



Uintah Basin Ozone

10/05/2011

Air Quality Board Briefing

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Imagery Date: 6/22/2009

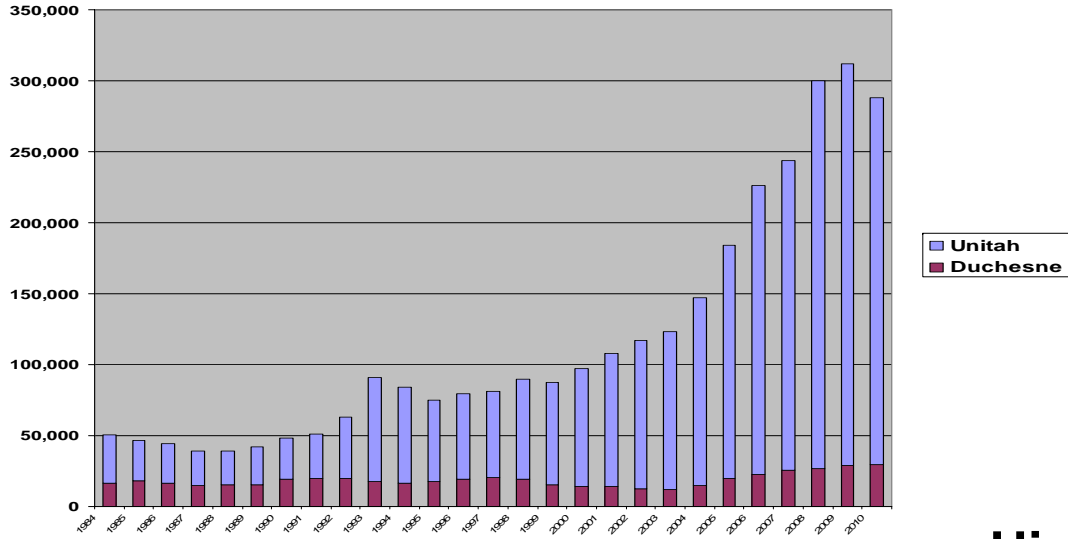
Department of Environmental Quality



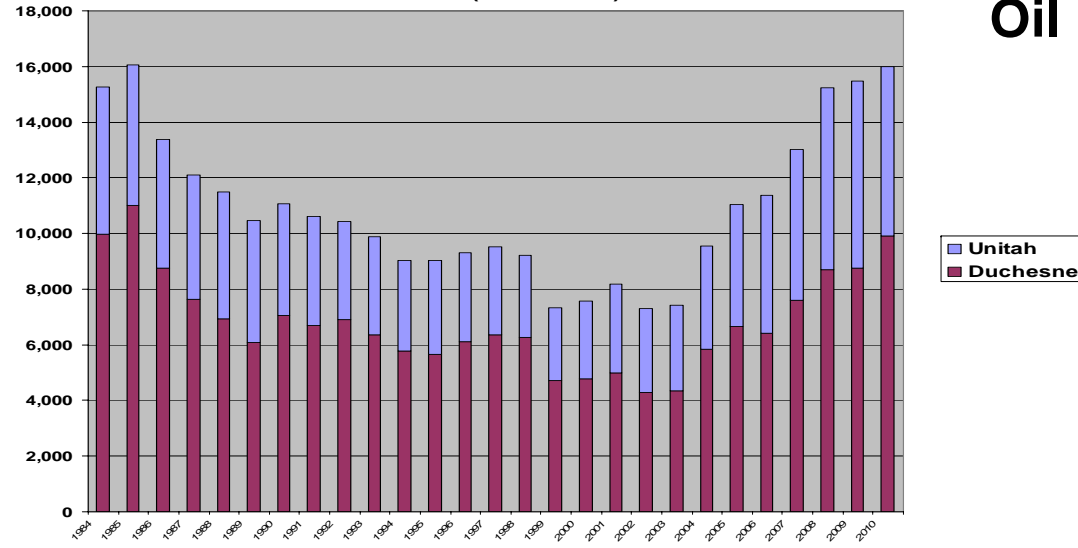
Division of Air Quality

Eye alt 21388 ft

**Natural Gas Production 1984 - 2010
(million cubic feet)**



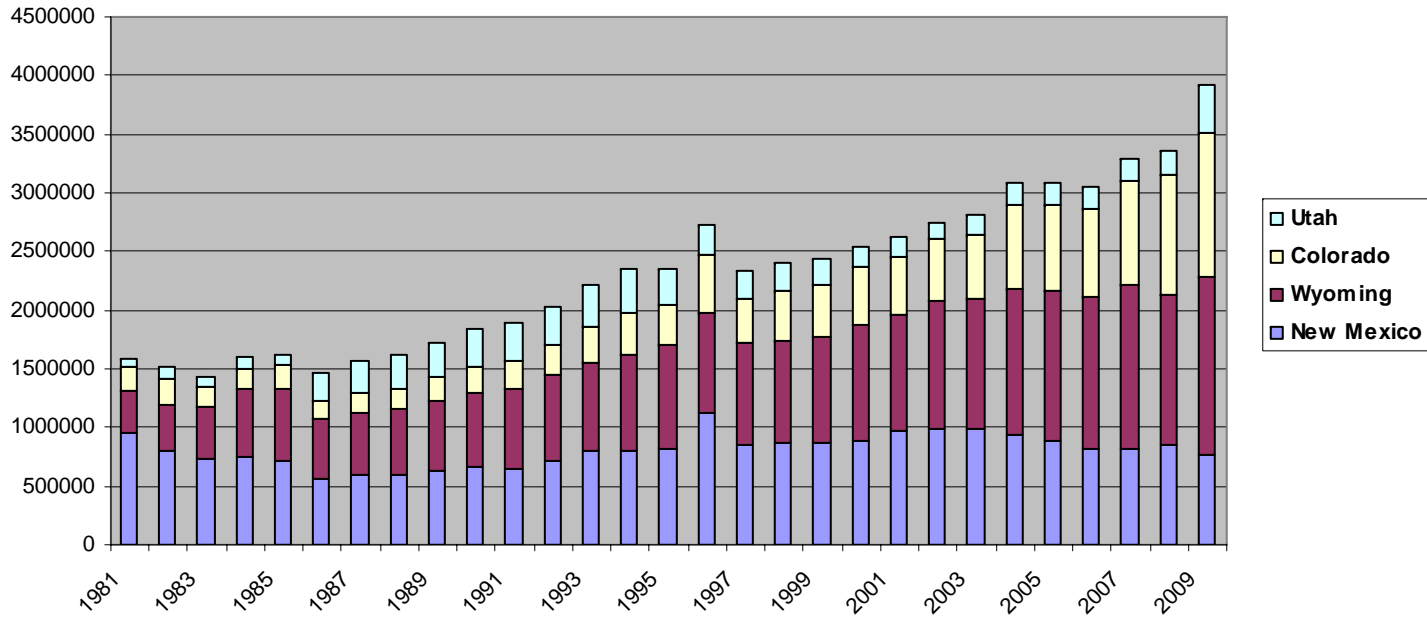
**Oil Production 1984 - 2010
(1000 barrels)**



