



**Climate Change, Wildfires and Air Quality Exceptional Events:
At the Intersection of Science and Policy
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Abstract:

Climate Change, Wildfires and Air Quality Exceptional Events: At the Intersection of Science and Policy

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State, Local and Tribal (SLTs) air pollution control agencies are charged with implementation of the Clean Air Act, compliance with the National Ambient Air Quality Standards (NAAQS), and protection of public health and the environment. A primary objective of air quality program implementation is to attainment the NAAQS by minimizing criteria pollutants exceedances. However, air quality Exceptional Events (EE) lead to a significant number of NAAQS exceedances and cause attainment challenges.

Smoke due to wildfires cause EE conditions, and there appears to be a continually expanding wildfire season due to Climate Change (CC). CC induced wildfires can lead to NAAQS exceedances, non-attainment, comprehensive State Implementation Plan (SIP) development, and a stringent and costly regulatory environment. CC leads to more wildfires and wildfire severity. Wildfires generate Particulate Matter with an aerodynamic mean diameter of 2.5 microns or less (PM_{2.5}) and precursor emissions, such as Volatile Organic Compounds (VOC) and Nitrogen Oxides (NO_x), which form downwind Ozone (O₃). These precursor emissions increase the likelihood of criteria pollutant NAAQS exceedances.

SLTs have responsibility to investigate if EE have occurred, and if so, prepare EE demonstrations to have data excluded from Design Value calculations for attainment purposes. EE demonstration packages, and their review, are based on a weight-of-evidence (WOE) approach. However, CC is generally not factored into WOE.

Developing EE demonstrations are resource intensive for SLTs, as well as for EPA's reviewers. Policy limitations and resource demands can make it cost prohibitive to develop EE demonstrations, which can have a direct impact on attainment status. EE demonstration rules and guidance do not take into account CC that leads unpredictable/extreme meteorological patterns and more wildfires, which subsequently leads to more O₃ exceedances. This discontinuity is a shortcoming of EE rule and guidance.

With insight from developing numerous EE packages, the Clark County Department of Environment and Sustainability (DES) has encountered technical opportunities, lessons-learned and is positioned to make policy recommendations. SLTs are encouraged to continue engaging with EPA in order to revise guidance so EE demonstrations are significantly less resource intensive, allow for broader EE demonstration approaches, and allow for CC related considerations. DES endorses a holistic approach to CC, wildfires and EE demonstrations. CC causes downstream effects, and related policies should utilize a multi-discipline strategy. Opportunities still remain with further rulemaking and the guidance development process.

Introduction

State-Local-Tribal (SLT) Agencies: Clean Air Act (CAA)

National Ambient Air Quality Standards (NAAQS)

Goal of Attainment: All Criteria Pollutants

Wildfires: Ozone (O_3) and $PM_{2.5}$ Emissions

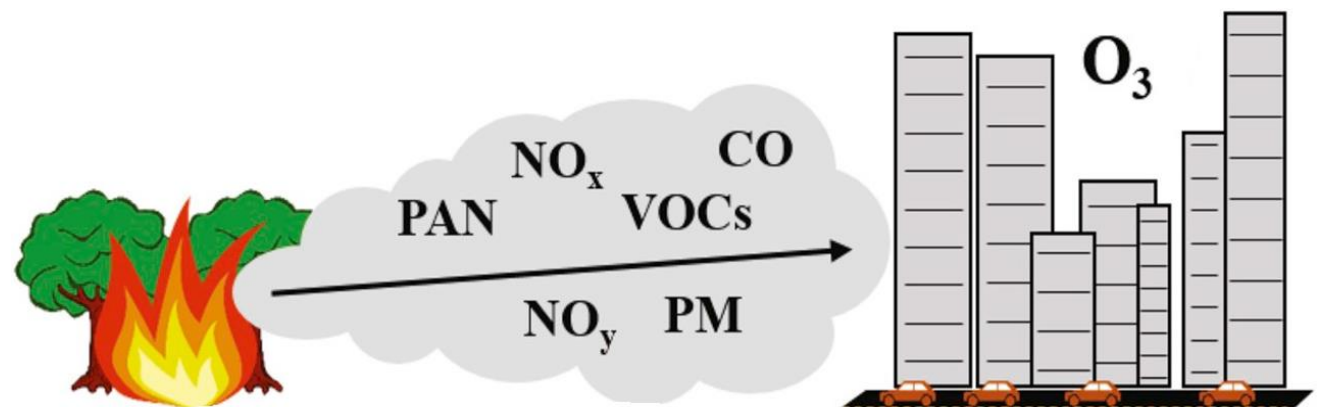
Exceptional Events (EE)

