

# Utah's Air Quality Program

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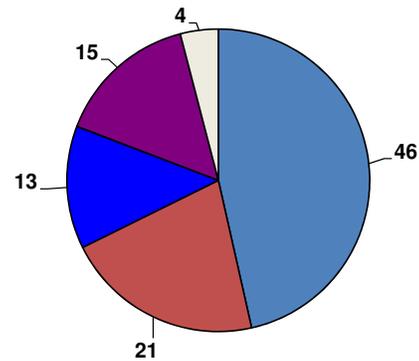
801-536-4000

## Presentation

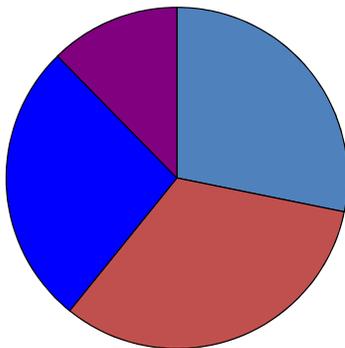
- Current Air Quality and Program Status
- 2014 Legislation Report
- Immediate Strategies
- Long Term Strategies
- 2015 Legislation Priorities

# Current Air Quality Program

- Staff -16.2 average years of state service
- 80% Science and Engineering Degrees
- Funding

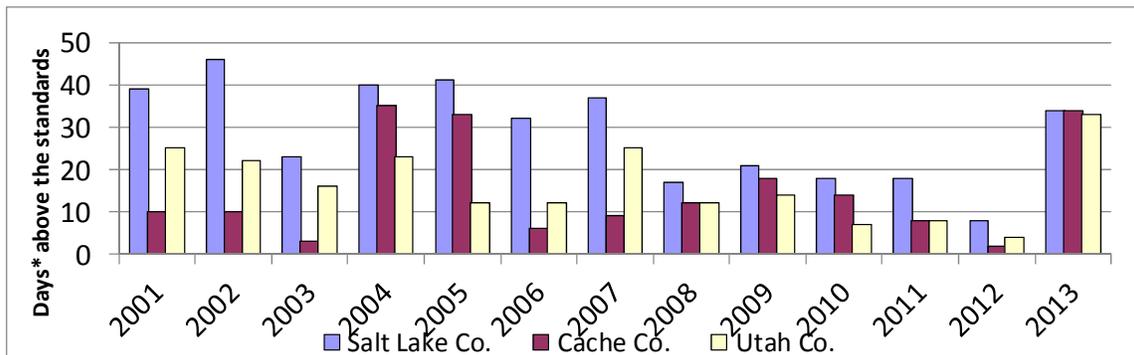


2014 = \$12.9 M



- General Fund
- Fees
- Federal Grants
- Pass Through Federal Grants
- Environmental Scientist
- Environmental Engineer
- Environmental Program Manager
- Support
- Planning Consultant

Number of Days That Are and Those That Would Have Been Above the Current Federal Standards  
Salt Lake, Cache, and Utah County Areas



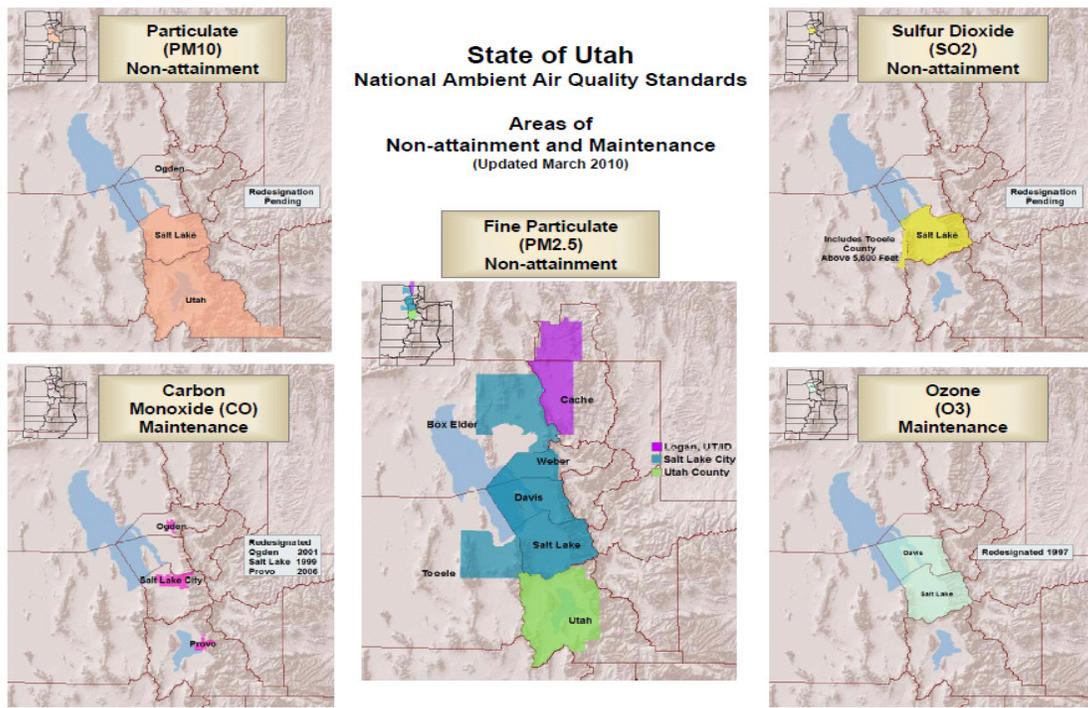
\* Days with monitored values above the level of the **current** National Ambient Air Quality Standards combined for PM2.5 and ozone (PM2.5 standard revised in 2006, ozone standard revised in 2008)

