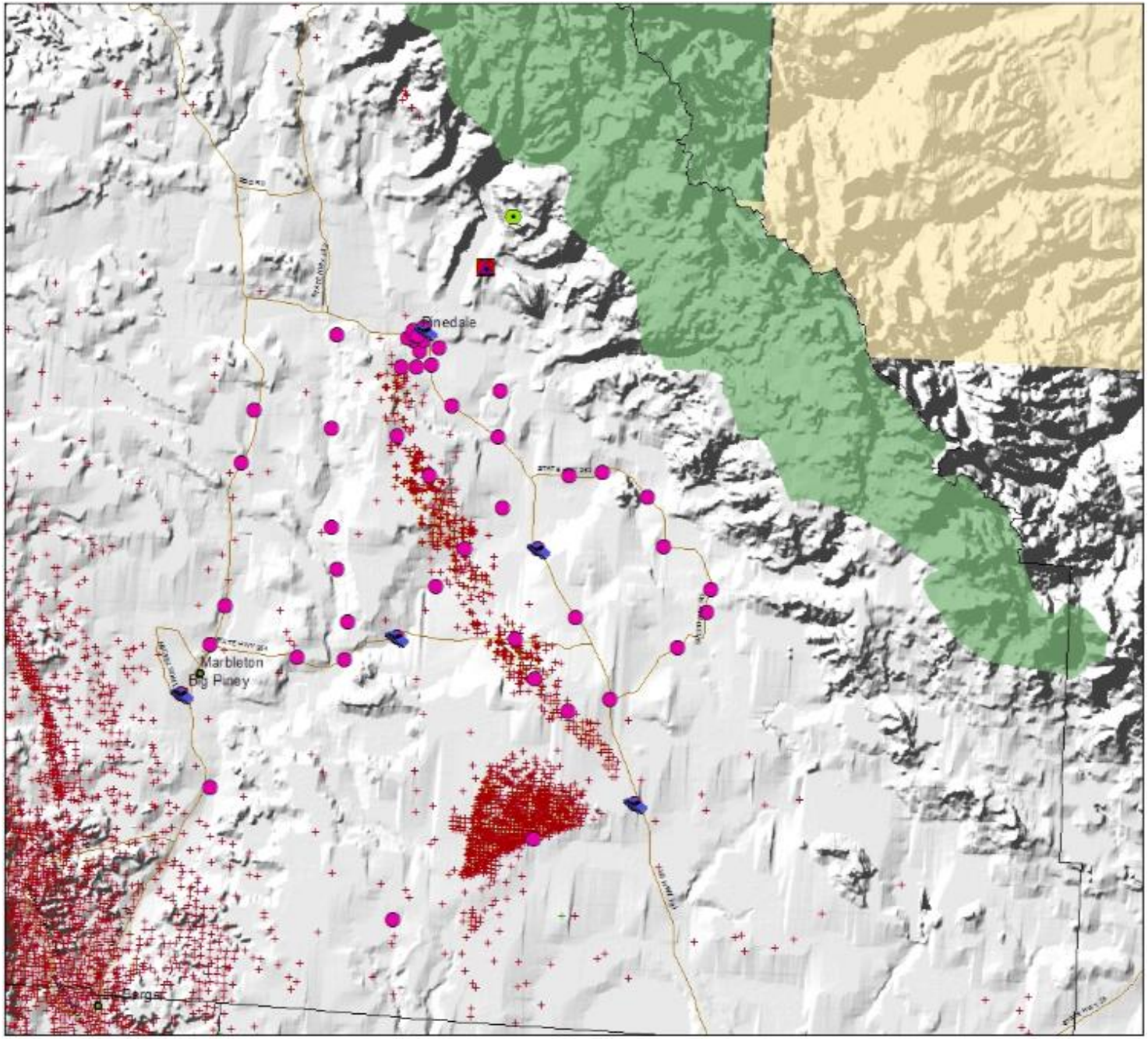
Pinedale Anticline Spatial Air Quality Assessment

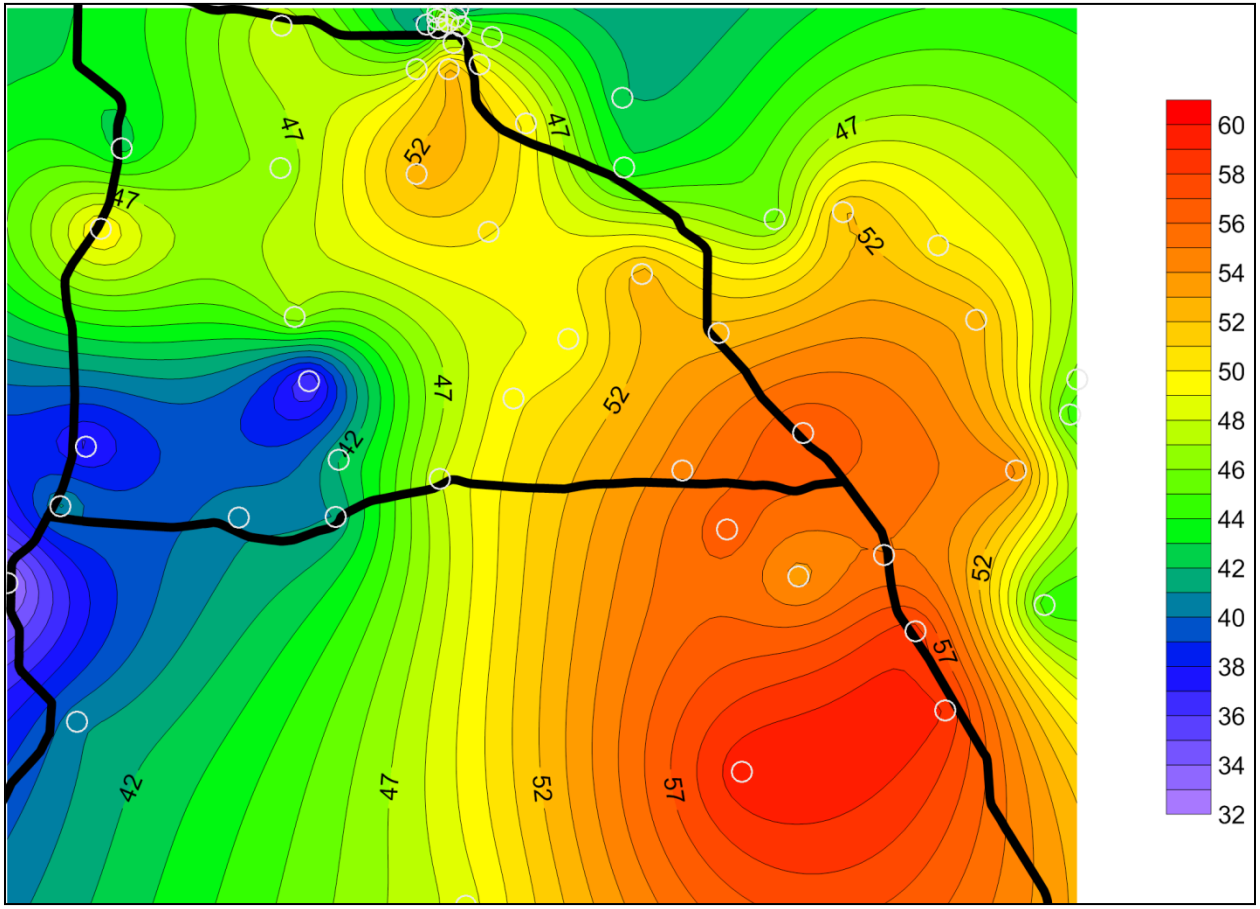
PASQUA

Year 2 Preliminary overview & thoughts for Year 3

Funded by PAPO & UW SER


Pinedale
Marbleton
Big Piney
Cora

Ozone distribution 2/22/2009



Ozone (ppb)

