Uinta Basin Ozone Status

Air Quality Board Meeting

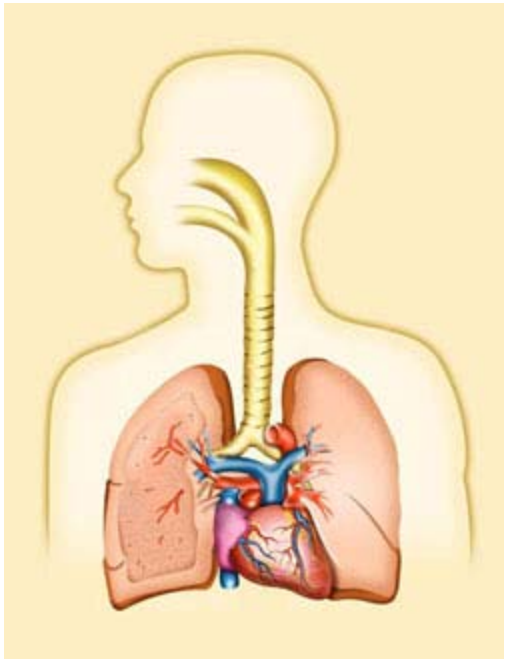
June 1, 2016

Presentation Overview

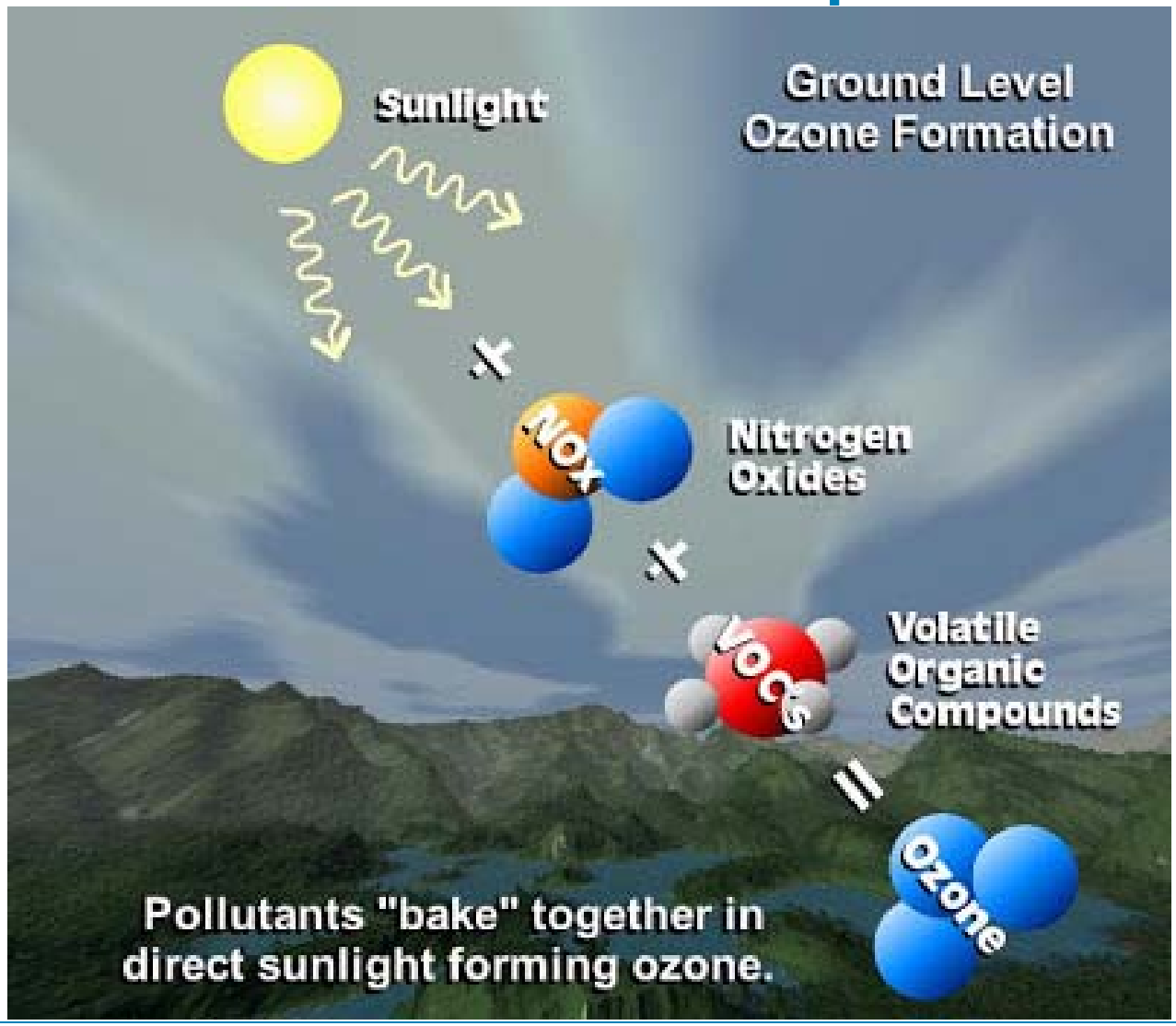
- Ozone fundamentals
- History of Ozone in the Uinta Basin
- Cooperative winter studies and findings
- New rules and jurisdiction
- New Ozone standard
- Designation process for determination of Attainment/Nonattainment
- Classification and SIP development.
- Next steps – Permit by Rule
- Questions/Discussion

