

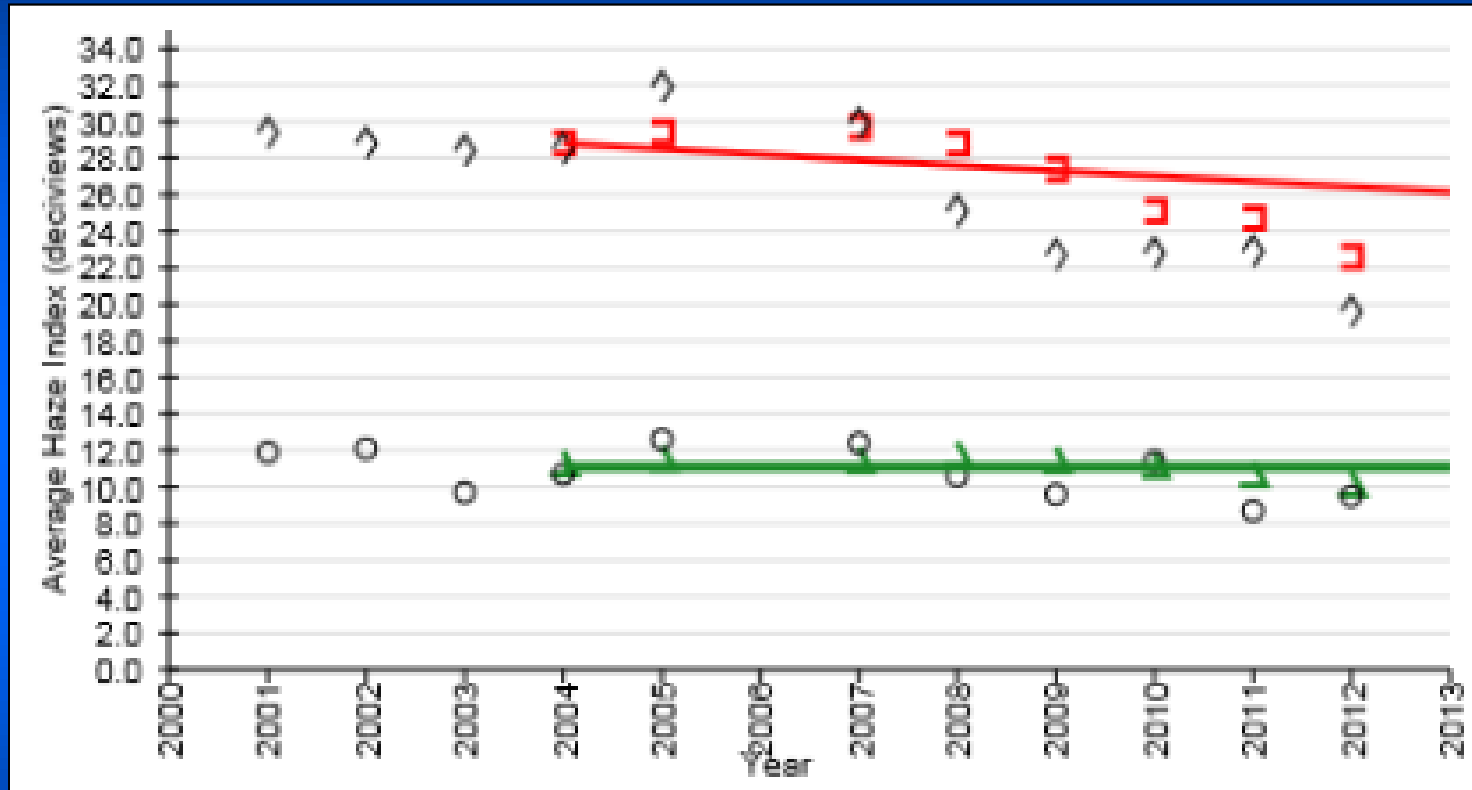
# **Air Quality in North Carolina and Smoke Management Tools**