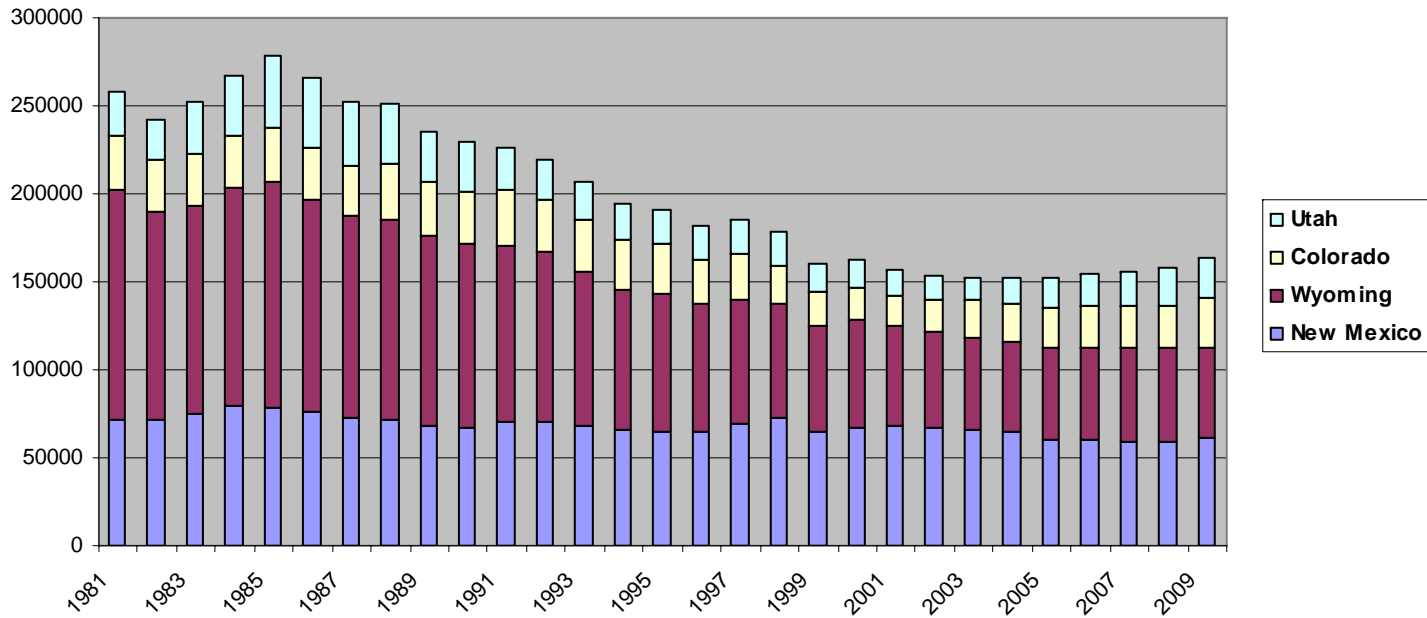
Uintah and Duchesne County Natural Gas and Oil Production 1984 - 2010

* Division of Oil, Gas and Mining

Natural Gas Production (MMcf)



Oil Production (Thousand Barrels)



* Energy Information Administration – US DOE

Uintah Basin - O3 Wintertime Exception

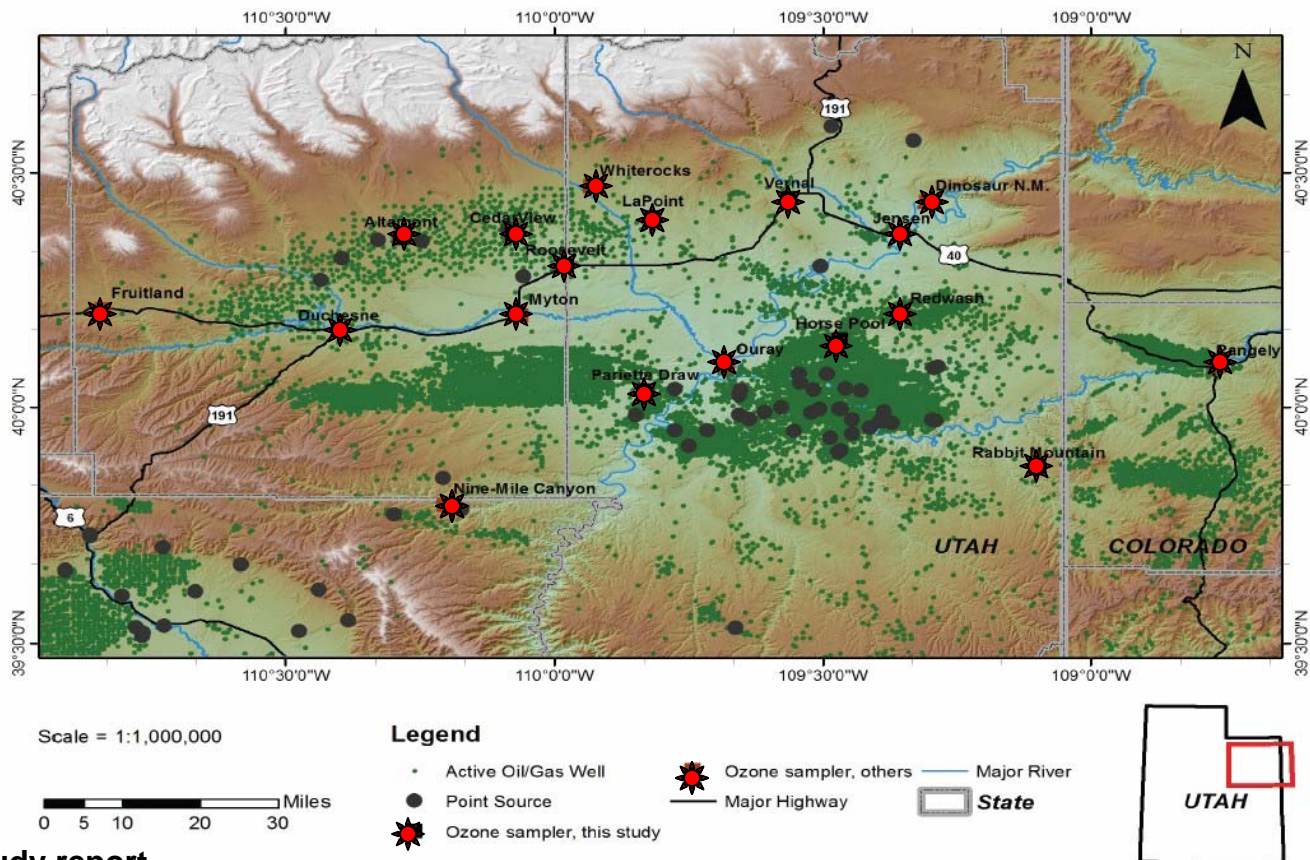
- UDAQ special studies monitoring '07, '08, '09 – PM2.5 focus
- EPA permanent monitors – installed at Redwash and Ouray, mid '09
- Tribal data from White Rocks and Myton starting mid '09 but currently not available
- USU/EDL special study winter '10/'11