Ozone Health Effects

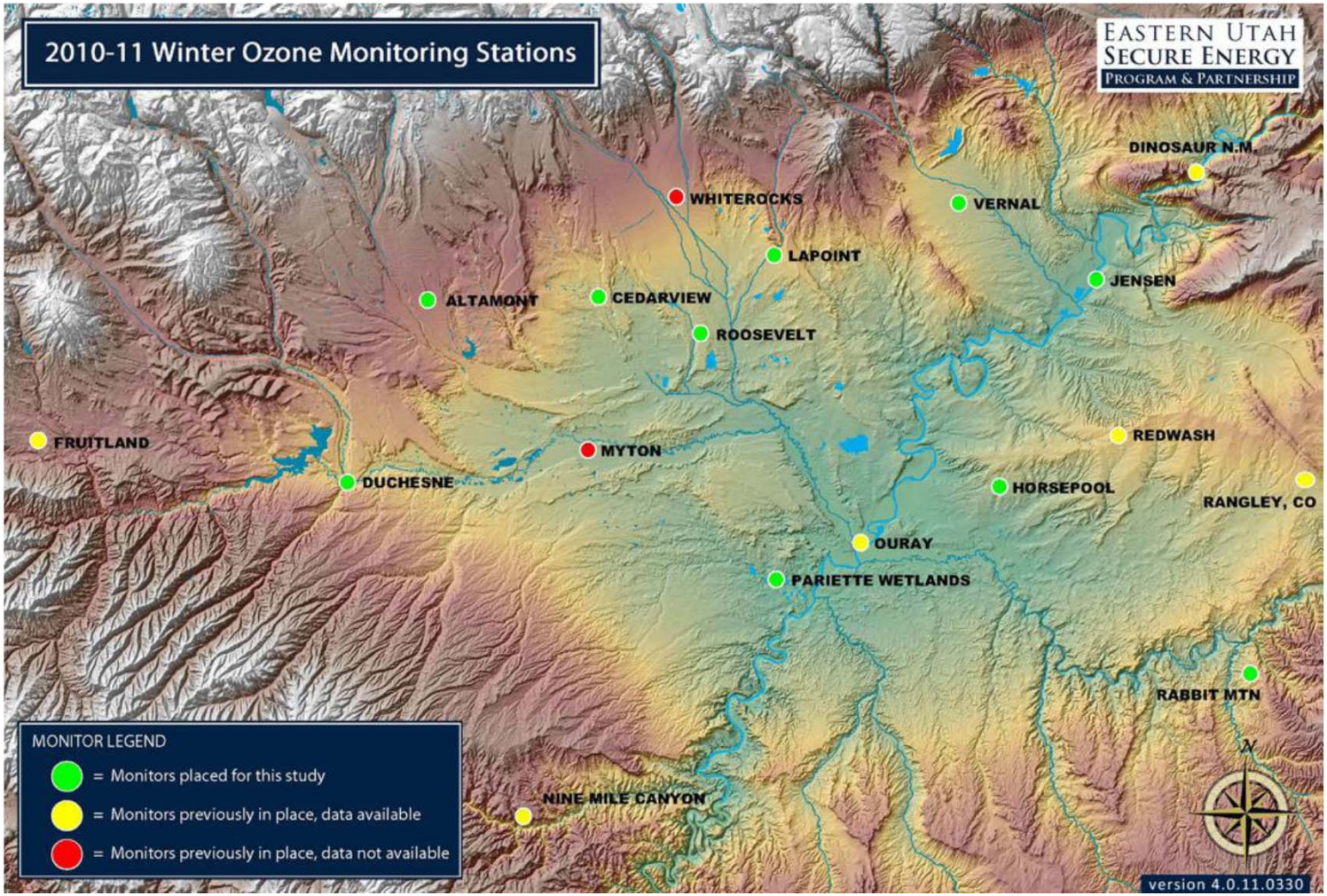
- Inflame and damage the airways.
- Aggravate lung diseases such as asthma, emphysema, and chronic bronchitis.
- Increase the frequency of asthma attacks.
- Make the lungs more susceptible to infection.
- Continue to damage the lungs even when the symptoms have disappeared.