EE Rules – potential data exclusions

EE Demonstrations

Policy Shortcomings – Climate Change

Potential Solutions



Role of Wildfires

Role of Wildfires – Emissions

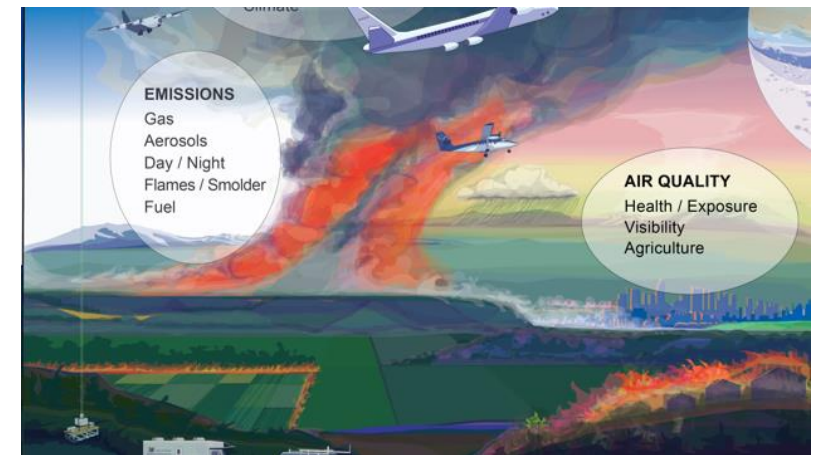
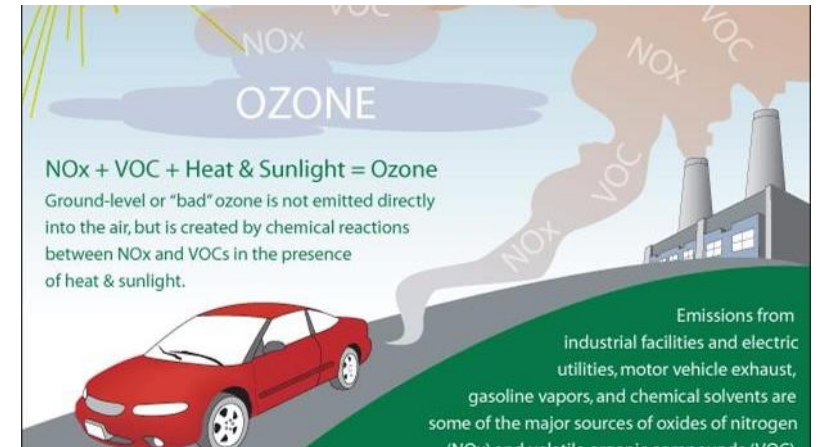
Precursors Emissions (leads to O₃ formation)

Transport: Aloft and at Surface

- Can transport long distances
- Receptors

PM_{2.5} Emissions (direct emissions)

O₃ Emissions (secondary pollutant)



Warneke, NOAA et al.



Wildfire Events

Wildfires Smoke: Can Qualify as Exceptional Events

O₃ and PM_{2.5} are Pollutants of Concern (when exceeding NAAQS)
Targeted for EE Demonstrations

EE Rule (CAA 319(b)) and 40 CFR 50.14 and Guidance's

- Tools Can Help Exclude Data
- Design Value (DV) and NAAQS Attainment Status

EE Demonstrations

- Not reasonably controllable or preventable, and unlikely to reoccur at same location (if anthropogenic)
- Clear causal relationship (between event and monitor)
- Comparison of event days to non-event days