Randy Martin

USU/EDL Special Monitoring Study Winter 2010/2011

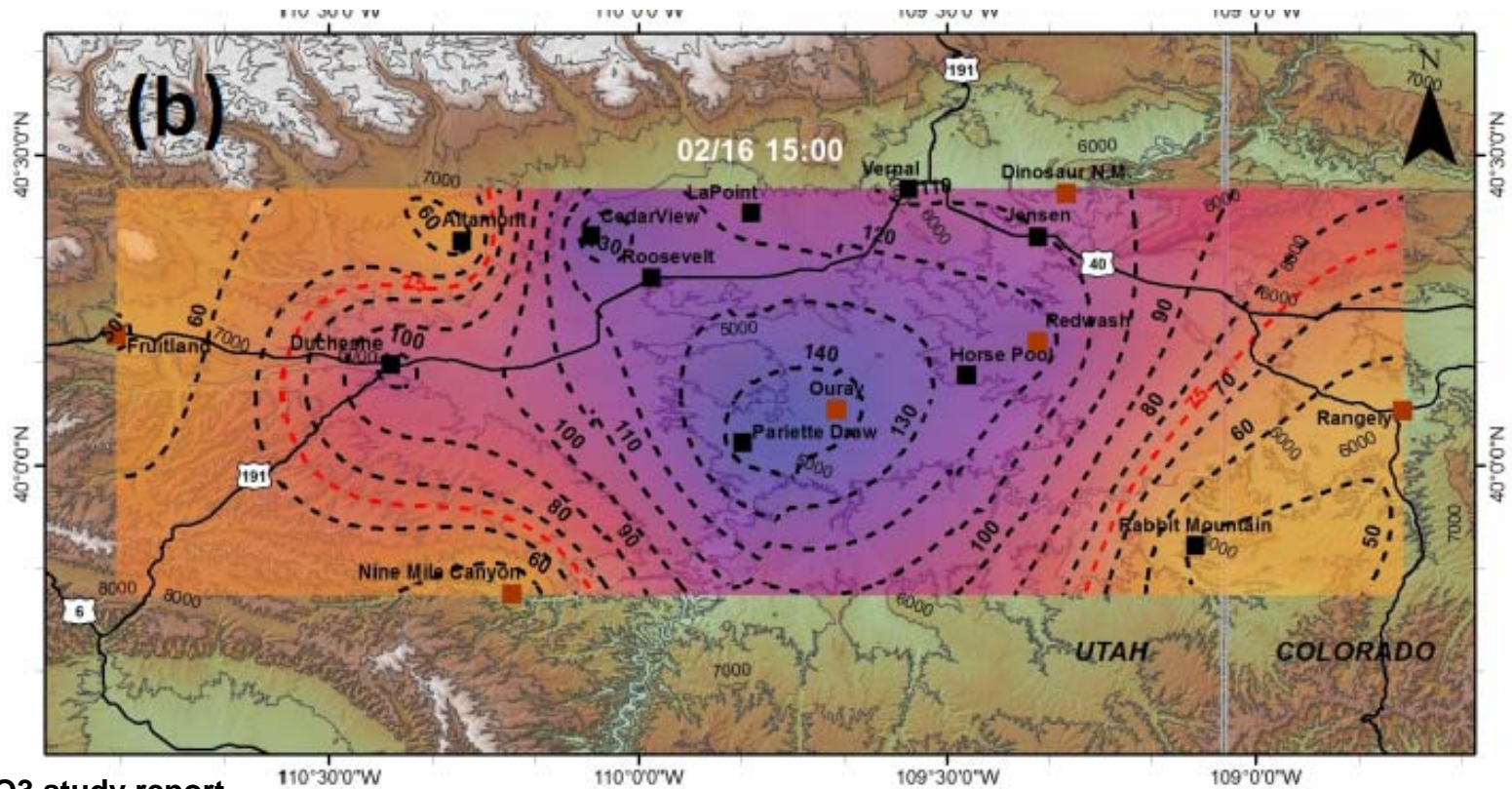
- 8 permanent and 10 portable sites
- O₃, PM_{2.5}, NO_x and Met, VOC sampling



