

**MATES-III:
PM_{2.5} Measurements for a Weekday/Weekend
Comparison**

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**MATES III Technical Advisory Group
South Coast Air Quality Management District
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Background

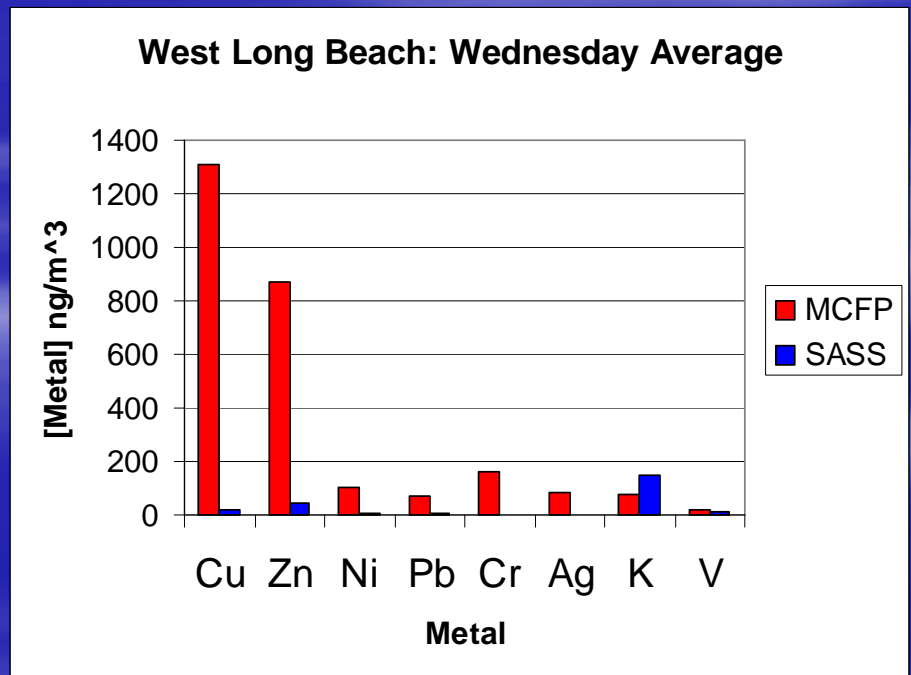
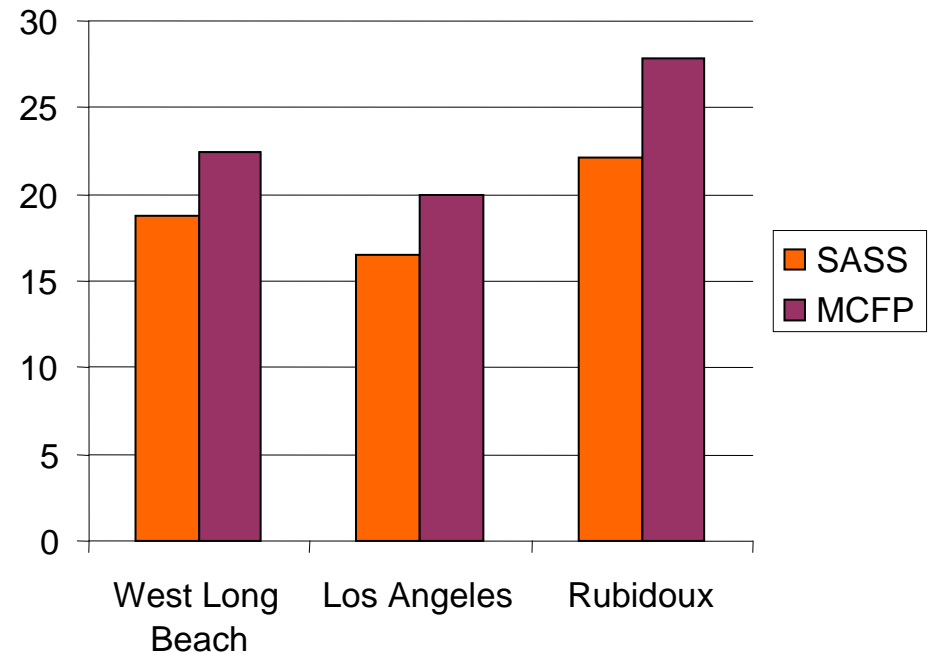
- MATES-III: Diesel Emissions
 - EC/OC on PM₁₀ and PM_{2.5} Samples
 - Organic Tracer Analysis
- Interest in segregation of weekday versus weekend data
 - Connection to Southern California activity data (ARB, 2003; STI, 2004)
 - Some activity increases on weekend (recreation) while others decrease (vehicular traffic)

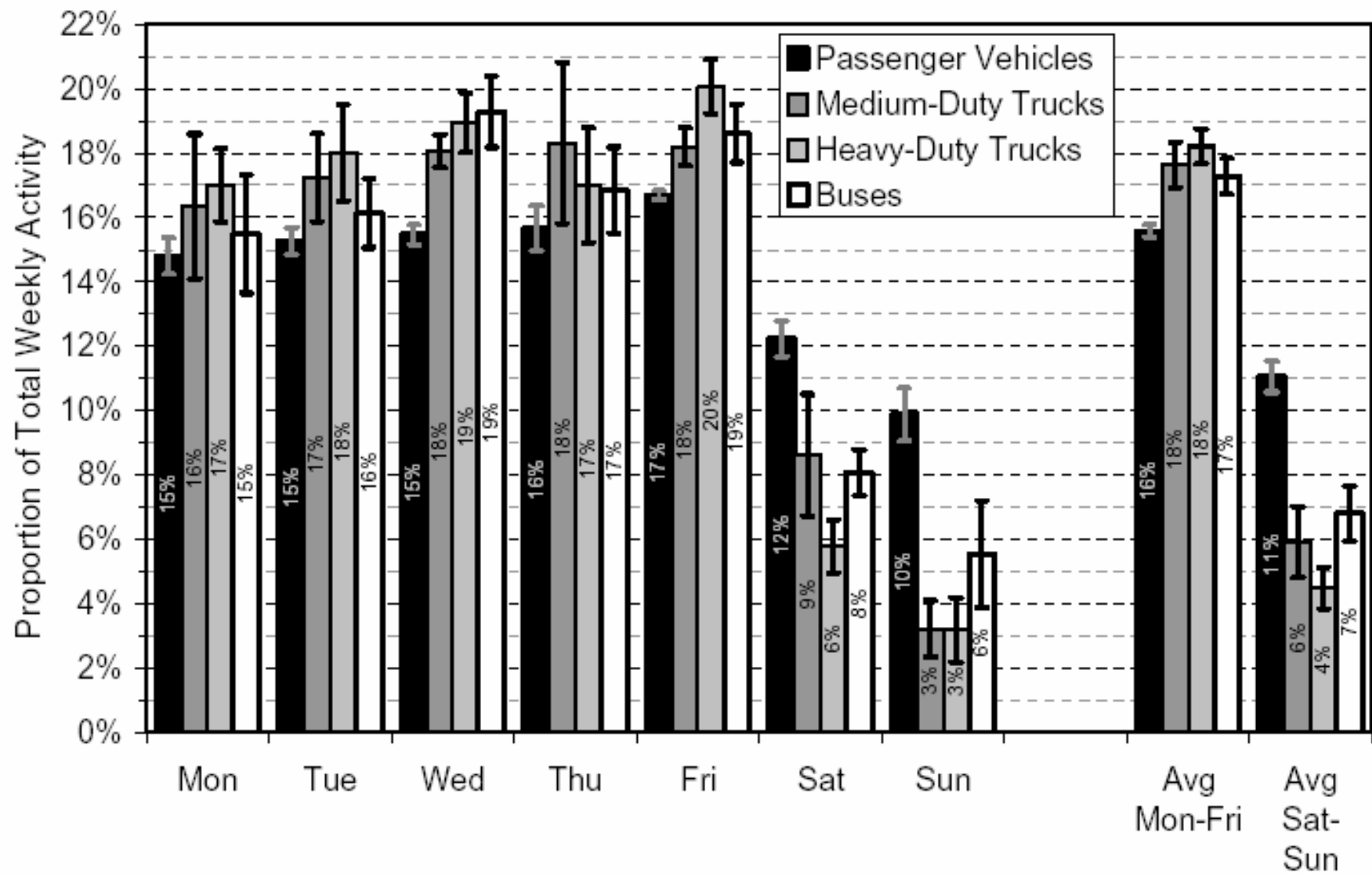
Wednesday/ Sunday Special Study Workplan

- Supplement to Fixed Site MATES-III Sampling using multiple channel fine particulate (MCFP) samplers
- Locations:
 - West Long Beach
 - Central Los Angeles
 - Rubidoux
- Time Period:
 - Phase I: October 3, 2004 through March 30, 2005
 - Phase II: October 5, 2005 through March 29, 2006

Data Selection

- Point to point comparison of Fixed Station Data (SASS) to MCFP Data showed difference
- Brass contamination found in metals QC data
- Metals and mass MCFP data not used for MATES III final analysis.
- Only fixed site data used for MATES III day of week comparisons