Ozone is Formed in the Atmosphere



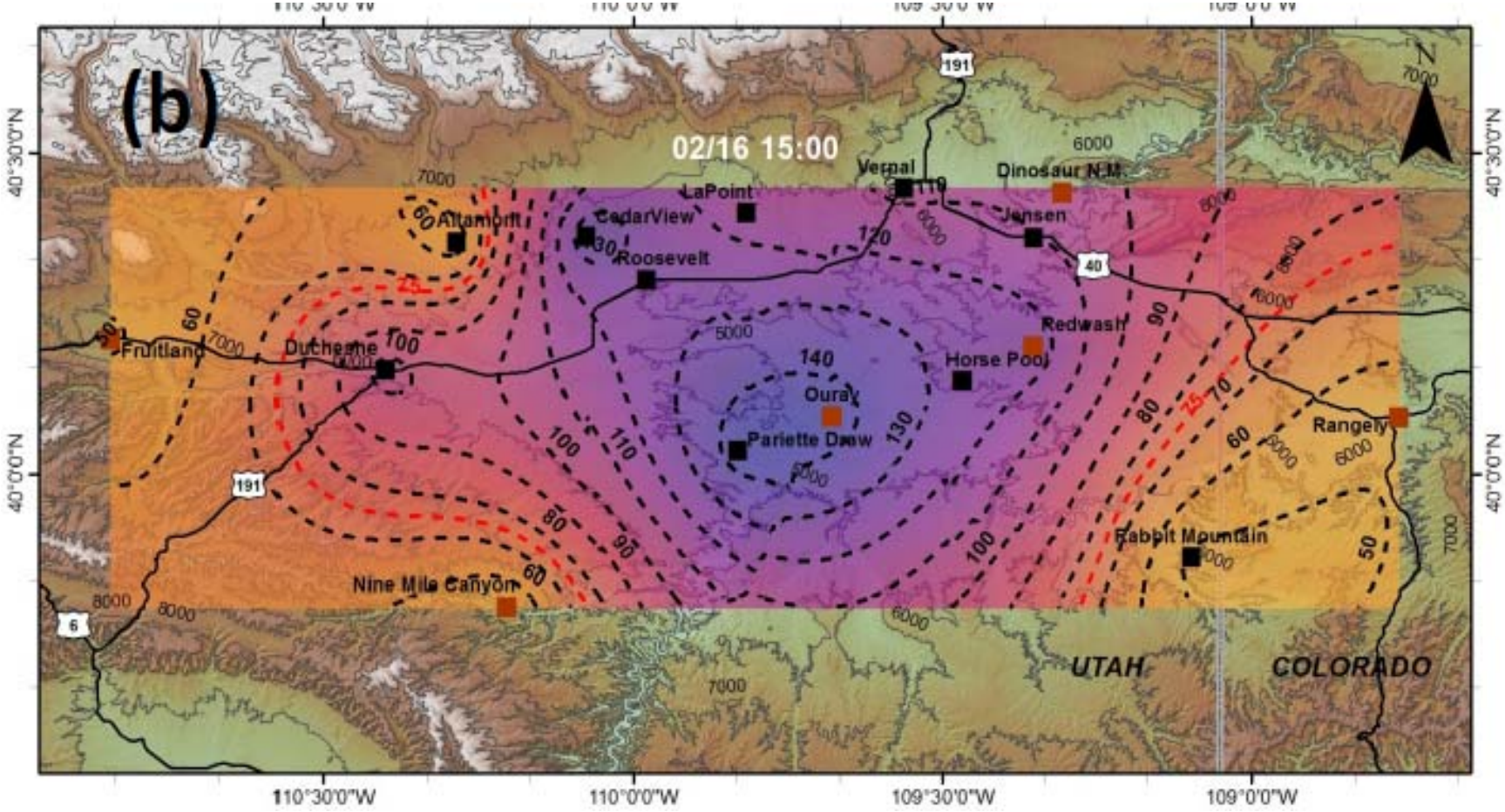
Saturation Study Monitoring Site Locations
Winter 2010/2011



Ozone Concentration Map Winter 2010/2011

Ozone 1-hour at 3 pm Feb 16, 2011

Basin-wide O3, highest at lower elevations



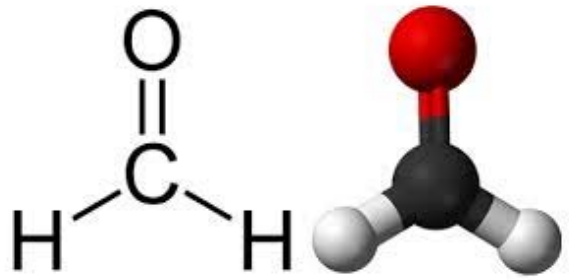
Monitoring and Winter Studies

UINTA BASIN OZONE STUDY (UBOS)

- A coordinated multi-winter (2012-2014) research effort aimed at identifying the emissions, meteorology and photochemical processes that cause elevated winter ozone concentration, and to identify the most effective reduction strategies.
- A cooperative effort between the UDEQ, EPA, BLM, NOAA, Bingham Research Center, Uintah Impact Mitigation Special Service District, Western Energy Alliance, and others for research and support.
- Largest air quality research effort ever conducted in the State.

Research Findings

- Elevated winter ozone is episodic and only occurs with snow cover and a persistent temperature inversion that traps emission close to the ground where they can react.
- Study results show that the primary chemical drivers of winter ozone formation in the Uinta Basin differ greatly from summer ozone formation in urban areas.
- Measurements confirmed that formaldehyde and other aldehydes are the dominant radical sources for the Basin's winter ozone chemistry.
- Aromatic VOCs (including toluene and xylene), while less abundant than other VOC species in the Basin, are important sources of radicals.
- Research to date indicates that VOC controls focused on these reactive species will be particularly effective.