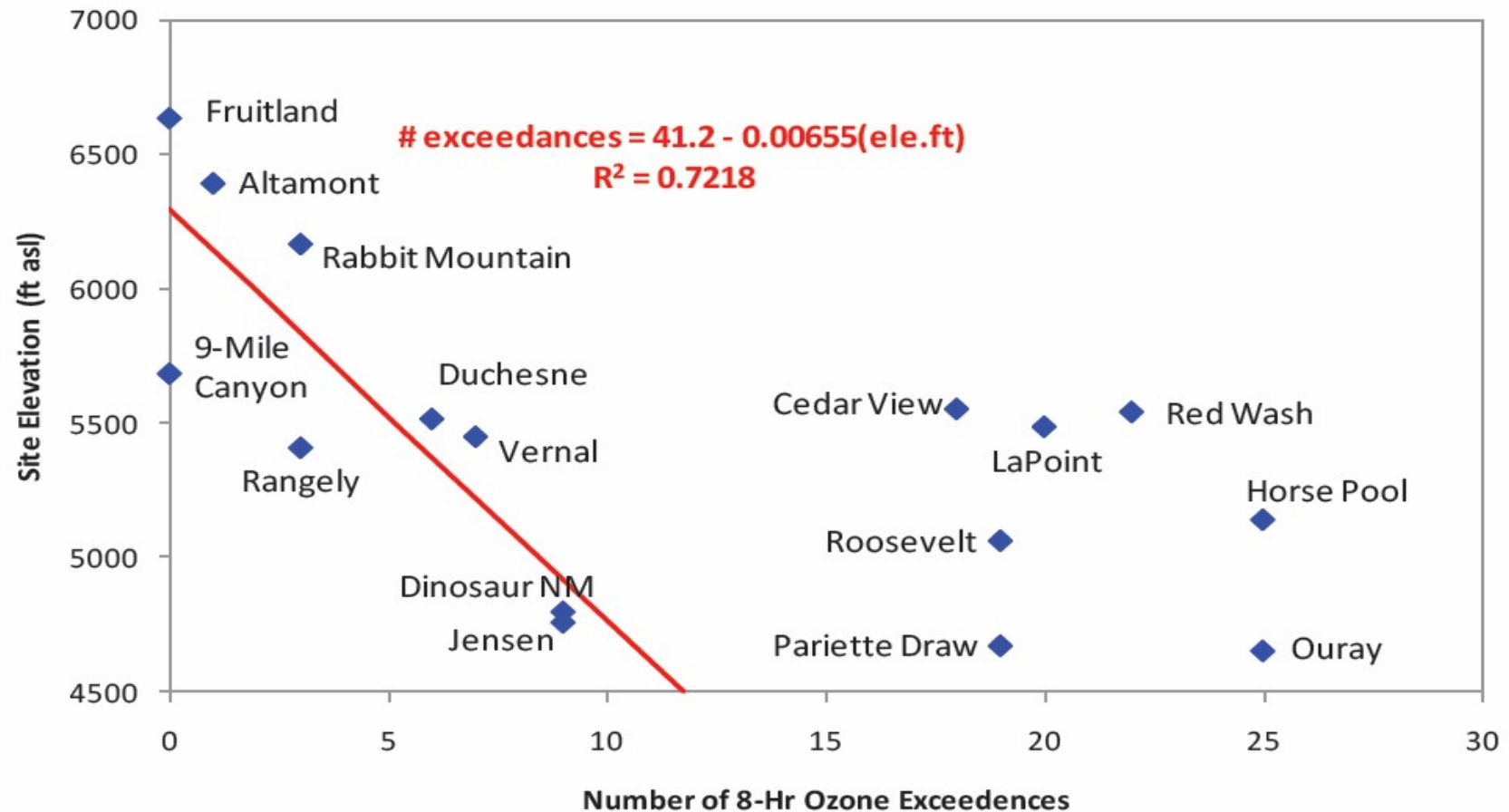
* EDL 2011 O₃ study report

USU/EDL Special Monitoring Study Winter 2010/2011

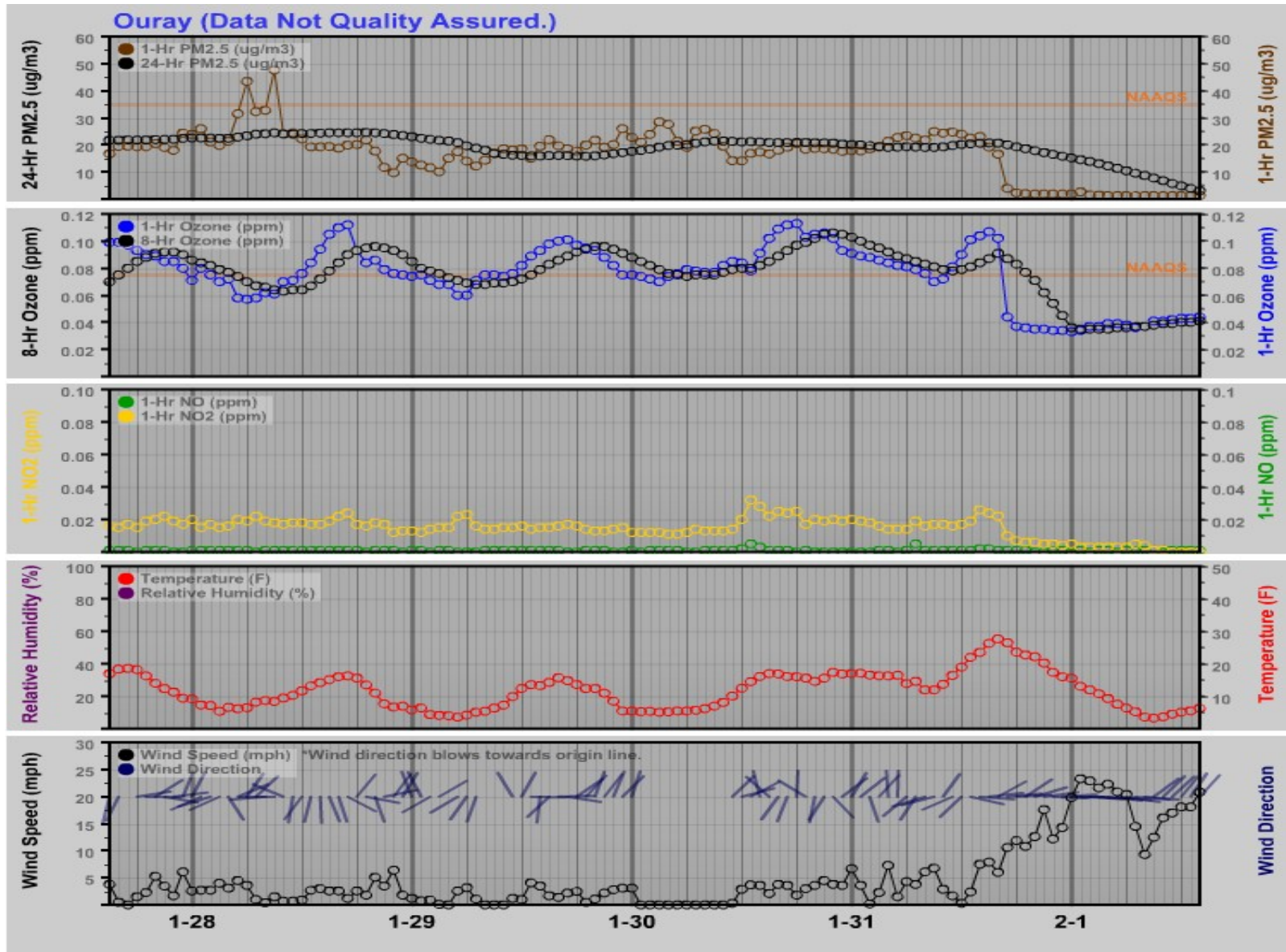
- Ozone 1-hour at 3 pm Feb 16, 2011
- Basin-wide O₃



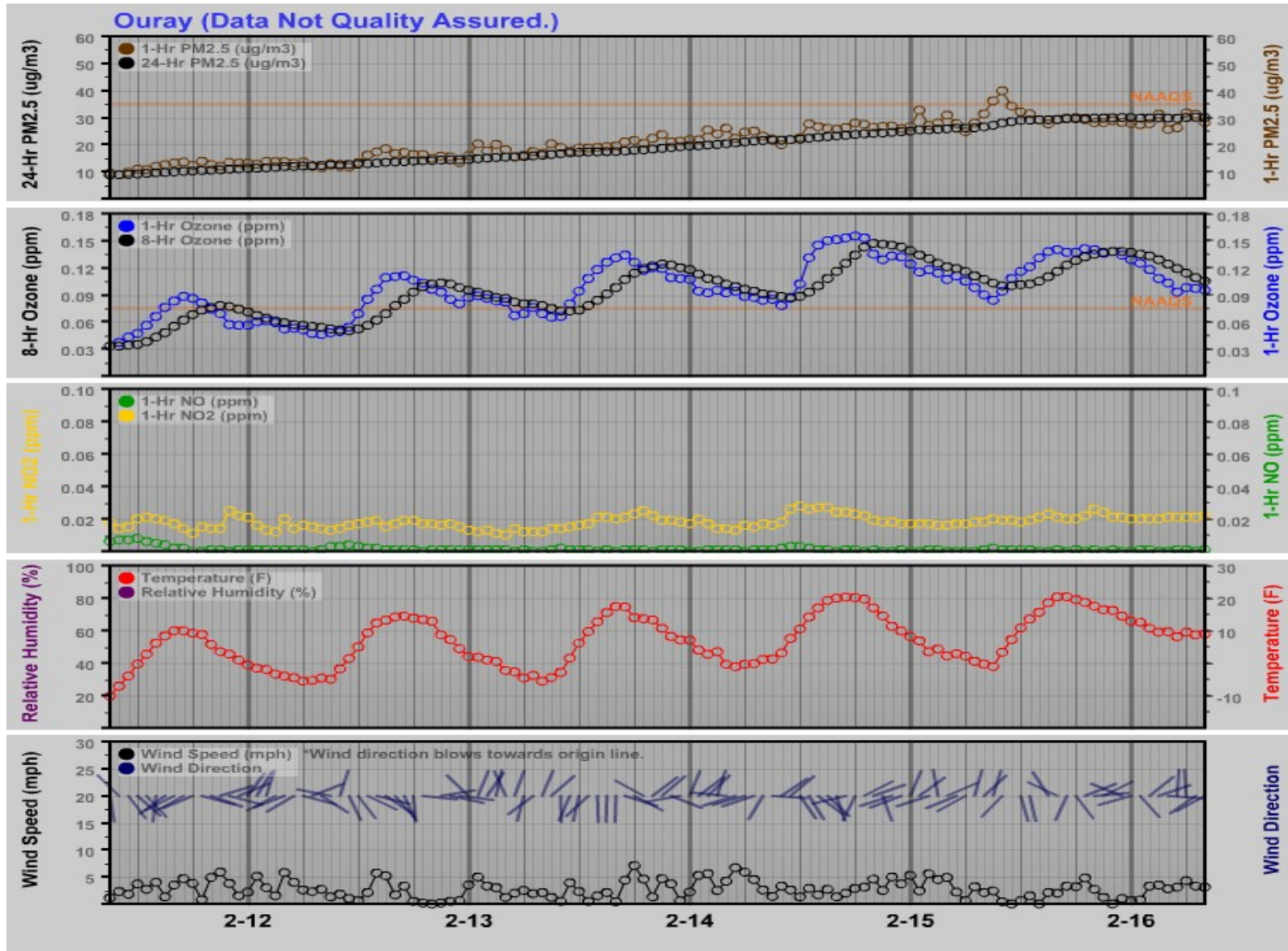
USU/EDL Special Monitoring Study Winter 2010/2011



