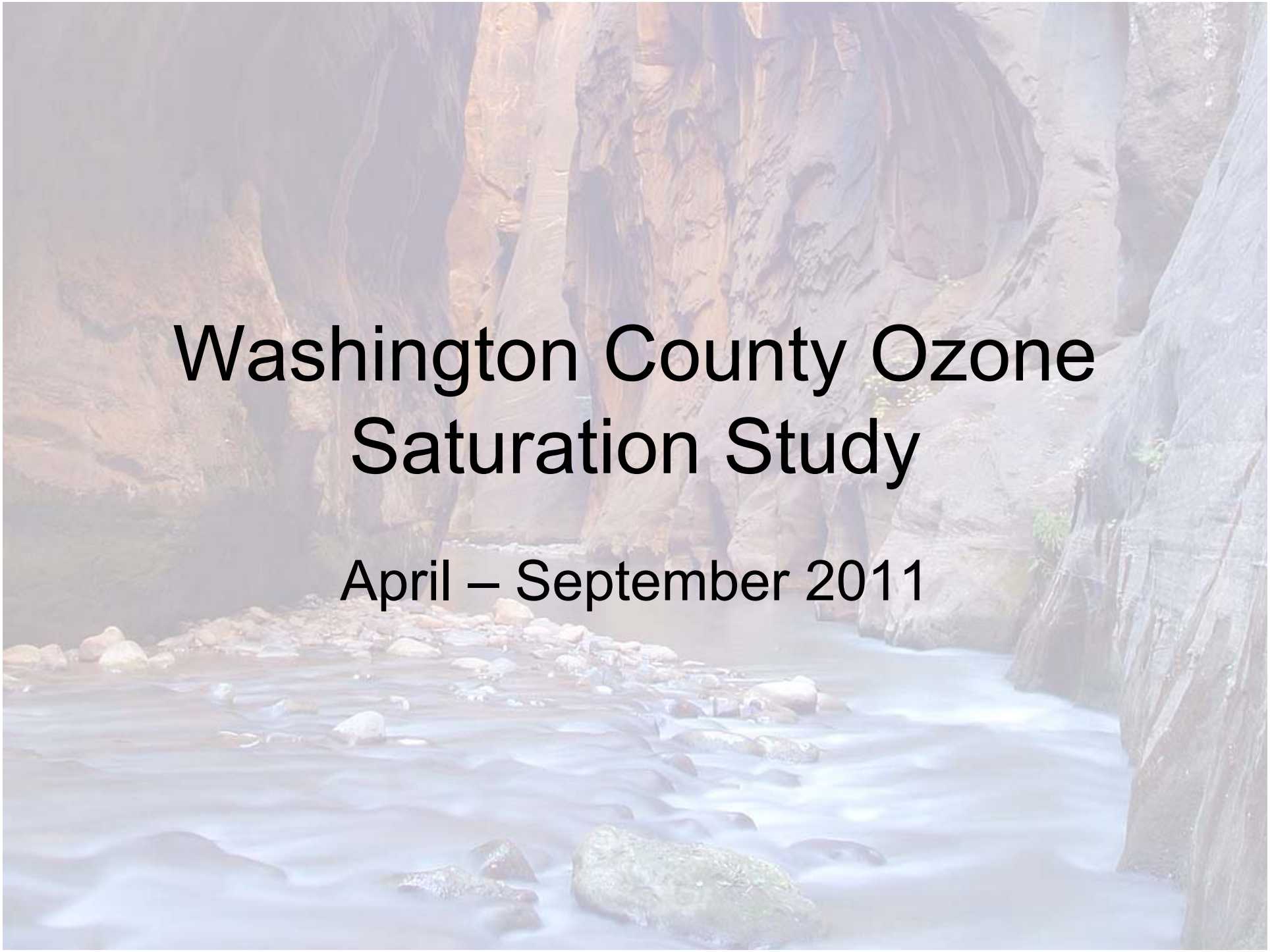
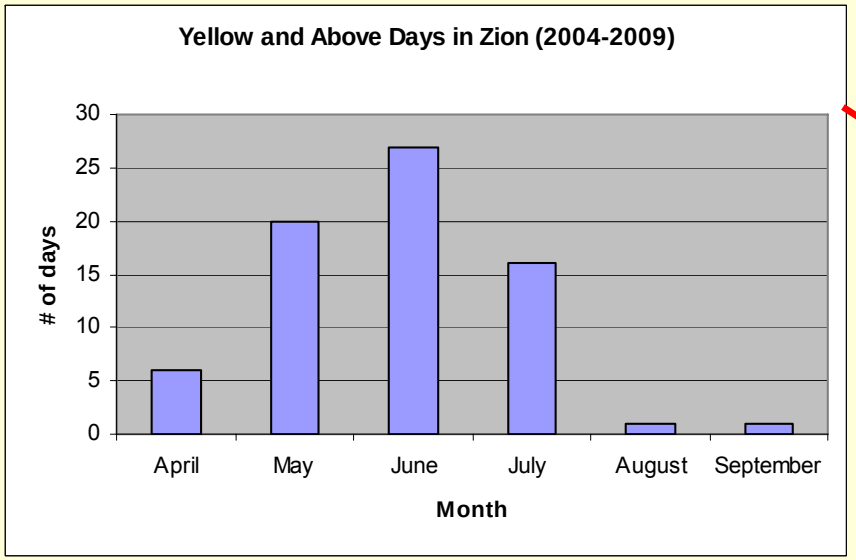
