



United States Department of Agriculture  
Natural Resources Conservation Service

## **Air Quality Basics**

**- *Why do we care?***

**- *Air Quality Regulations***

## Rule of Threes

- Humans can survive for:
  - Three months without hope
  - Three weeks without food
  - Three days without water
  - Three hours without shelter
  - Three minutes without air







## Why is NRCS Involved?

- Air is the first “A” in SWAPA + H
- Air Quality was one of the original drivers for the creation of our agency





## Why is NRCS Involved? (cont.)

- Private landowners are increasingly required to address AQAC issues
- Rural/urban interface
  - Current: 3.1%
  - 2030: 8.1%
- Increased regulation in many areas



Current Urban Area: 3.1%

2030 Urban Area: 8.1% - more than doubling

## Why is NRCS Involved?

- So...Regulations must be a driver for NRCS AQAC efforts, right?
- Regulatory pressures may help focus NRCS efforts, but they are not the reason we do what we do
  - “Voluntary” in voluntary conservation means above and beyond requirements
  - Regulations are really “minimum treatment levels” for our conservation plans



# Goals of AQ Regulatory Process

- Maintain AQ better than established standards
  - Standards should be set at levels necessary for protecting public health and welfare
- Control emissions of air pollutants where needed and practically and economically feasible



# How AQ Goals are Achieved

- Delineation of responsibilities
  - Federal government – Clean Air Act (CAA)
    - Establish benchmarks/standards
      - Can only consider human health and welfare
    - Establish programs to regulate certain industries and sources
    - Require/review/approve State Implementation Plans (SIPs)
      - Consider economics in control strategies



## How AQ Goals are Achieved (cont.)

- Delineation of responsibilities
  - State/local governments
    - Implement Federal programs and standards
    - Develop programs/standards/regulations that are at least as stringent as Federal to address local issues
      - Can be more stringent
      - Examples – odors, greenhouse gases, nuisance dust



# Location, Location, Location

- AQ requirements are a function of location
  - If you are in an area that has an urban/rural interface, you will likely have more pressure
  - If you are in an area with bad air quality, you will have more requirements
  - If you are near a Federally-protected airshed, you will have more requirements



## National Ambient Air Quality Standards (NAAQS)

- EPA establishes ambient air standards for certain “criteria” pollutants
  - Primary standards – designed to protect public health
    - Based on the most sensitive individuals
  - Secondary standards – designed to protect human welfare
    - Usually defined in terms of effects on vegetation, soil, and visibility



## Criteria Pollutants

- Particulate matter (PM) – PM<sub>2.5</sub>, PM<sub>10</sub>
- Tropospheric (ground-level) ozone (O<sub>3</sub>)
- Nitrogen dioxide (NO<sub>2</sub>)
- Sulfur dioxide (SO<sub>2</sub>)
- Carbon monoxide (CO)
- Lead



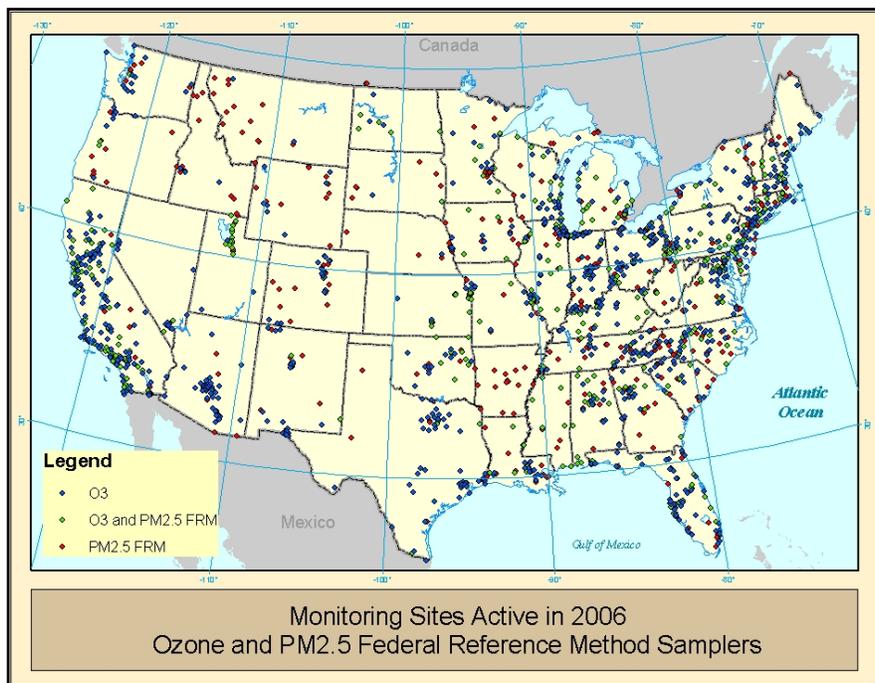
## NAAQS (cont.)