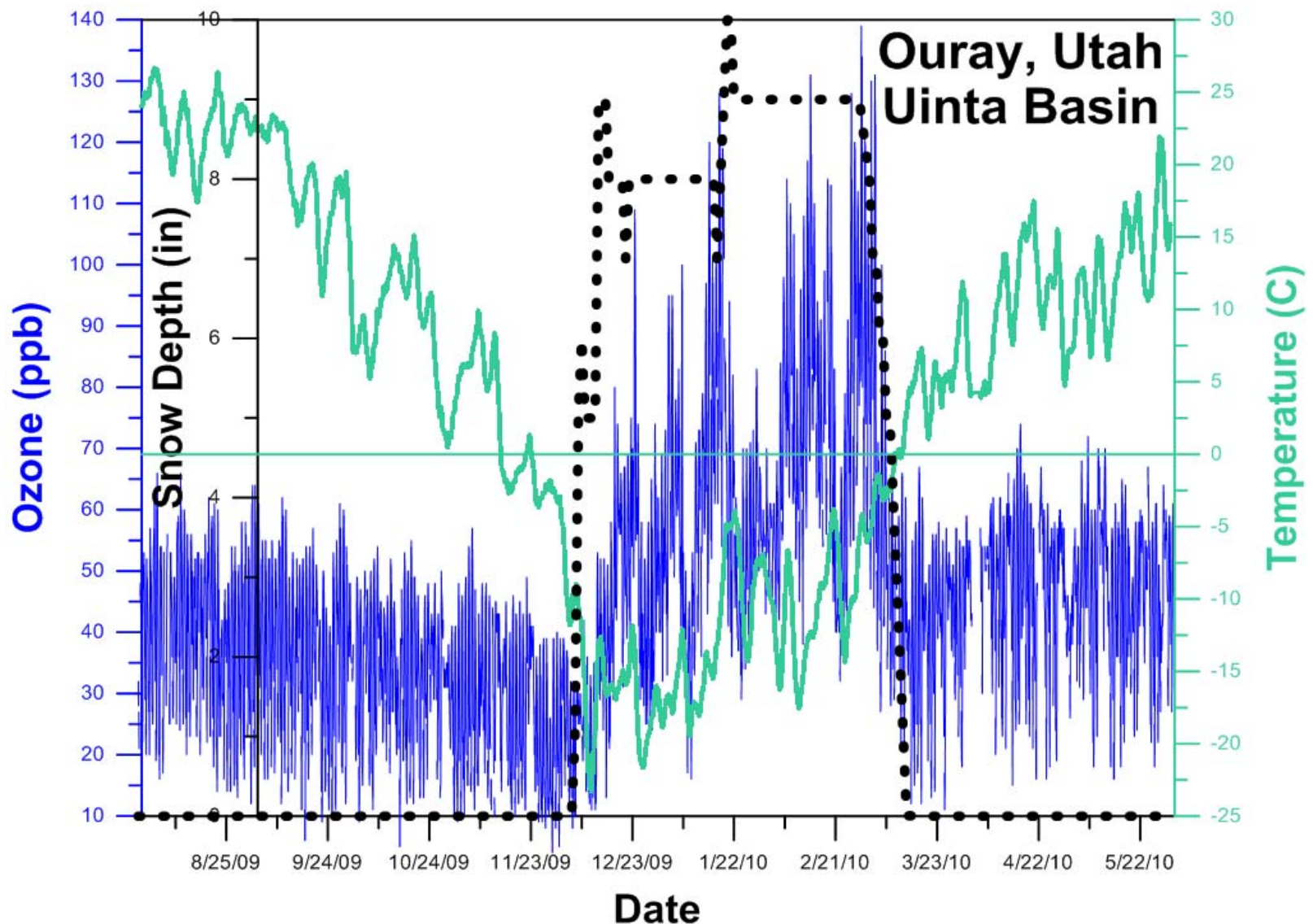
5-Day Episode – Ouray Site



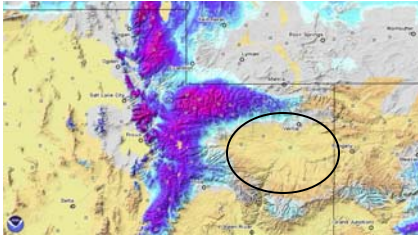
5-Day Episode – Ouray Site



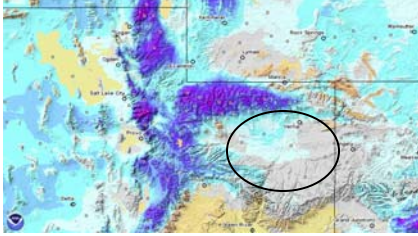
Ozone, Temperature and Snow Depth



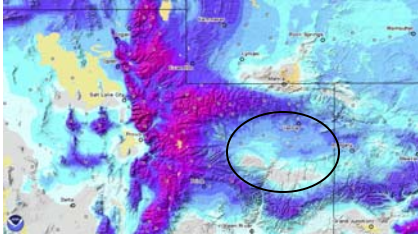
Source: Russ Schnell, Director, Observatory Operations, NOAA/CMDL



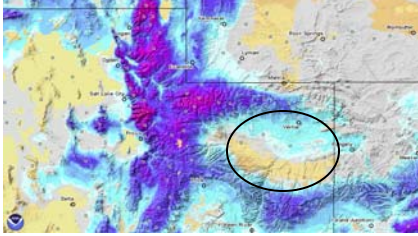
2006 – No Snow



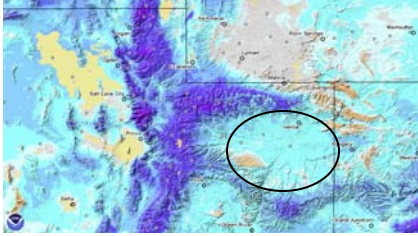
2007 – Low Snow



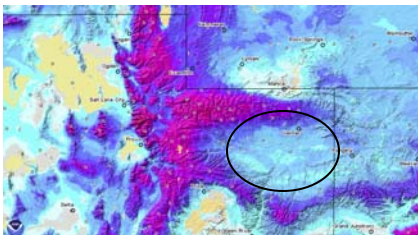
2008 – Moderate Snow



2009 – Low Snow



2010 – Moderate Snow



2011 – High Snow

Basin Snow Cover (January 9th)