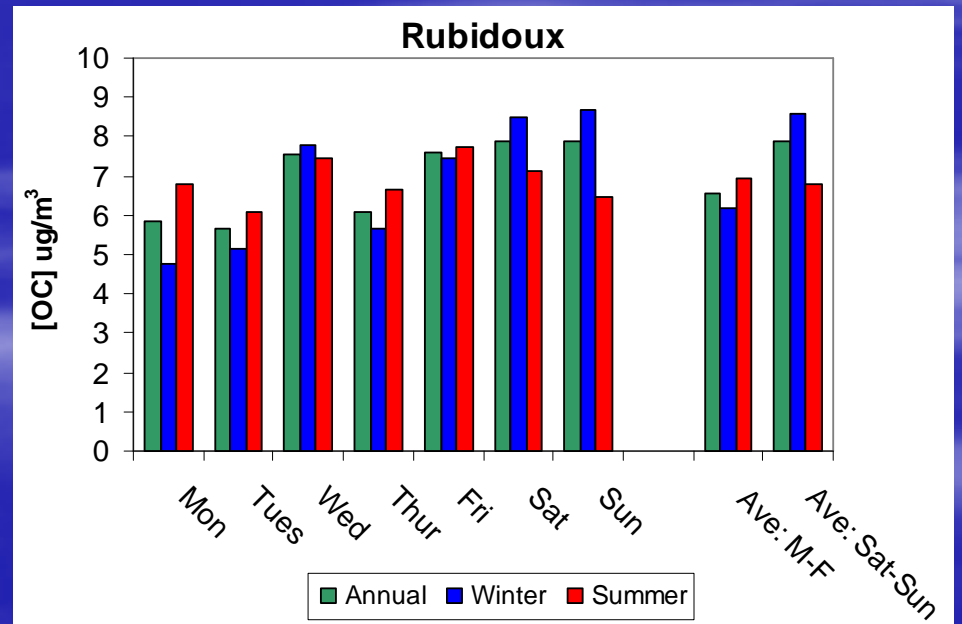
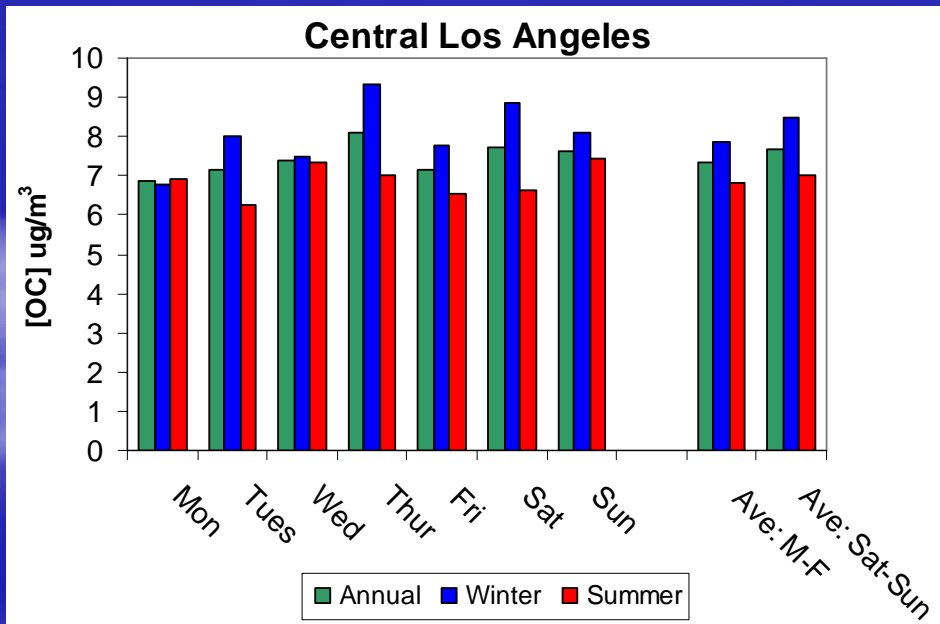
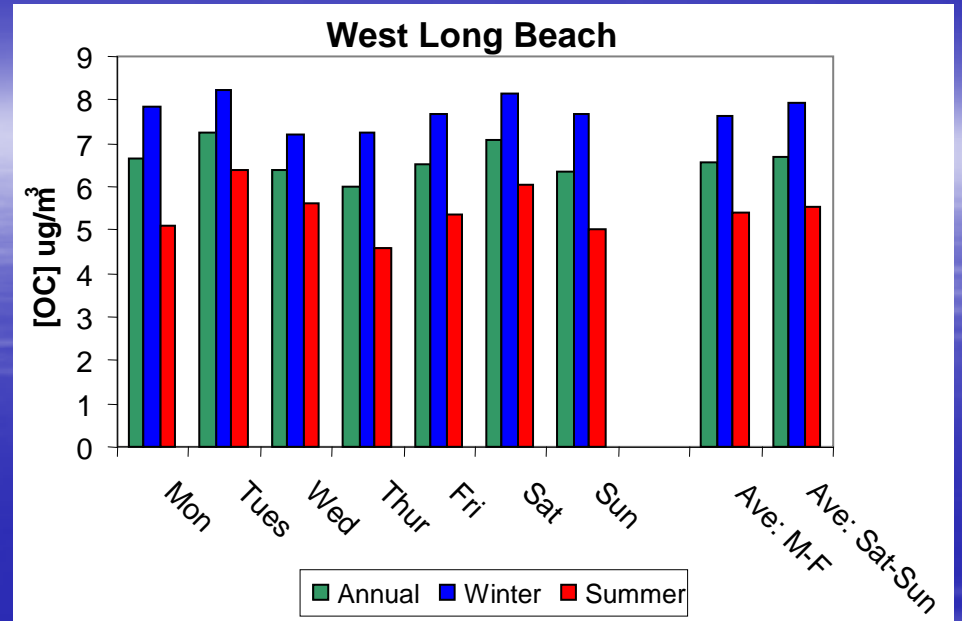




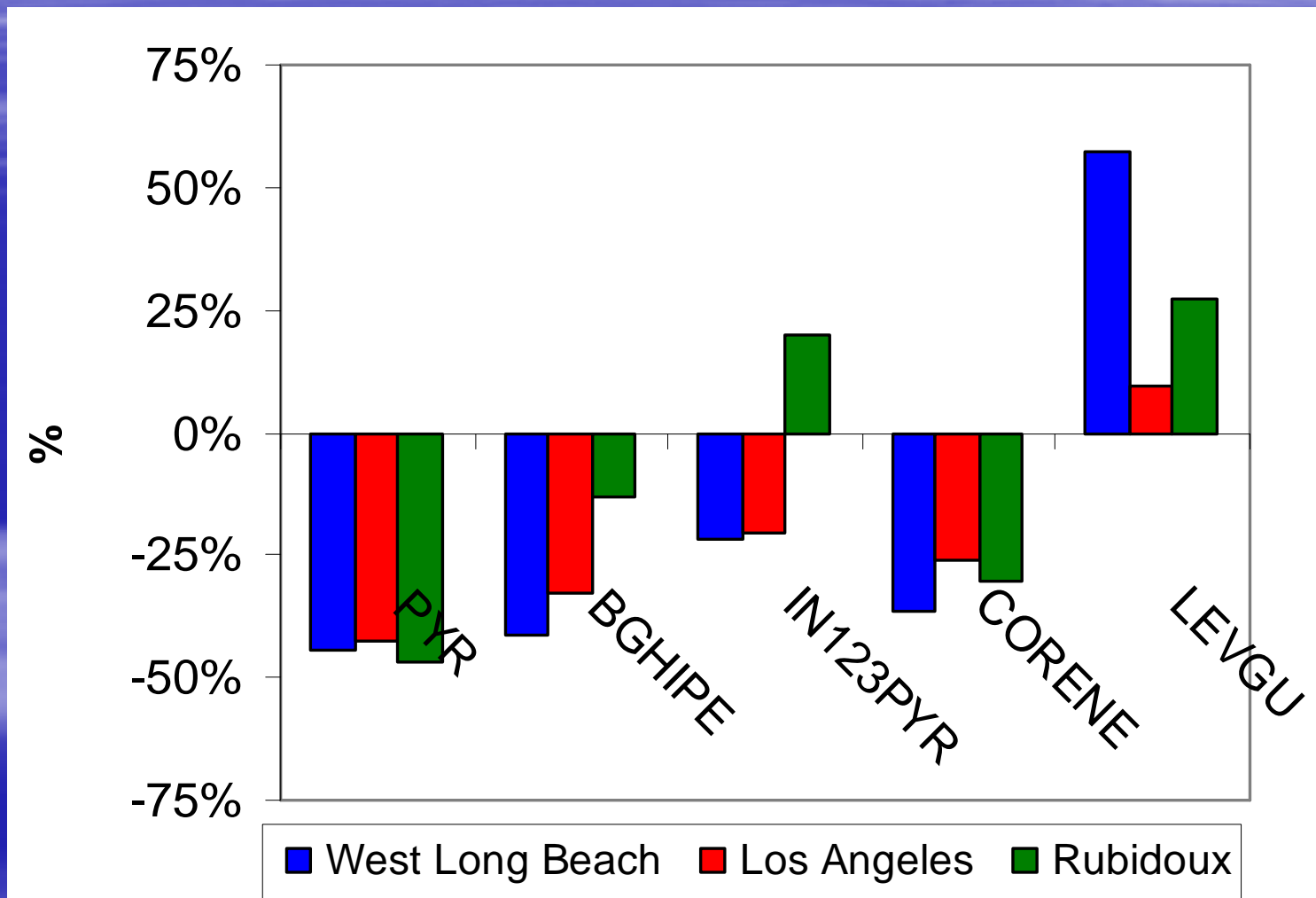
(Error bars are ± 1 standard error of the mean.)