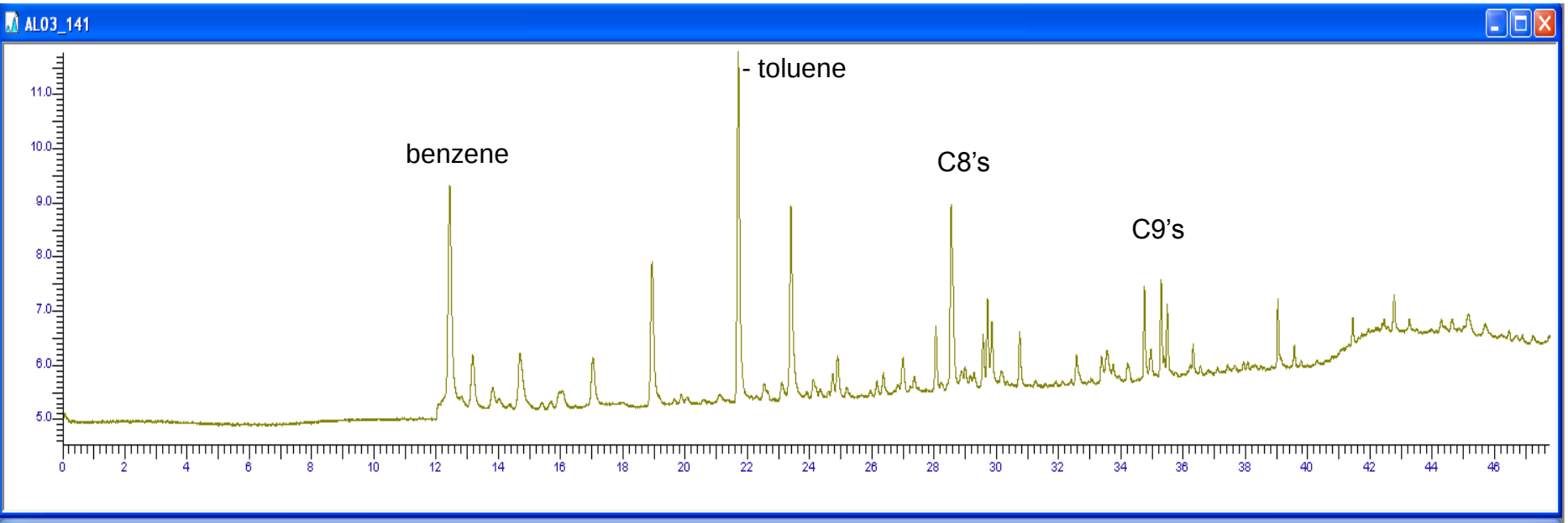
Spatial survey

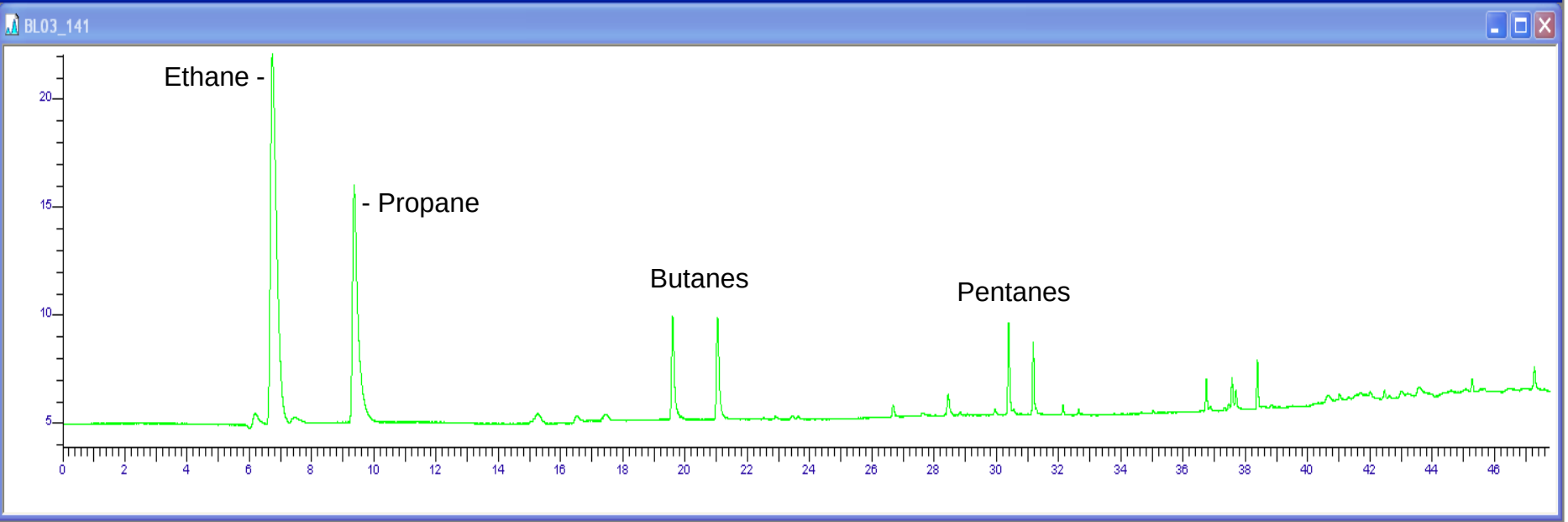
Pinedale
Boulder South Rd
Olson Ranch
Big Piney High School
Luman Rd
Google

UW	Class
ethane	1
ethene	2
propane	1
propene	2
i-butane	1
n-butane	1
ethyne	2
t-2-butene	2
1-butene	2
c-2-butene	2
cyclopentane	1
i-pentane	1
n-pentane	1
1,3-butadiene	2
propyne	2
1-pentene	2
2-methylpentane	1
3-methylpentane	1
n-hexane	1
isoprene	2
benzene	3
cyclohexane	1
i-octane	1
n-heptane	1
toluene	3
Methylcyclohexane	1
n-octane	1
ethylbenzene	3
m+p-xylene	3
o-xylene	3
styrene	3
nonane	1
1,3,5-trimethylbenzene	3
1,2,4-trimethylbenzene	3
decane	1
1,2,3-trimethylbenzene	3

Objective 1: Mobile Laboratory

Chromatograms 5/1/2011 12:00





October 2010 to May 2011

Routine air quality parameters: O_3, CO, NO, NO_2, NO_x, plus meteorological measures

AND the less so but so much more……..

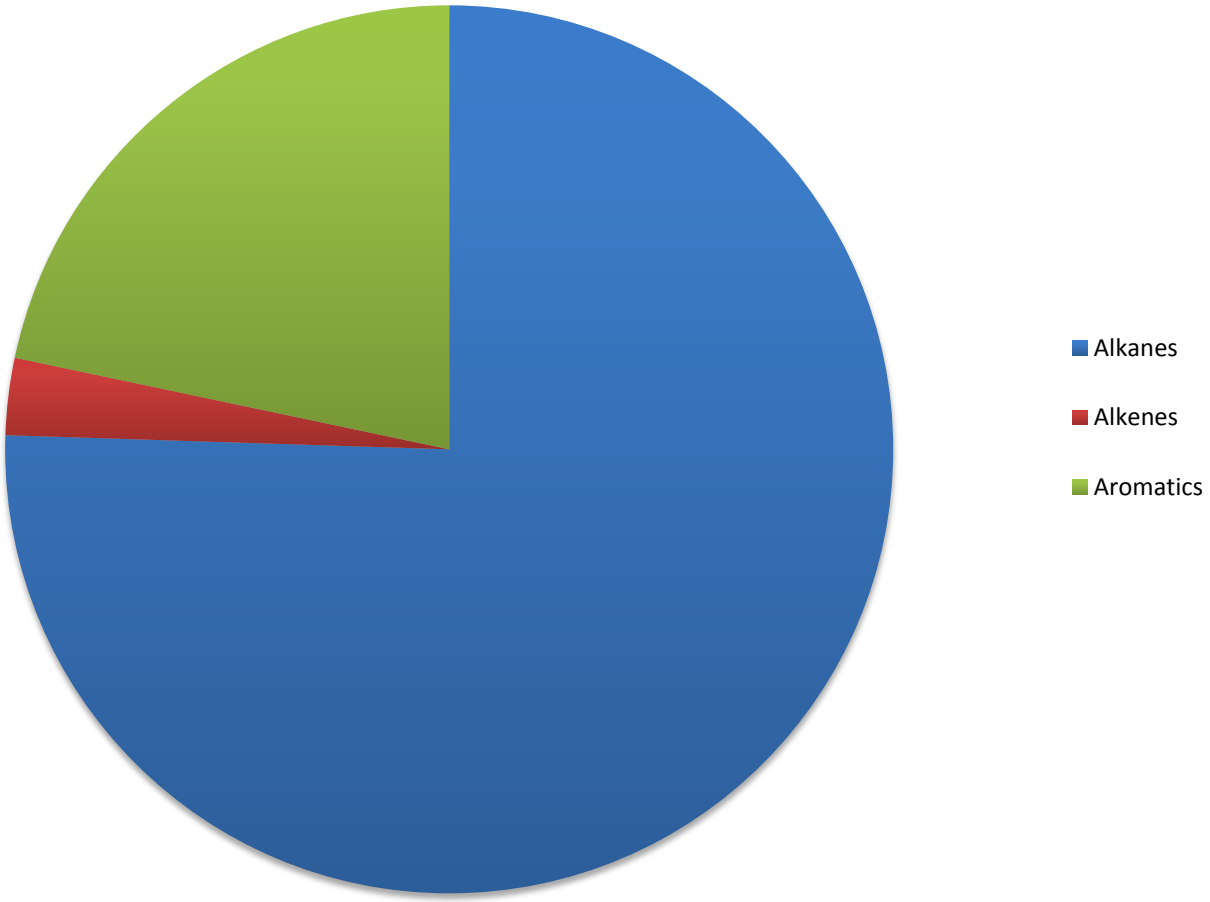
~ 3000 valid VOC hourly samples

- **Utility of continuous methane and NMHC**

NMHC (55i) & VOC (PE OPA) Ambient air: March 1st to 6th

- **NMHC (as propane) ~ 1150 ppb**
- **UW (list) VOC C_1 to C_{10} (as propane) ~ 800 ppb**
- **UW non reported C_1 to C_{10} ~ 150 ppb**