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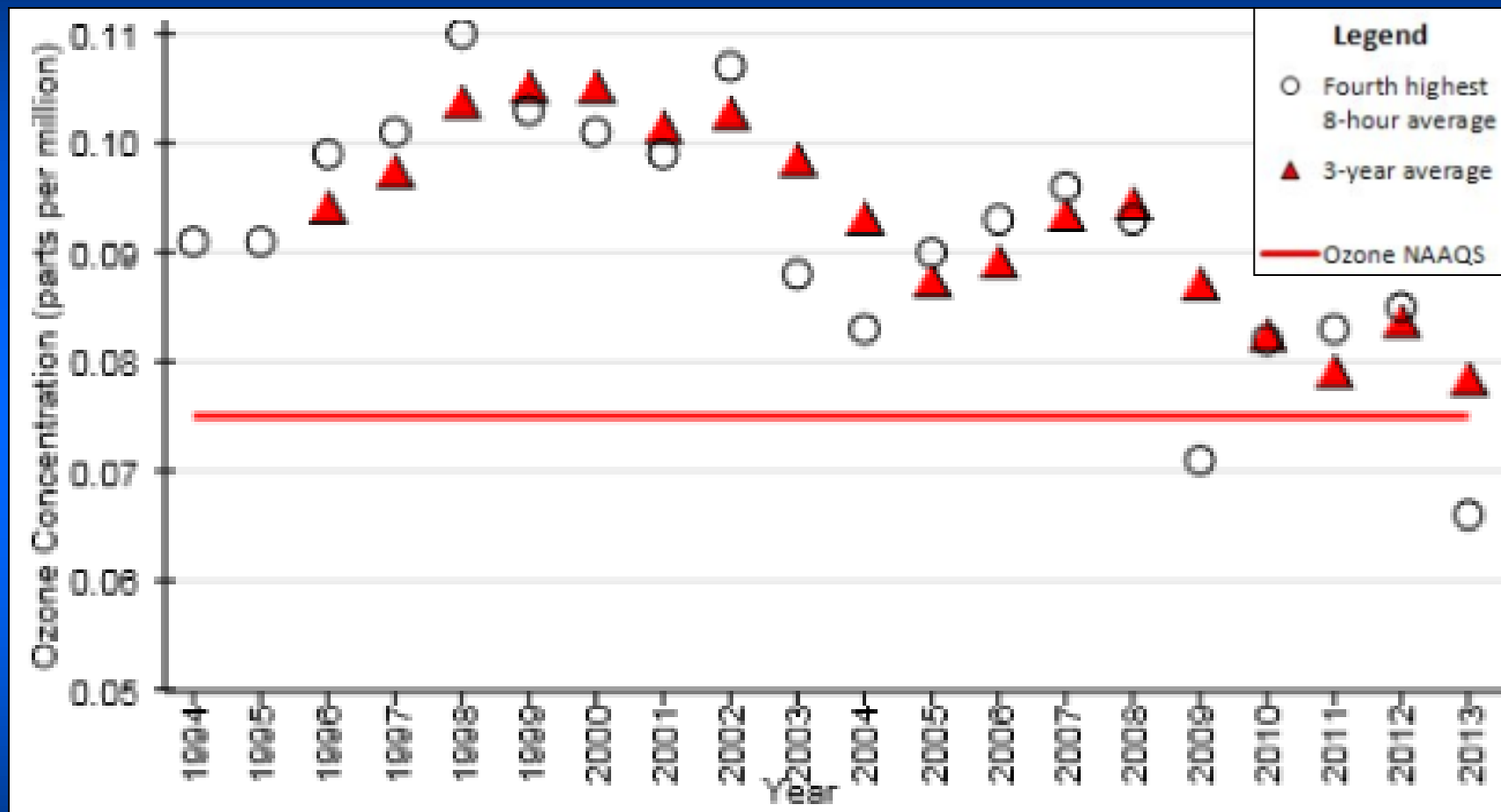