# National Ambient Air Quality Standards

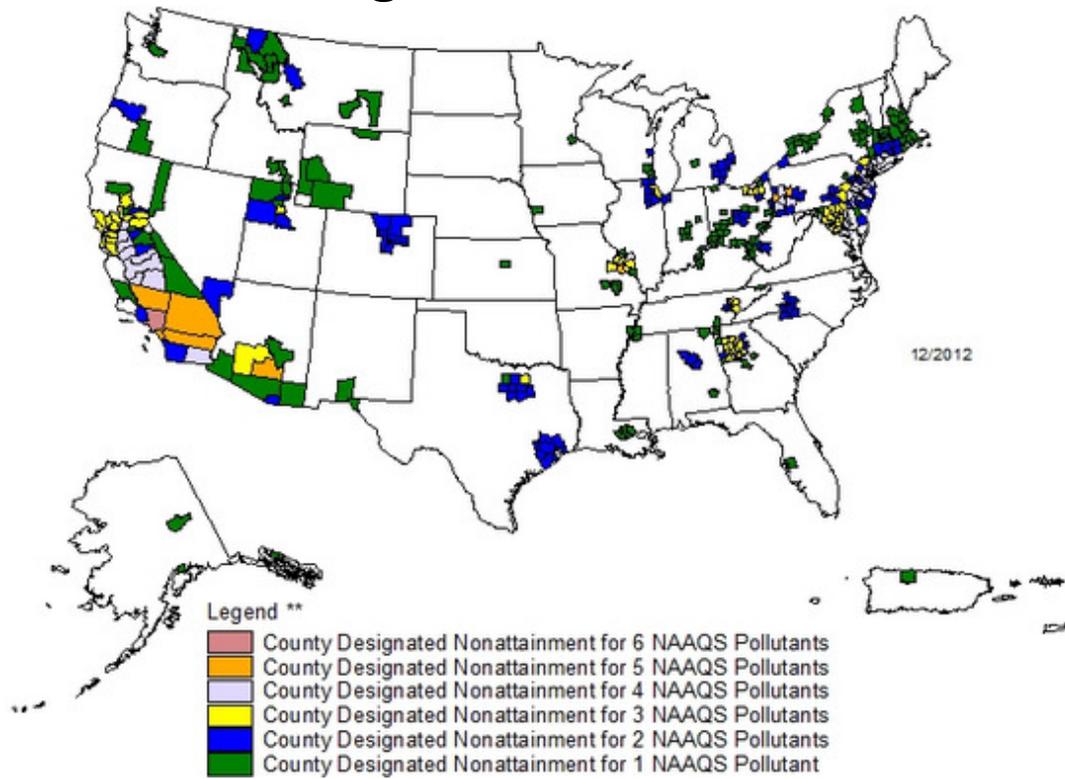
| Pollutant                  | Primary Standards                     |  | Secondary Standards               |                       |
|----------------------------|---------------------------------------|--|-----------------------------------|-----------------------|
|                            | Level                                 | Averaging Time                             | Level                             | Averaging Time        |
| Carbon Monoxide            | 9 ppm (10 mg/m <sup>3</sup> )         | 8-hour <sup>(1)</sup>                      | None                              |                       |
|                            | 35 ppm (40 mg/m <sup>3</sup> )        | 1-hour <sup>(1)</sup>                      |                                   |                       |
| Lead                       | 0.15 µg/m <sup>3</sup> <sup>(2)</sup> | Rolling 3-Month Average                    | Same as Primary                   |                       |
|                            | 1.5 µg/m <sup>3</sup>                 | Quarterly Average                          | Same as Primary                   |                       |
| Nitrogen Dioxide           | 53 ppb (0.053 ppm)                    | Annual (Arithmetic Average)                | Same as Primary                   |                       |
|                            | 100 ppb                               | 1-hour <sup>(3)</sup>                      | None                              |                       |
| Particulate Matter (PM10)  | 150 µg/m <sup>3</sup>                 | 24-hour <sup>(4)</sup>                     | Same as Primary                   |                       |
| Particulate Matter (PM2.5) | 12 µg/m <sup>3</sup>                  | Annual <sup>(5)</sup> (Arithmetic Average) | Same as Primary                   |                       |
|                            | 35 µg/m <sup>3</sup>                  | 24-hour <sup>(6)</sup>                     | Same as Primary                   |                       |
| Ozone                      | 0.075 ppm (2008 std)                  | 8-hour <sup>(7)</sup>                      | Same as Primary                   |                       |
|                            | 0.08 ppm (1997 std)                   | 8-hour <sup>(8)</sup>                      | Same as Primary                   |                       |
|                            | 0.12 ppm                              | 1-hour <sup>(9)</sup>                      | Same as Primary                   |                       |
| Sulfur Dioxide             | 0.03 ppm                              | Annual (Arithmetic Average)                | 0.5 ppm (1300 µg/m <sup>3</sup> ) | 3-hour <sup>(1)</sup> |
|                            | 0.14 ppm                              | 24-hour <sup>(1)</sup>                     |                                   |                       |
|                            | 75 ppb <sup>(10)</sup>                | 1-hour                                     | None                              |                       |

Revised      2006       2008       2010       2012 

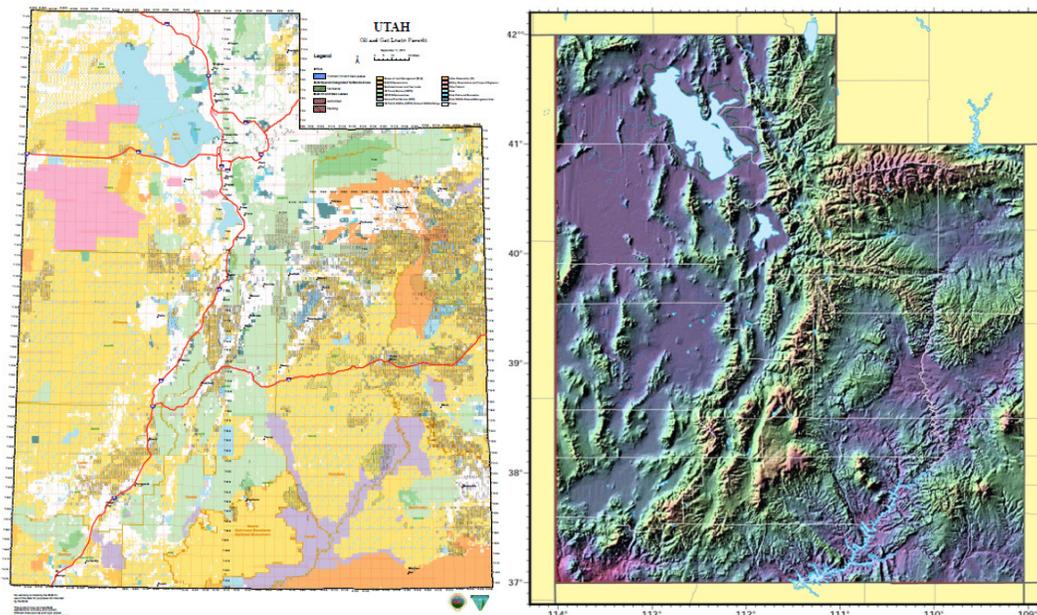
## Non-attainment and Maintenance Areas



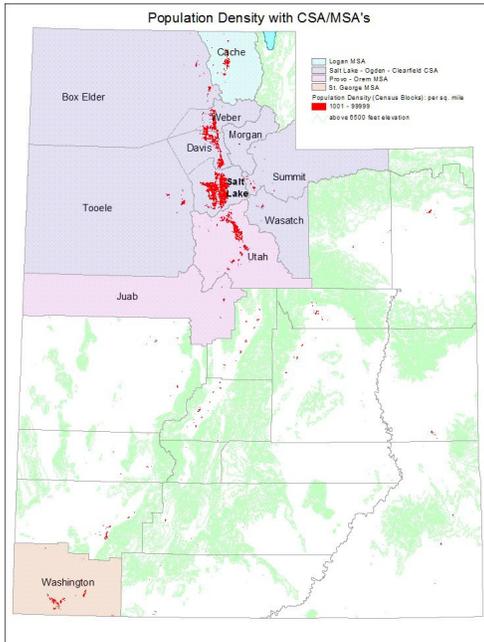
# Counties Designated “Non-attainment”