(STI-901140/901150-2477-FR, 2004)

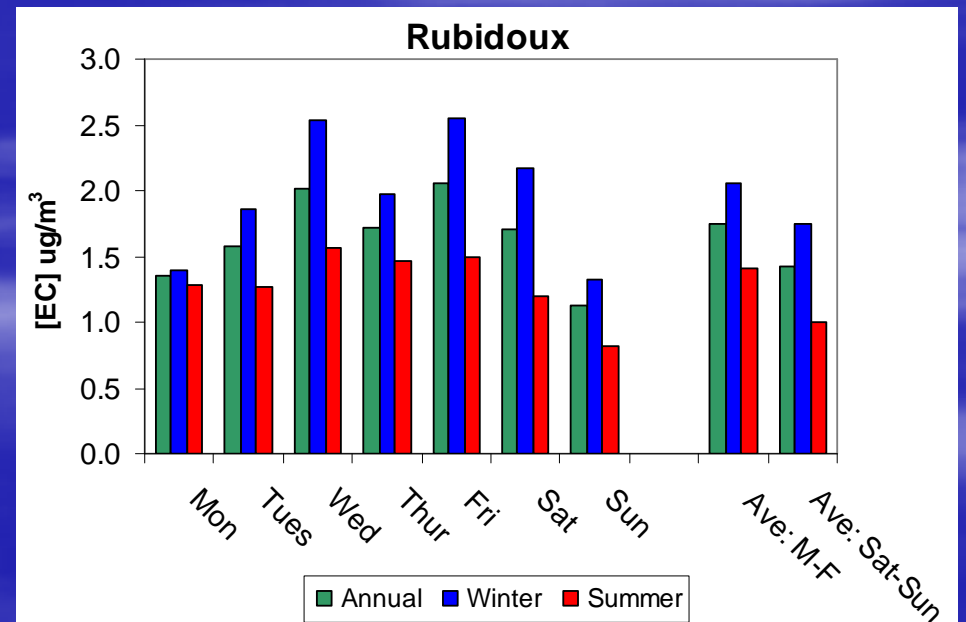
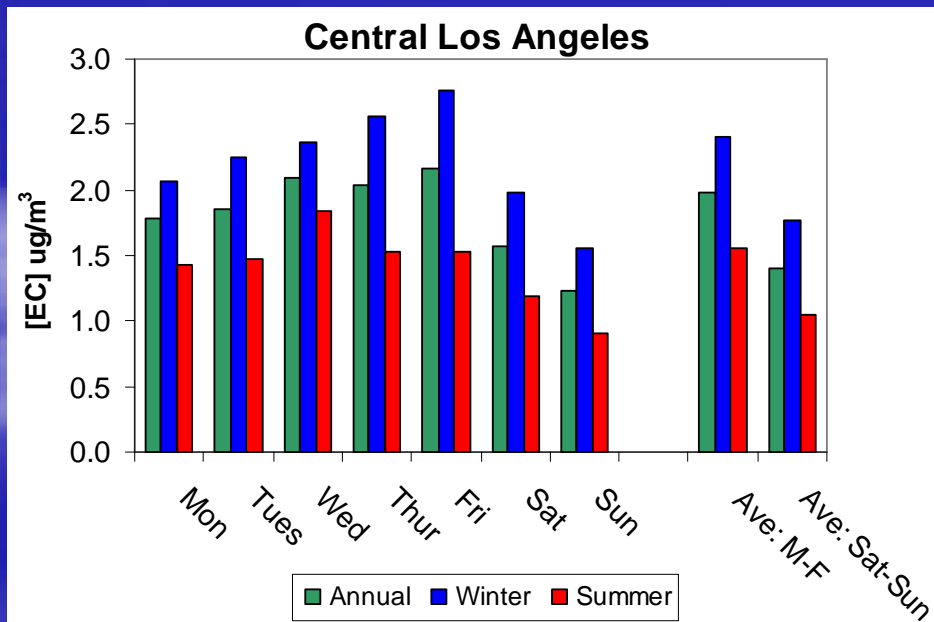
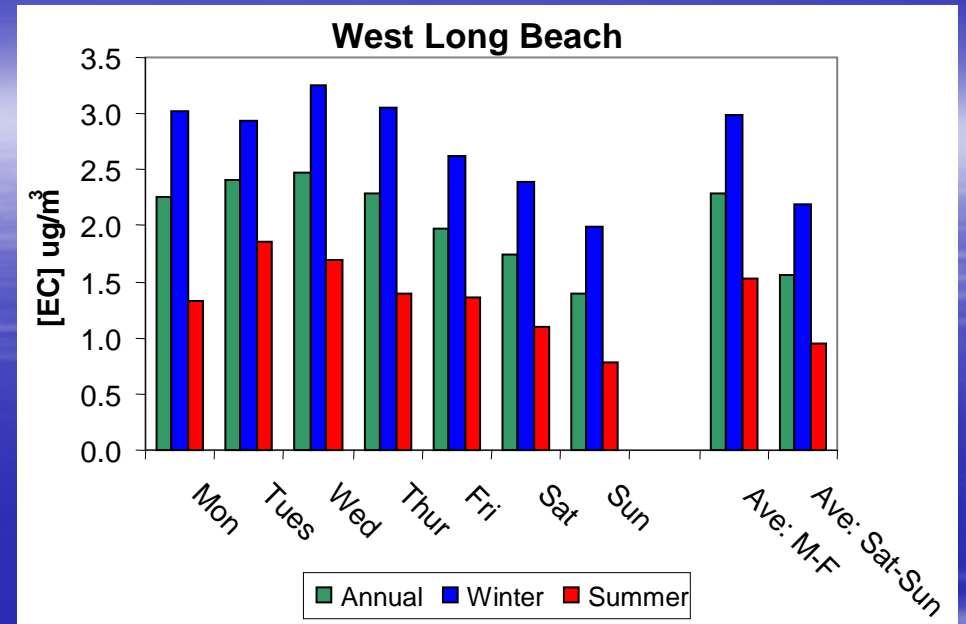
Organic Carbon (Fixed Site Data)



Particle-Bound Organic Compounds: Wed to Sun (MCFP data)