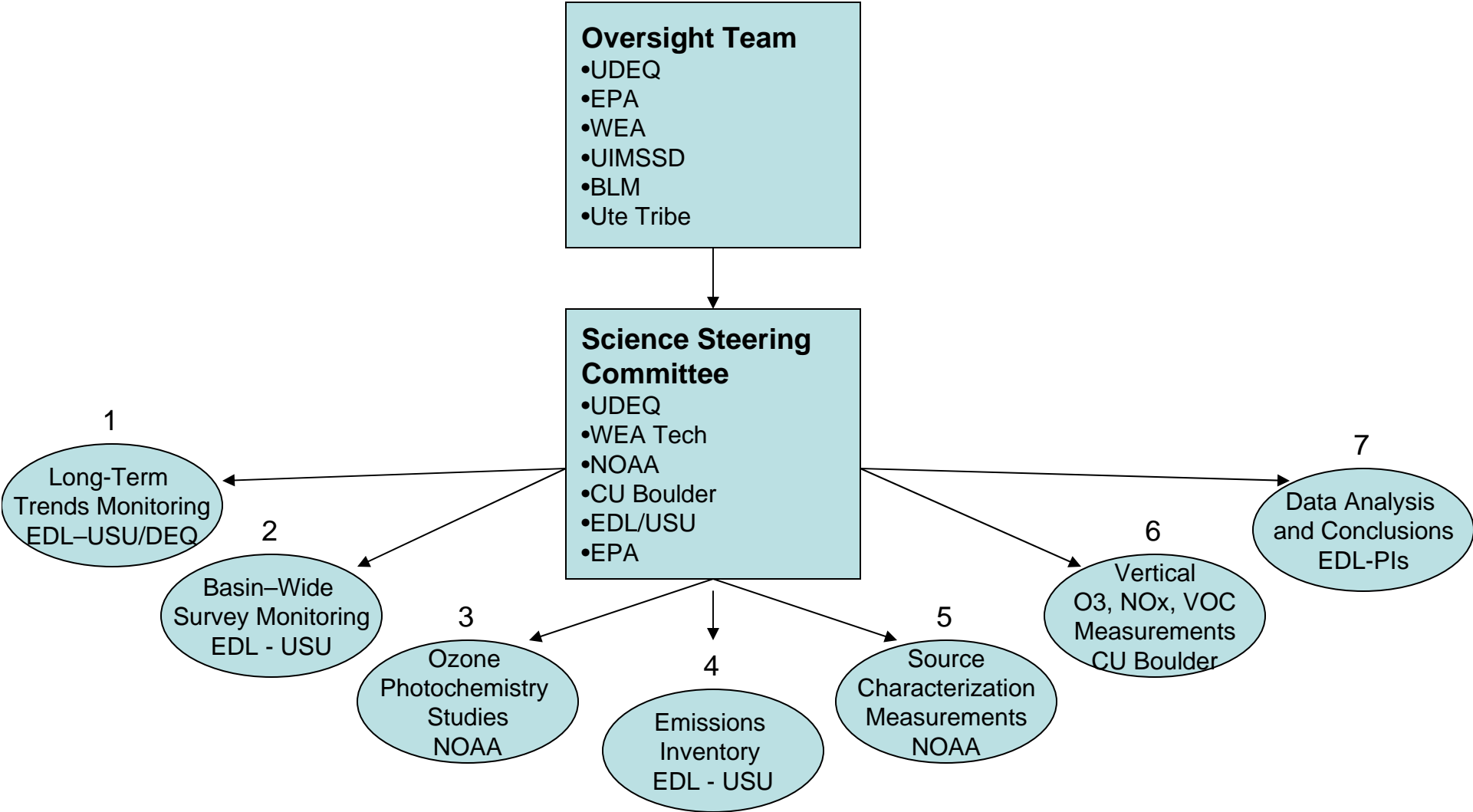
What is the Cause of High Wintertime O₃?

- We don't know yet, but ...
- Relatively few emission source types
- Occurs during stable meteorology (physiography + inversion = capped bowl)
- Associated with snow cover (enhanced photolysis rates, snow chemistry?)
- Atmospheric formation chemistry models are available (but may not be complete)
- Cooperative study of O₃ formation chemistry planned for this winter