# Land Ownership and Topography



# Results in Concentrated Population and Associated Pollution



**Urbanites: Nine of 10 Utahns live on 1 percent of state's land**  
**Census » Utah is among most urban states in nation.**

By Lee Davidson The Salt Lake Tribune

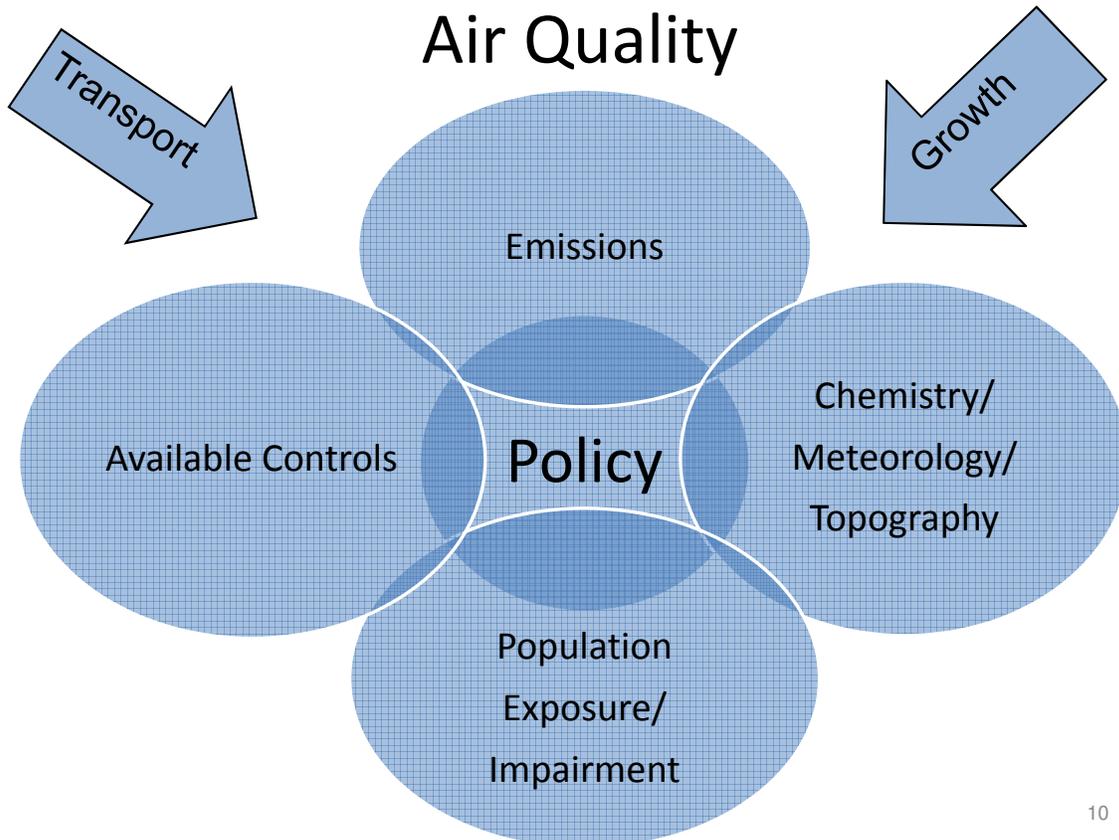
First Published Mar 26 2012 04:14 pm • Last Updated Mar 27 2012 11:42 am

Nine of every 10 Utahns now live in urban areas — and crowd together onto just 1.1 percent of the state's land mass, according to 2010 Census data released Monday.

That makes Utah the eighth most-urbanized state in the nation. It is more urban than such states as New York, Illinois and Connecticut.

<http://www.sltrib.com/sltrib/politics/53794385-90/areas-census-concentration-front.html.csp>

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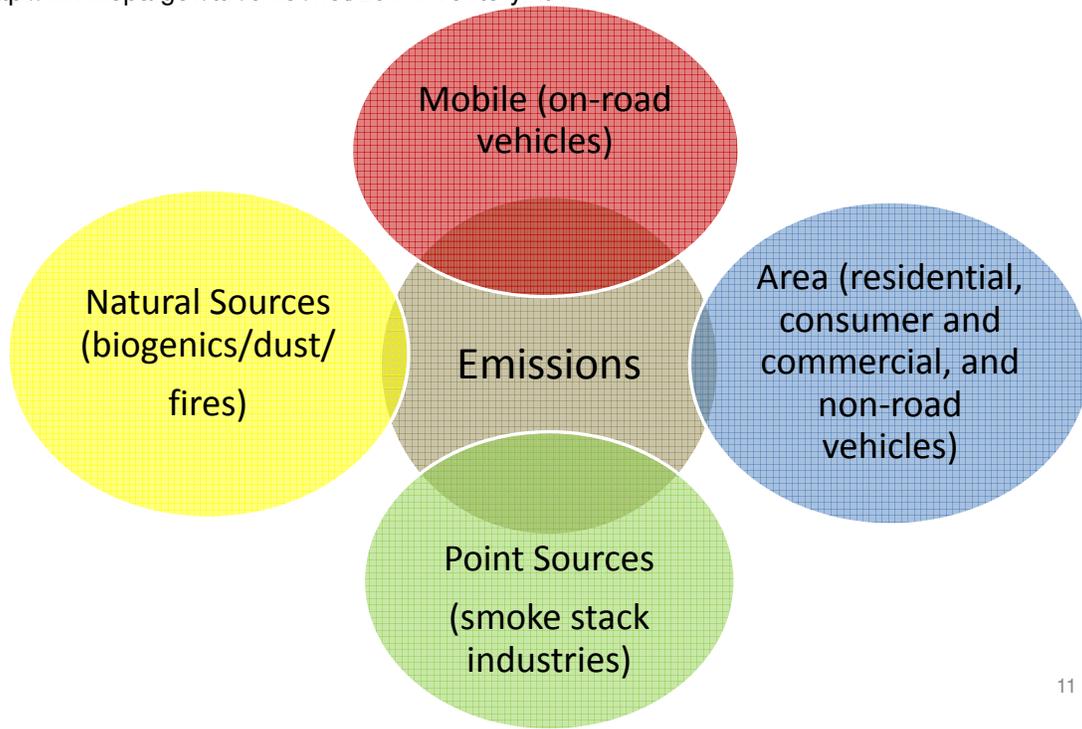