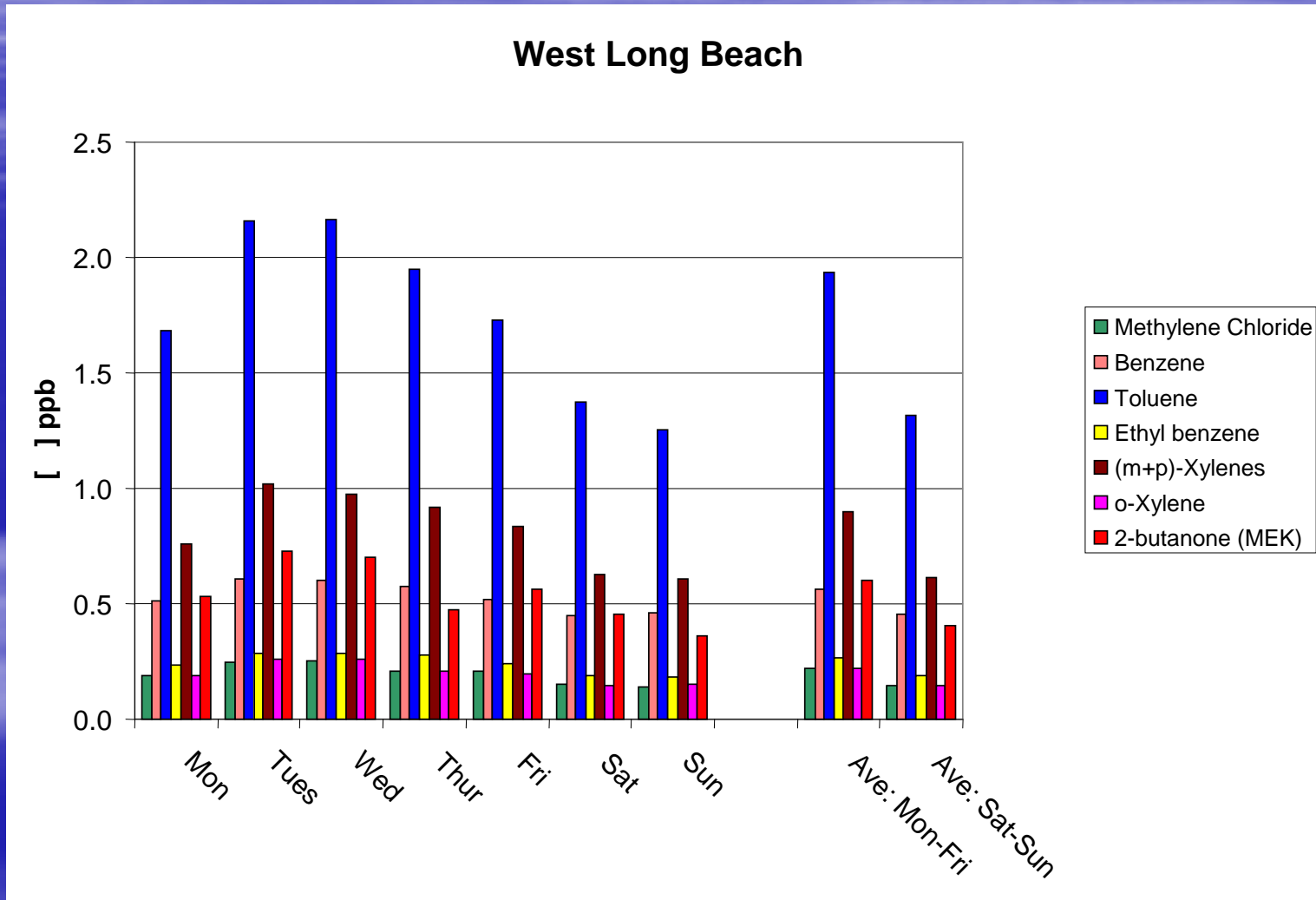


Elemental Carbon (Fixed Site Data)

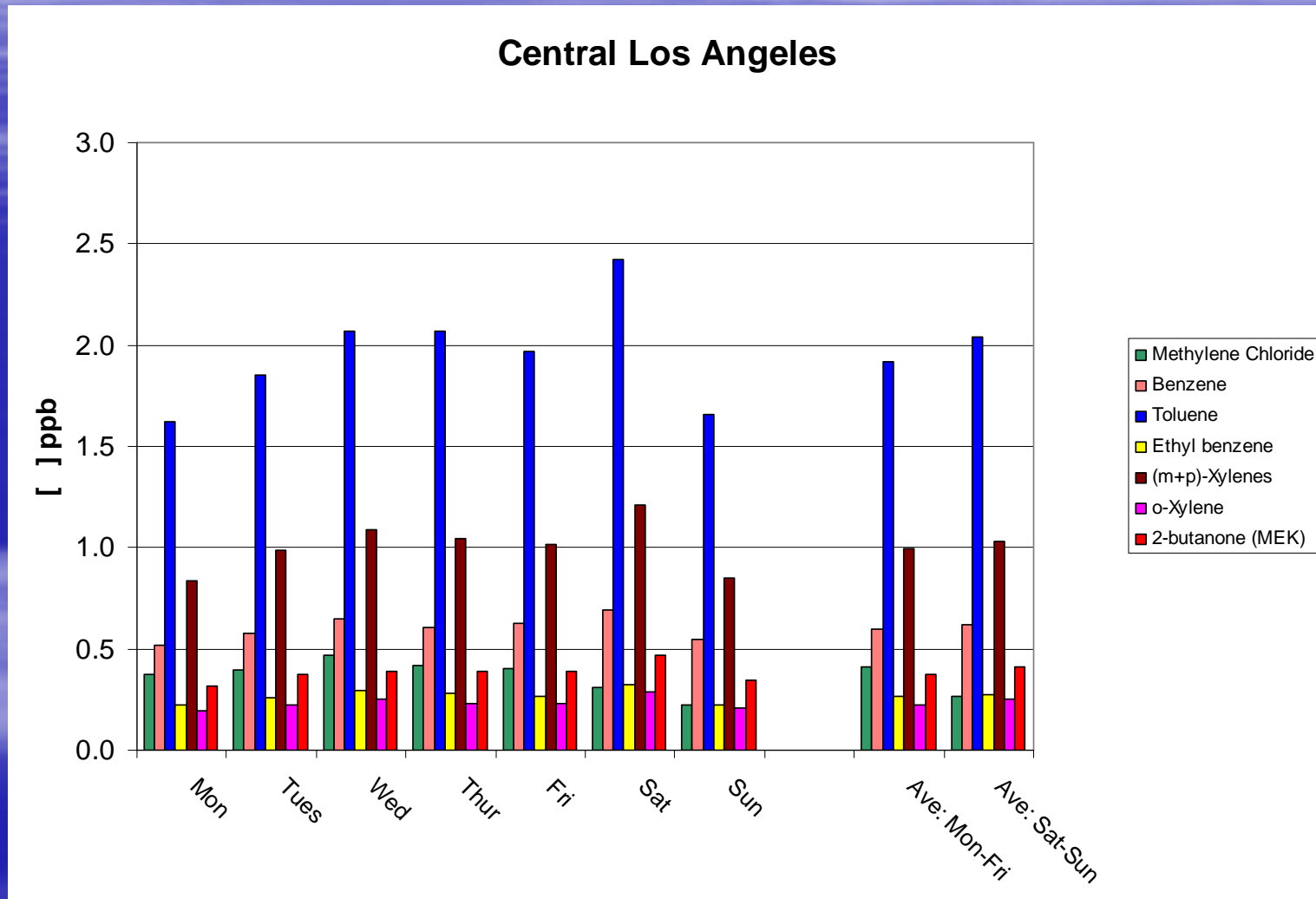


VOC: West Long Beach

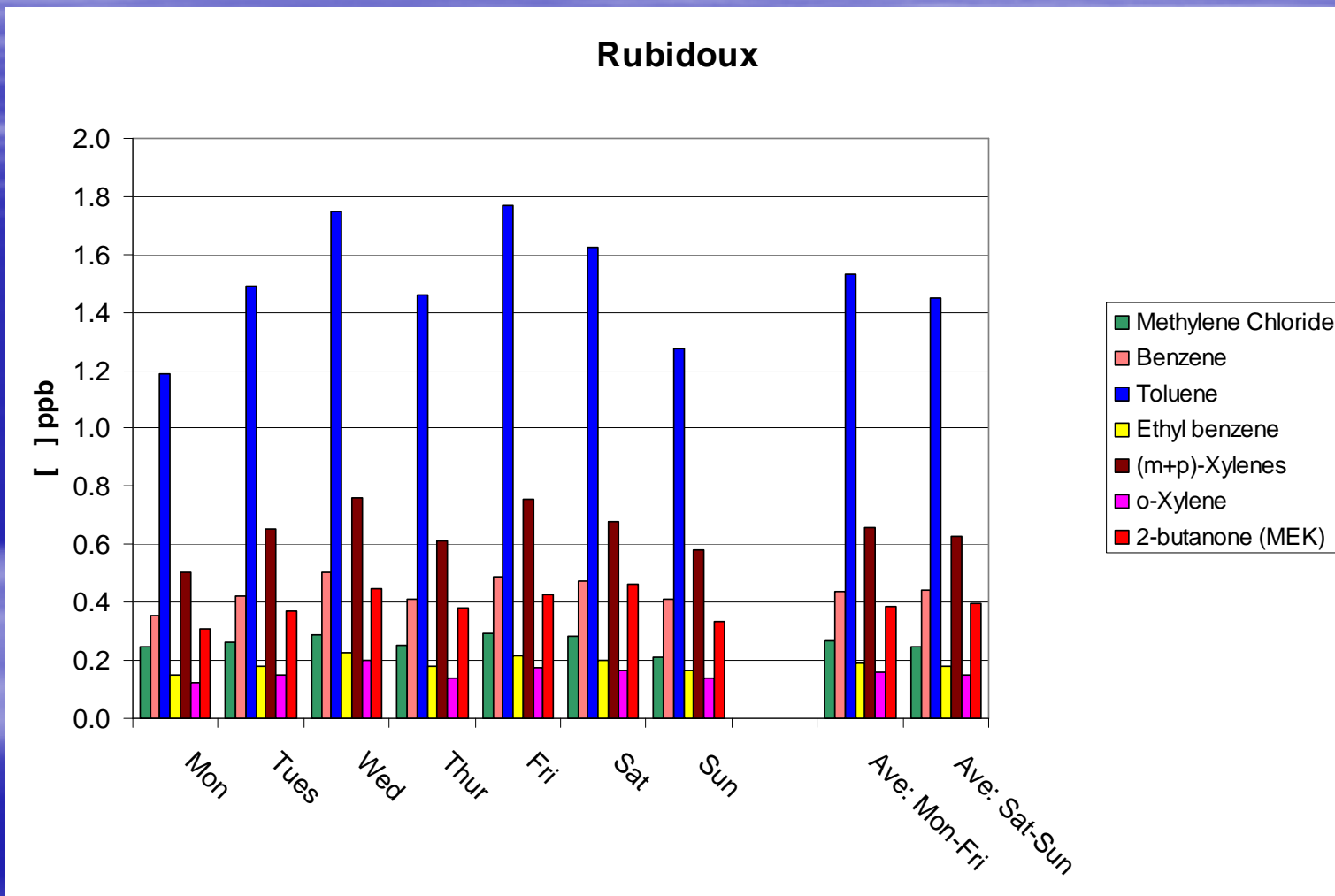
(Fixed Site Data)