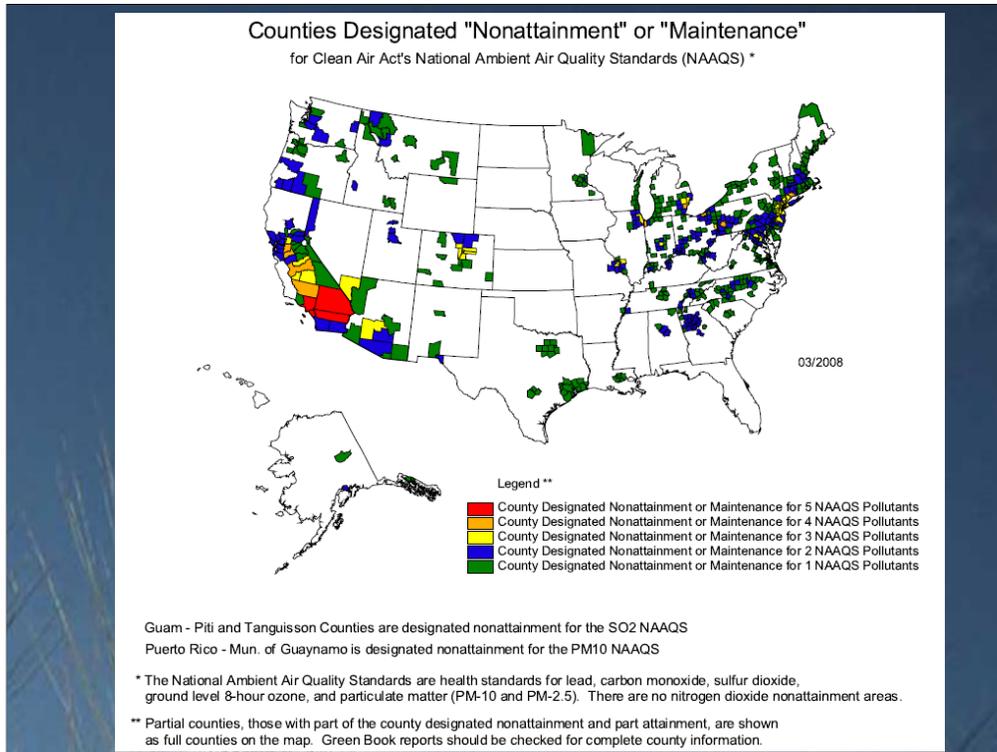
- A pollutant-by-pollutant analysis must be made to determine how AQ in an area compares to the NAAQS
  - “Attainment” = better than or equal to NAAQS
  - “Nonattainment” = does not meet NAAQS
  - “Unclassifiable” = no representative data
    - Assumed to be “attainment”
  - “Maintenance” = used to be nonattainment, now attainment, with additional requirements

## What Does Nonattainment Mean?

- Lower threshold for major source permitting (based on severity)
- More stringent permitting and control requirements







**According to Oregon DEQ:**

Oakridge and Eugene – nonattainment for PM<sub>10</sub>

There are not any O<sub>3</sub> or CO nonattainment areas

Klamath Falls and Eugene – are probably being designated as nonattainment for PM<sub>2.5</sub> (for the new std of 35 micrograms/m<sup>3</sup>)

NOTE: Oregon's nonattainment website conflicts with EPA's nonattainment data. <http://www.deq.state.or.us/air/planning/nonattainment.htm>. Both of these websites (OR DEQ & EPA greenbook) are incorrect. Below are details of what those websites say.