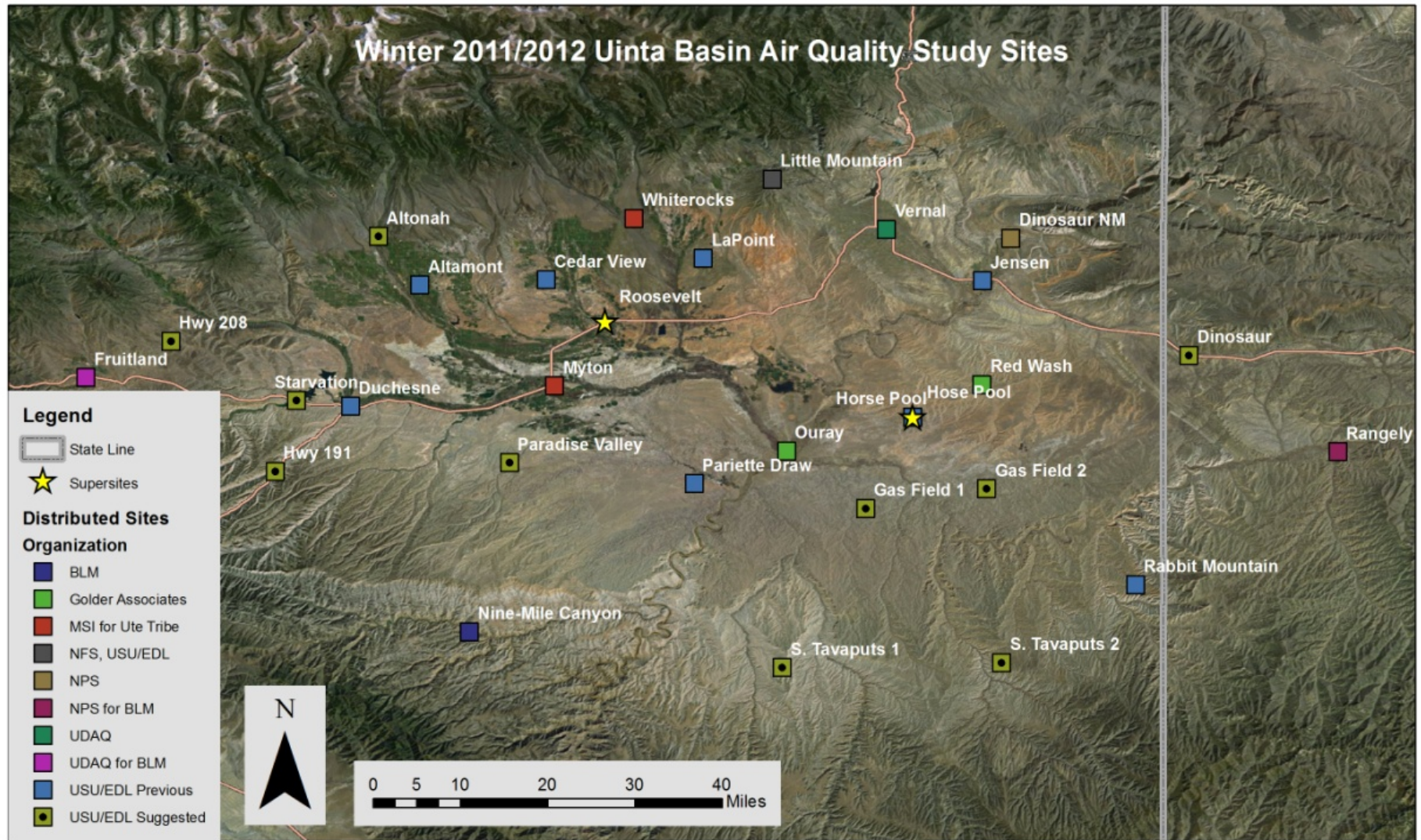
This Winter's Ozone Study

- Purpose: to understand how ozone is formed in the Basin during wintertime inversion conditions. Identify the chemical pathways that are unique to the Basin's winter situation.
- Investigators: USU/EDL, NOAA, EPA, UDEQ, CU
- 7-Components to the Study:
 1. Long-term wintertime monitoring for ozone and key precursors
 2. Distributed Basin-wide ozone survey
 3. Intensive ozone formation chemistry study
 4. Emissions inventory development
 5. Source specific emissions measurements
 6. Vertical profiles of O₃, NO_x, VOCs
 7. Analysis and recommendation