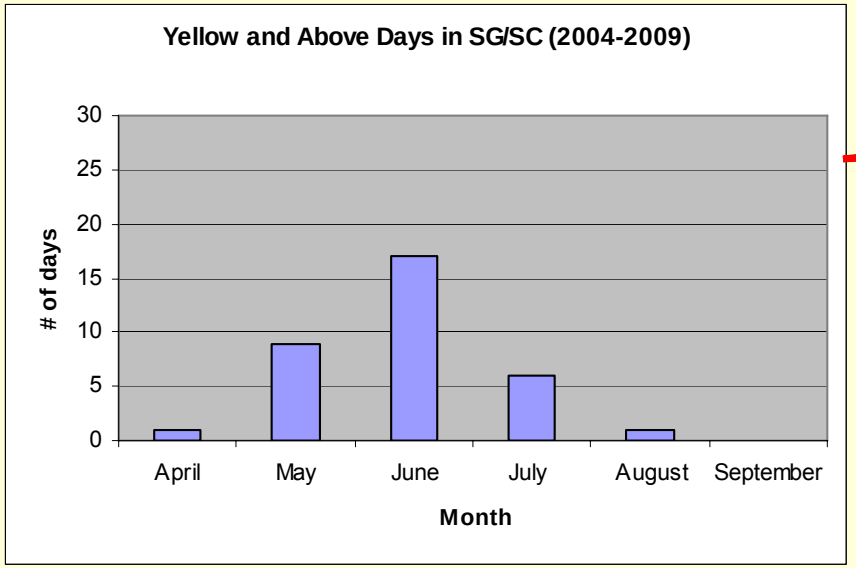