**According to the Oregon DEQ website (<http://www.deq.state.or.us/air/planning/nonattainment.htm>) – which is incorrect:**

On the EPA greenbook website, Oregon has two nonattainment areas - Lane Co for PM<sub>10</sub> and the Salem area for CO. When I go to the Oregon State nonattainment website (<http://www.deq.state.or.us/air/planning/nonattainment.htm>) it says that the Salem area is also in nonattainment for ozone. Oregon does not have any ozone nonattainment areas and the EPA greenbook website does not list any ozone maintenance areas (i.e. former nonattainment areas) for Oregon.

**OREGON(Region X) – PM<sub>10</sub> (nonattainment)**

- Eugene-Springfield, OR (Moderate) Lane Co (P) *Urban Growth Boundary*
- Lane Co, OR (Moderate) Lane Co (P) *Oakridge (Urban Growth Boundary)*

**OREGON(Region X) – Carbon Monoxide (nonattainment)**

- Salem, OR (Not Classified) Marion Co (P) *City of Salem*, Polk Co (P) *City of Salem*

**OREGON(Region X) – Carbon Monoxide (maintenance)**

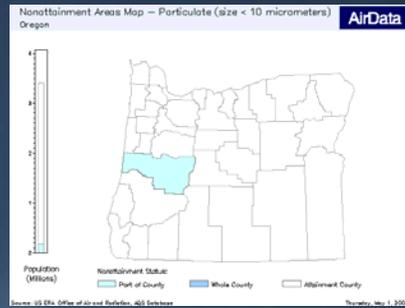
- [Eugene-Springfield, OR](#) (Not Classified) Lane Co (P) *Air Quality Maintenance Area*
- Grants Pass, OR (Moderate <= 12.7ppm) Josephine Co (P) *Central Business District*
- Klamath Falls, OR (Moderate <= 12.7ppm) Klamath Co (P) *Urban Growth Boundary*
- Medford, OR (Moderate <= 12.7ppm) Jackson Co (P) *Medford-Ashland Urban Growth Boundary*
- Portland, OR (Moderate <= 12.7ppm) Clackamas Co (P) *Portland Metro Service District Boundary*, Multnomah Co (P) *Portland Metro Service District Boundary*, Washington Co (P) *Portland Metro Service District Boundary*

**OREGON(Region X) - PM<sub>10</sub> (maintenance)**

- Grants Pass, OR (Moderate) Josephine Co (P) *Urban Growth Boundary*
- Klamath Falls, OR (Moderate) Klamath Co (P) *Urban Growth Boundary*
- LaGrande, OR (Moderate) Union Co (P) *Urban Growth Boundary*
- Lake Co, OR (Moderate) Lake Co (P) *Lakeview (Urban Growth Boundary)*.
- [Medford, Ashland, OR](#) (Moderate) Jackson Co (P)

# Oregon Air Quality

- PM<sub>10</sub> nonattainment
  - Oakridge
  - Eugene
- PM<sub>10</sub> maintenance:
  - 5 counties – Union, Lake, Klamath, Jackson, Josephine
- CO maintenance:
  - 7 counties – Portland area (Washington, Multnomah, Clackamas counties), Klamath, Jackson, Josephine