VOC Class Distribution March 1st to March 6th 2011



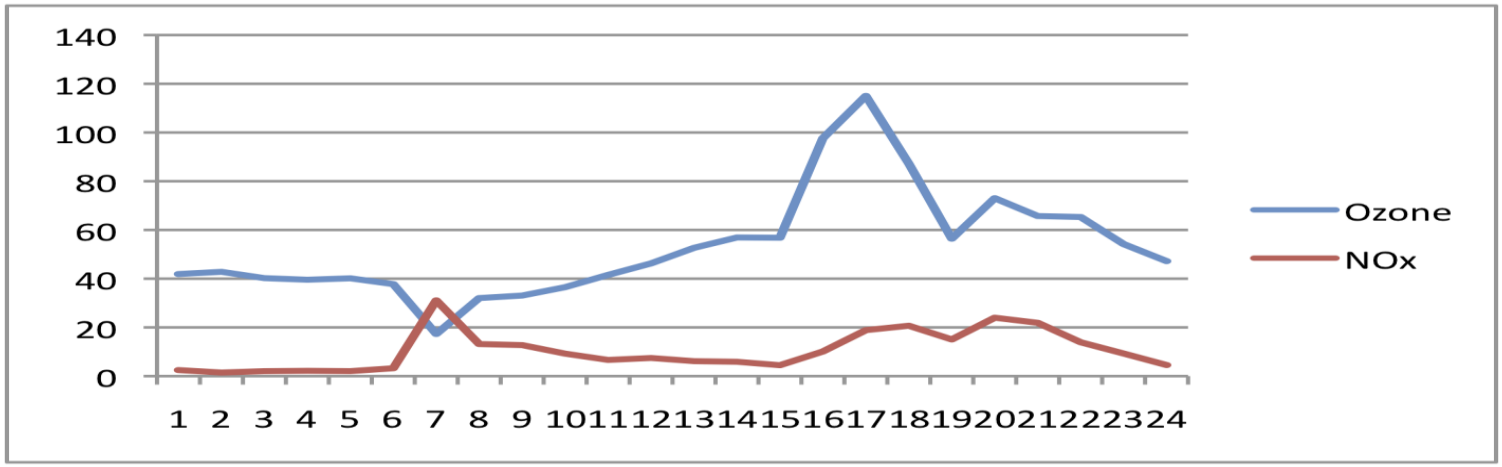
PAPA Wet Gas vs Ambient air

% contribution based on ppb

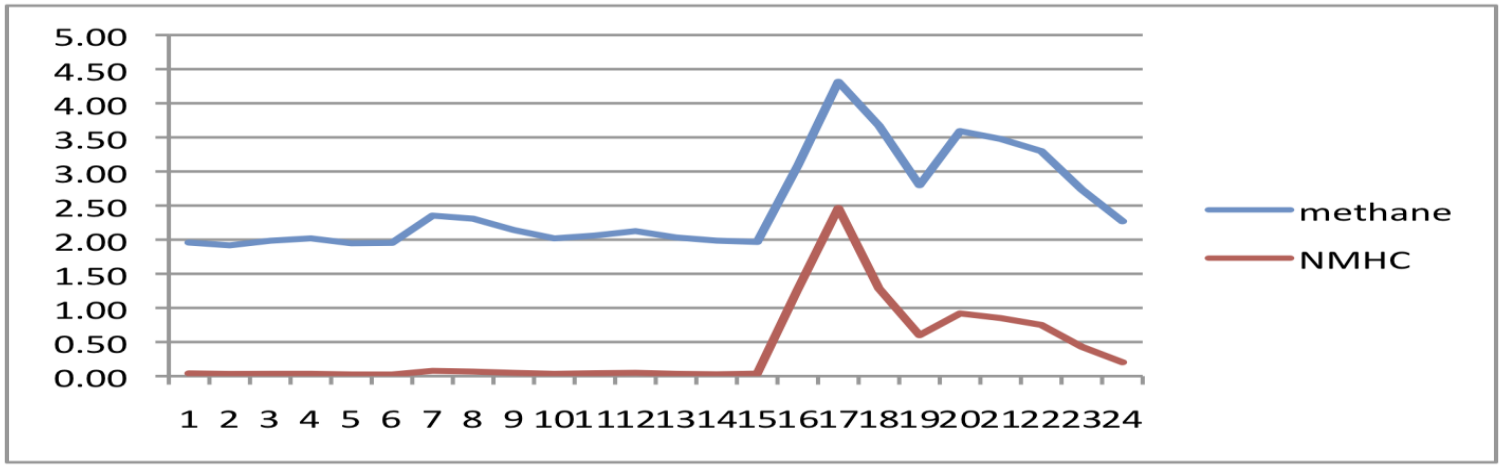
PAPA		UW
51.6	Ethane	51.0
22.7	Propane	18.9
7.0	i-Butane	5.2
6.1	n-Butane	5.4
0.4	Cyclopentane	0.2
3.4	i-Pentane	2.6
1.6	n-Pentane	1.8
	2-methylpentane	0.7
	3-methylpentane	0.4
1.1	n-Hexane	1.0
0.4	Benzene	2.0
1.0	Cyclohexane	1.1
2.6	Heptanes	1.0
0.1	i-octane	0.3
0.3	Methylcyclohexane	
0.7	Toluene	4.1
0.6	n-octane	0.9
0.0	Ethylbenzene	0.4
0.4	Xylenes	2.8