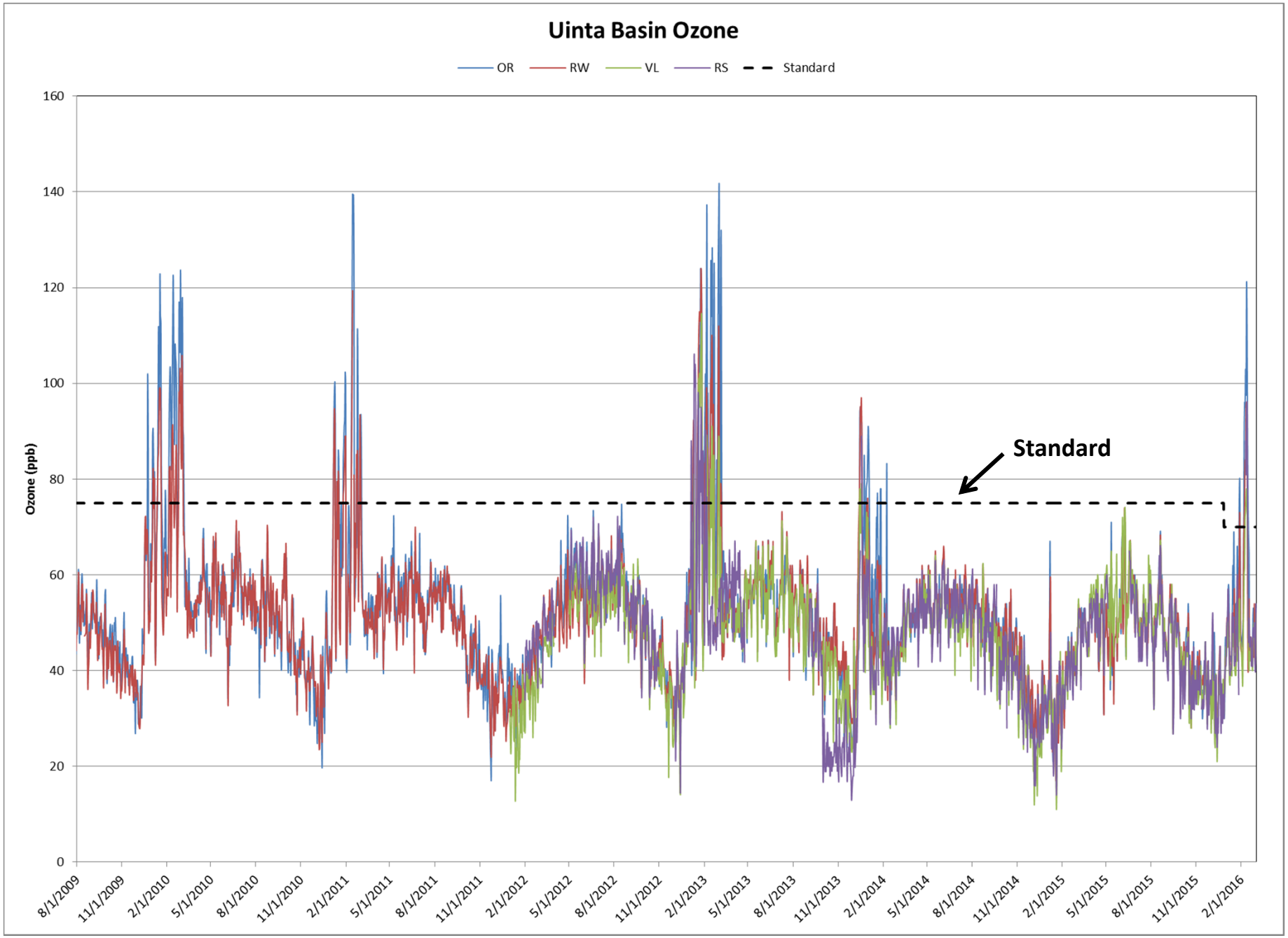


Current Research Projects

Based on collaborative work between DEQ and researchers involved with the UBOS study, DAQ has selected applied research projects directed towards inventories, meteorology, and chemistry to target the most effective controls to reduce winter ozone.

Out of the $1 million funded by the Legislature in FY 2015, $295,000 is directed to four projects specific to winter time ozone in the Uinta Basin.

- Assess formaldehyde emissions from oil and gas sources
- Improve the overall emissions inventory for oil and gas sources
- Incorporate low temperature reactions into model ozone chemistry
- Change model process for the effect of snow on chemical production of ozone


Uinta Basin Ozone
OR
RW
VL
RS
Standard
Ozone (ppb)
160
140
120
100
80
60
40
20
0
Standard
8/1/2009
11/1/2009
2/1/2010
5/1/2010
8/1/2010
11/1/2010
2/1/2011
5/1/2011
8/1/2011
11/1/2011
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11/1/2013
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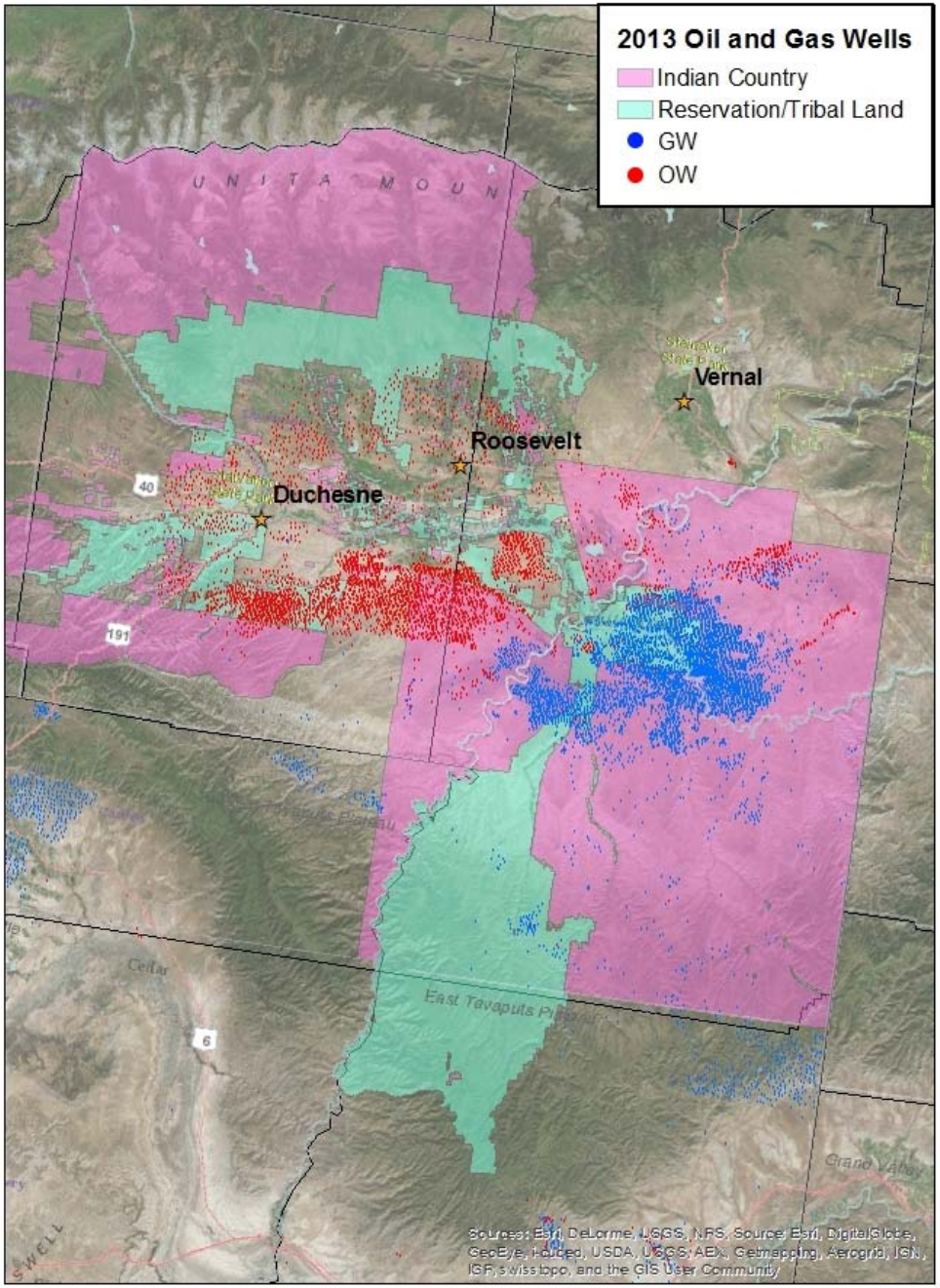
5/1/2014
8/1/2014
11/1/2014
2/1/2015
5/1/2015
8/1/2015
11/1/2015
2/1/2016