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# Sources of Air Pollution

[http://www.airquality.utah.gov/Planning/Emission-Inventory/Available\\_inventory.htm](http://www.airquality.utah.gov/Planning/Emission-Inventory/Available_inventory.htm)

<http://www.epa.gov/ttn/chief/net/2011inventory.html>

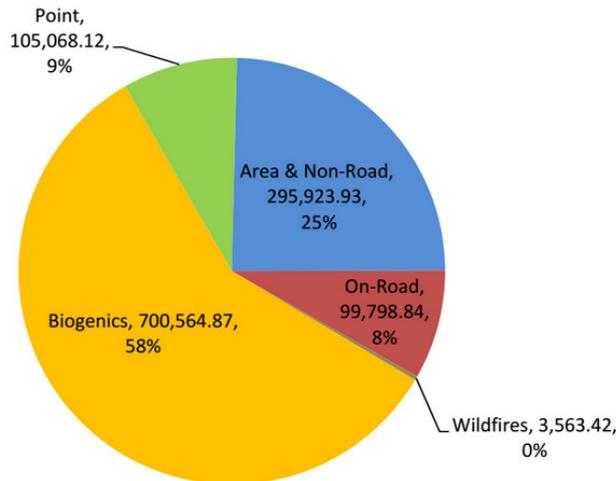


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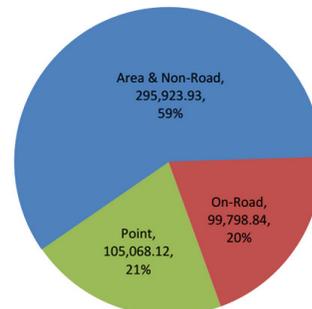
## Emission Inventories

### State-wide Annual Emissions

All Sources  
PM2.5+NOx+SO2+VOC

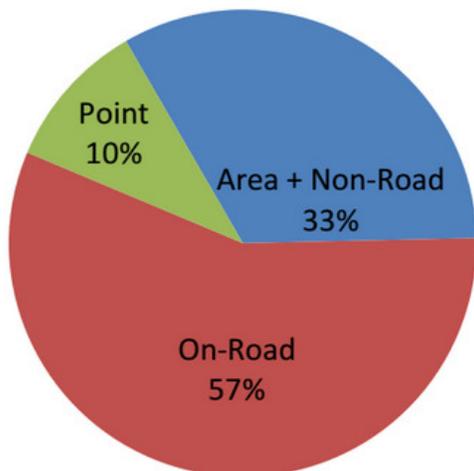


Anthropogenic Sources  
PM2.5+NOx+SO2+VOC

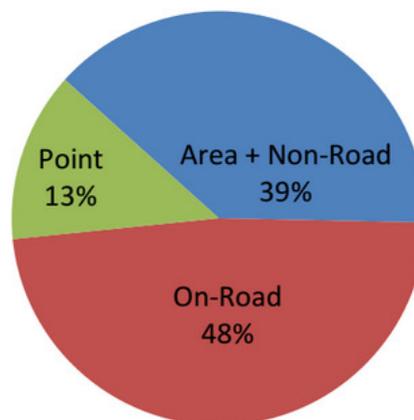


# Emission Inventories

**2008**  
**PM<sub>2.5</sub> + NO<sub>x</sub> + SO<sub>2</sub> + VOC**  
**Typical Winter Day in**  
**Salt Lake, Davis, Utah, Weber Counties**

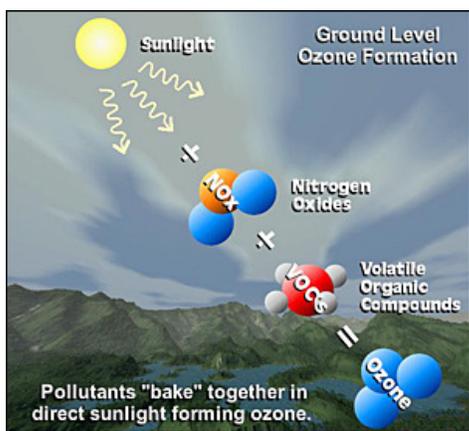


**2014**  
**PM<sub>2.5</sub> + NO<sub>x</sub> + SO<sub>2</sub> + VOC**  
**Typical Winter Day in**  
**Salt Lake, Davis, Utah, Weber Counties**



# Air Pollutants

## Ground Level Ozone



## Particulate Matter PM<sub>10</sub> and PM<sub>2.5</sub>

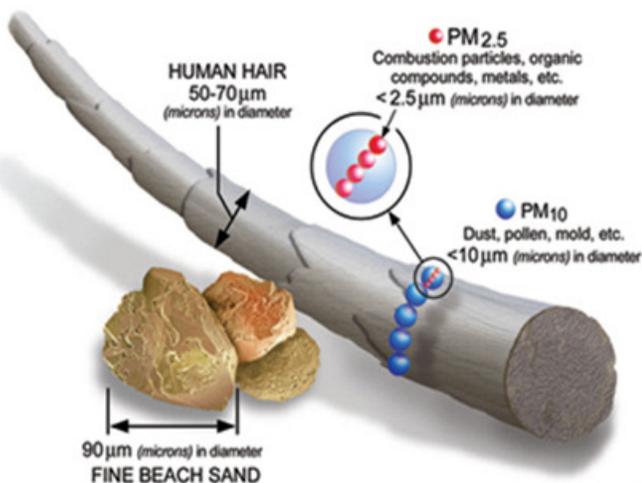
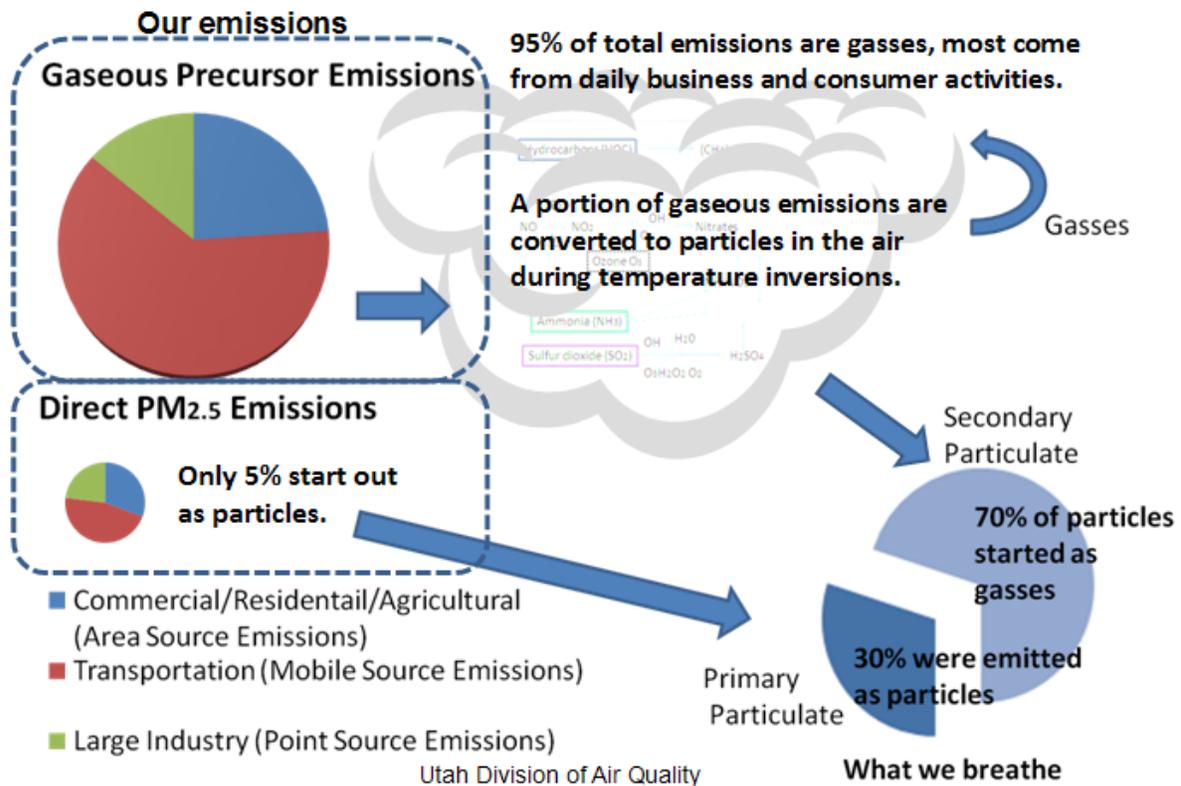