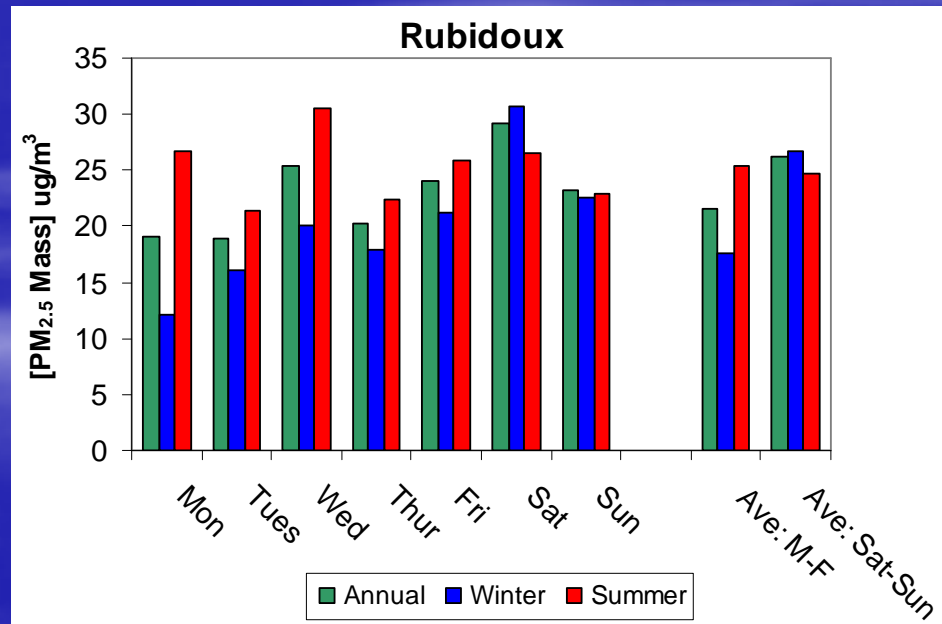
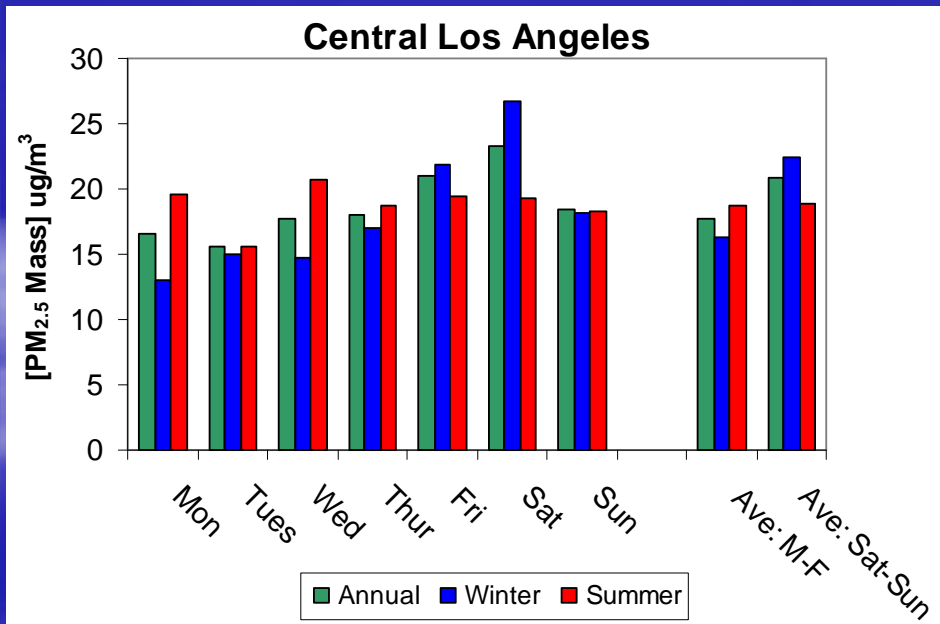
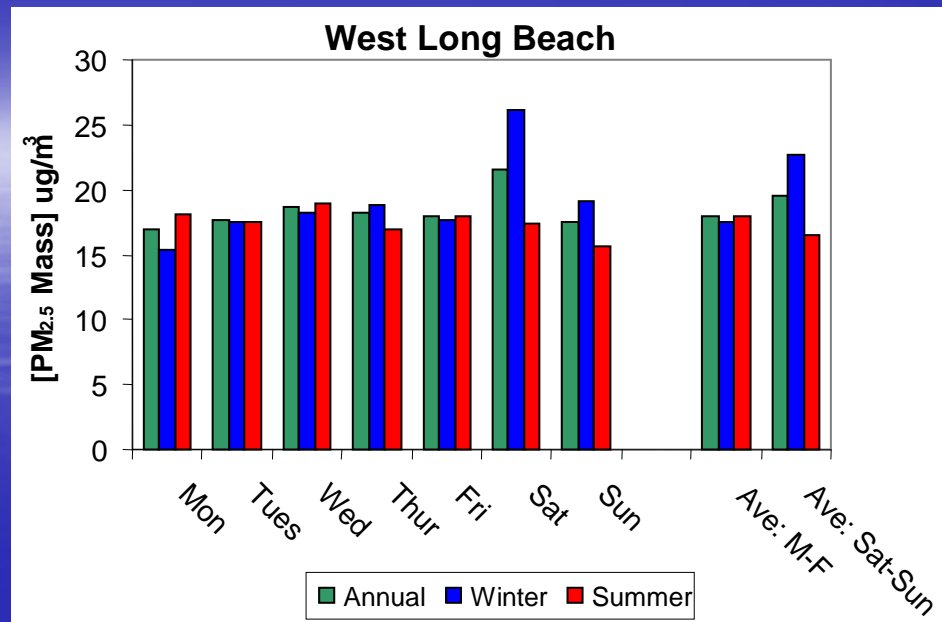
VOC: Central Los Angeles (Fixed Site Data)



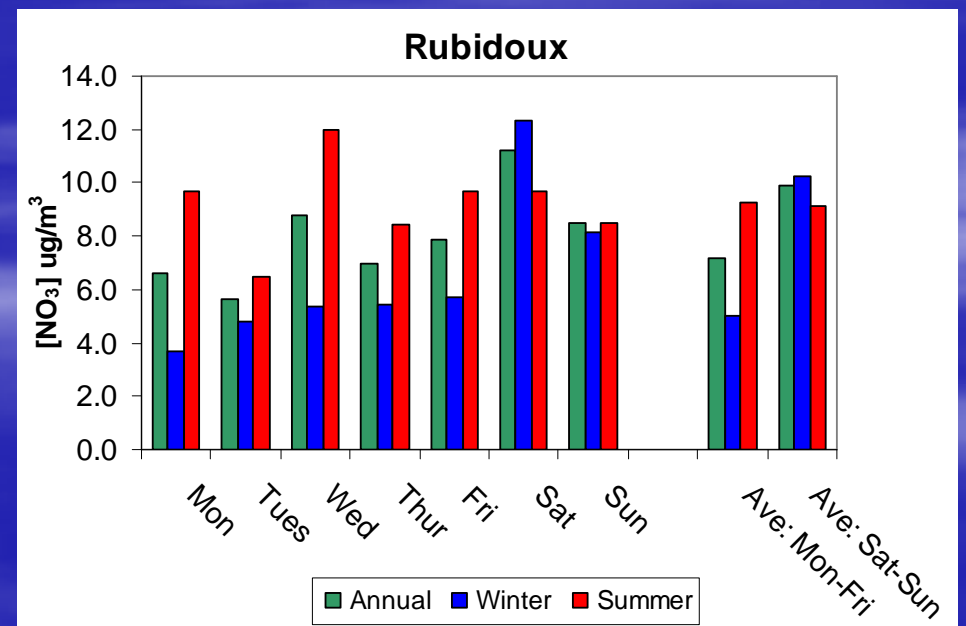
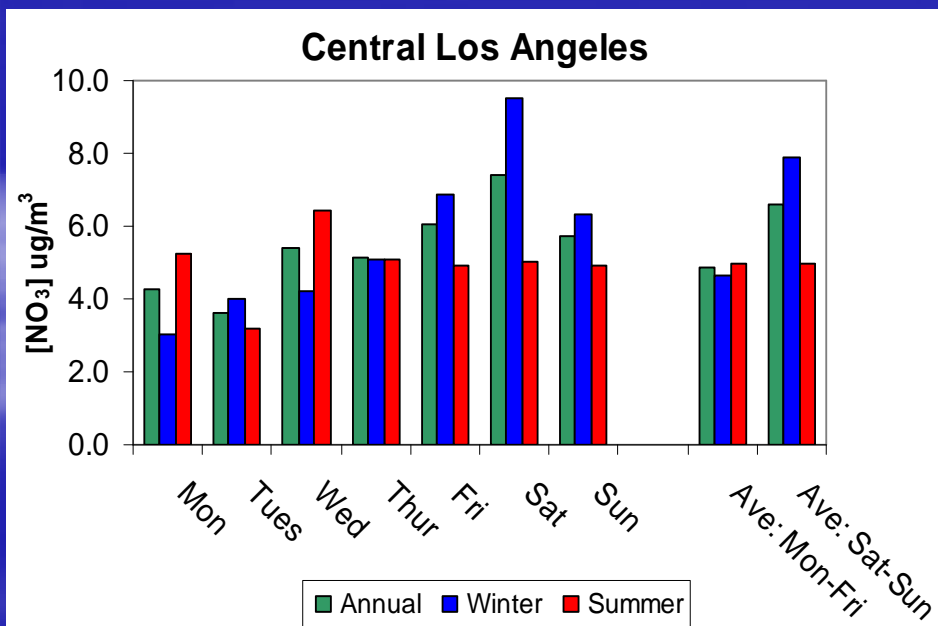
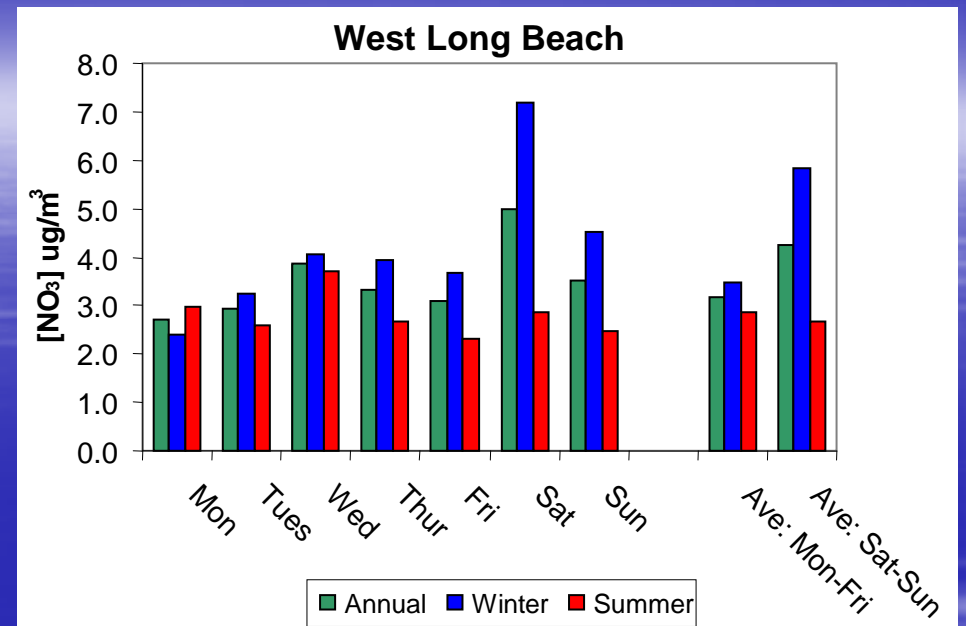
VOC: Rubidoux (Fixed Site Data)