New Utah Rules – *existing source emissions*

- R307-501 establishes general requirements for the prevention of emissions and good air pollution control practices for all oil and gas exploration and production operations, well sites, natural gas compressor stations, and natural gas processing plants.
- R307-502 reduces emissions of volatile organic compounds from pneumatic controllers that are associated with oil and gas operations. The rule requires existing pneumatic controllers to meet the standards established for new controllers.
- R307-503 establishes conditions to ensure that flares used in the oil and gas industry are operated effectively.
- R307-504 establishes control requirements for loading of liquids containing volatile organic compounds at oil or gas well sites.



Air Regulation

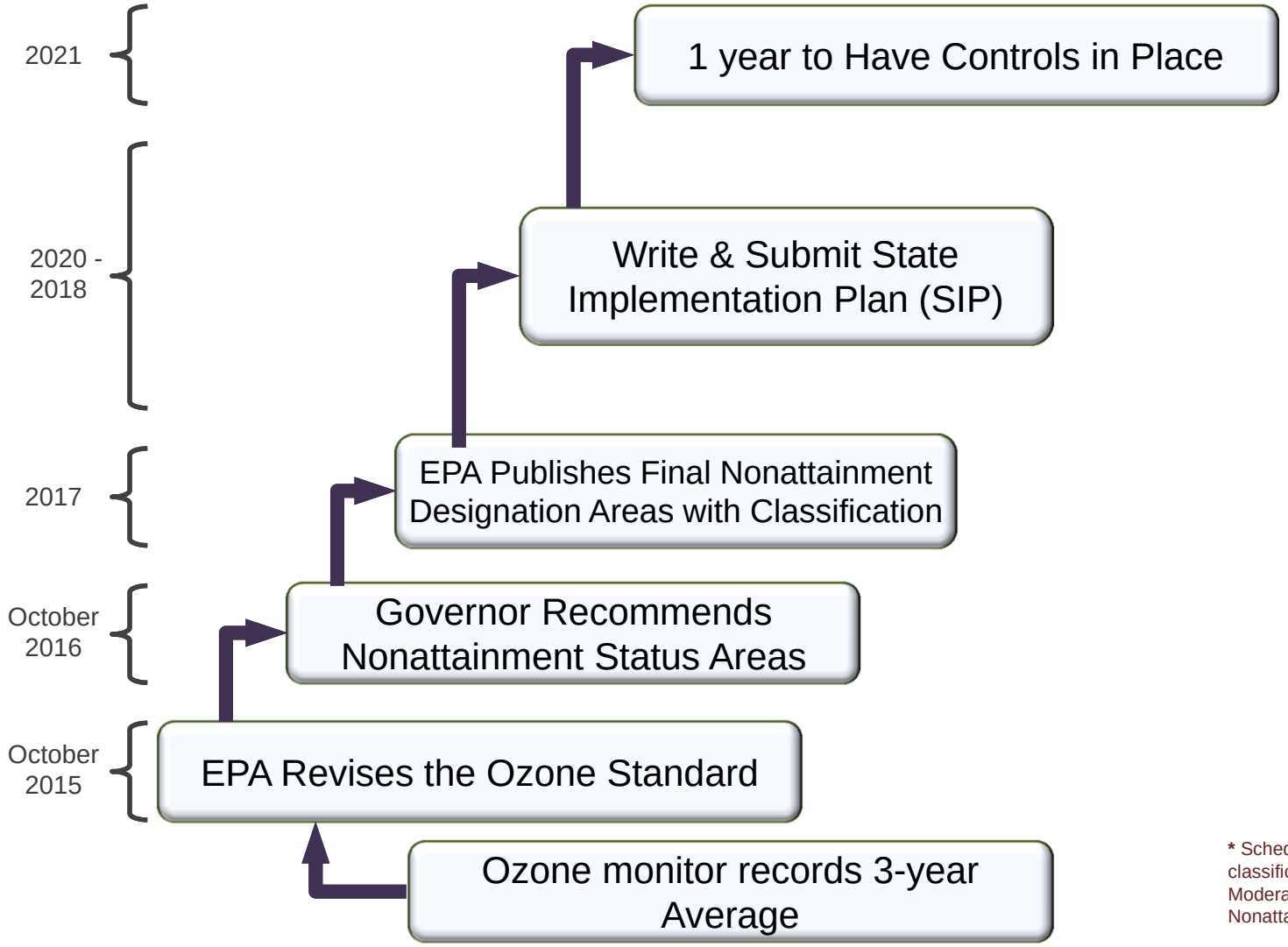
The Basin is a complex mixture of State and Tribal/EPA air jurisdiction.