Image courtesy of the U.S. EPA

# Winter Particulate (PM<sub>2.5</sub>) Formation



## Control Strategies developed through an 18-month Stakeholder Process

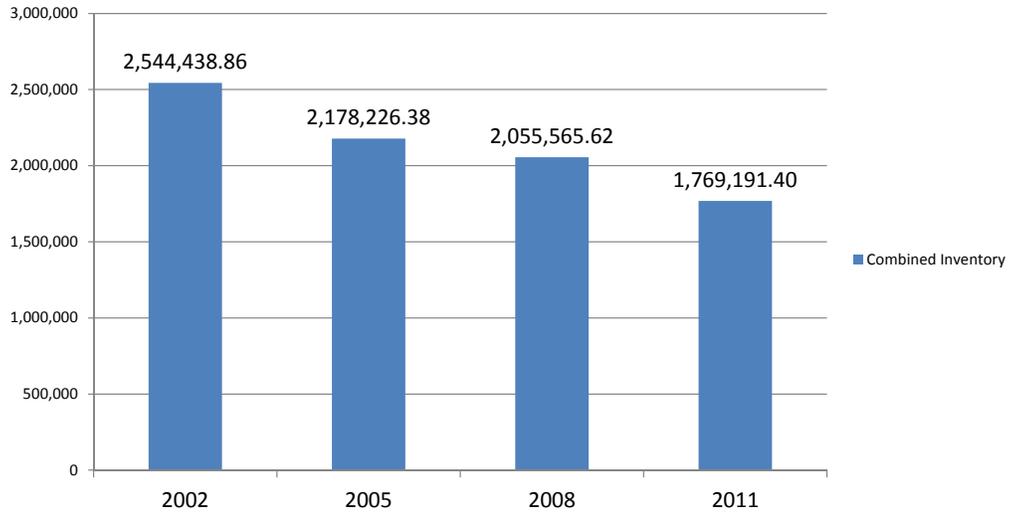
- Controls are Permanent, Enforceable and Quantifiable
- Selected based on cost, emission reduction and other environmental and operational impacts