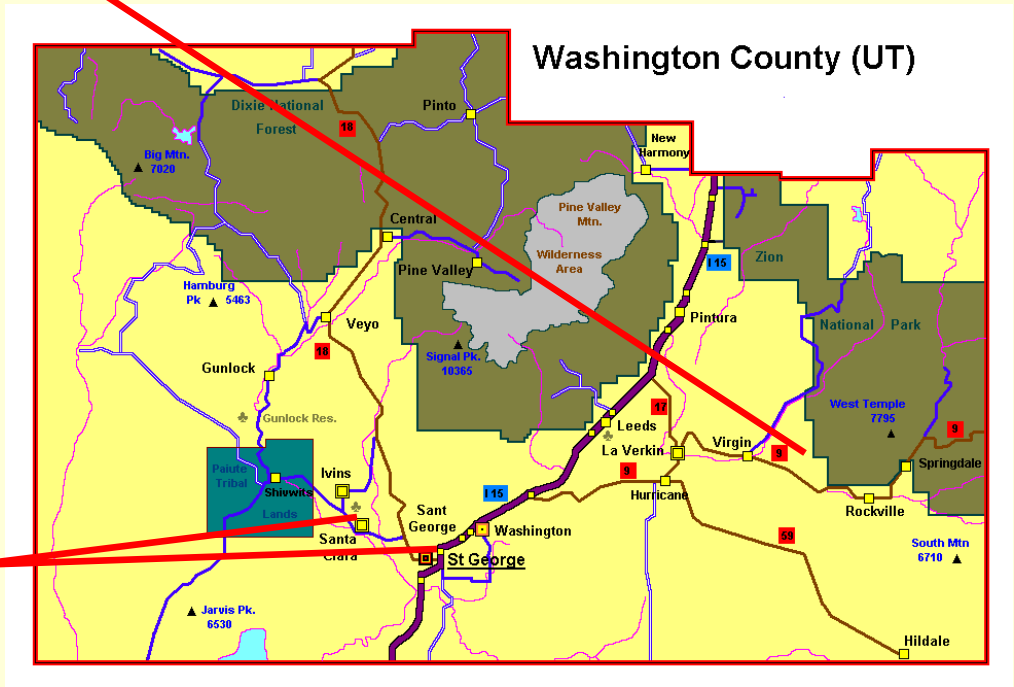
Washington County Ozone Saturation Study