# Air Quality Trends – Fine Particles



Ambient monitoring results from Avery County

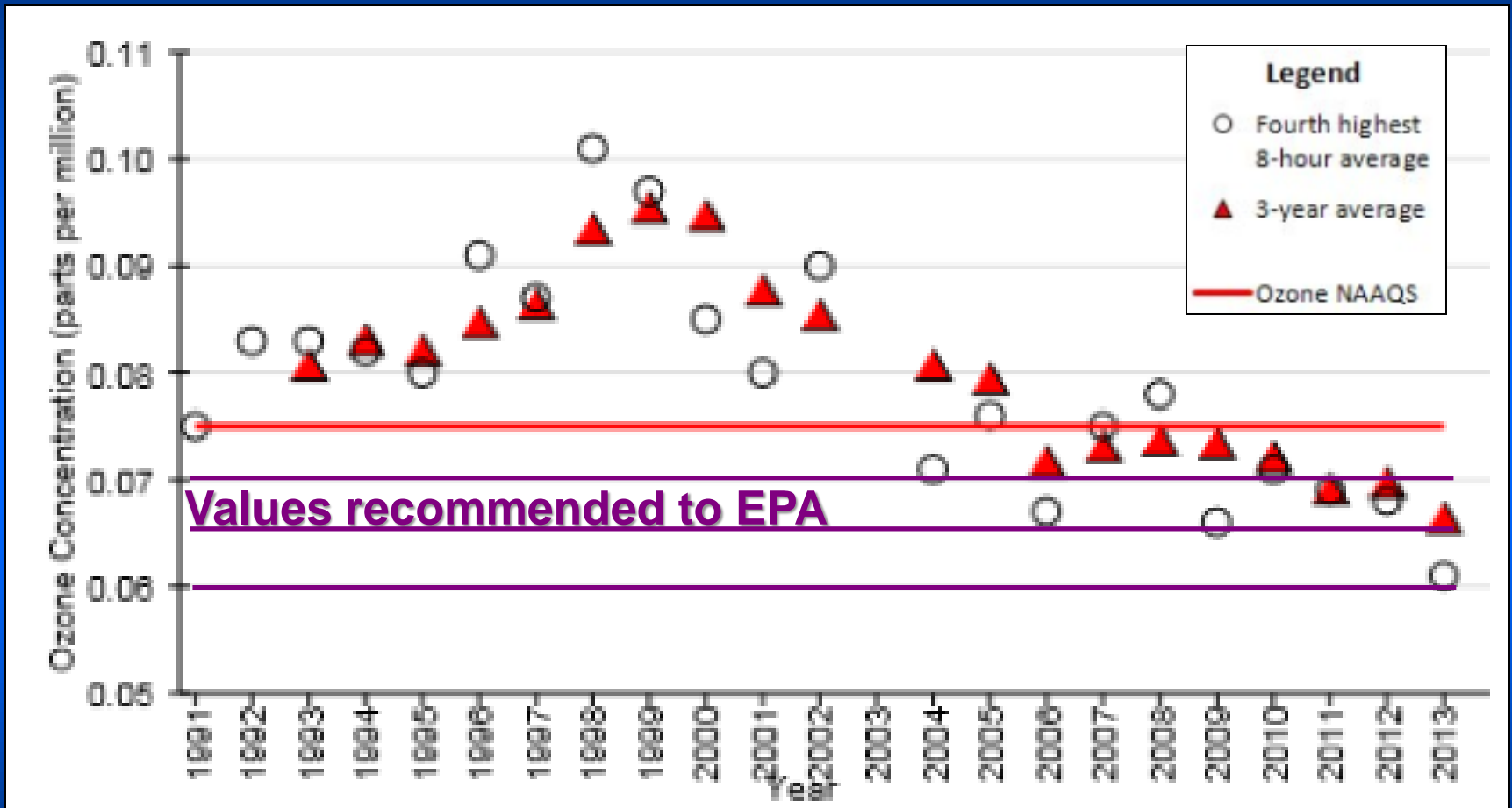
# Air Quality Trends - Ozone



Ambient monitoring results from Mecklenburg County

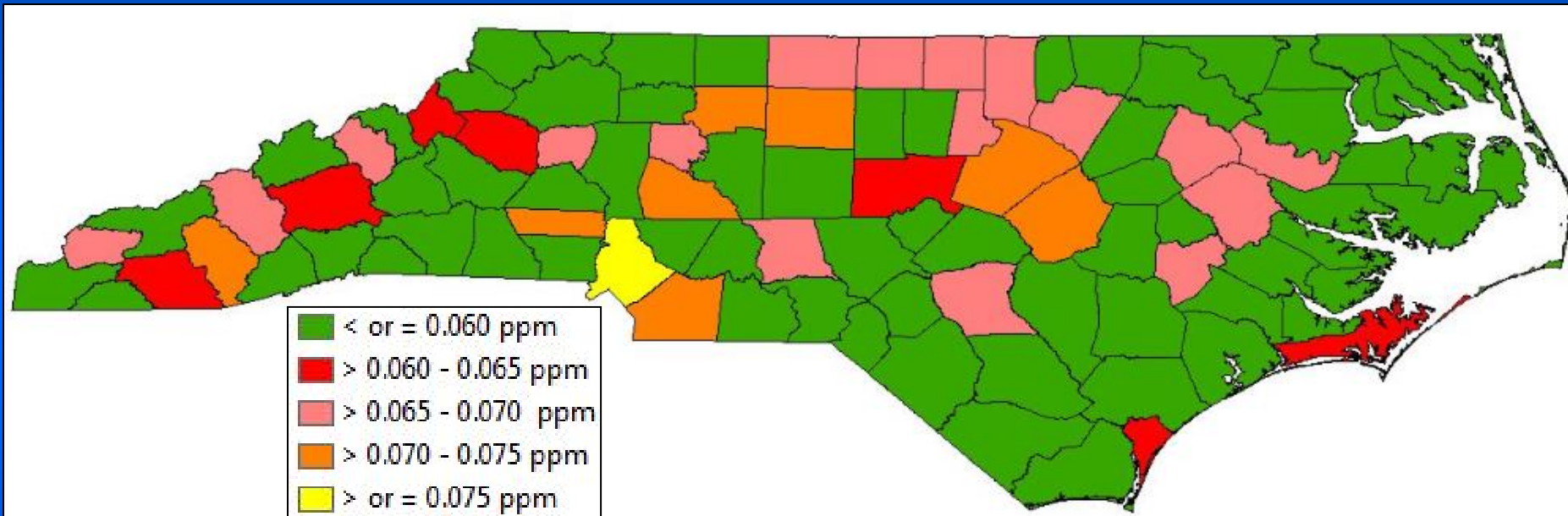


# Air Quality Trends - Ozone



Ambient monitoring results from Montgomery County

# Possible Ozone Non-attainment Areas



# Smoke Management Tools

## Simple → Advanced

Simple:

- North Carolina Smoke Management Guidelines (Category Day)

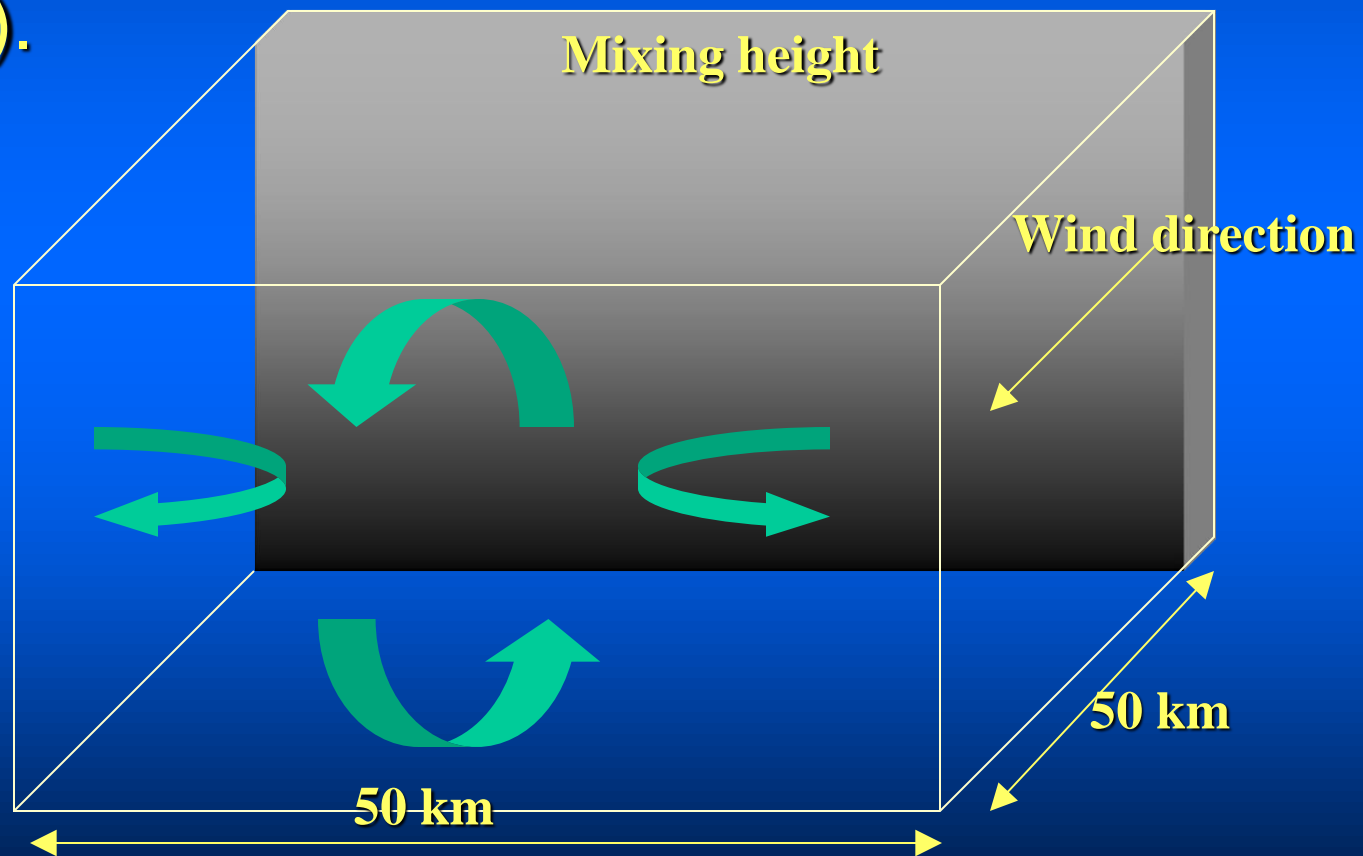
Advanced:

- Planning: VSMOKE and VSMOKE-GIS
- Operational: PC HYSPLIT



# Simple Method To Estimate Smoke Impact

**Lavdas Dispersion index:** An estimate of the capacity of the atmosphere to disperse smoke (DI  $\geq 30$ ).





# Low Visibility Occurrence Risk Index

A risk index of low visibility on highways due to smoke and/or fog. Input values include dispersion index and relative humidity. (LVORI  $\leq 4$ )