Problem: Climate Change and Impacts

Climate Change

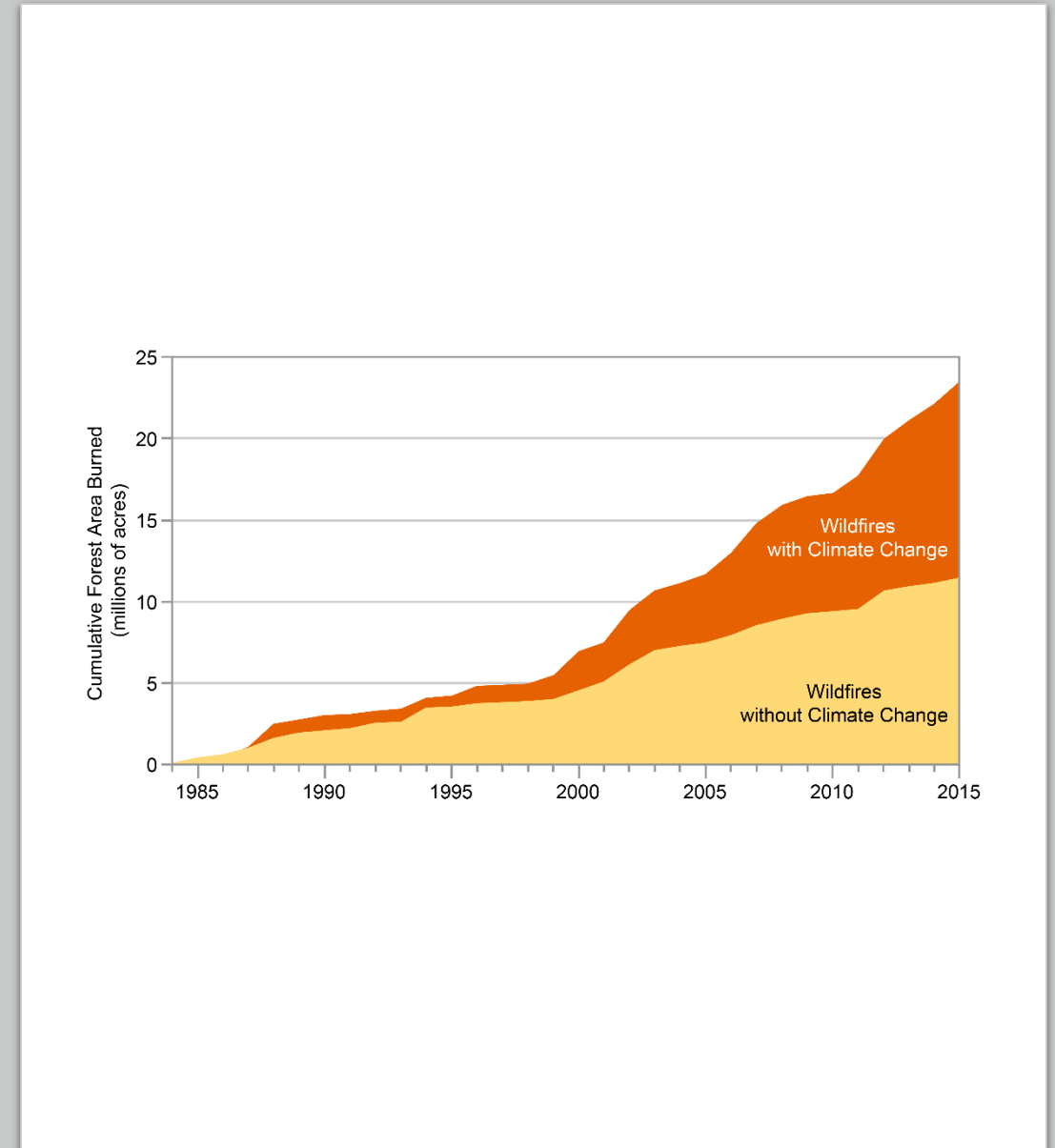
Creating a Through-Line:

Climate Change Leads to Increased Wildfires (duration and intensity)

Increased Wildfires (in acres burned) Leads to Greater Emissions

Greater (Precursor) Emissions Leads to More O₃ Exceedances

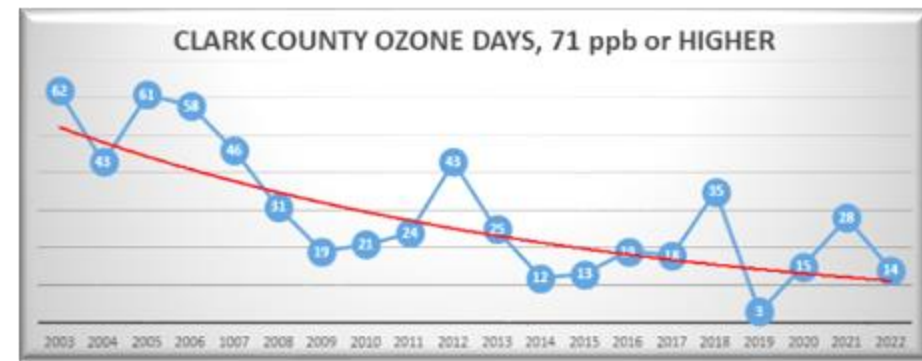
- Effect on O₃ DV
- Effect on O₃ Attainment Status