14th February 2011

ppb

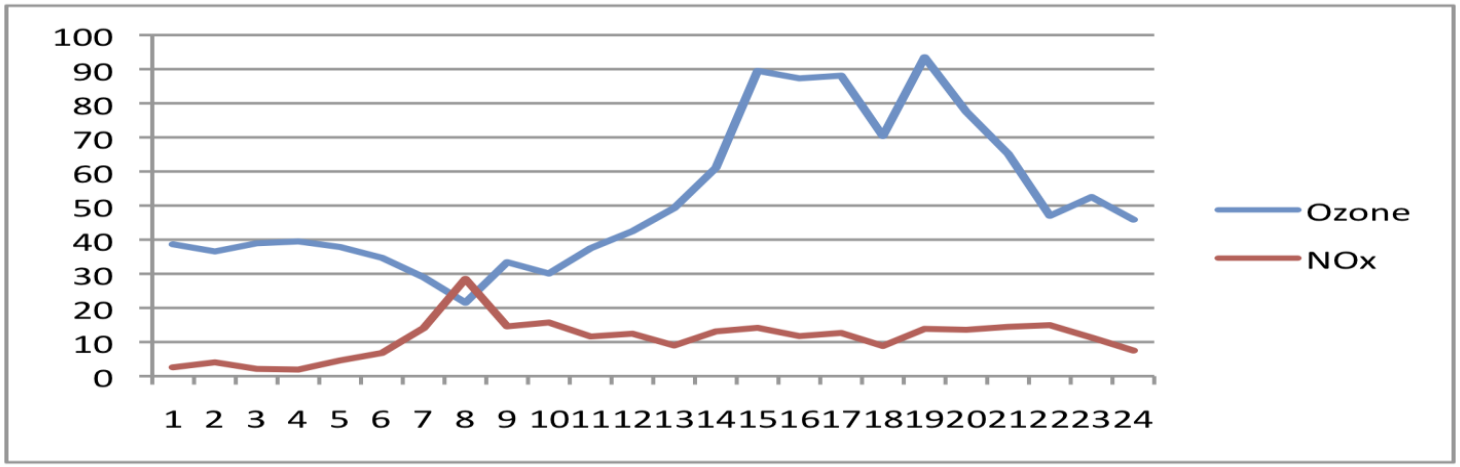


ppm

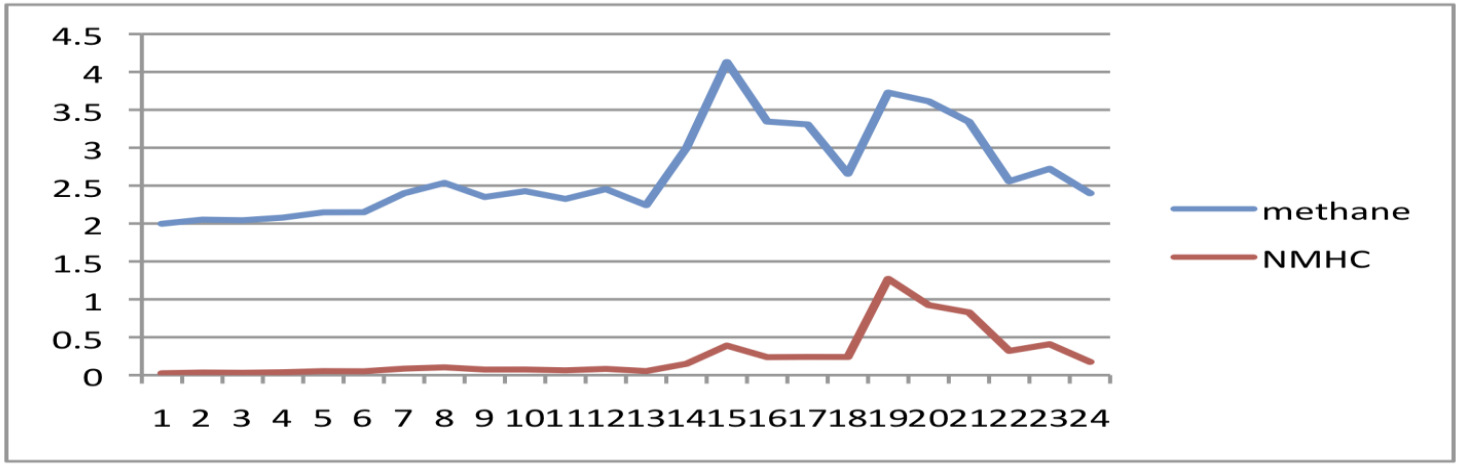


25th February 2011

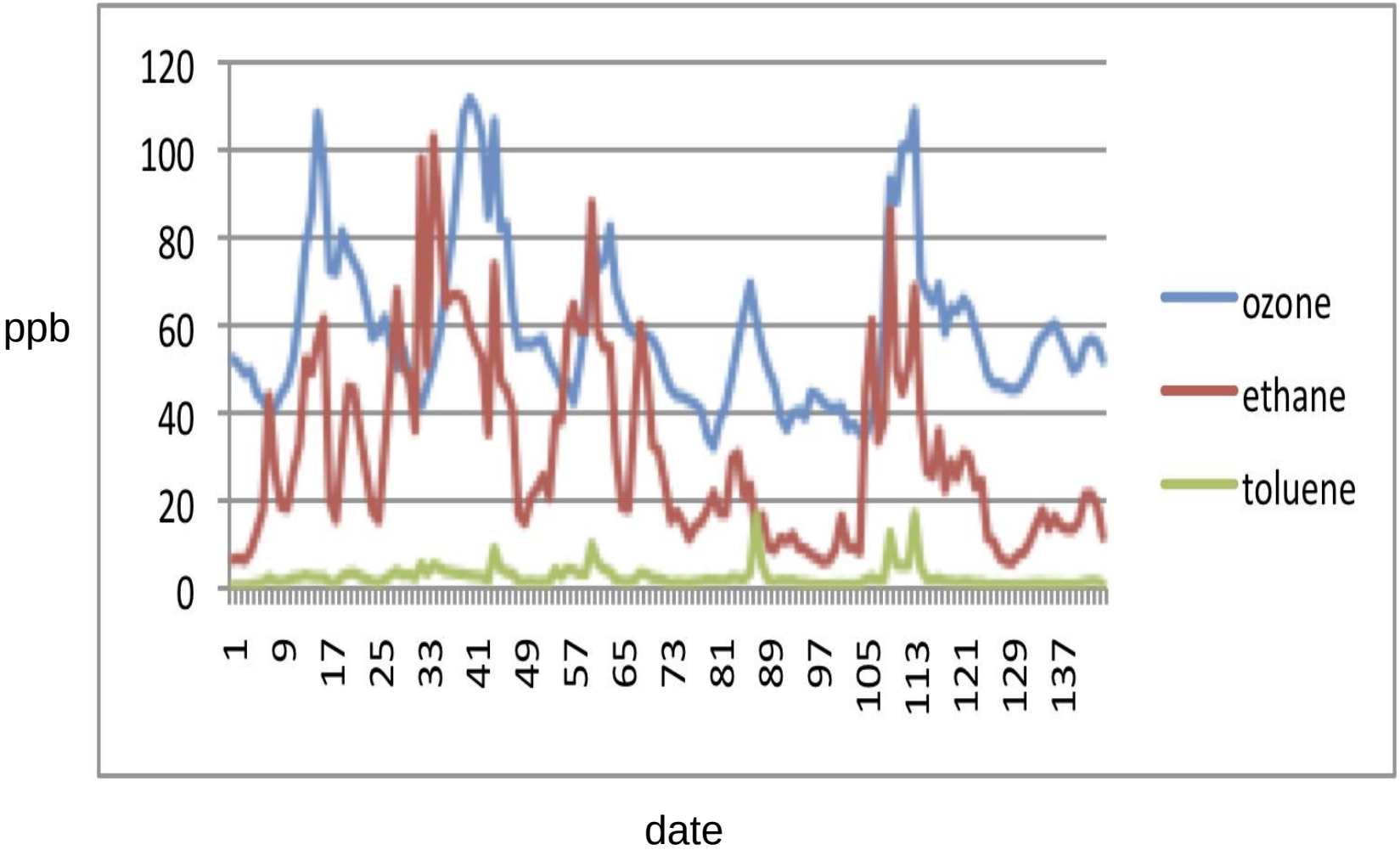
ppb



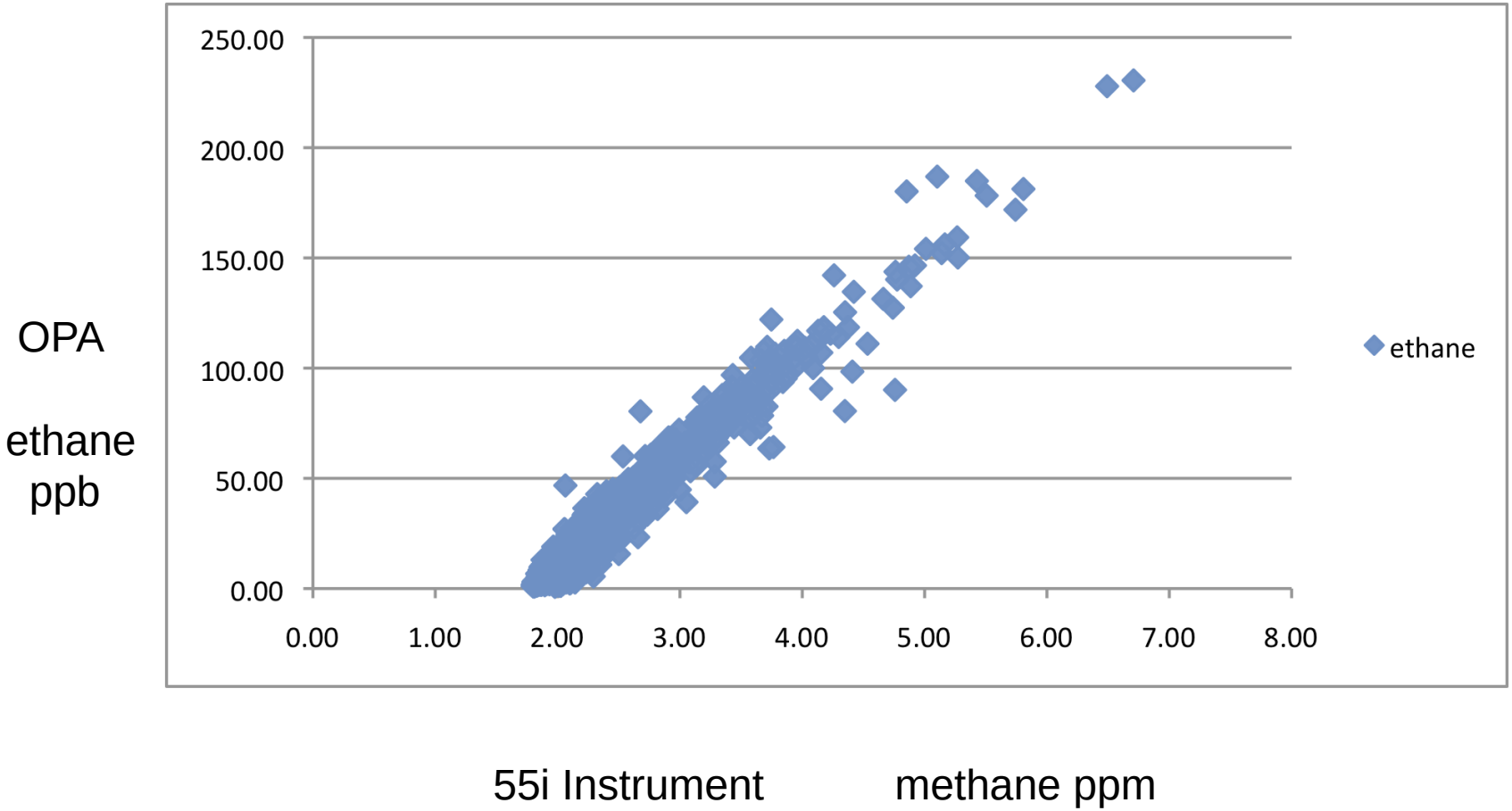
ppm



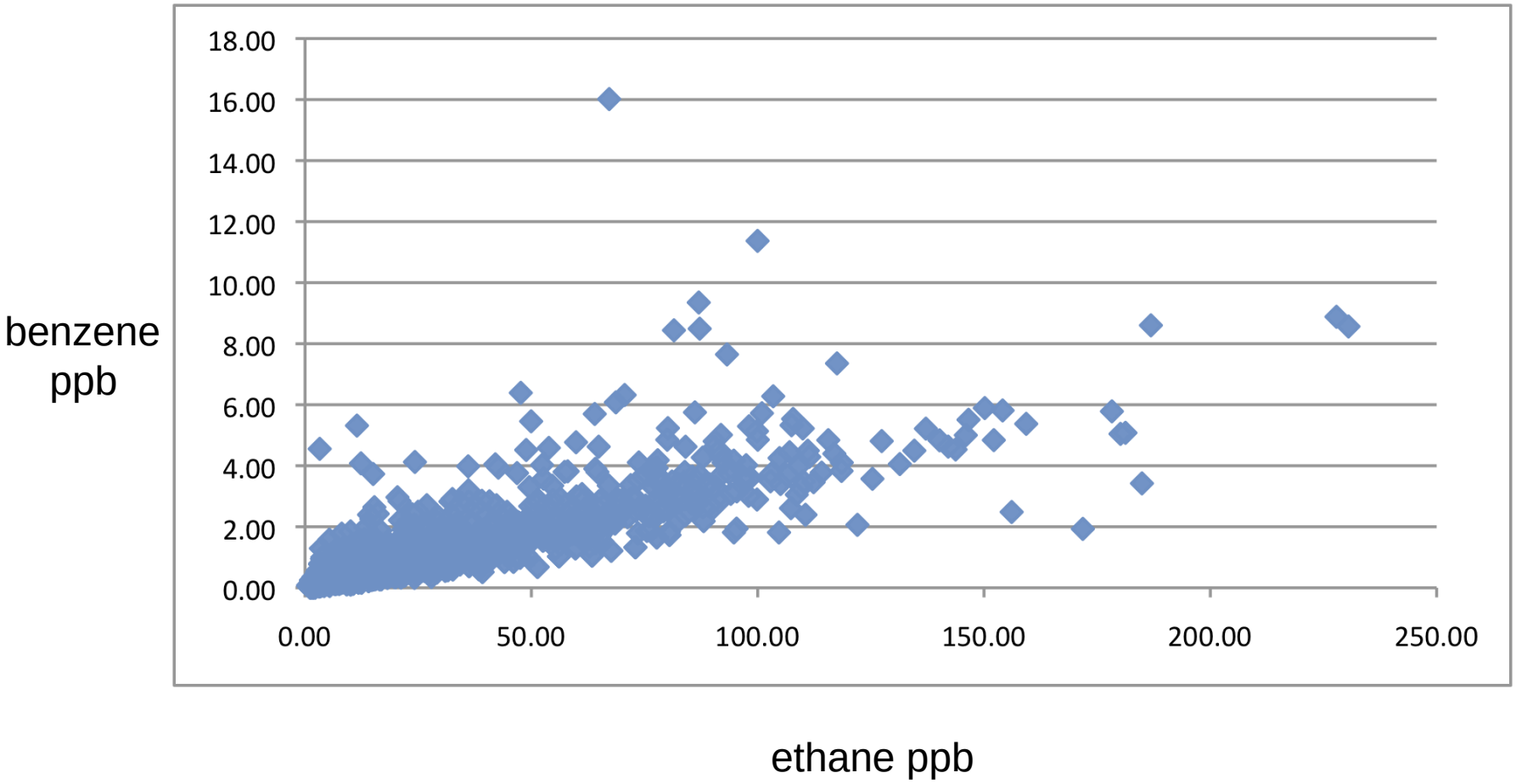
1st March to 6th March 2011



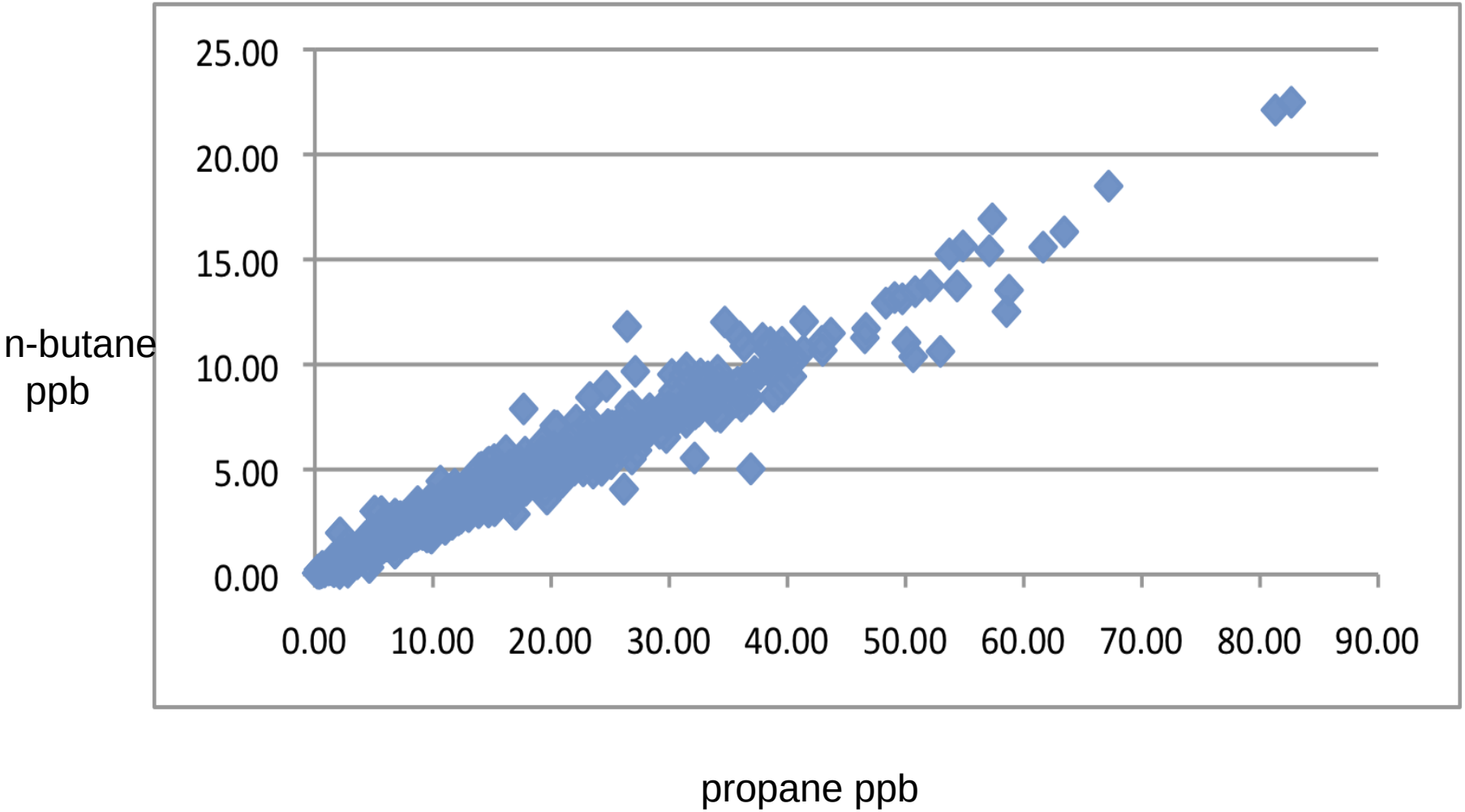
Methane vs ethane Nov 2010 to Apr 2011