# Utah Summary of State Air Emissions

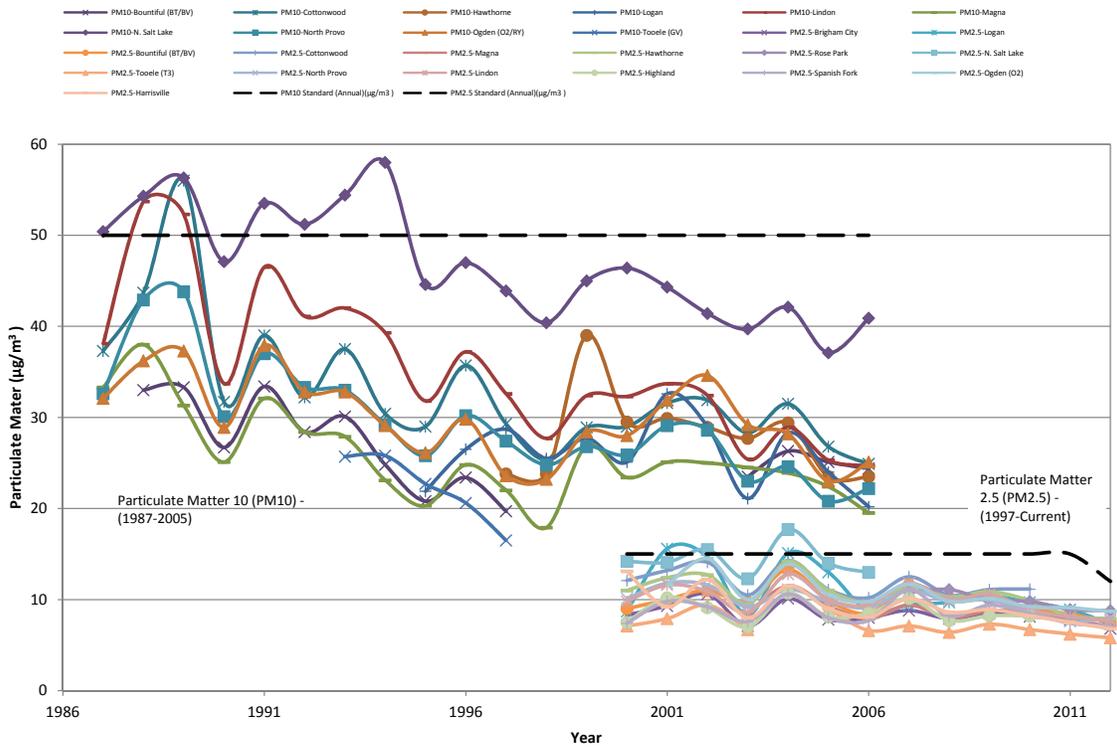
## Total Tons Emitted

### Statewide Emissions

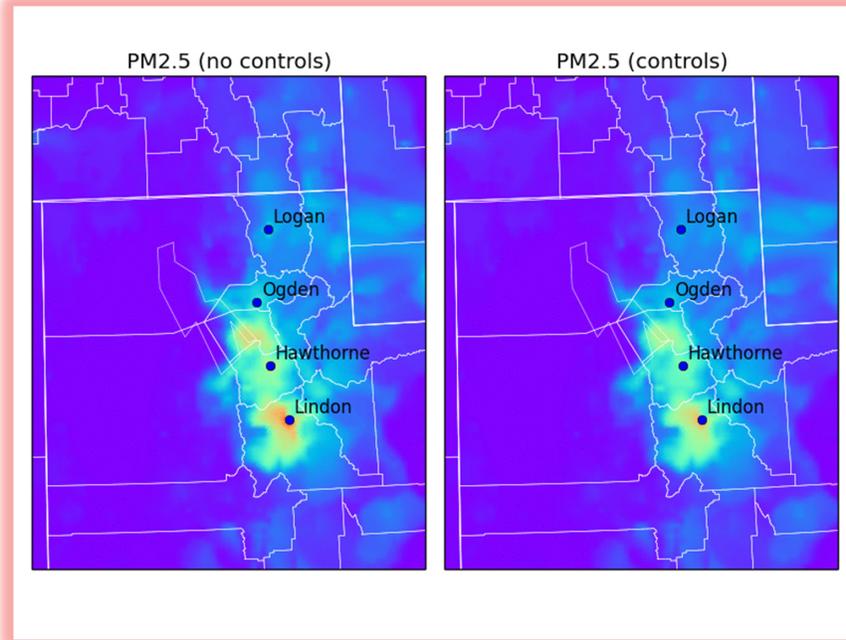


[http://www.airquality.utah.gov/Planning/Emission-Inventory/Available\\_inventory.htm](http://www.airquality.utah.gov/Planning/Emission-Inventory/Available_inventory.htm)

### Particulate Matter (PM) Standards - Annual



2019



<http://www.airquality.utah.gov/Pollutants/ParticulateMatter/PM25/SaltLakeProvo/index.htm>

## Three Day Forecast

- Notify the Public of:
  - Forecast Air Quality Conditions to allow the Public to Plan Activities
  - Public Health Advisories
- Air Pollution Alert and Action Days

DEQ Home > DAQ Home > 3 Day Forecast Forecast Current Trends

Salt Lake County—3 Day Forecast Forecast Current Trends

Box Elder Cache Carbon Davis Duchesne **Salt Lake** Tooele Uintah Utah Washington Weber

July 15, 2014 12:00 PM (updated hourly)

| Day       | Health   | Action              |
|-----------|----------|---------------------|
| Tuesday   | Moderate | Voluntary Action    |
| Wednesday | Moderate | Unrestricted Action |
| Thursday  | Moderate | Unrestricted Action |

Ozone AQI

|                                 |                   |
|---------------------------------|-------------------|
| PM 2.5<br>8.8 µg/m <sup>3</sup> | Ozone<br>0.05 ppm |
| Temperature<br>81° F            | Wind<br>E 3.9 mph |

As with temperature, air pollution varies throughout the day.

Web cam courtesy of the UBATC

Phone forecasts for all counties 801-536-0072 or toll-free 1-800-228-5434. Sign up for Email Alerts.  
Recommend Follow @deqdnm Download the UtahAir app on: Android iOS

# Air Quality Partnerships

The screenshot shows the UCAIR website. The top navigation bar includes 'UCAIR UTAH CLEAN AIR', 'WHAT YOU CAN DO', 'GRANTS & LOANS', 'PARTNERS', 'ABOUT', and 'AIR QUALITY 101'. Below the navigation is a banner for 'CLEAR THE AIR CHALLENGE' with the slogan 'Drive Down Your Miles' and social media icons. A 'Hot Topics' section features a 'Summer Ozone White Paper' dated June 9. To the right, a 'CLEAR THE AIR UTAH' section highlights achievements: 'Last year, we came together and made a huge difference in Utah's air quality. This year, we're planning to surpass our goals once again by eliminating 300,000 single-occupant vehicle trips, averting 2 million miles.' It includes a 'TAKE THE CHALLENGE' button for 'JULY 1st - 31st, 2014' and a 'REGISTER HERE' button. At the bottom of the challenge section, it states: 'TOTAL TRIPS ELIMINATED: 176,199 = 1,973,771 MILES SAVED = \$1,204,000 SAVED = 25,653 POUNDS OF EMISSIONS REDUCED'.

## YOUR UTAH. YOUR FUTURE.

Our state's population has doubled in the last thirty years, and we're projected to add another 2.5 million people by 2050. We all love our high quality of life, our beautiful natural surroundings, and our strong economy. To protect those things that we value about living here, we need to establish a vision together for our Utah and our future.

### How we grow matters.

Will we have **clean air to breathe**? Enough **water** for our needs? **Transportation** choices that promote a high quality of life? An affordable cost of living, with **good housing options** for everyone? **Open space**, including natural lands, agriculture, and recreational options? **Quality jobs** for all of us? An **educated** population? **Affordable energy** supplies that don't damage our air and environment? **The answers to all of these questions depend on the choices we make.**

Governor Gary Herbert has kicked off the *Your Utah, Your Future* effort which will tackle the following issues:



## 2014 Legislation

- Pollution Control Equipment (HB31)
- CARROT (HB61, \$200K)
- Vehicle Tax Credits (HB74)
- Wood Burning (HB154, \$750K)
- Medical Waste Incineration (SB 196 Sub 1)
- Pubic Awareness Campaign (\$500K appropriation)
- Research (\$1M appropriation)
- 4 FTEs and Equipment (\$800K appropriation)