April – September 2011

Zion vs. St. George/Santa Clara





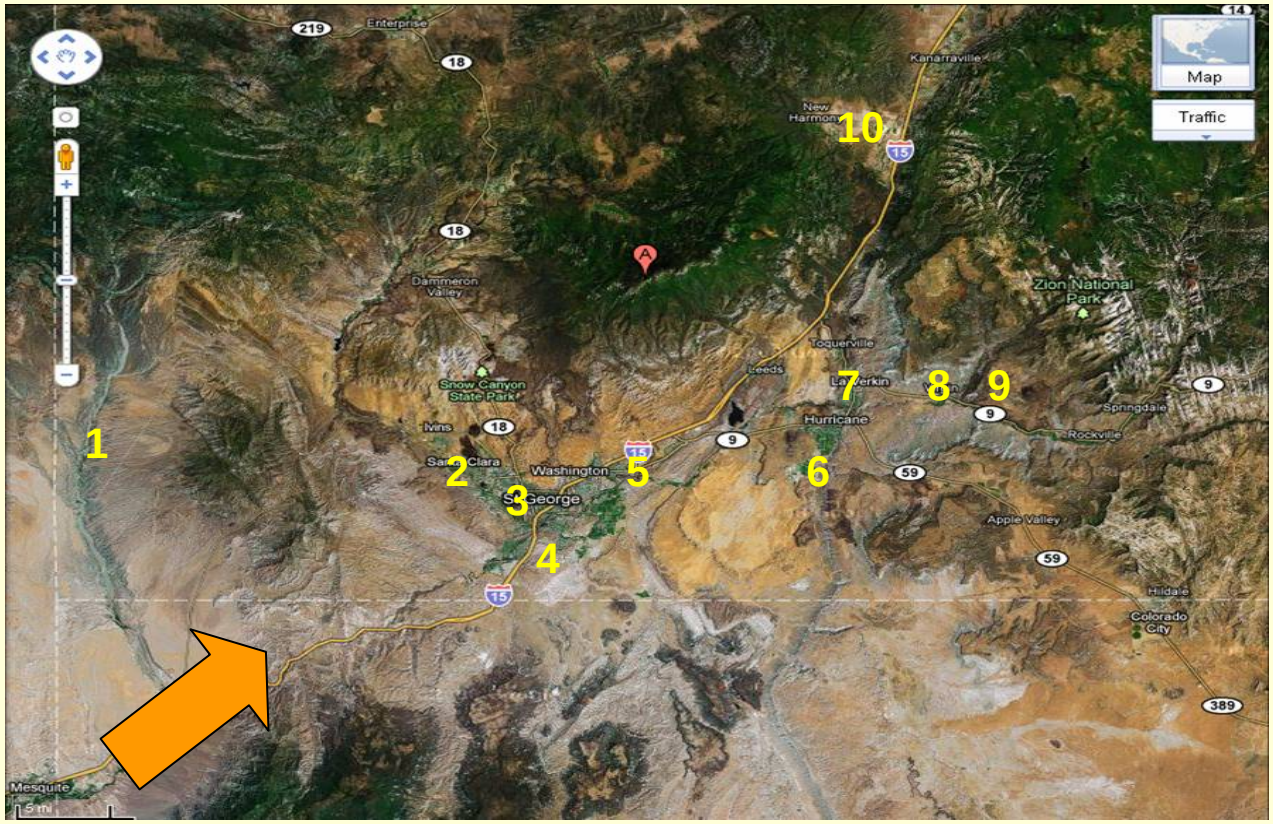


Objectives

- Locate a suitable permanent location for ozone monitoring
- Pollution transport from Las Vegas/Southern California

Site Locations

1. Lytle Ranch
2. Santa Clara
3. St. George
4. South St. George
5. Washington
6. Hurricane
7. La Verkin
8. Virgin
9. Zion (Dalton Wash)
10. New Harmony



8-hour max values
April-August

Location	1st highest 8-hour max	4th highest 8-hour max
Lytle Ranch	77 (6/16)	72 (6/8)
New Harmony	70 (5/7)	65 (6/3)
S. St. George	72 (6/16)	69 (5/7)
Santa Clara	72 (8/25)*	69 (6/15)
St. George	75 (6/16)	71 (6/2)
Washington	73 (5/7)	72 (6/16)
Hurricane	76 (5/6)	74 (6/15)
La Verkin	77 (4/29)	71 (6/1)
Virgin	77 (4/29)	72 (5/23)
Zion	75 (4/29, 6/15)	73 (6/1)