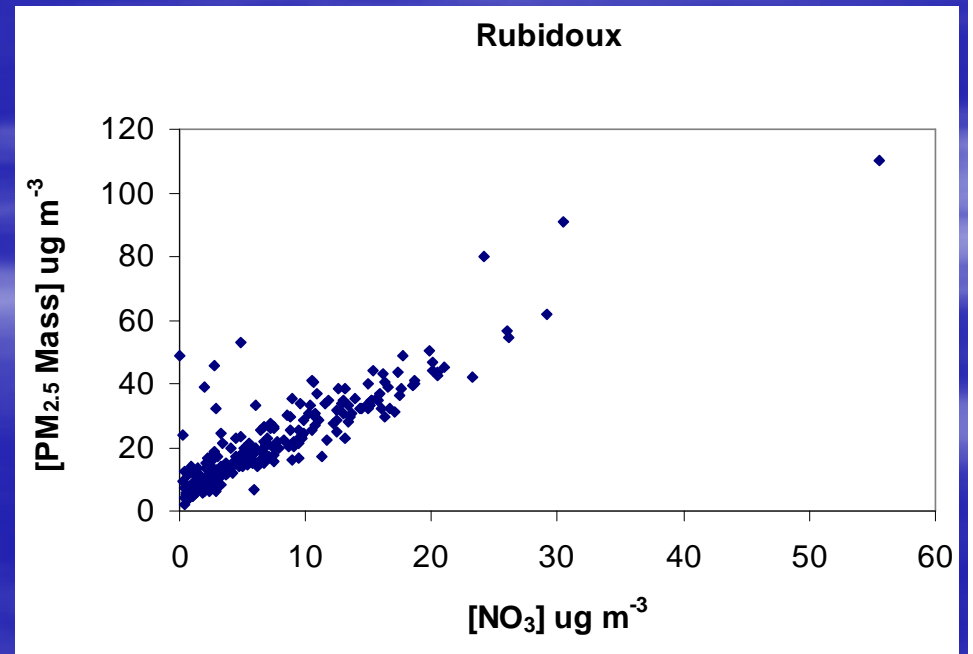
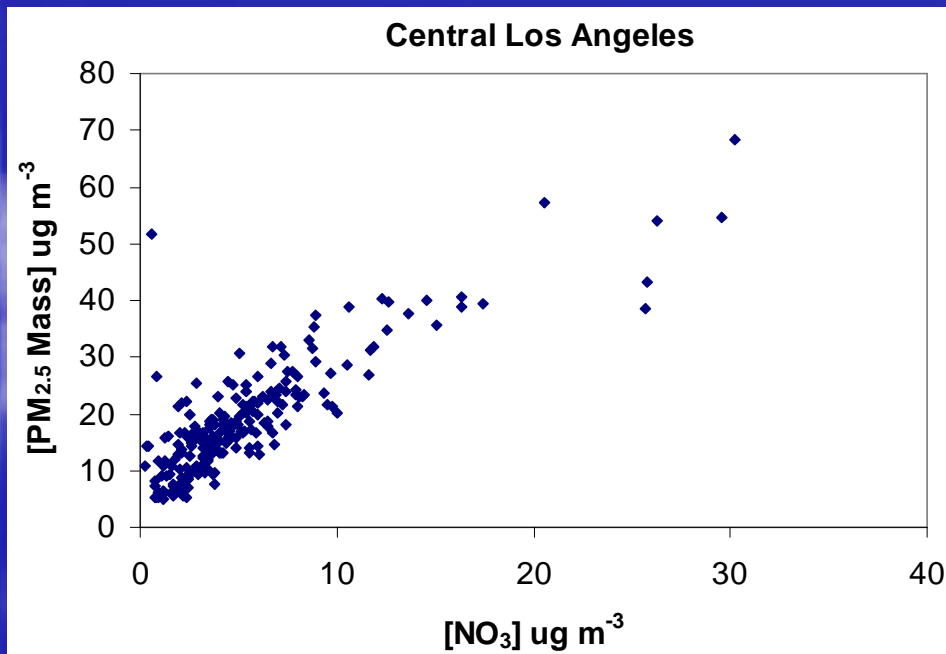
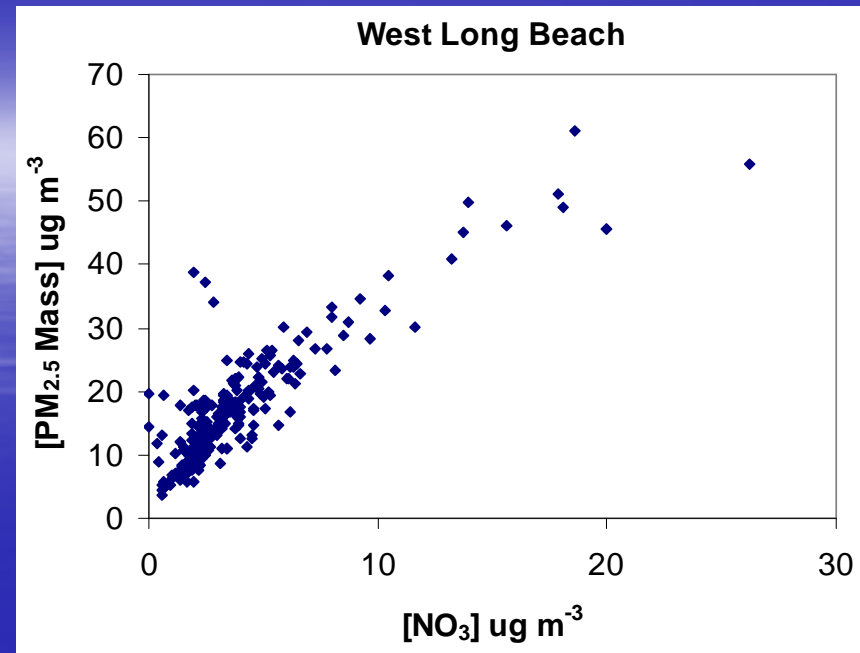
PM_{2.5} Mass (Fixed Site Data)



