Air Quality Forecast Feedback: Los Angeles Air Basin

NOAA Forecast Working Group Meeting
September 15-16, 2016

Sang-Mi Lee, Ph.D and Scott Epstein, Ph.D

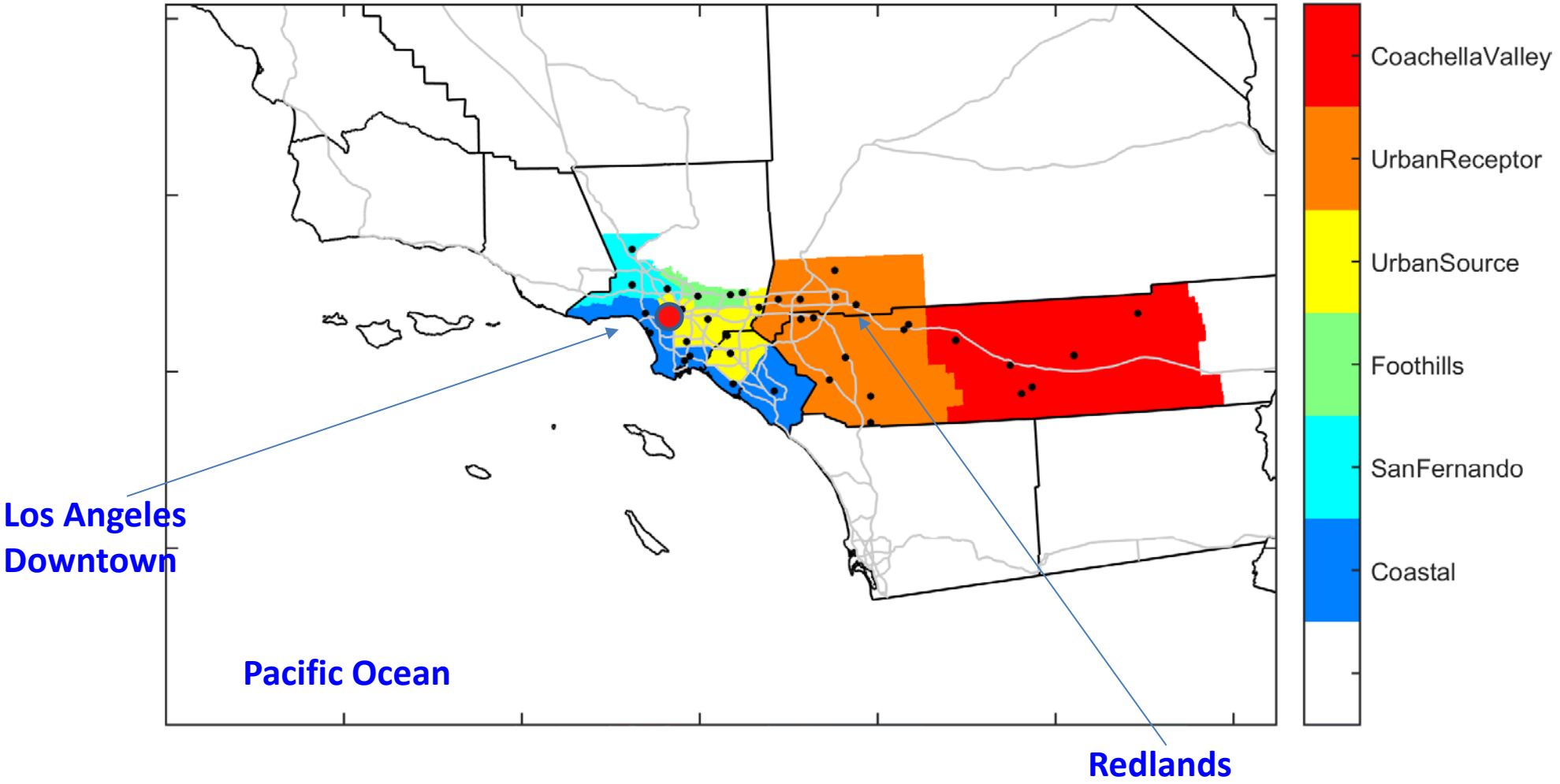
South Coast Air Quality Management District
21865 Copley Dr, Diamond Bar, CA 92886

