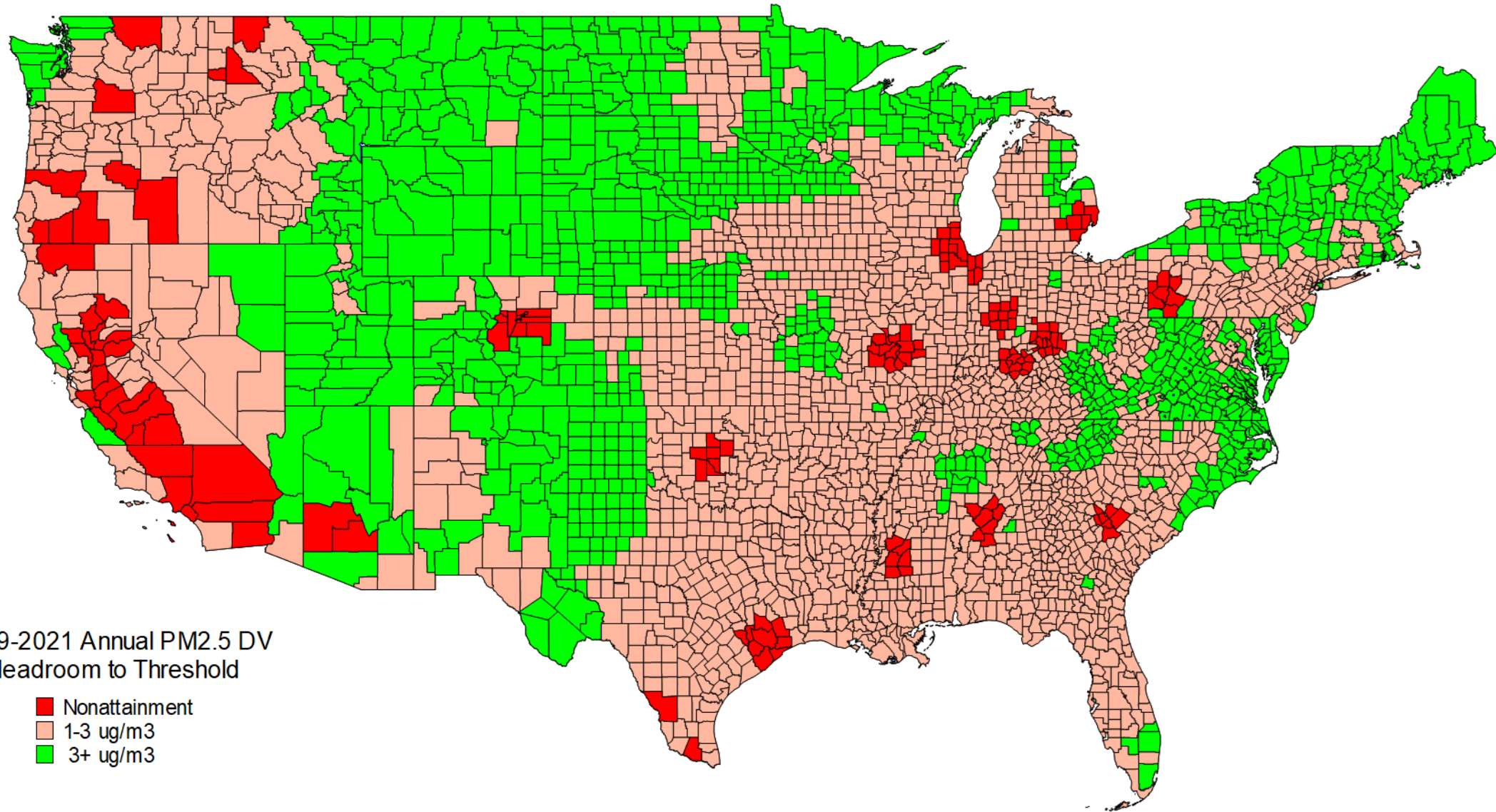
- Nonattainment
- 1-3 $\mu\text{g}/\text{m}^3$
- 3+ $\mu\text{g}/\text{m}^3$

Headroom to $11 \mu\text{g}/\text{m}^3$ with Current 2019-2021 DVs



Non-monitored county values are calculated using inverse distance weighting average of five closest monitored values