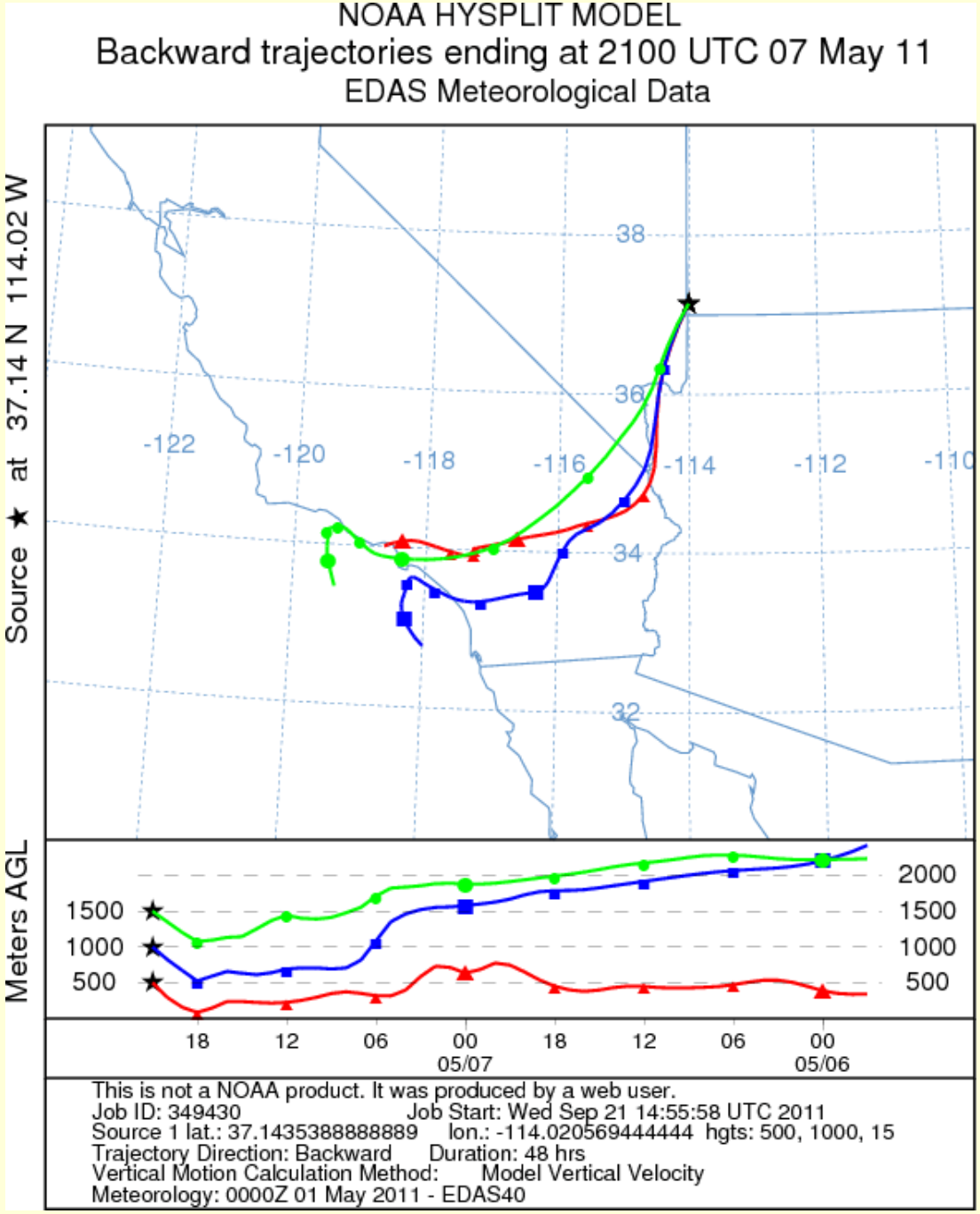
*Wildfires

April – July 25

Location	# Days > 75 ppb	# Days > 70 ppb	# Days > 65 ppb
Lytle Ranch	1	5	20
New Harmony	0	0	3
S. St. George	0	2	11
Santa Clara	0	1	11
St. George	0	6	23
Washington	0	5	22
Hurricane	1	5	23
La Verkin	1	4	22
Virgin	1	6	23
Zion	0	7	32

Where should the station be placed??

1. Hurricane
2. Virgin
3. St. George


NOAA HYSPLIT MODEL
Backward trajectories ending at 2100 UTC 07 May 11
EDAS Meteorological Data
Source ★ at 37.14 N 114.02 W
38
36
34
32
-122
-120
-118
-116
-114
-112
-110
Meters AGL
1500
1000
500
2000
1500
1000
500
18
12
06
00
05/07
18
12
06
00
05/06
This is not a NOAA product. It was produced by a web user.
Job ID: 349430 Job Start: Wed Sep 21 14:55:58 UTC 2011
Source 1 lat.: 37.1435388888889 lon.: -114.020569444444 hgts: 500, 1000, 15
Trajectory Direction: Backward Duration: 48 hrs
Vertical Motion Calculation Method: Model Vertical Velocity
Meteorology: 0000Z 01 May 2011 - EDAS40

High Ozone Days
Hysplit and NOx Statistics

- 39 of the highest ozone days (>65 ppb)
- 64% of high days passed over southern California
- 74% of high days passed over Las Vegas area
- 74% passed over one or the other
- 64% passed over both
- 17% of high days passing over LA had high NOx* in LA, two days prior
- 35% of high days passing over Barstow had high NOx* in Barstow, CA, two days prior
- 48% of high days passing over Las Vegas had high NOx* in Vegas, one day prior