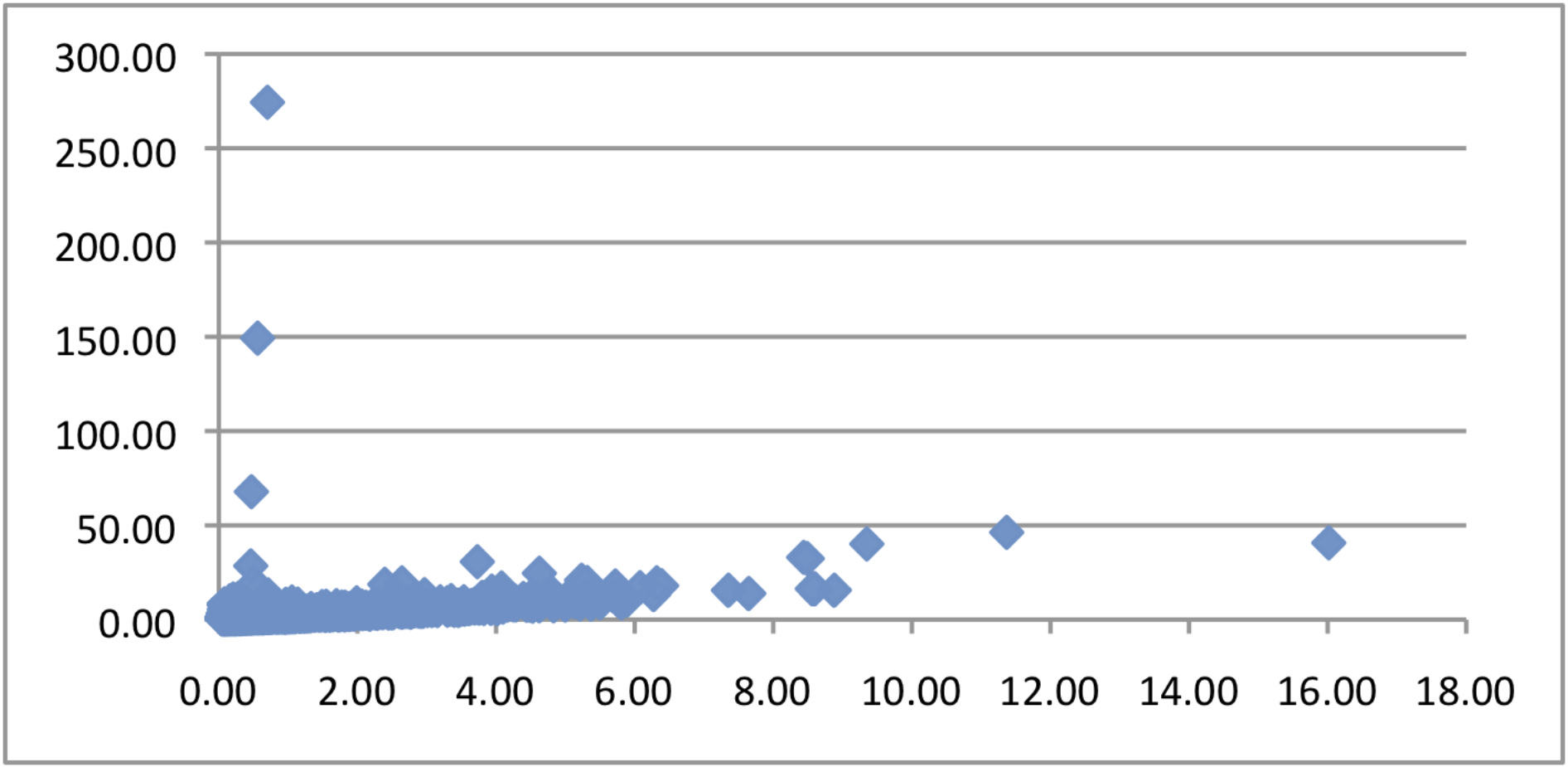
Benzene vs. Ethane Nov 2010 to Apr 2011



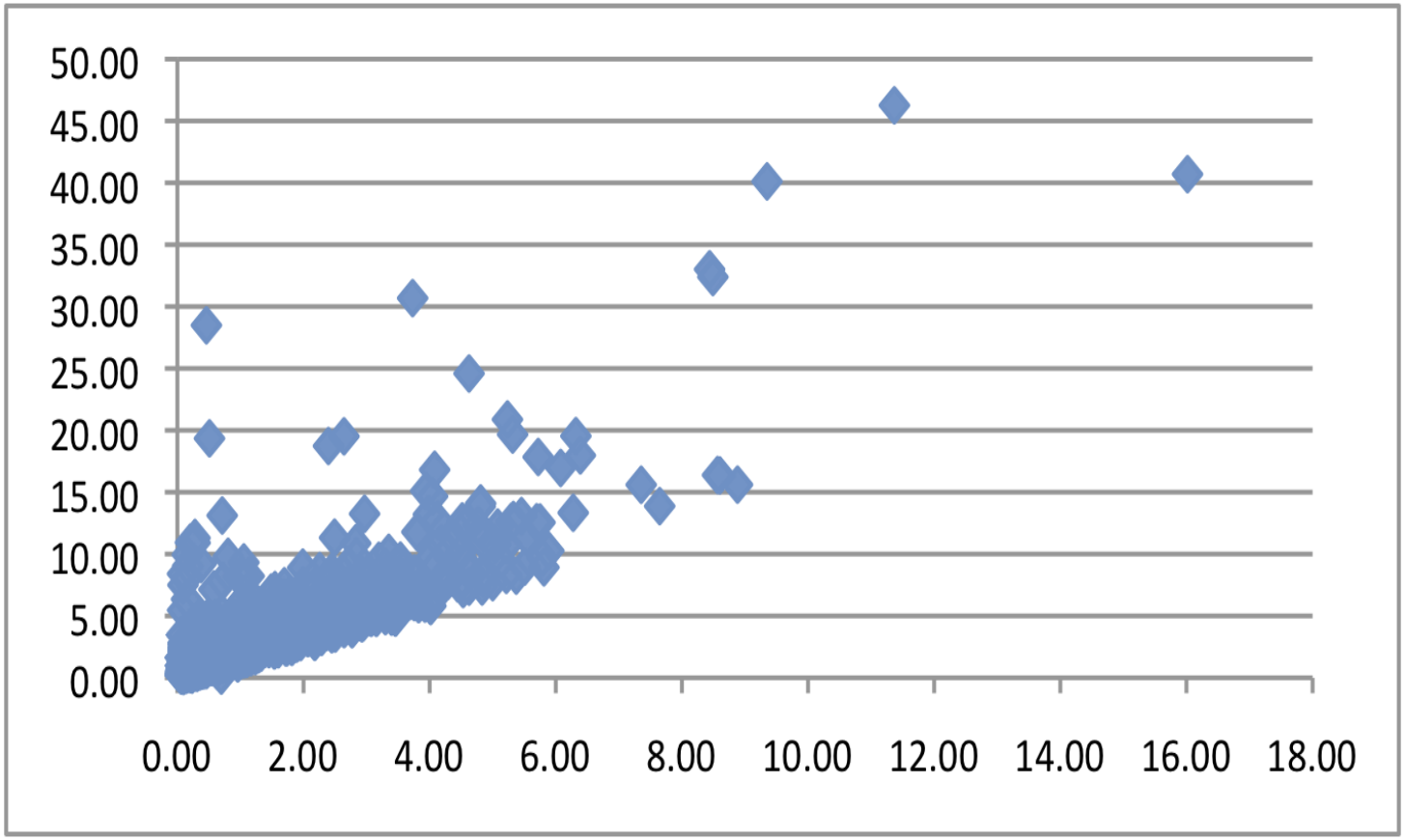
Propane vs. n-butane



Benzene vs. Toluene

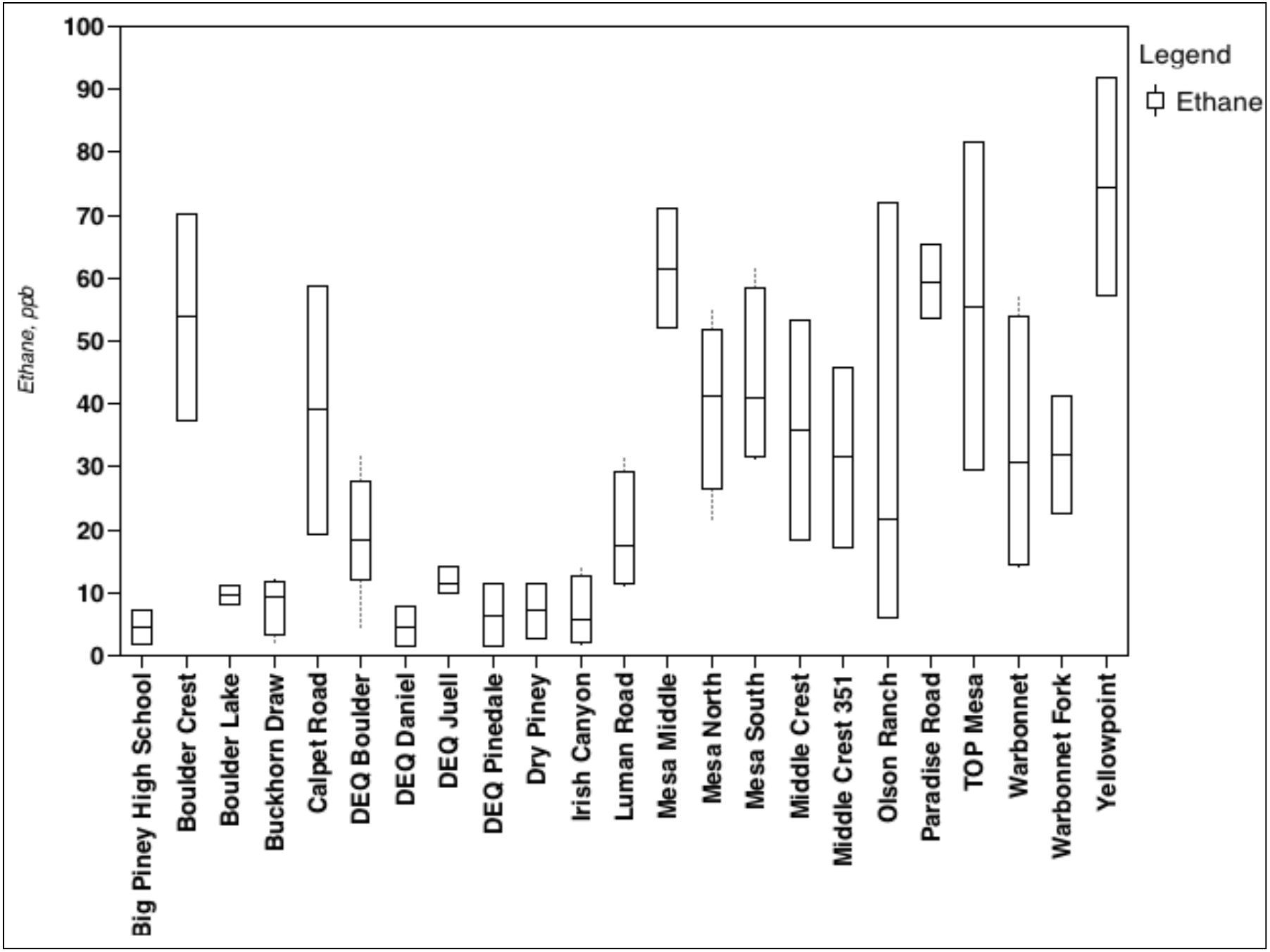


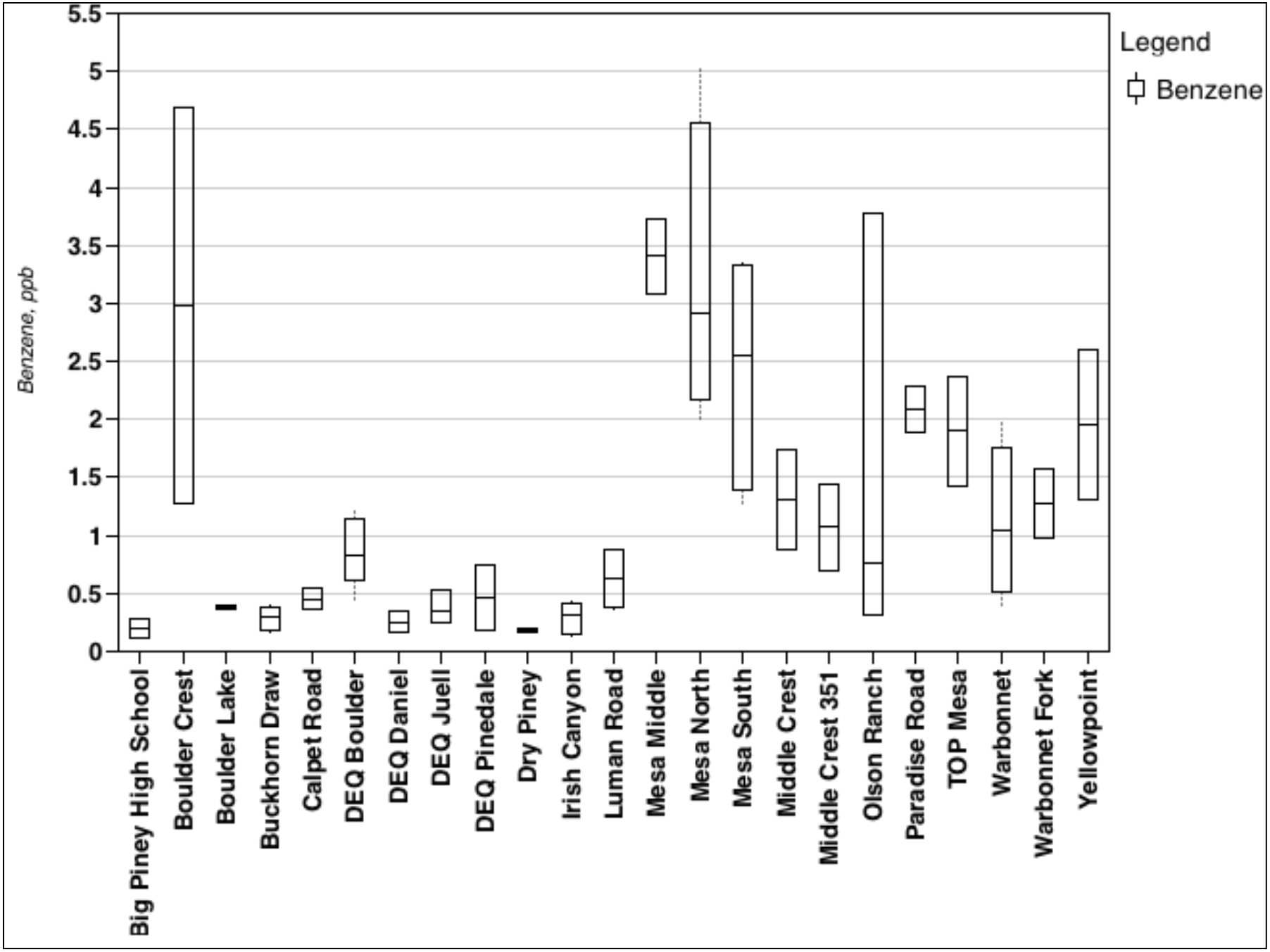
Benzene vs toluene minus extremes



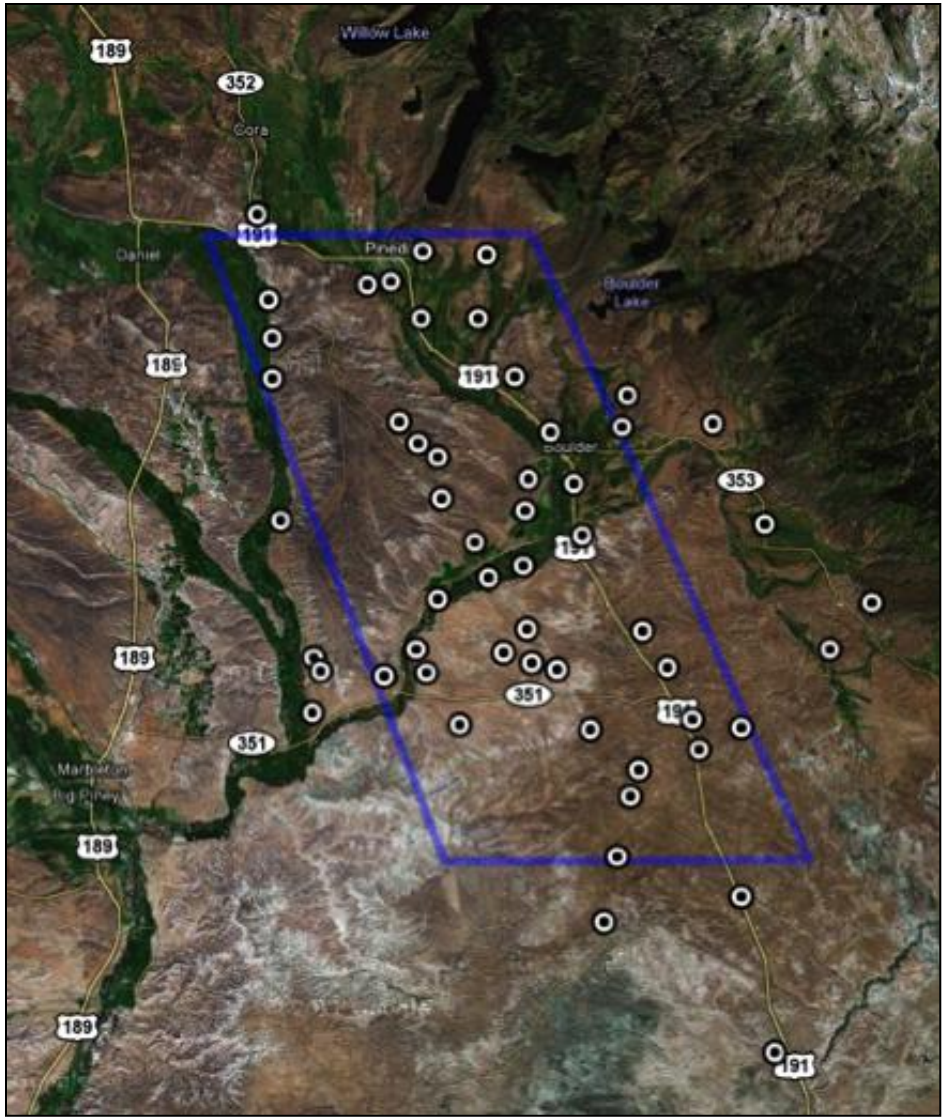
Objective 2: Spatial VOC

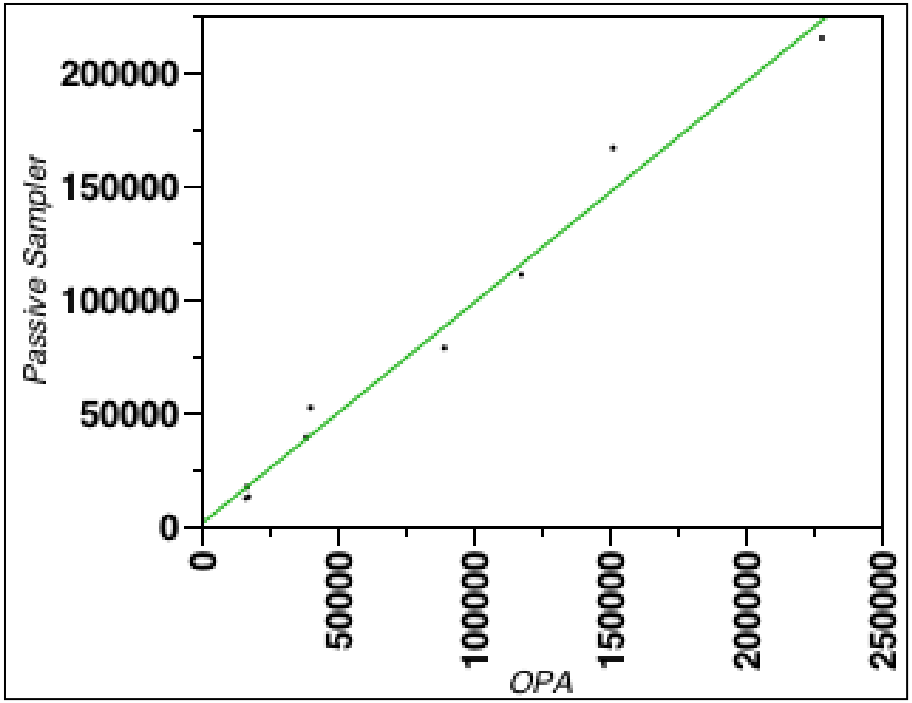