Headroom to $10 \mu\text{g}/\text{m}^3$ with Current 2019-2021 DVs

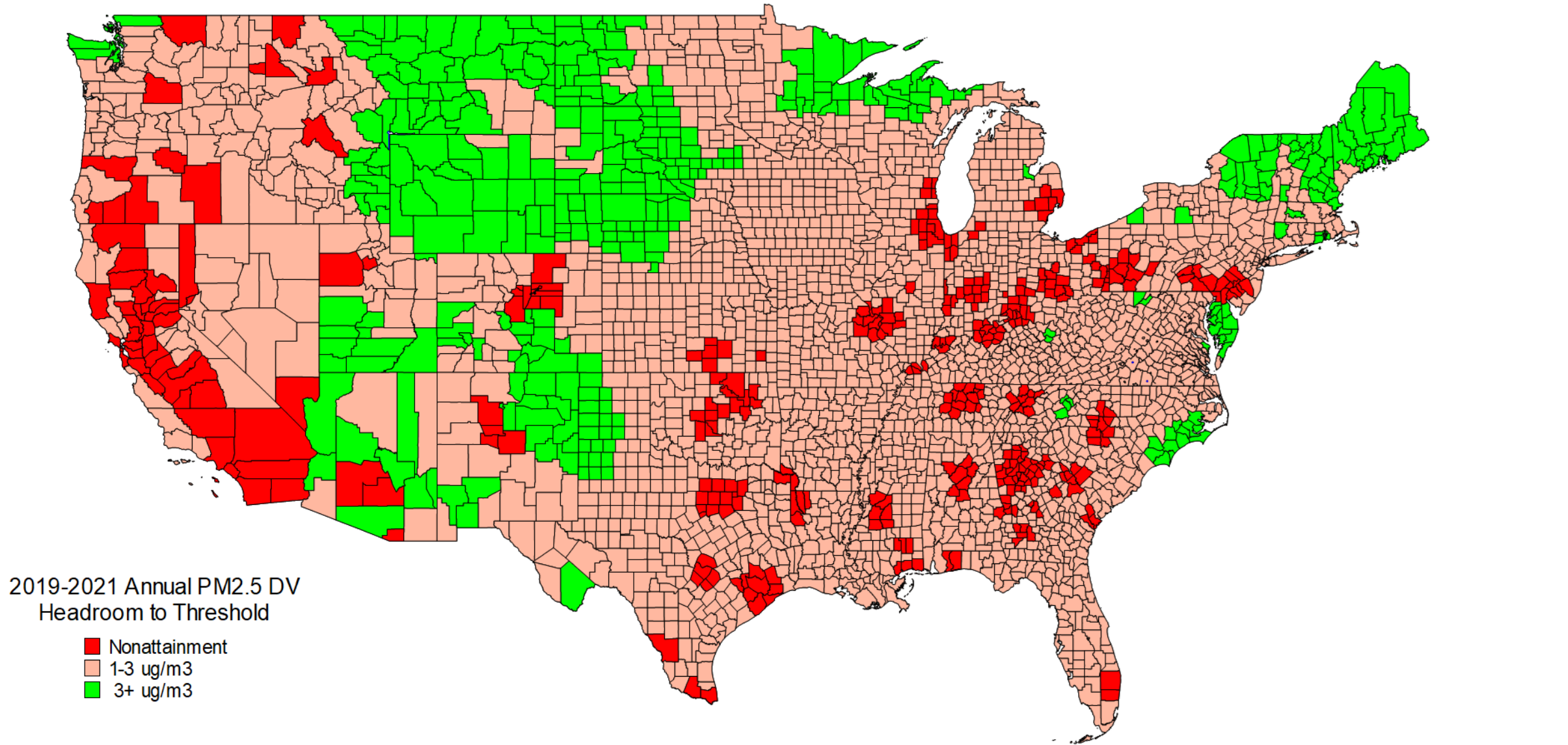


2019-2021 Annual PM2.5 DV
Headroom to Threshold

- Nonattainment
- 1-3 $\mu\text{g}/\text{m}^3$
- 3+ $\mu\text{g}/\text{m}^3$

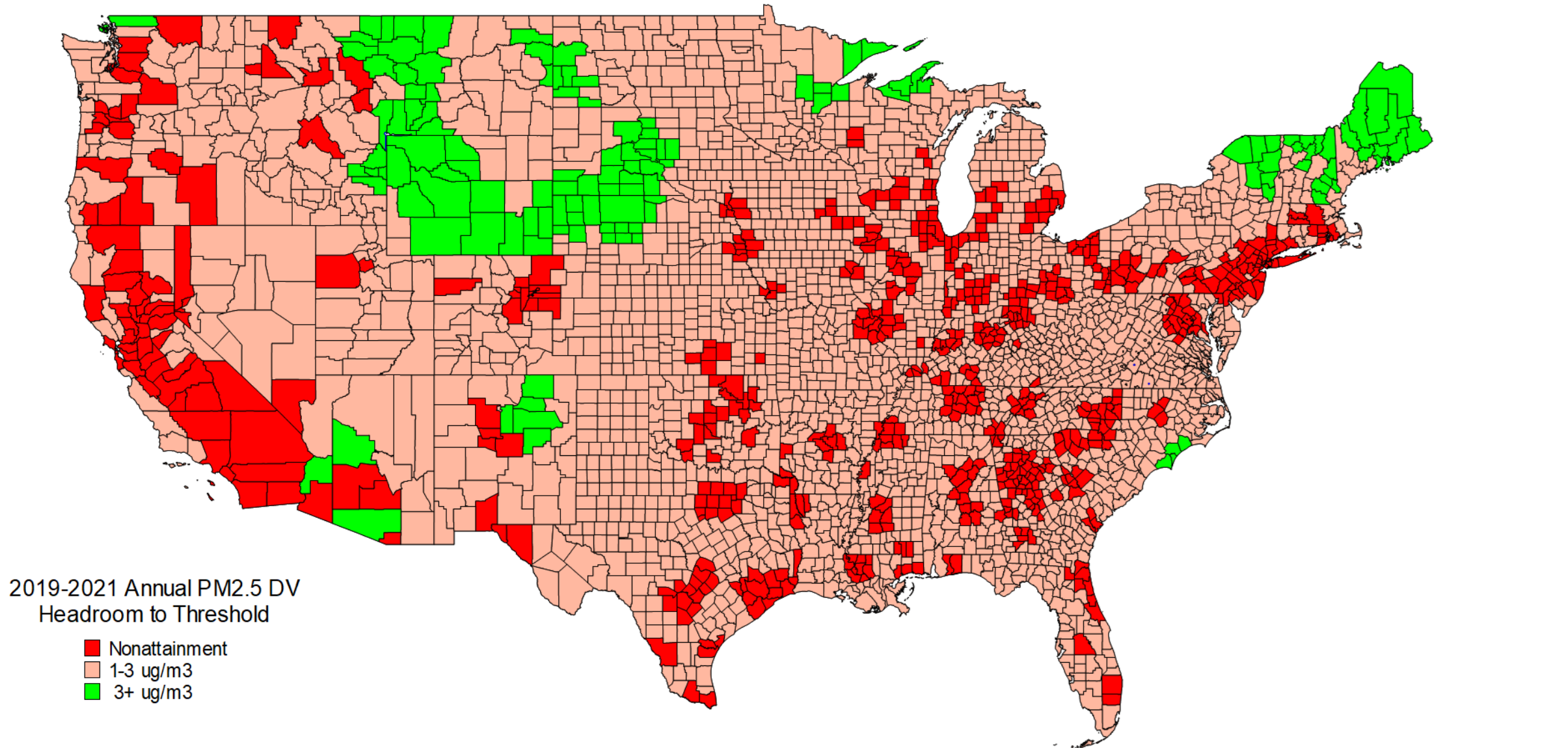
Non-monitored county values are calculated using inverse distance weighting average of five closest monitored values

Headroom to $9 \mu\text{g}/\text{m}^3$ with Current 2019-2021 DVs