**Black Area**

**Estimated**

**Fuel Loading**

**Photo series and FCCS**

**Fuel Consumption**

**Consume 3.0**

**Emission Factor**

**Consume 3.0 and FEPS**

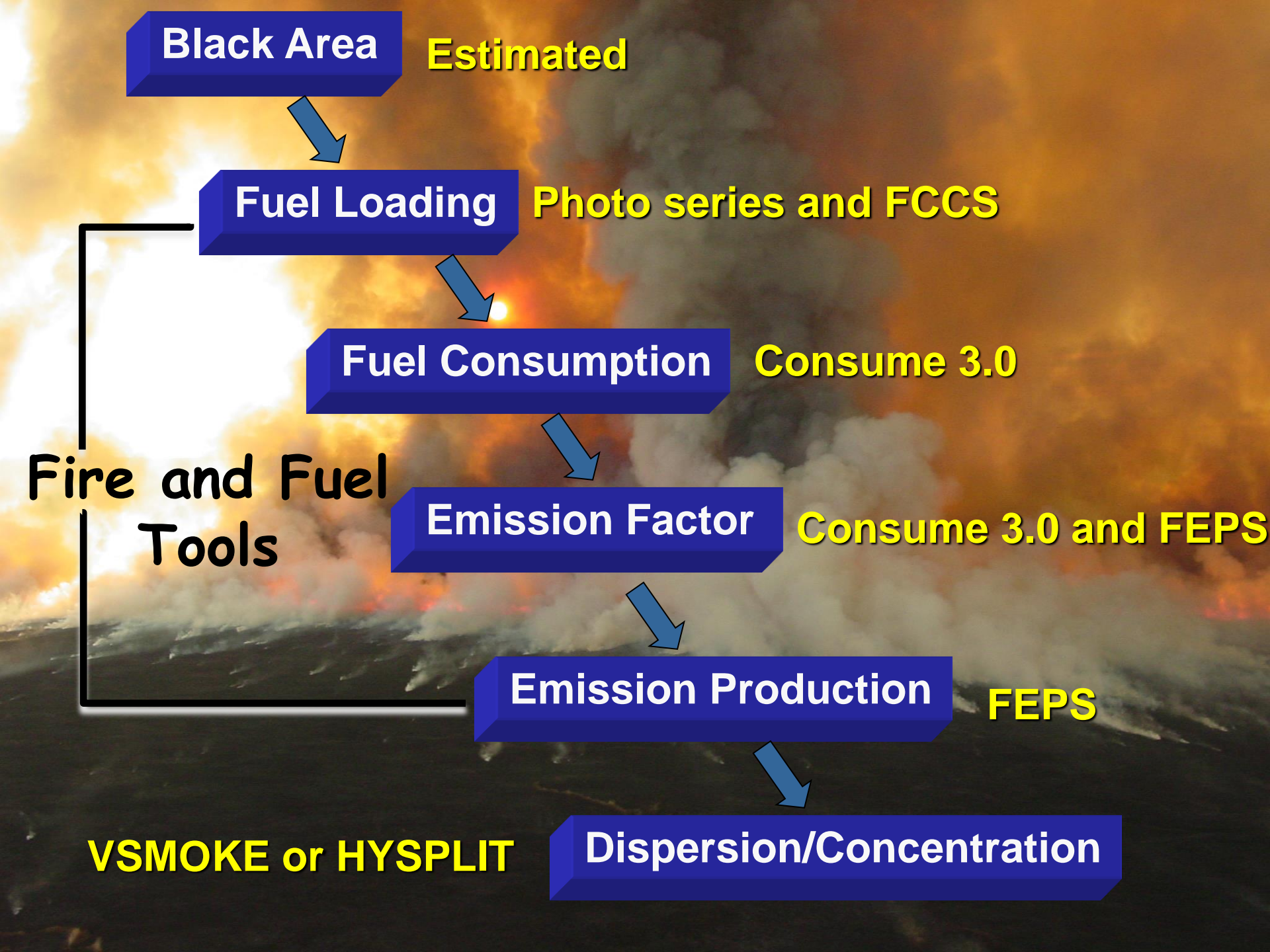
**Emission Production**

**FEPS**

**Dispersion/Concentration**

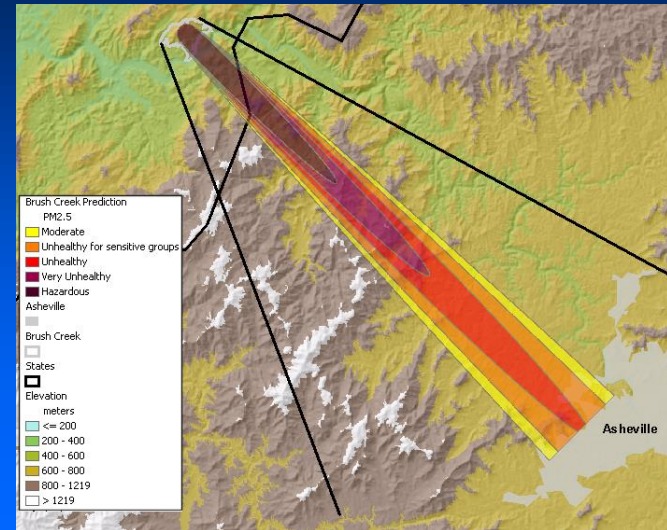
**VSMOKE or HYSPLIT**

**Fire and Fuel  
Tools**



# Planning - VSMOKE

- A simple screening model to show predicted downwind concentrations of particulate matter.
- For use in flat to gently rolling terrain, and steady wind conditions.
- Use with caution in complex terrain.
- Results are tabular and GIS.
- Draft report prepared.