* ≥ 50 ppb

Low Ozone Days

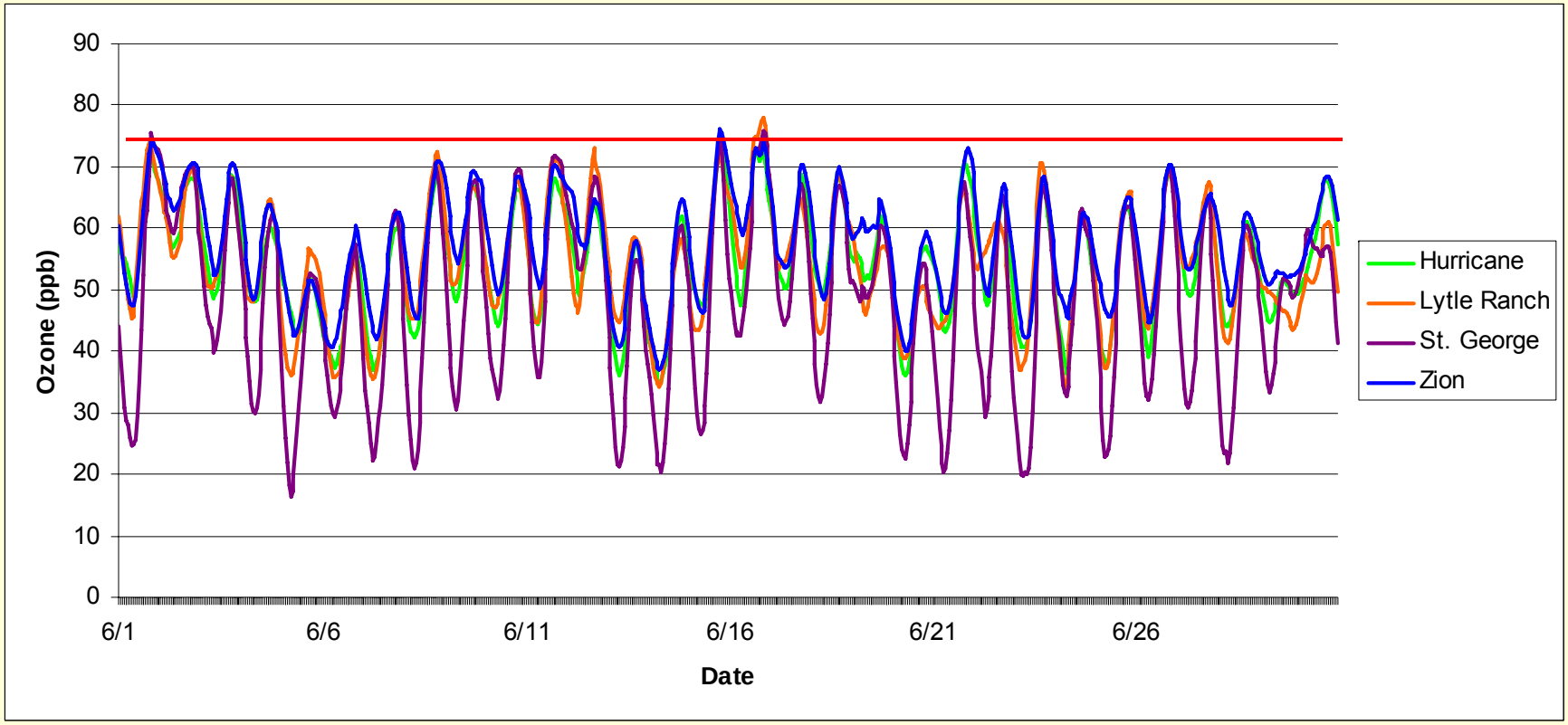
Hysplit and NOx Statistics

- 20 random low ozone days (43-61 ppb)
- 30% of low days passed over the southern California
- 45% of low days passed over the Las Vegas area
- 45% passed over one or the other
- 25% passed over both
- 0% of low days passing over LA had high NOx* in LA, two days prior
- 5% of low days passing over Barstow had high NOx* in Barstow, CA, two days prior
- 15% of low days passing over Las Vegas had high NOx* in Vegas, one day prior