New EPA Ozone Standard

October 2015

- Lowered from 75 ppb to 70 ppb
- Based new health studies and research
- Level recommended by EPA's CASAC
- Set to protect the sensitive populations
- Calculated as the 3-year average of the 4th high 8-hour average at a monitor
- Triggers a non-attainment evaluation based on monitoring data (prior 3 years)

Planning Timeline



***** Schedule based on a classification of Moderate Nonattainment

Area Designation Factors to Consider When Determining Nonattainment Boundary

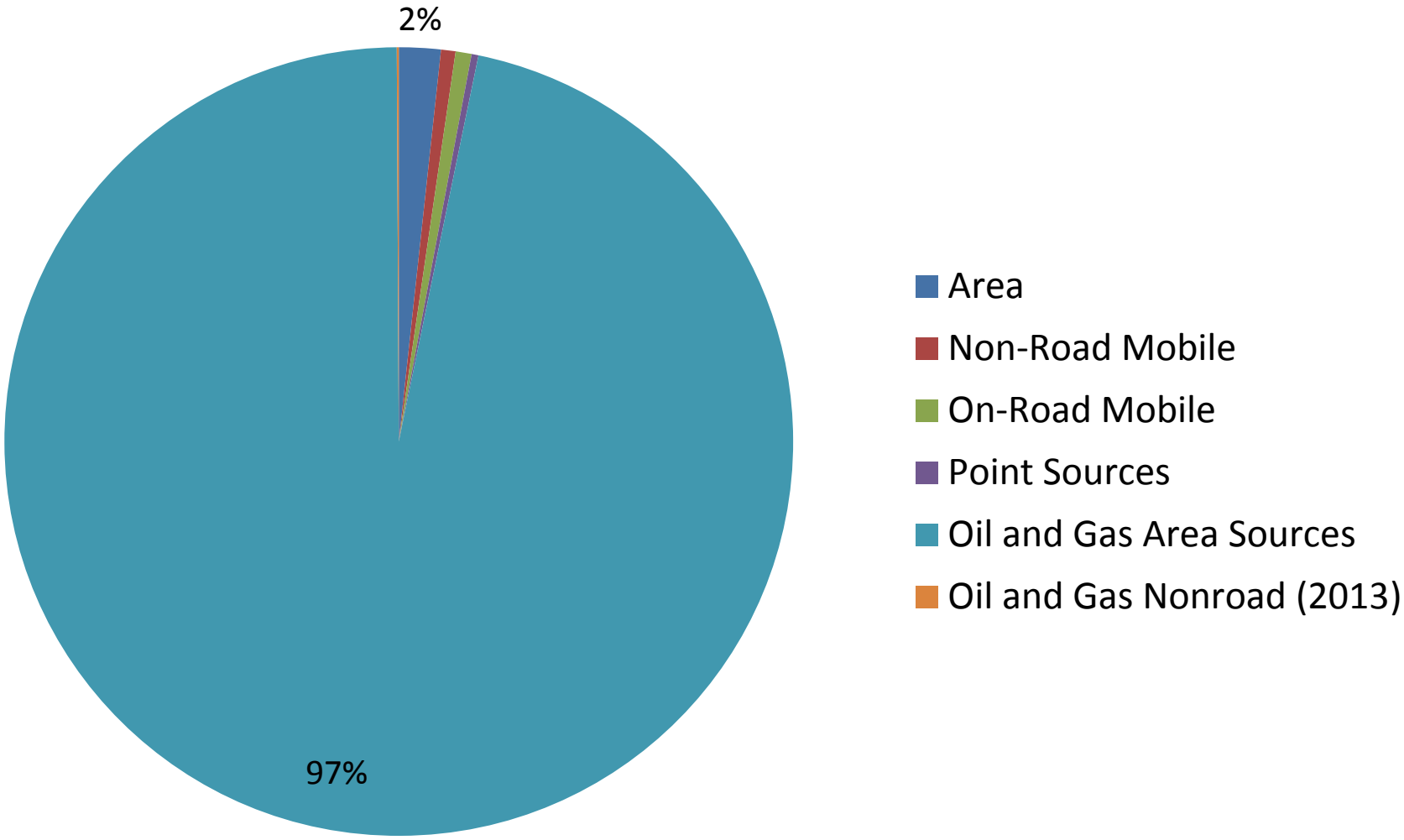
- Air Quality Data
- Emissions and Emissions Related Data
- Meteorology
- Geography and Topography
- Jurisdictional Boundaries