**VSmoke Results**

Concentrations | Visibility | Plume | Stability, DI, and LVORR

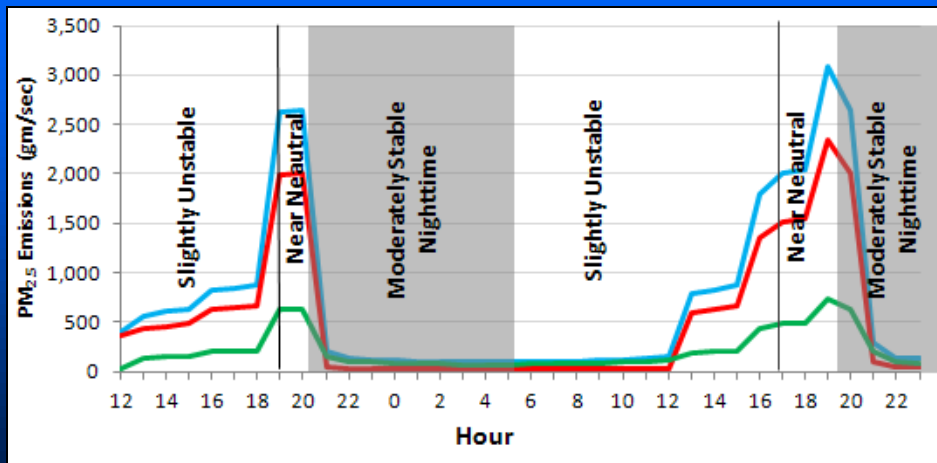
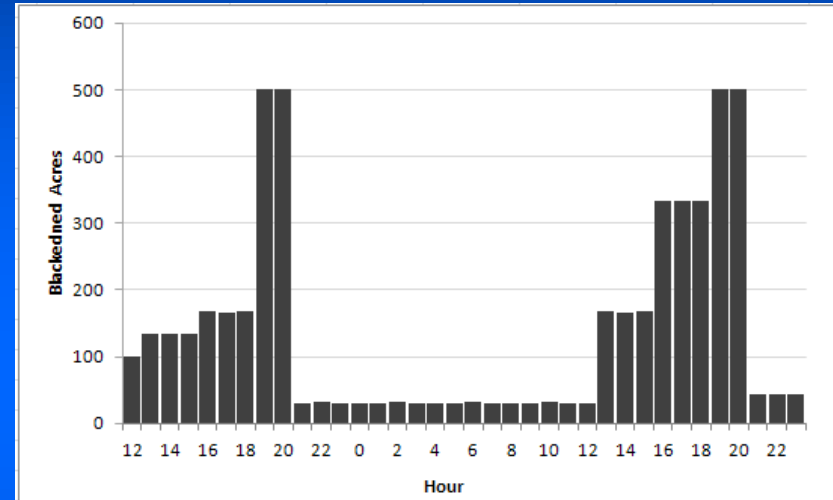
Ground level estimates

Distance from fire	PM2.5 (ug/m3)	CO (ppb)	Distance from fire	PM2.5 (ug/m3)	CO (ppb)
317 ft	2,972	1	2.47 mi	413	1
422 ft	2,634	1	3.11 mi	380	1
528 ft	2,316	1	3.92 mi	347	1
634 ft	2,024	1	4.94 mi	314	1
845 ft	1,760	1	6.21 mi	281	1
1056 ft	1,525	1	7.82 mi	247	1
0.25 mi	1,321	1	9.85 mi	213	1
0.31 mi	1,144	1	12.40 mi	182	1
0.39 mi	994	1	15.61 mi	154	1
0.49 mi	867	1	19.65 mi	129	1
0.62 mi	761	1	24.74 mi	109	1
0.78 mi	673	1	31.14 mi	91	1
0.98 mi	599	1	39.21 mi	77	1
1.24 mi	539	1	49.36 mi	65	1
1.56 mi	489	1	62.14 mi	55	1
1.96 mi	448	1			