## Visibility - Class I Areas

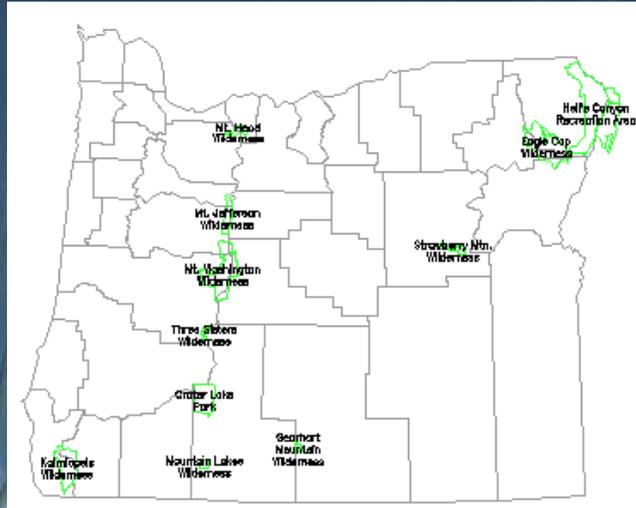
- Regional Haze Rule
- Applies to areas of special national or regional natural, scenic, recreational, or historic value that are afforded Federal protection under the Clean Air Act
  - National parks
  - National wilderness areas





## Oregon Air Quality (cont.)

- There are 11 Class I Wilderness areas in Oregon



Best 20% Days

Worst 20% Days



**Dolly Sods Wilderness Area, West Virginia**

## State Implementation Plans (SIPs)

- A SIP describes how a State will maintain or improve its Air Quality
- If an area is in nonattainment:
  - Sources contributing to the nonattainment will be identified (modeling, emission inventories)
  - Those sources will probably be targeted for controls

# Changing NAAQS

- EPA required to review (and potentially update) the NAAQS every 5 years
- Ozone – March 2008
  - Current Standard = 0.084 ppm (8-hr)
  - New Standard = 0.075 ppm (8-hr)
- PM<sub>2.5</sub> – December 2006
  - Old Standard = 65  $\mu\text{g}/\text{m}^3$  (24-hr)
  - New Standard = 35  $\mu\text{g}/\text{m}^3$  (24-hr)
- PM<sub>10</sub> – December 2006
  - Old/New Standard = 150  $\mu\text{g}/\text{m}^3$  (24-hr)
  - Annual Standard Revoked

# Implications of the proposed Ozone Std

Nonattainment Areas Map – Ozone (8-hour)  
United States

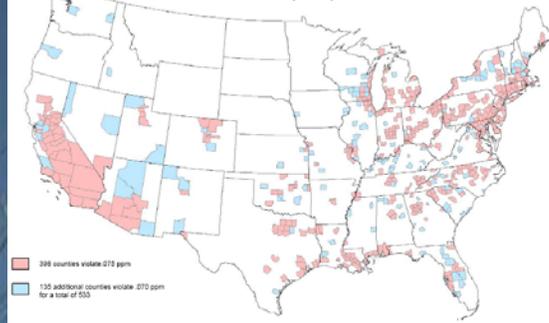
AirData



Estimates are based on the most recent data (2003 – 2006). EPA will designate areas as nonattainment on these data, but likely on 2005 – 2006 data which are expected to show improved air quality.

EPA United States Environmental Protection Agency

Counties With Monitors Violating Alternate 8-hour Ozone Standards  
0.070 and 0.075 parts per million



298 counties violate 0.075 ppm  
135 additional counties violate 0.070 ppm  
for a total of 433