* ≥ 50 ppb

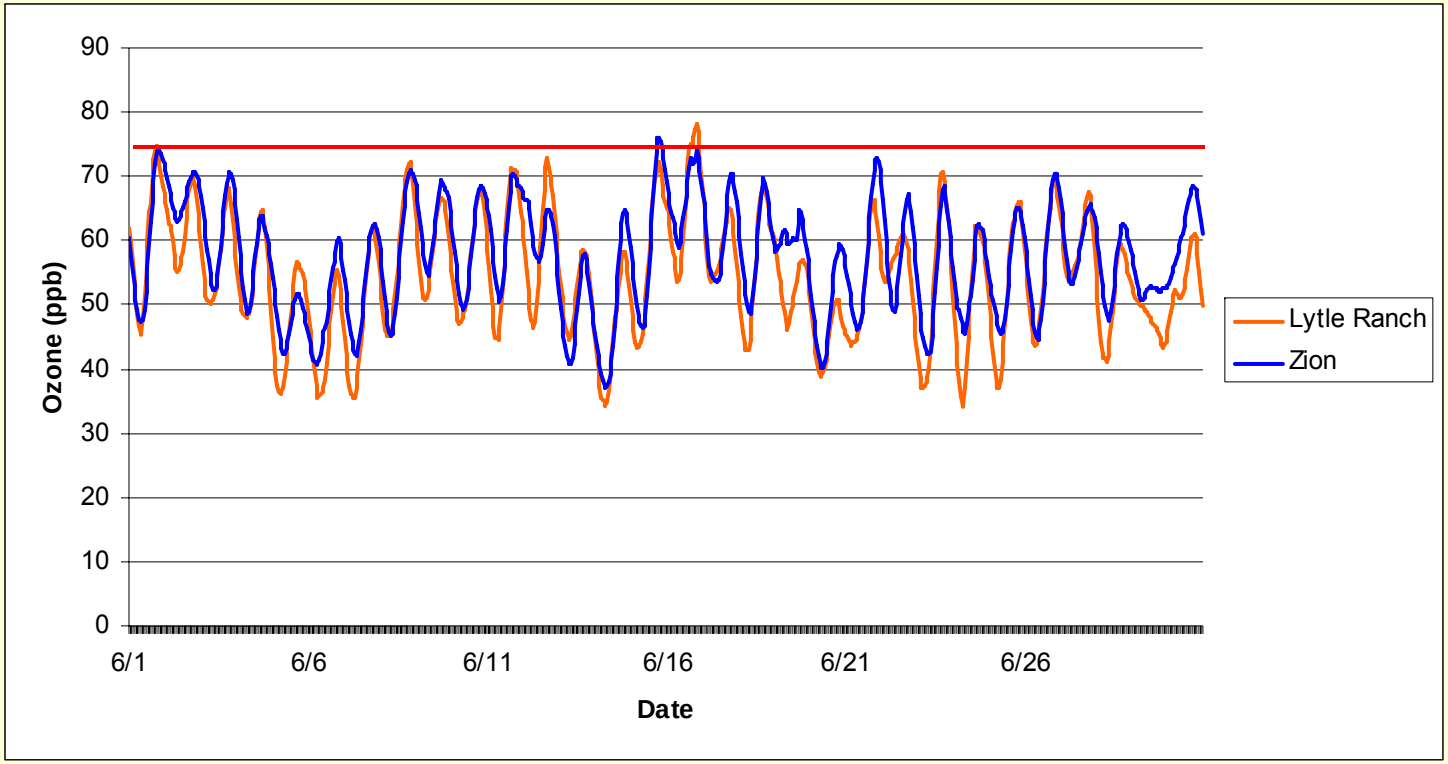
June

8-hour average



Lytle Ranch vs. Zion
June

8-hour average



$r^2 = 0.77$

- Find a more suitable site for permanent ozone monitoring
  - Hurricane, Virgin, St. George
- Assess pollution transport from the Southwest
  - Continue monitoring near Lytle Ranch