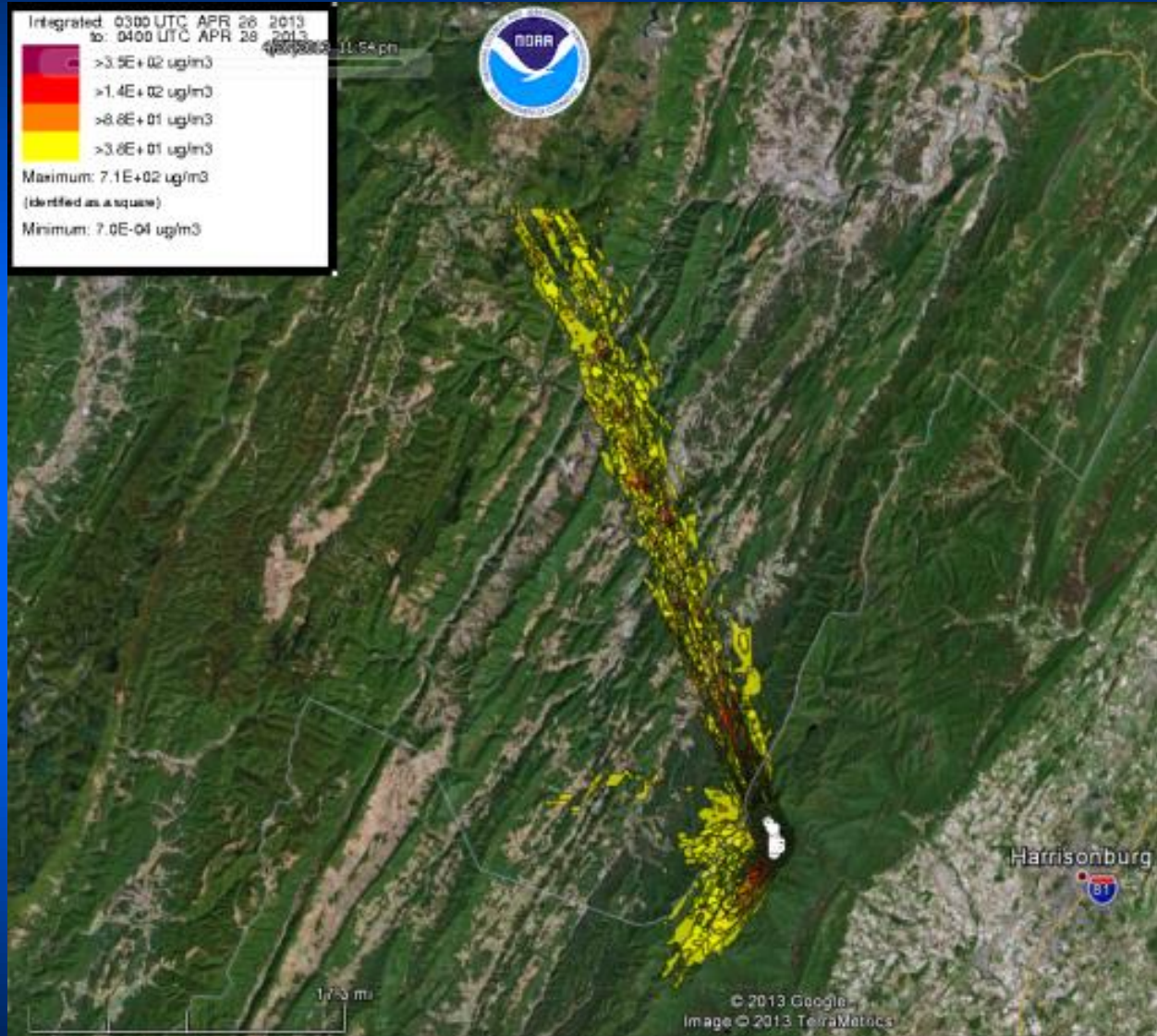
# Operational – PC HYSPLIT Hone Quarry

- Decided to burn the unit over two days on April 26 and 27, 2013.