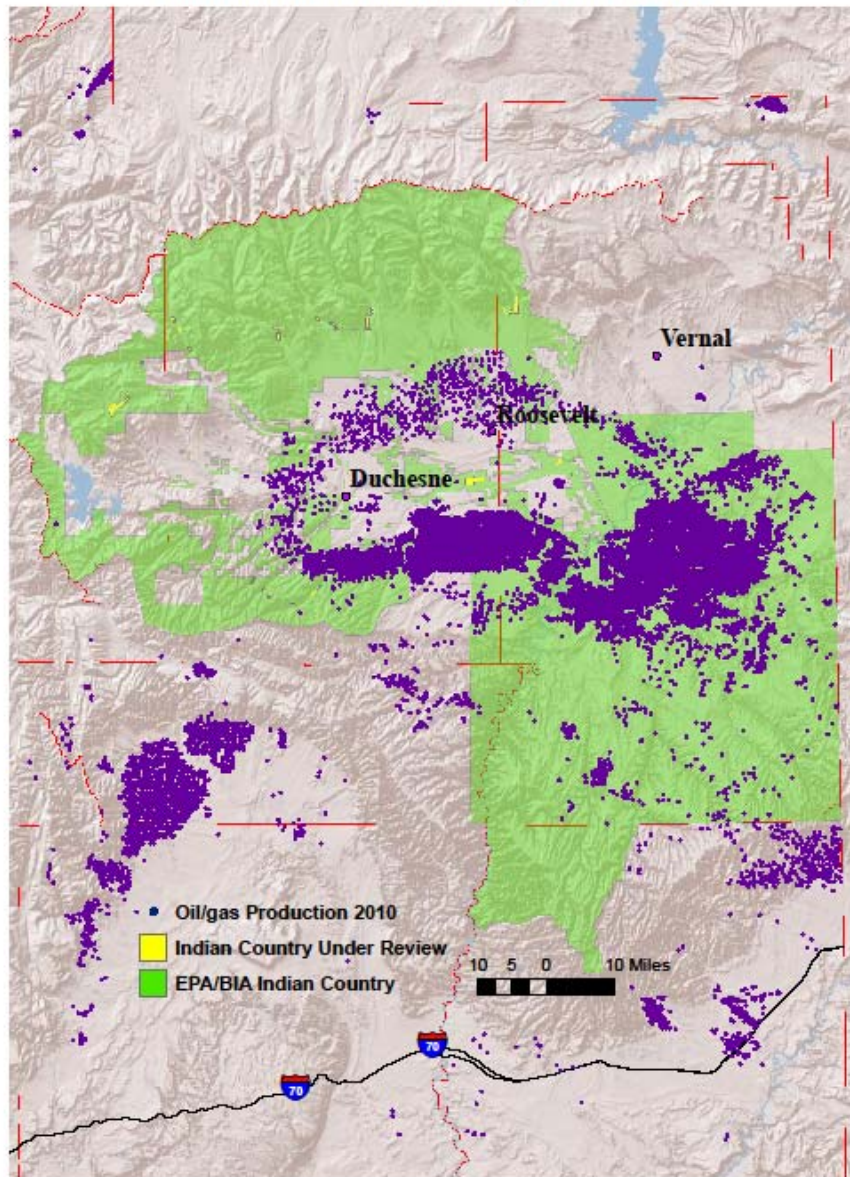
Study Organization



Proposed Monitor Locations



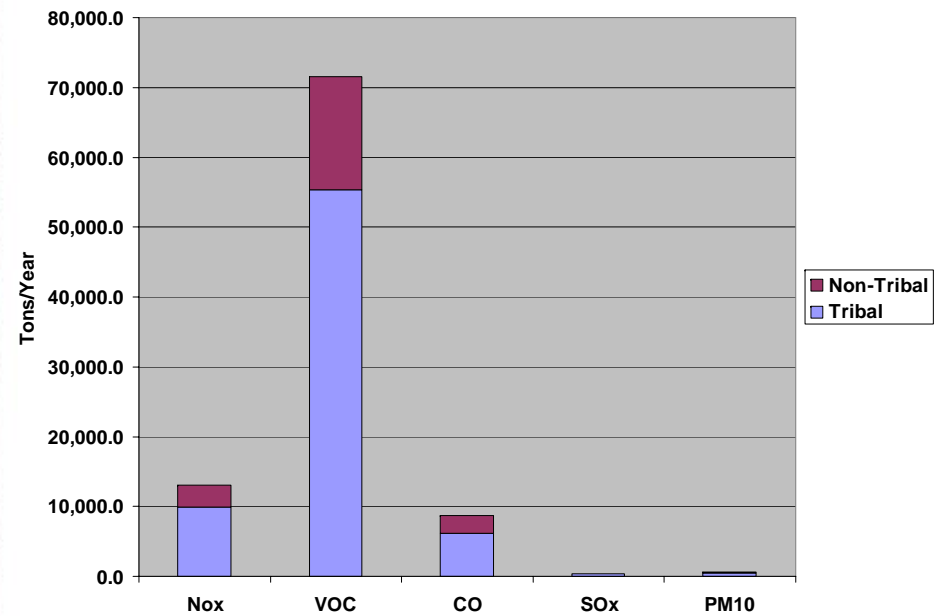
Uintah Basin Air Quality Jurisdiction



Utah Division of Air Quality January, 2011

Regulatory Authority

Tribal vs State Oil/Gas Emissions



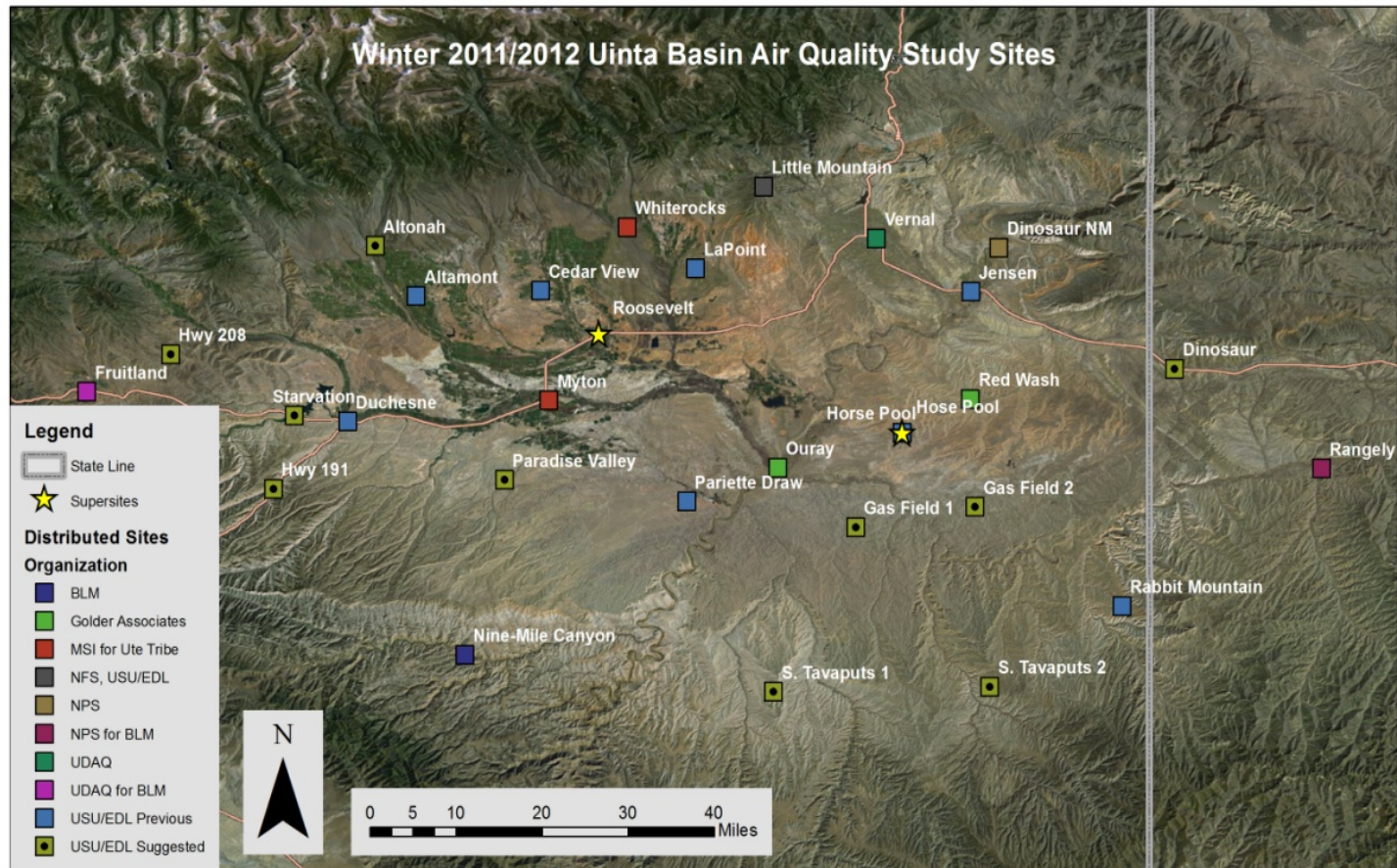
* WRAP 2006 Oil/Gas EI - mobile not included

Questions?



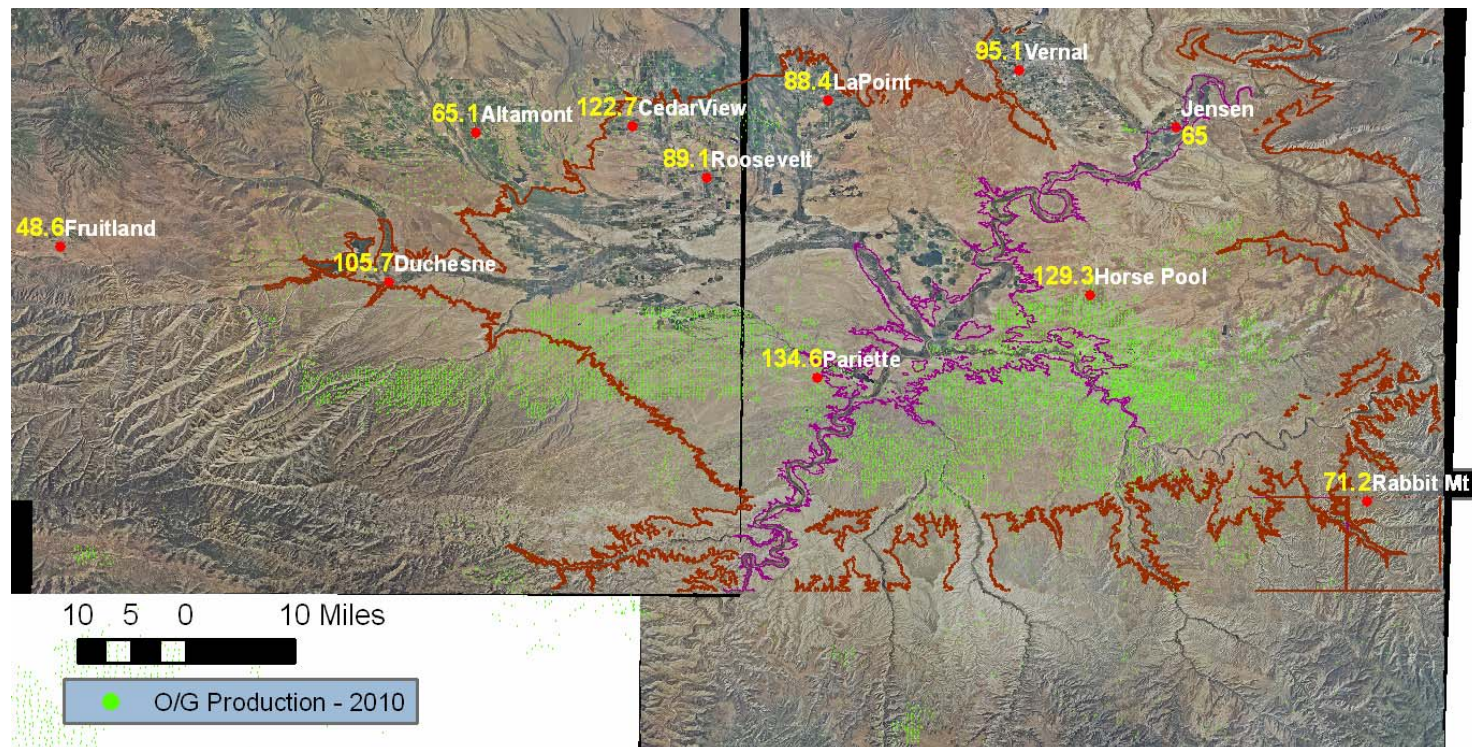
USU/EDL Special Monitoring Study Winter 2010/2011

- 8 permanent and 10 portable sites
- O₃, PM_{2.5}, NO_x and Met, VOC sampling



USU/EDL Special Monitoring Study Winter 2010/2011

- Jan – Feb '11
- Max 8-hour ozone
- Basin-wide O3



* EDL 2011 O3 study report