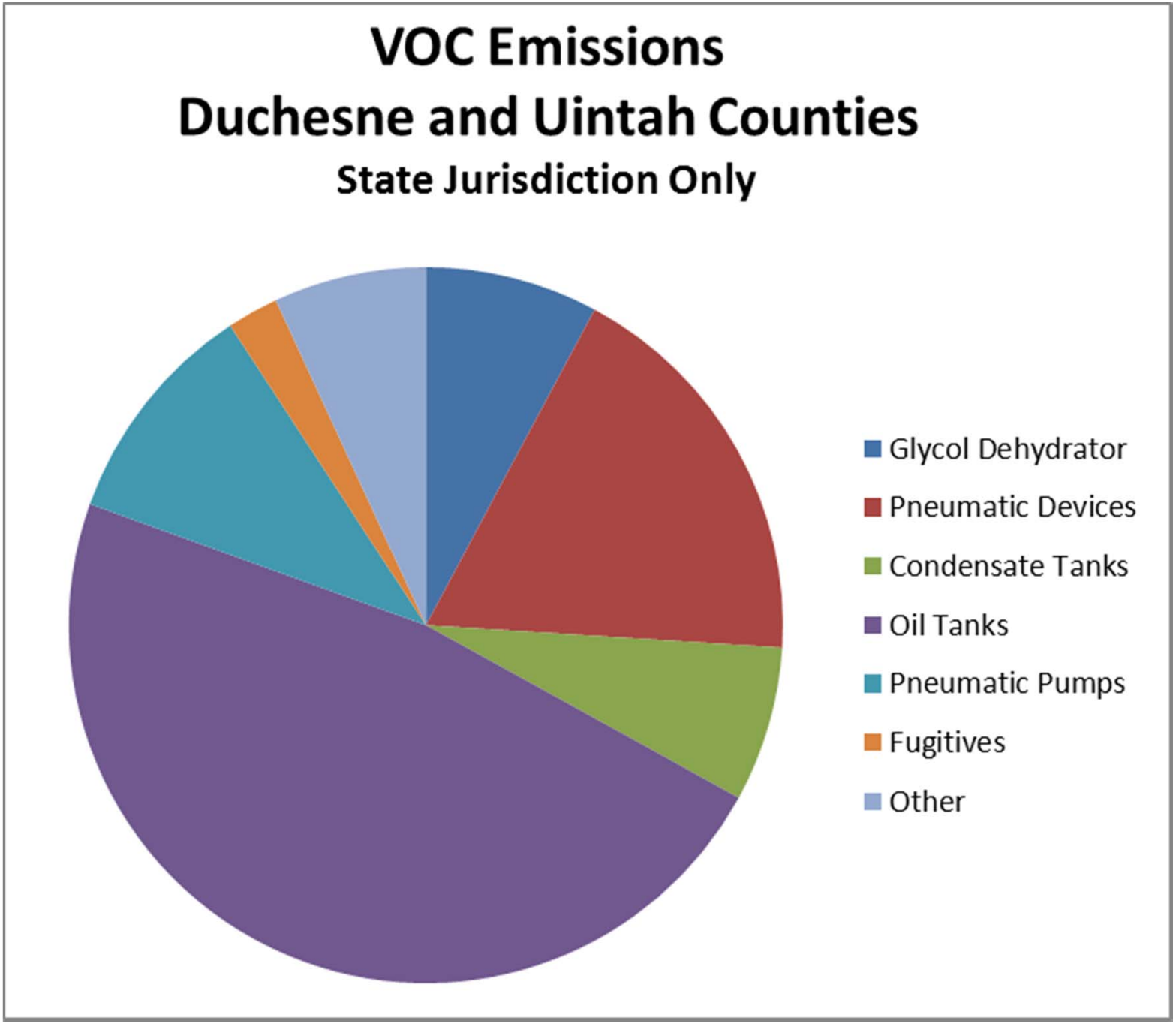
Area Classification Thresholds

	2008 Standard		2015 Standard*	
Area Classification	From	Up to but not including	From	Up to but not including
Marginal	76	86	71	81
Moderate	86	100	81	93
Serious	100	113	93	105
Severe	113	175	105	163
Extreme	equal to or above 175		equal to or above 163	

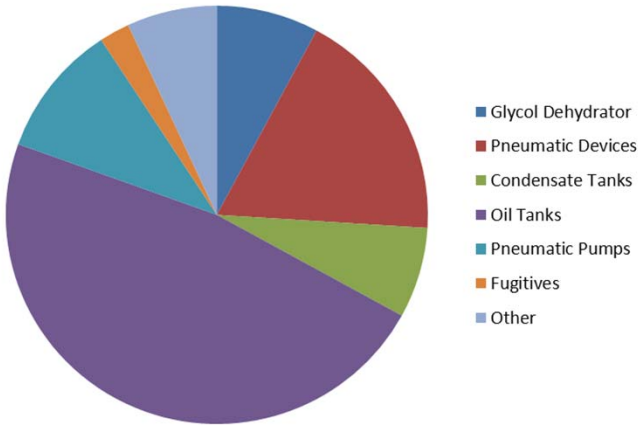
*Not the final implementation rule. These are estimates based on assumptions from the 1997 and 2008 ozone NAAQS.