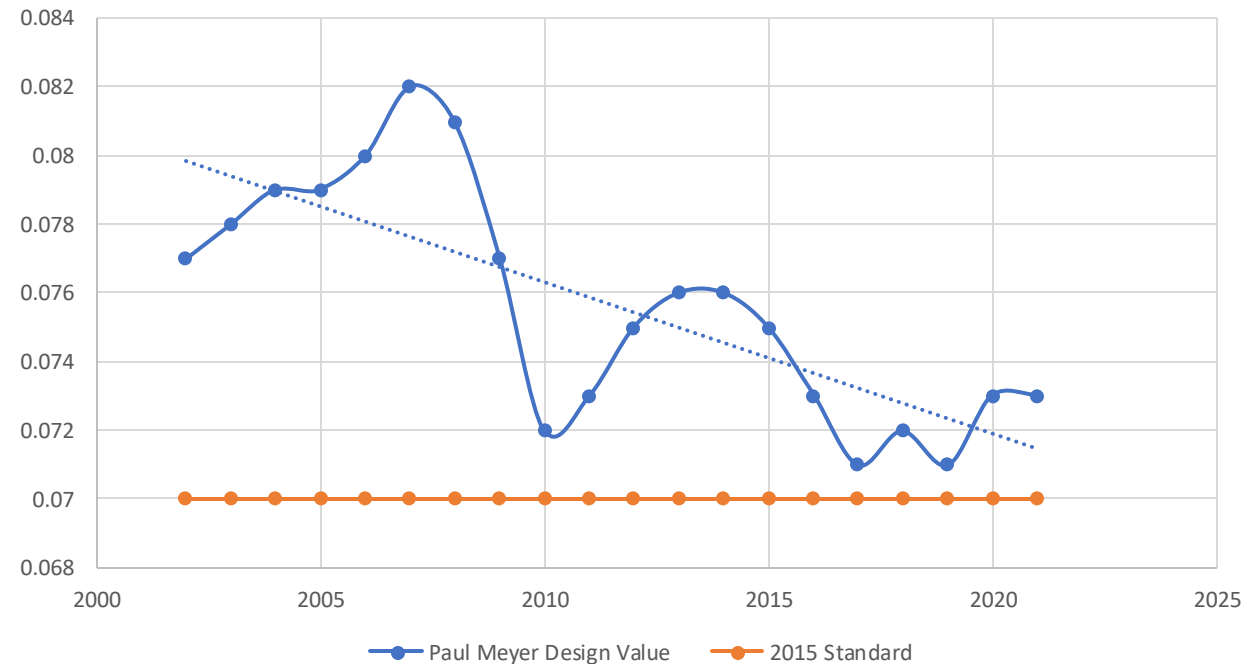
Outlook & Trends

NAAQS 8-hour O₃ History

- 1997: 0.080 ppm
- 2008: 0.075 ppm
- 2015: 0.070 ppm
- What's Next?



Paul Meyer Ozone Design Value



Wildfire Season and EE Demonstrations

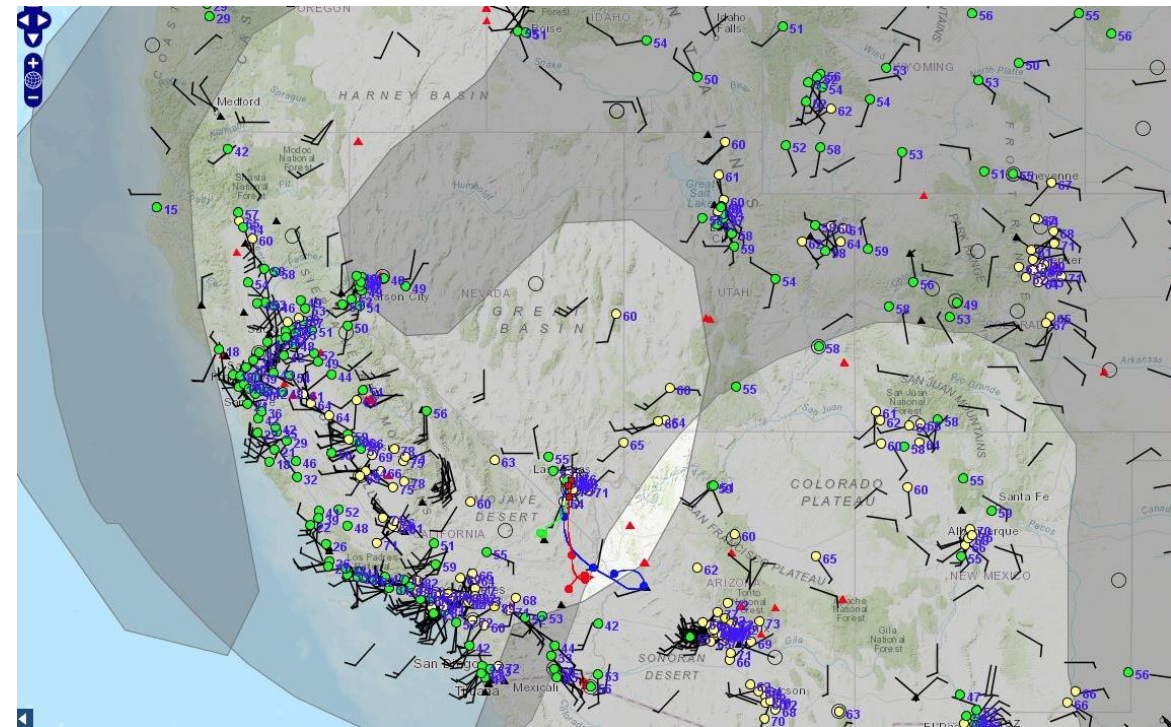
Wildfire Season: April – Sept.