Survey	Type	Data Recovery
		% Collected
1	Wide	100%
2	Wide	100%
3	Tight	100%
4	Transect	100%
5	Tight	82%
6	Transect	100%


Ethane, ppb
100
90
80
70
60
50
40
30
20
10
0
Legend
Ethane
Big Piney High School
Boulder Crest
Boulder Lake
Buckhorn Draw
Calpet Road
DEQ Boulder
DEQ Daniel
DEQ Juell
DEQ Pinedale
Dry Piney
Irish Canyon
Luman Road
Mesa Middle
Mesa North
Mesa South
Middle Crest
Middle Crest 351
Olson Ranch
Paradise Road
TOP Mesa
Warbonnet
Warbonnet Fork
Yellowpoint

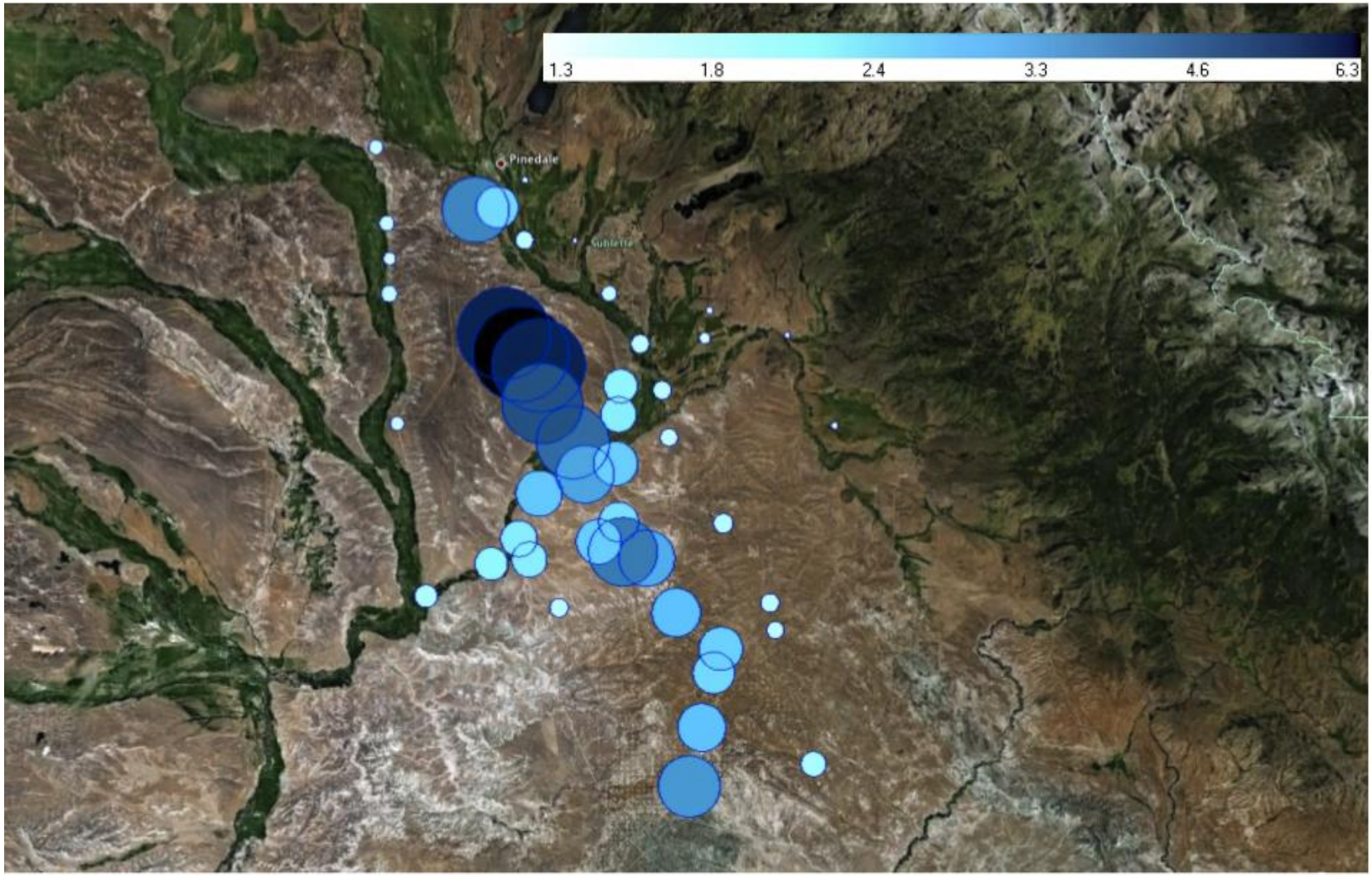

Benzene, ppb
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Legend
Benzene
Big Piney High School
Boulder Crest
Boulder Lake
Buckhorn Draw
Calpet Road
DEQ Boulder
DEQ Daniel
DEQ Juell
DEQ Pinedale
Dry Piney
Irish Canyon
Luman Road
Mesa Middle
Mesa North
Mesa South
Middle Crest
Middle Crest 351
Olson Ranch
Paradise Road
TOP Mesa
Warbonnet
Warbonnet Fork
Yellowpoint

Objective 3: Spatial BTEX & NO_x





Benzene distribution
BTEX survey



ppb

Next Year

- Final study design to be formed in September
- Mobile methane system for locating hot spots
- Continued support for ambient modeling & emission inventory
- Spatial sampling strategy to be determined