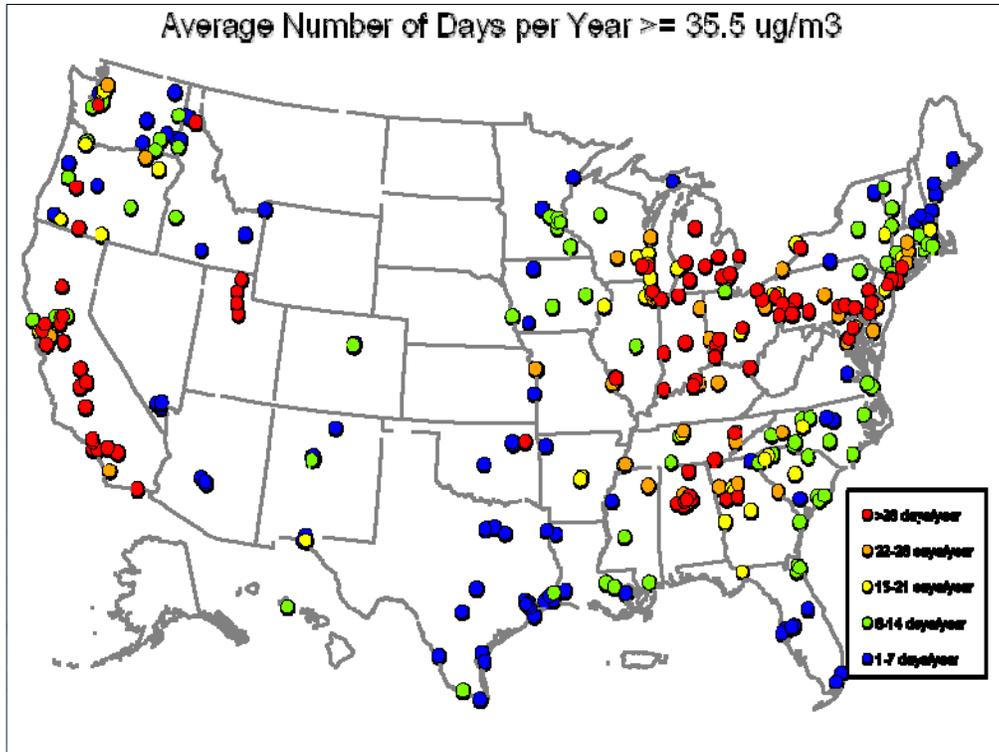
Notes:

<sup>1</sup> 320 of 433 monitored counties violate 0.075.  
<sup>2</sup> 233 of 433 monitored counties violate 0.070.  
<sup>3</sup> No monitored counties outside the continental U.S. violate.

Attainment Status:  
Part of County Whole County Attainment

AGS Database Tuesday, November 20, 2007





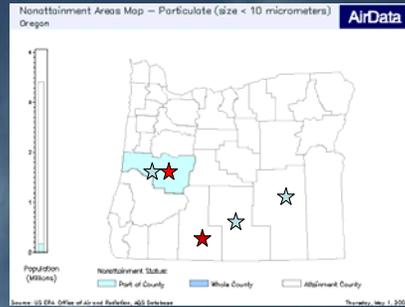
From: EPA presentation at the 2007 Fire Behavior & Smoke Mgmt Destin, FL Conference

The data used for the analysis combined information from both the FRM and continuous PM monitoring networks for the time period between October 2003 and October 2006. This period was chosen because most States were reporting their continuous PM data to AIRNOW by the beginning of October 2003. Three years were used to take into account varying meteorology over time.

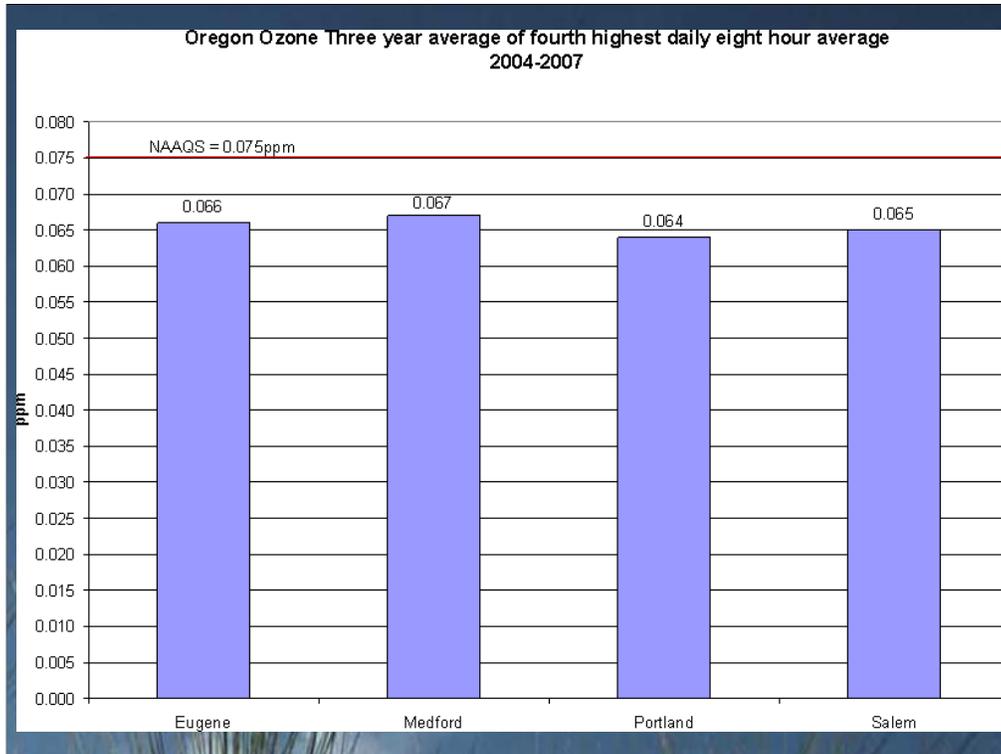
The map shows the average number of days per year that sites across the country measure a 24 hour average greater than  $35.5 \text{ ug/m}^3$ . Only those sites which contained 75% of the data for the three year period were used which would be 845 observations out of a possible 1127. The parts of the country that experience a month or more of days per year greater than the 24 hour standard are mostly in the East being heavily concentrated in the Midwest, the Ohio River Valley and the Northeast. The data from the Western United States show that Southern California, the San Joaquin Valley, the Salt Lake Valley and parts of the Northwest would have the largest amount of days greater than  $35 \text{ ug/m}^3$ .