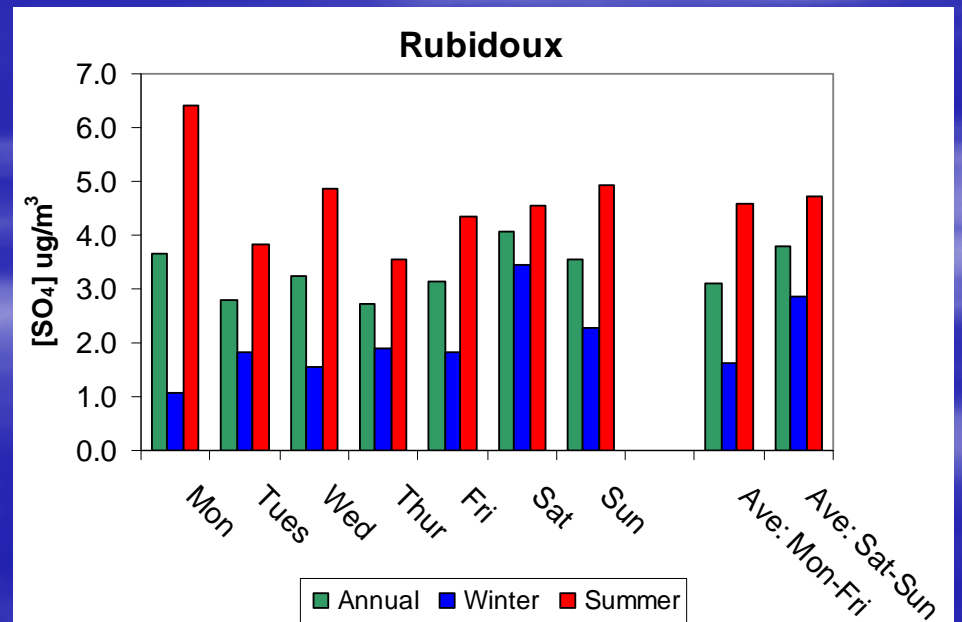
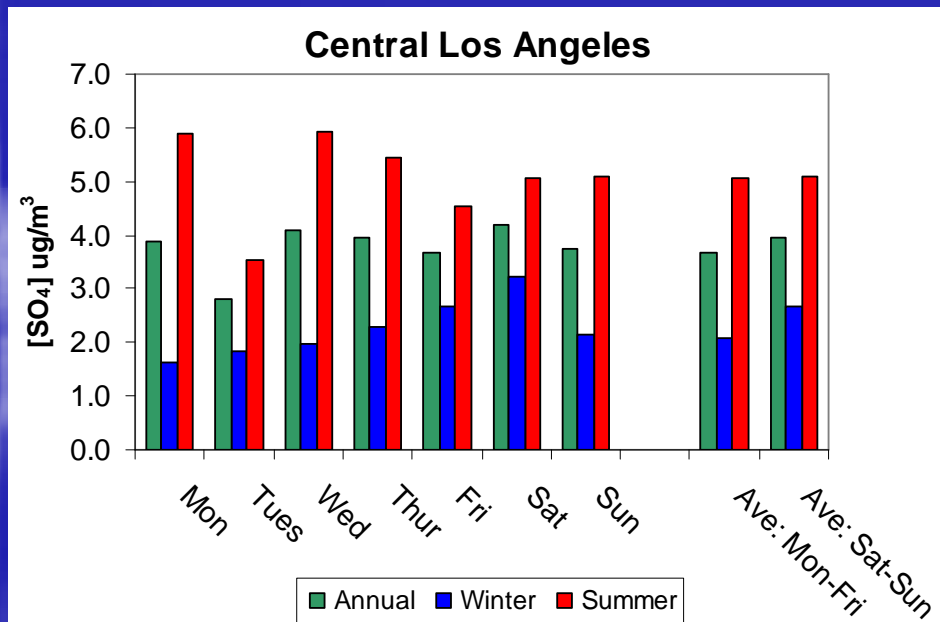
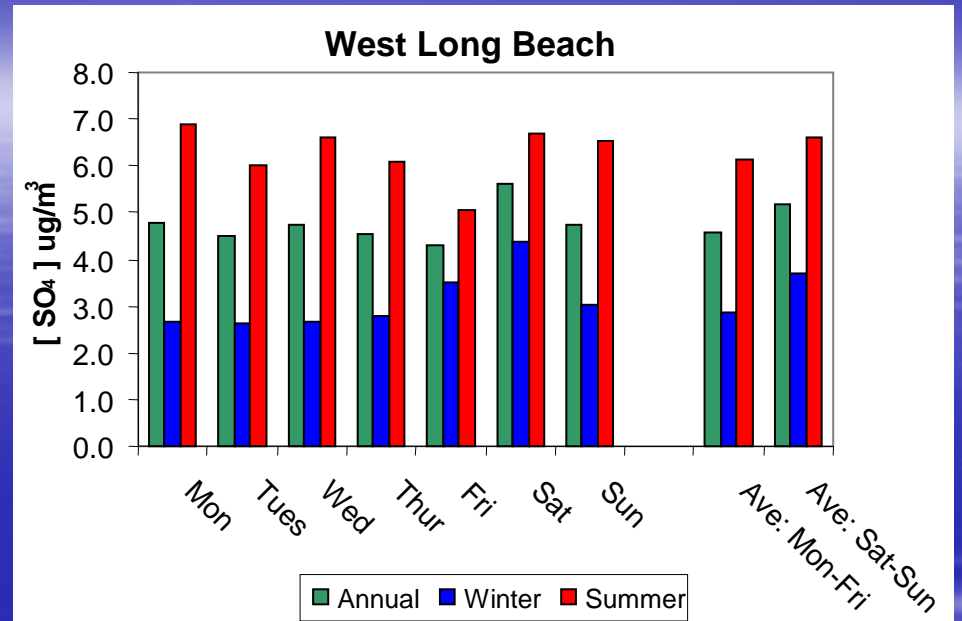
NO₃ (Fixed Site Data)



PM_{2.5} Mass vs. NO₃ (Fixed Site Data)

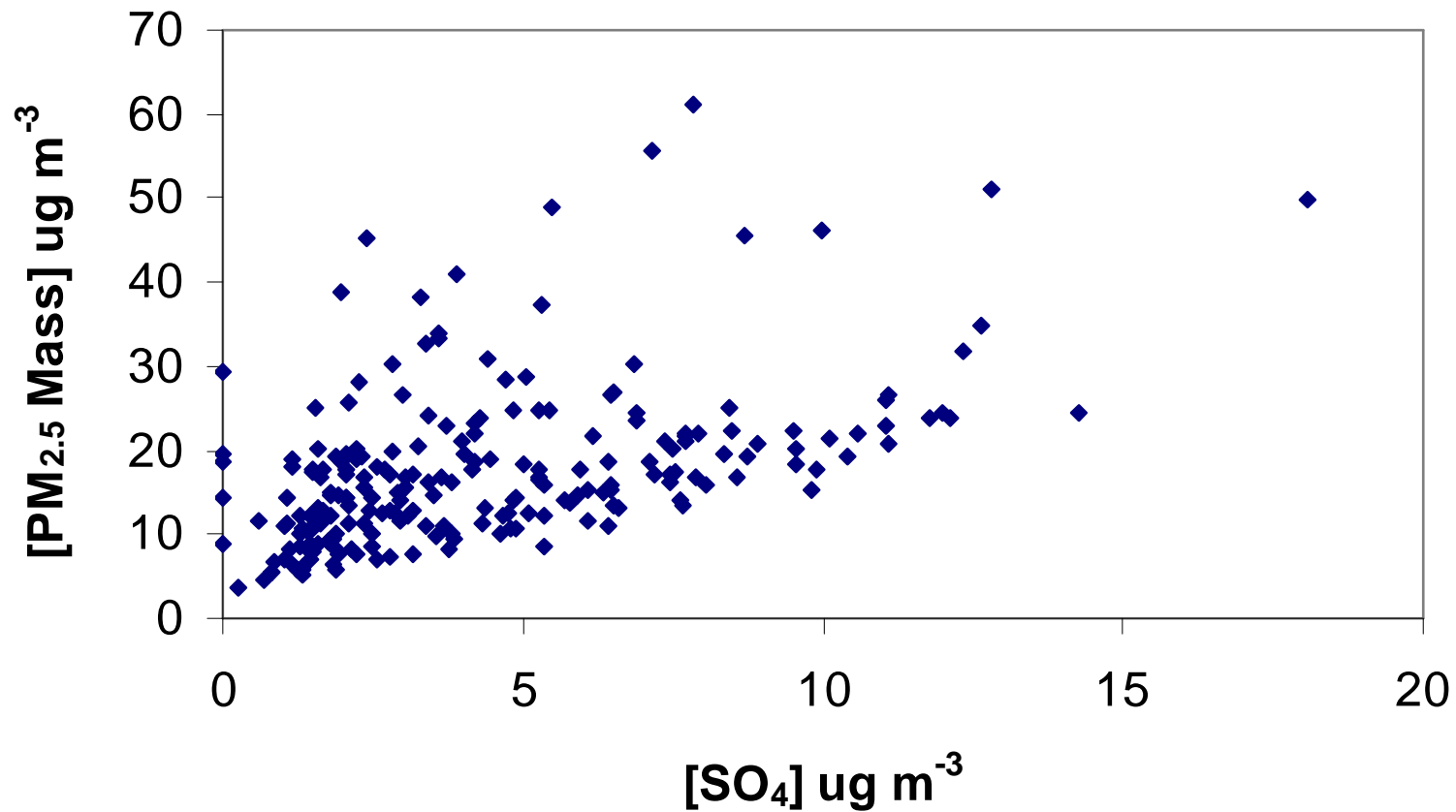


SO₄ (Fixed Site Data)