Uinta Basin 2011 Annual Anthropogenic VOC Emissions

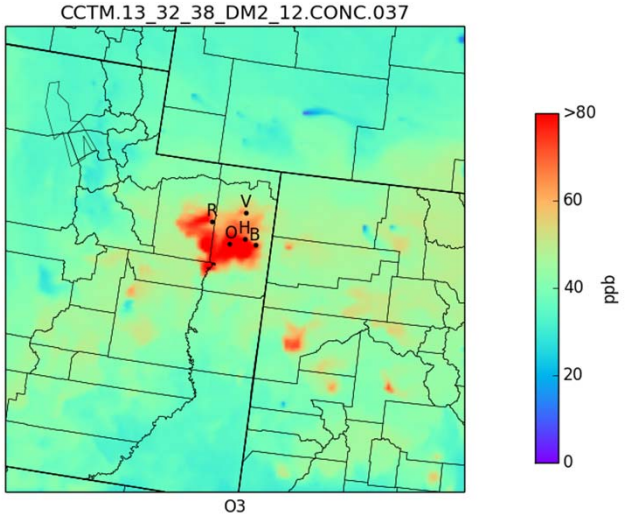



VOC Emissions
Duchesne and Uintah Counties
State Jurisdiction Only
Glycol Dehydrator
Pneumatic Devices
Condensate Tanks
Oil Tanks
Pneumatic Pumps
Fugitives
Other

Inventory



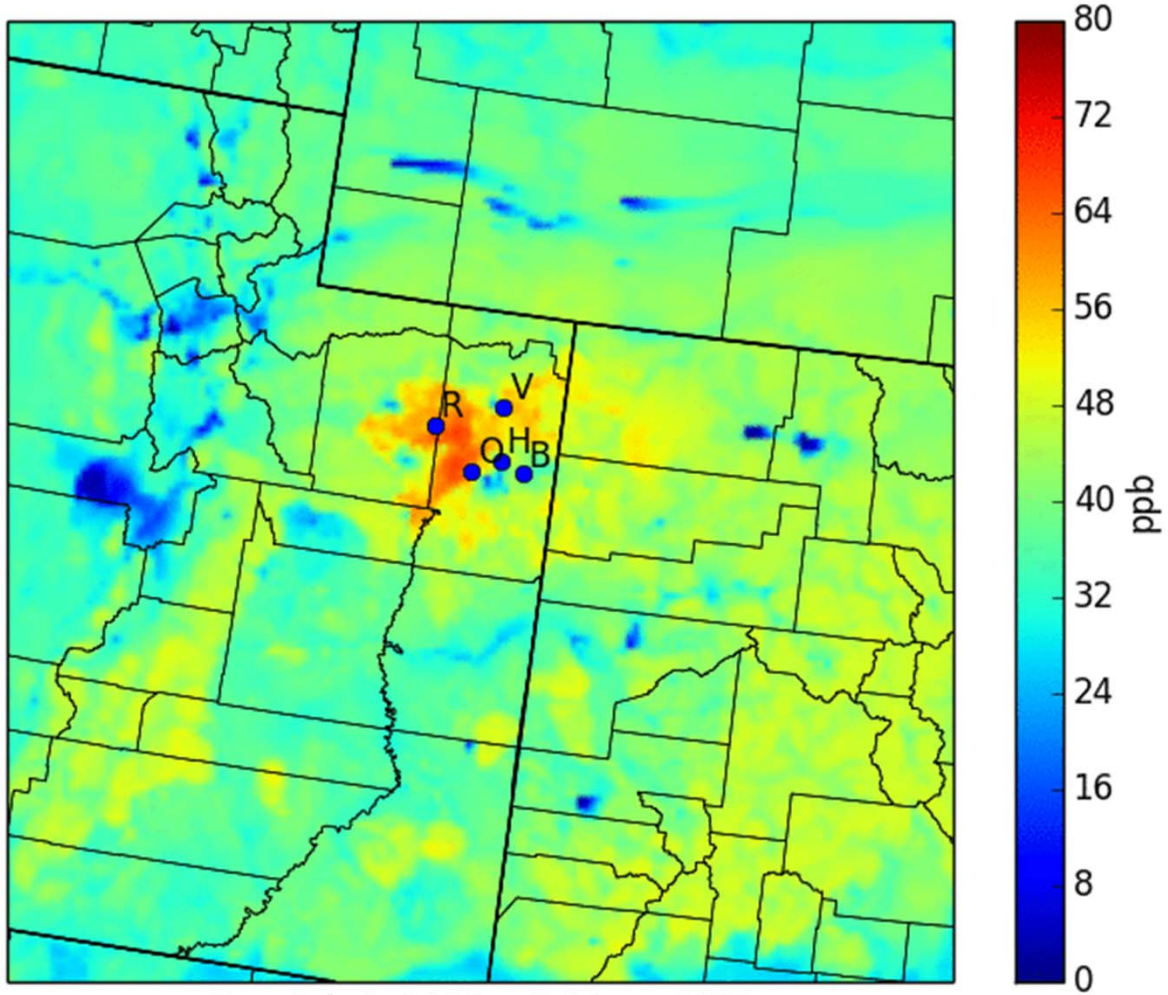
Modeling



Effective Control Strategies

Uinta Basin Ozone

B - Bonanza
H - Horsepool
O - Ouray
R - Roosevelt
V - Vernal



Tue. Feb 5, 2013 - 5:00 pm MST

Potential Rule Changes for Oil and Gas Sources

- Change minor source permitting to a “permit by rule” approach
- Consistent with current NSR BACT
- Streamlined permitting process
- Simplified compliance
- Less costly both in terms of dollars and resources

Stakeholder Timeline

- Environmental Advocates, Oil and Gas Producers and Local Officials and Leaders – currently on-going
- Draft Rules and Stakeholder review – late summer, early fall
- Proposed rules to Air Quality Board – fall/winter

Questions?/Discussion

Ozone information and Air Quality Information

http://www.deq.utah.gov/

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