Regional Smoke Impacts (see DES Monitoring website)

- Throughout Wildfire Season
- Elevated O₃, even if not exceeding

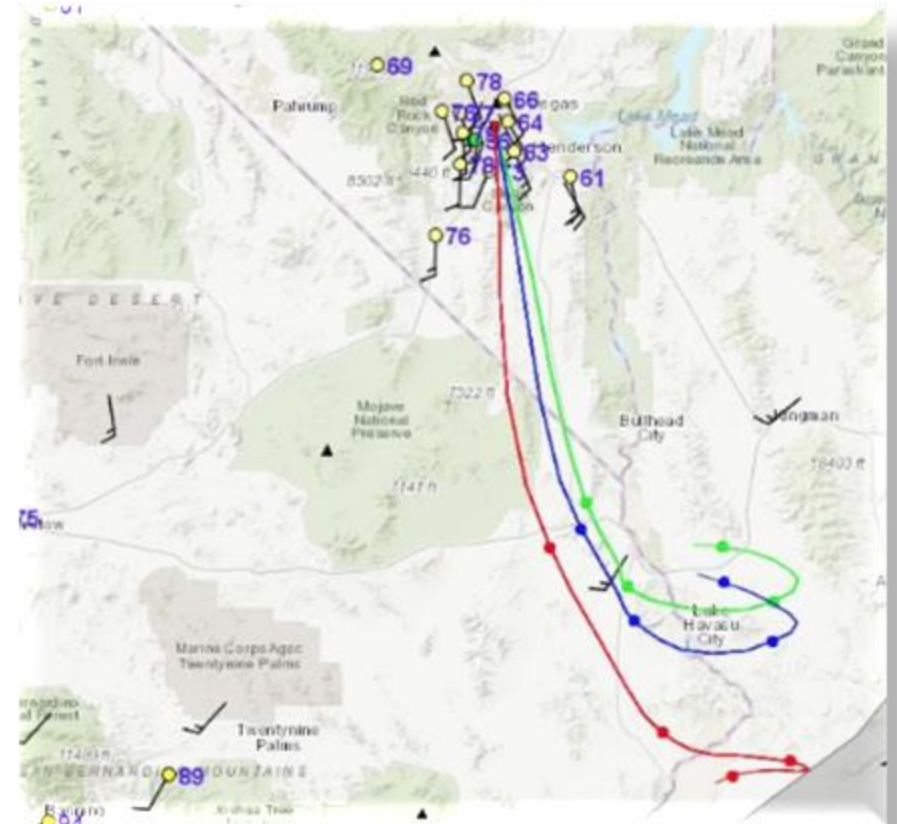
EE Demonstration Process

- Prior to 2016 “But For” Argument
- Weight of Evidence



EE Rule and Guidance(s) Shortcomings

- No Climate Change Discussed
- Cumbersome Process
- Q/D: Screening Factor (example)



Potential Solutions/Considerations



Rulemaking and Guidance Development

- Consider Scaling/Weighting for Climate Change
- Create Automation
- Streamlined Approach: Less is More

Continued Work with Federal Partners

- Products and Services
- EE Demonstration Process



Summary and Conclusions

SLT Responsibilities Under CAA

Attainment and NAAQS

Wildfires (O_3 and $PM_{2.5}$)

Exceptional Event Demonstrations

EE Rule and Guidance

Potential Strategies and Solutions



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The End

Thank You!

Any Questions?



Clark County DES Website

https://www.clarkcountynv.gov/government/departments/environment_and_sustainability/index.php