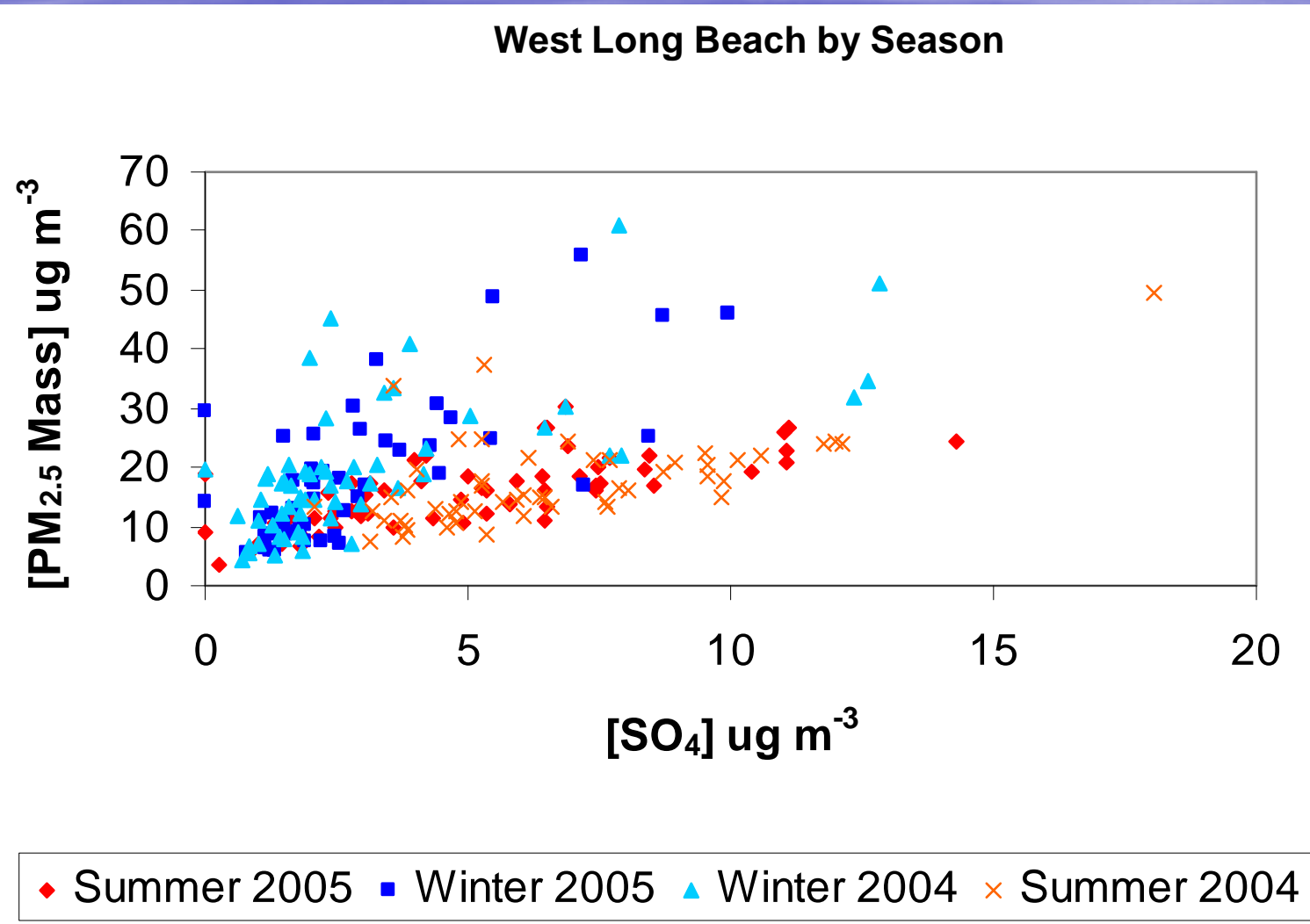


PM_{2.5} Mass vs SO₄ (Fixed Site Data)

West Long Beach

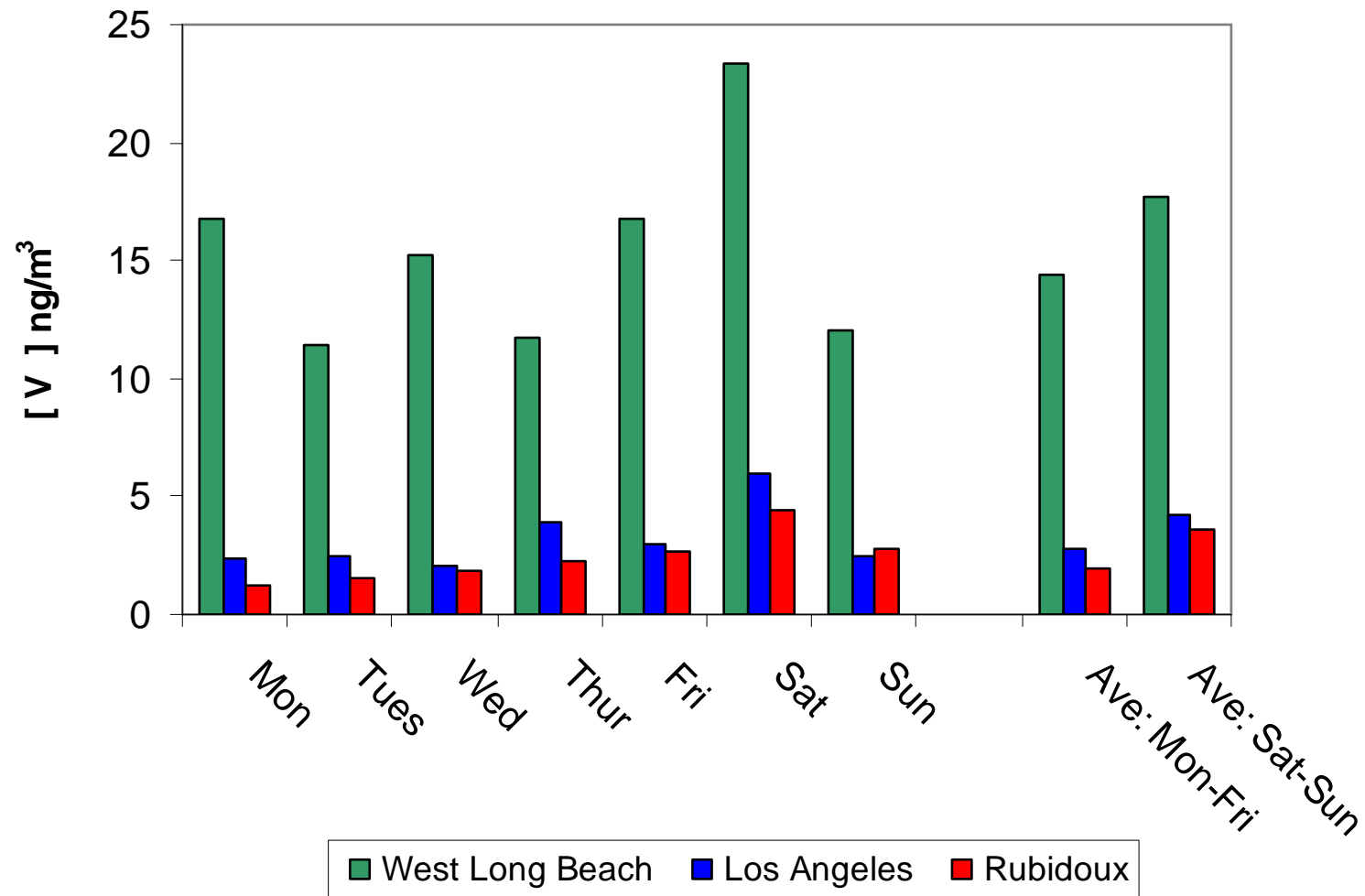


PM_{2.5} Mass vs SO₄ (Fixed Site Data)



Vanadium

(Fixed Site Data)



Conclusions

(For W. Long Beach, Los Angeles, and Rubidoux)

- Average Wed/ Sun special project OC and EC concentrations are comparable to fixed station data. If adjusted for metal contamination, average PM mass values are comparable also. Mostly fixed site data was used to perform analysis for day of week trends.
- The day of week data for species such as particle-bound organic compounds and VOCs associated with mobile sources and EC are generally consistent with vehicular traffic activity data.
- PM_{2.5} average mass has a maximum concentration on Saturday and a minimum on Monday (20 -30% difference). Differences in concentrations are observed between stations.

Conclusion

(For W. Long Beach, Los Angeles, and Rubidoux)

- NO_3 and SO_4 day of week trends are not similar to previous reported studies in Basin which indicated a decrease from weekday to weekend. NO_3 concentrations generally correlate to $\text{PM}_{2.5}$ mass with a Saturday maximum.
- $\text{PM}_{2.5}$ Vanadium also has a Saturday maximum with the highest observed averages at West Long Beach.
- Day of week has some effect but seasonal effects are stronger.