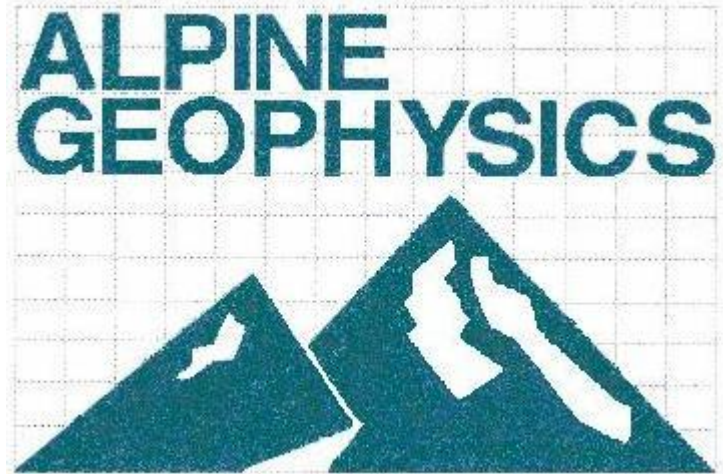


Non-monitored county values are calculated using inverse distance weighting average of five closest monitored values

Headroom to 8 $\mu\text{g}/\text{m}^3$ with Current 2019-2021 DVs



Non-monitored county values are calculated using inverse distance weighting average of five closest monitored values



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