# PC HYSPLIT – Hone Quarry



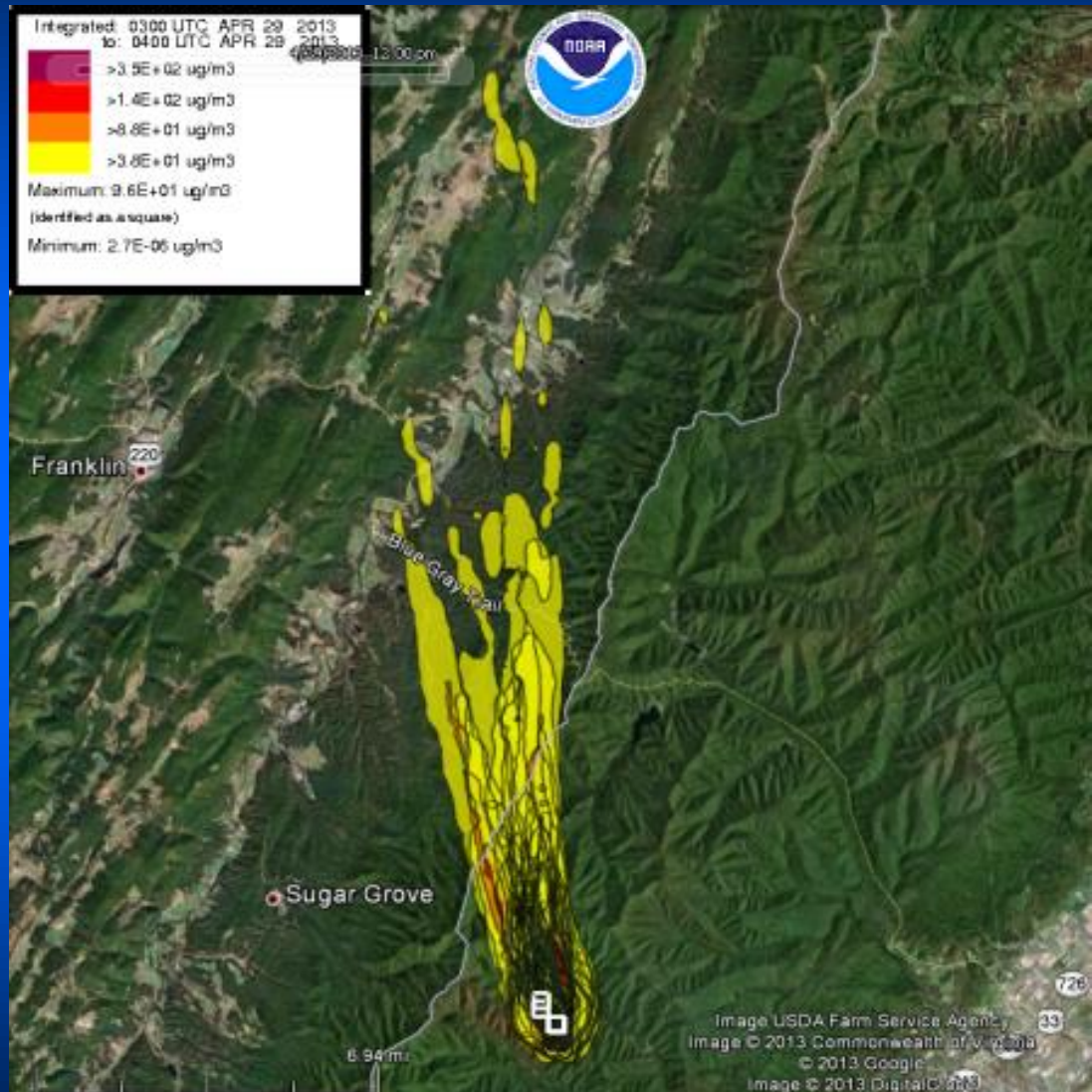
- 1<sup>st</sup> Day

AQI Orange: 28.7 miles

Air Resource Management



# PC HYSPLIT – Hone Quarry



- 2<sup>nd</sup> Day

AQI Orange: 7.8 miles

Air Resource Management





# http:webcam.srs.fs.fed.us

USDAUnited States Department of AgricultureForest Service

Air Resource ManagementRegion 8

U.S. Forest Service

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Air Resource Management

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Why do we monitor air quality and visibility?

Monitoring the air quality within and near the National Forests in the Eastern (Region 9) and Southern (Region 8) Regions is one example of how the Forest Service is "caring for the land, and serving people." The air quality monitoring information is used for environmental assessments, and for our forest planning for each National Forest in the Eastern and Southern Regions. Furthermore, the Region 8 and 9 Air Resource Management staff use the information when providing technical advice to the appropriate Forest Supervisor (designated as the Federal Land Manager according to the Clean Air Act Amendments of 1977) when a new (large) stationary source of air pollution has the potential to impact any Air Quality Related Value at one or more of the 17 federally mandated Class I areas.

Webcams:

Joyce Kilmer

Shining Rock

Upper Buffalo

Air Pollutants of Concern:

Acidic Deposition

Ozone

Air Pollution Impacts:

Acidification

Ozone

Mercury

Visibility

Other Information:

PSD Analysis

Air Quality Results (Coming Soon)

Tools

Climate Change Presentations

Air Resource Management