## Changing NAAQS (cont.)

- PM2.5 nonattainment (proposed)
  - Klamath Basin
  - Eugene
- Areas of concern
  - Lakeview (Lake County)
  - Burns (Harney County)
  - Cottage Grove (Lane County)



Lakeview, Burns, and Cottage Grove all have 24hr 98th percentiles over the standard but none have three consecutive years of recent data. They all started collecting again in 2007 but the attainment statuses will be set by 2009 when they have their three years.



## Oregon Air Quality and Agricultural Productivity

- $PM_{10}$  nonattainment:
  - Lane county
    - In the top 25% of U.S. agricultural production counties
- $PM_{2.5}$  nonattainment (proposed):
  - Klamath County
    - In the top 25% of U.S. agricultural production counties



## Oregon Dairy Task Force

- Created in 2007 by Senate Bill 235
- Charged with:
  - Studying the emissions of air contaminants from Dairy Operations
  - Evaluating alternatives for reducing emissions
    - Economics
    - Human health and the environment
    - Impacts of alternatives to other media (water, soil etc)
    - Feasibility of implementation
- Final Recommendations due July 1, 2008
- <http://www.deq.state.or.us/aq/dairy/index.htm>

## NRCS National Environmental Compliance Handbook (NECH)

- Provides guidance about how to comply with Federal environmental requirements.
- Includes questions/worksheets to begin addressing air quality issues.
- [http://policy.nrcs.usda.gov/media/pdf/H\\_190\\_610.pdf](http://policy.nrcs.usda.gov/media/pdf/H_190_610.pdf)

Objectives of this Handbook are to:

Improve the quality of plans and decisions by integrating environmental considerations into the planning process

Promote efficiency in preparing environmental documentation

Provide a systematic framework for integrating the NRCS planning process and environmental requirements; and

Serve as a reference for NRCS environmental compliance procedures

# Real-time Air Quality: The Air Quality Index

- The US standard way of reporting air quality
- Daily updates and forecasts at:

<https://airnow.gov/>

- Primarily focused on ozone and PM



# EPA's Air Quality Index (AQI)

Air Quality Index	
Categories	Index Values
Good	0 – 50
Moderate	51 – 100
Unhealthy for Sensitive Groups	101 – 150
Unhealthy	151 – 200
Very Unhealthy	201 – 300
Hazardous	301 – 400
	401 – 500



## Emergency Episode Plans

- ← Alert Level
- ← Warning Level
- ← Emergency Level
- ← Significant Harm Level (SHL)

## Summary

- Some agricultural areas have AQAC issues—some formal (regulatory) and some nuisance
- The persistence of AQAC problems in many areas potentially means that **all** sources will likely come under greater scrutiny