Final Projects for Research Funding 6/4/2014

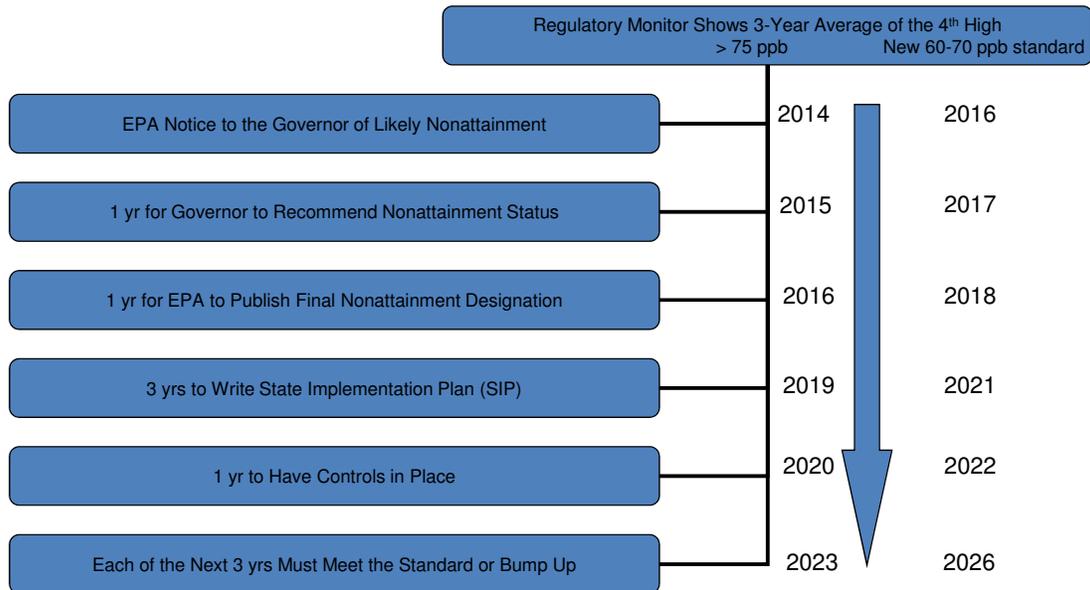
| Project  | Description   | Wasatch Front PM2.5 | Uinta Basin Winter ozone | Wasatch Front Summer ozone | Wasatch Front Health |
|--|---|---------------------|--------------------------|----------------------------|----------------------|
| Portable Monitoring Trailer  | Increase DAQ's flexibility in monitoring in different area for specific purposes -- <b>DAQ</b>  | X                   |                          | X                          | X                    |
| Toxics Study   | Expand DAQ analysis of toxics monitoring - compare new, temporary WV site with 2000-2002 data, temporary site in Provo, more frequent monitoring -- <b>DAQ &amp; Uofu</b>                           |                     |                          |                            | X                    |
| Exceptional events modeling - wildfire, aerosols, ozone, wind-blown dust   | Inventory development, source apportionment, STILT & STILTCHM model -- <b>Uofu</b>  | X                   |                          | X                          |                      |
| Cold Start Emissions   | Comrehensive study of cold start emissions for policy and regulatory purposes -- <b>USU &amp; WSU (NCAST)</b>   | X                   |                          |                            |                      |
| Centralize I/M databases across counties   | This project would be done by the NCAST/WSU lab after getting multi-county support ~ 10K/county -- <b>NCAST/WSU/DAQ</b>   | X                   |                          | X                          |                      |
| Uinta Basin Oil and Gas Emissions  | Formaldehyde emissions from non combustion sources. (Identified in the UBOS study as an important contributor to ozone) -- <b>Bingham Research Center/USU</b>                                       |                     | X                        |                            |                      |
| Oil & Gas Projection/Decline Curve Analysis - extension of DAQ whitepaper methodology -- Uofu  | Improve assumptions in the projection of Uinta Basin development and emissions growth -- <b>Uofu</b>  |                     | X                        |                            |                      |
| Winter ozone photochemical modeling I  | Addresses temperature dependent reactions or organic nitrate. Builds upon the work of Dr. William Carter done for UGR Wyoming. Add SAPRC chemistry and speciation profile to CMAQ -- <b>USU/BYU</b> |                     | X                        |                            |                      |
| Winter ozone photochemical modeling II CB05/CB06 low temperature organic nitrate & HONO chemistry. Sole-source contract with ENVIRON | A different approach from the SAPRC mechanism but important because it can apply to summer O3 modeling. Includes consulting for implementation of the HONO chemistry improvement -- <b>ENVIRON</b>  | X                   | X                        | X                          |                      |
| Improve Winter Atmospheric Modeling along the Wasatch Front  | Incorporate model improvements for winter conditions that were developed for the Uinta Basin into Wastach Front cold pool conditions -- <b>Uofu</b>   | X                   |                          |                            |                      |
| Salt Lake Valley wood burning emissions - micro-inventory  | Micro-inventory of residential wood burning emissions - ground truth are-source inventory -- <b>Uofu/DAQ</b>  | X                   |                          |                            |                      |
| GSL O3 Measurement Study - Summer 2015   | Atmospheric boundary layer analysis - air quality model conceptual understanding & model verification -- <b>Uofu/DAQ</b>  |                     |                          | X                          |                      |
| GSL O3 Measurement Study - Summer 2015   | mobile/van surface ozone monitoring on lake perimeter -- <b>Uofu</b>  |                     |                          | X                          |                      |
| GSL O3 Measurement Study - Summer 2015   | Stationary monitors to compare against mobile data -- <b>DAQ</b>  |                     |                          | X                          |                      |

## Immediate Issues

- PM2.5 Plan – 23 new rules with 2019 attainment
  - Increased incentives and education about voluntary measures (UCAIR and Envision Utah)
- Ozone – Uinta Basin winter
  - Clean up existing equipment
  - Streamlined permitting for cleanest new equipment
  - Improved inventory through connection with Oil Gas and Mining
  - Coordination with Counties, Tribe, Industry and Land Managers to cut emissions and facilitate production
- Carbon Emissions Regulations for Electrical Generation under CAA 111(d)

# Designation and SIP Process – Ozone

(Sequential Timeline)



## Green House Gas Regulations

EPA proposed state reduction goals for electricity generation under Section 111(d) of the Clean Air Act on June 2, 2014 (Published on June 17, with an October 16<sup>th</sup> end of comment period)

EPA to finalize the requirements in June of 2015

State “SIP-like” plans are due in June of 2016 with possible extensions to 2018

Block 1 - Efficiency Improvements at Coal-Fired Power Plants

Block 2 - Additional utilization of existing Combined Cycle Natural Gas Generation (using peaking plants for base load)

Block 3 - New Nuclear and Renewable Energy (Wind, Water, Solar and Geothermal)

Block 4 - New Demand Side Management Energy Efficiency Improvements

Utah's reduction goals:

Block 1 - 5.52%

Block 2 - 11.31%

Block 3 - 2.98%

Block 4 - 7.28%

Total reduction goal from 2012 rates - 27.08%

# Western States 111(d) Goals

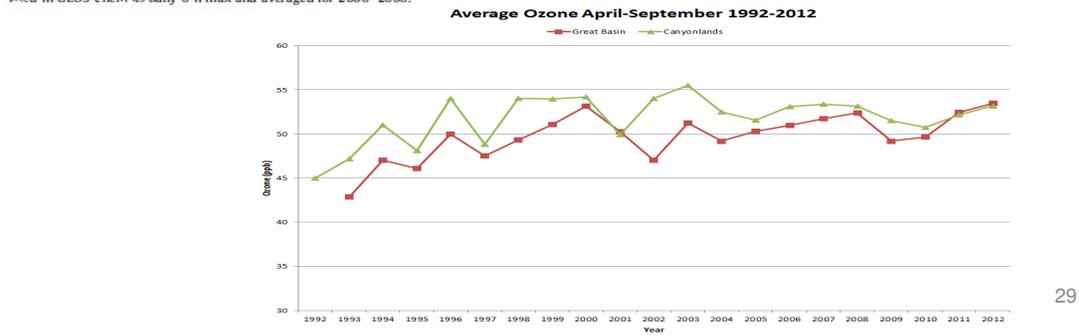
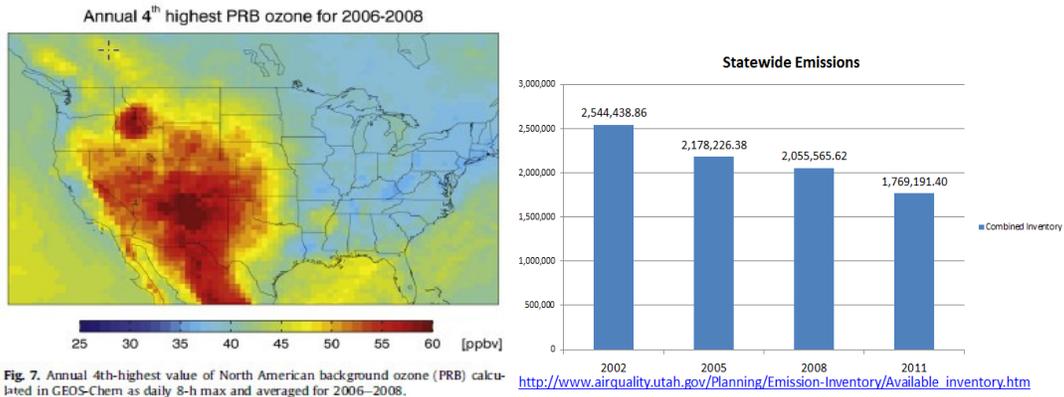
|            | Block 1      | Block 2       | Block 3      | Block 4      |               |         |
|------------|--------------|---------------|--------------|--------------|---------------|---------|
|            | Eff. Imp.    | NG redisb     | NUC&RE       | DS EE        | Total         |         |
| Alaska     | 0.81%        | 7.62%         | 3.40%        | 13.92%       | 25.76%        |         |
| Arizona    | 4.06%        | 37.92%        | 2.00%        | 7.71%        | 51.69%        |         |
| California | 0.14%        | 5.01%         | 6.73%        | 11.17%       | 23.07%        |         |
| Colorado   | 5.43%        | 16.74%        | 6.53%        | 6.65%        | 35.36%        |         |
| Hawaii     | 1.82%        | 0.00%         | 1.75%        | 11.62%       | 15.19%        |         |
| Idaho      | 0.00%        | 0.00%         | 14.16%       | 18.58%       | 32.74%        |         |
| Montana    | 5.88%        | 0.00%         | 7.93%        | 7.35%        | 21.15%        |         |
| Nevada     | 1.82%        | 17.31%        | 8.00%        | 7.39%        | 34.51%        |         |
| New Mexico | 4.60%        | 14.88%        | 7.19%        | 7.25%        | 33.92%        |         |
| N. Dakota  | 5.97%        | 0.00%         | 0.50%        | 4.11%        | 10.58%        |         |
| Oregon     | 2.23%        | 18.97%        | 15.76%       | 11.16%       | 48.12%        |         |
| S. Dakota  | 5.99%        | 29.52%        | -14.80%      | 14.01%       | 34.71%        |         |
| Utah       | <b>5.52%</b> | <b>11.31%</b> | <b>2.98%</b> | <b>7.28%</b> | <b>27.08%</b> |         |
| Washington | 3.70%        | 37.57%        | 19.31%       | 10.98%       | 71.56%        |         |
| Wyoming    | 6.00%        | 1.47%         | 8.79%        | 2.70%        | 18.96%        |         |
|            | 3.60%        | 13.22%        | 6.02%        | 9.46%        | 32.29%        | Average |

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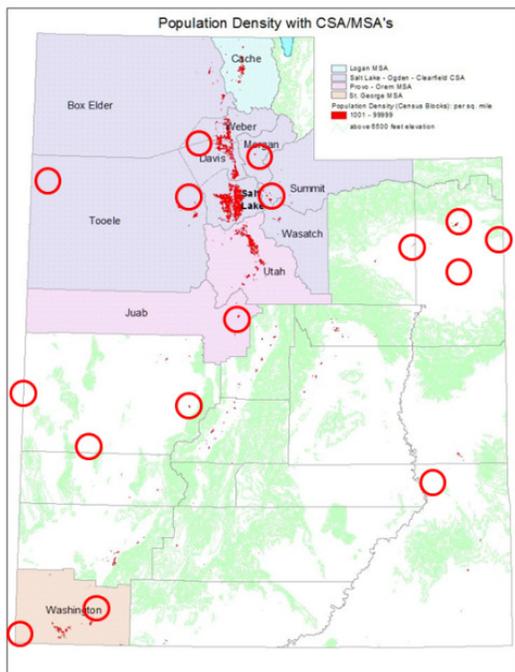
## Long Term Strategies

- Local research that informs local decisions
- Ozone – State-wide under expected 2015 revised standard
  - Understanding long-range transport, exceptional events and chemical pathways of formation
- Air Toxics
  - Mercury – fish and duck consumption advisories
  - Chronic and cancer exposure risk
- Increased Monitoring and Modeling
- Operating Permit emission fee restructure

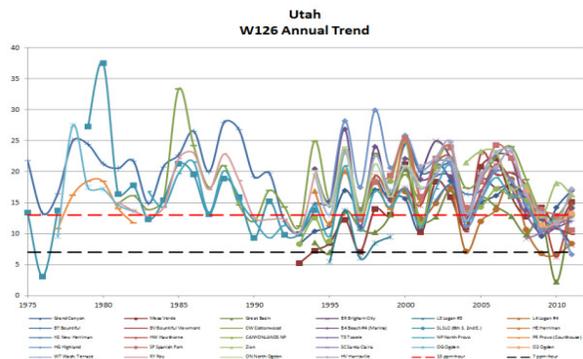
# Background Ozone



# New Ozone Standard



EPA to Propose the new standard by December 2014, and finalize by October 2015



## 2015 Legislation Priorities

- Operating Permit Emission Fee Restructure
- Research Building Block as Ongoing
- Statute clean-up
- Tier 3 Fuels and Vehicles
- Energy Efficiency Code Updates
- Increasing Transportation Options (first and last mile)
- Decreasing Diesel Emissions (Tier 4, retrofit and anti-tampering)

Questions?

[www.deq.utah.gov](http://www.deq.utah.gov)

[www.airquality.utah.gov](http://www.airquality.utah.gov)

[www.cleanair.utah.gov](http://www.cleanair.utah.gov)