South Coast
Air Quality Management District

Overview

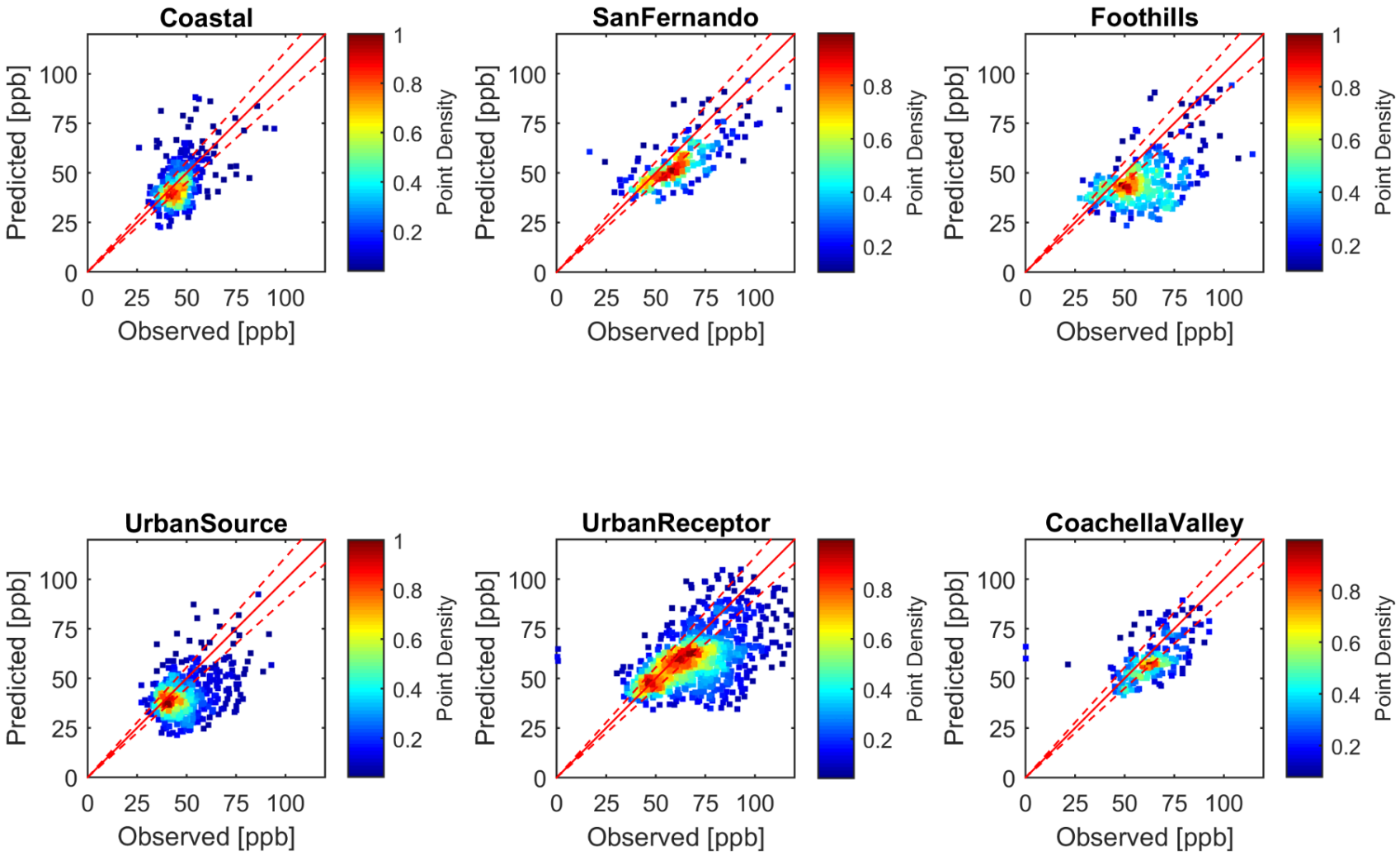
- 12 UTC cycle Forecast Products
- Retrieved for Los Angeles Air Basin
- 2nd day forecast variables were evaluated:
  - Daily Max 8-hour Ozone
  - Average 24-hour PM2.5
  - Meteorological variables (Wind Speed, Temperature and Humidity)

Performance Evaluation Zone



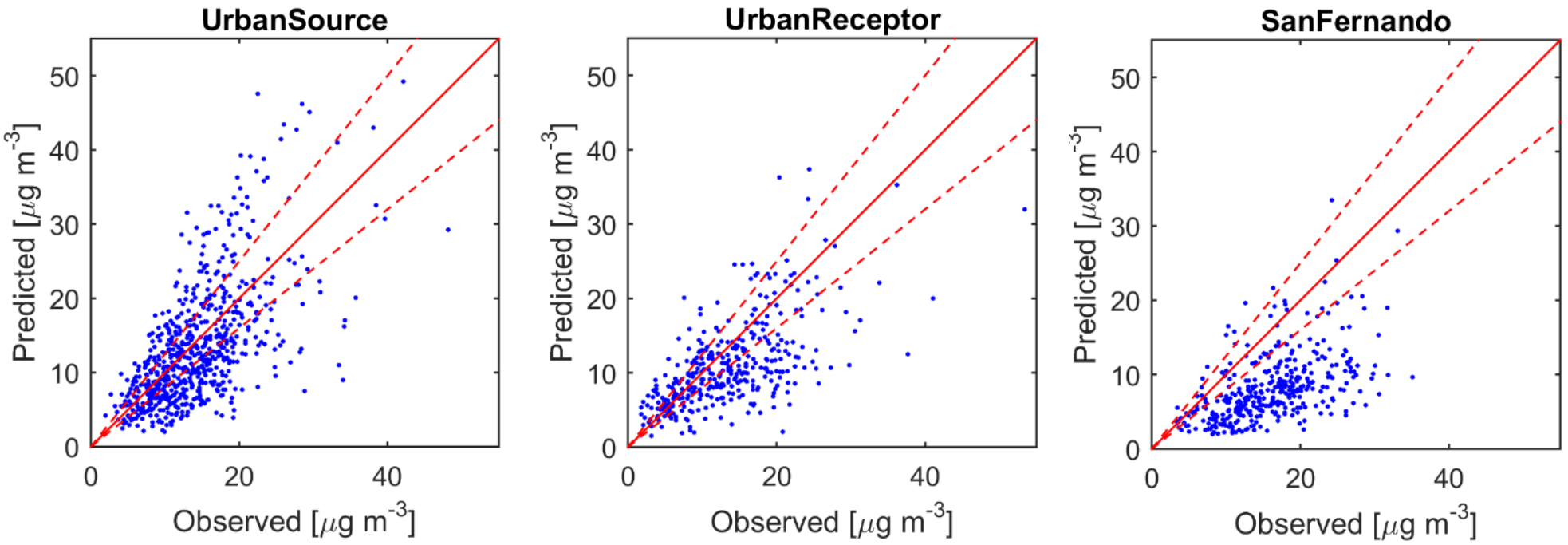
South Coast
Air Quality Management District

Daily Max 8-hour Ozone



South Coast
Air Quality Management District

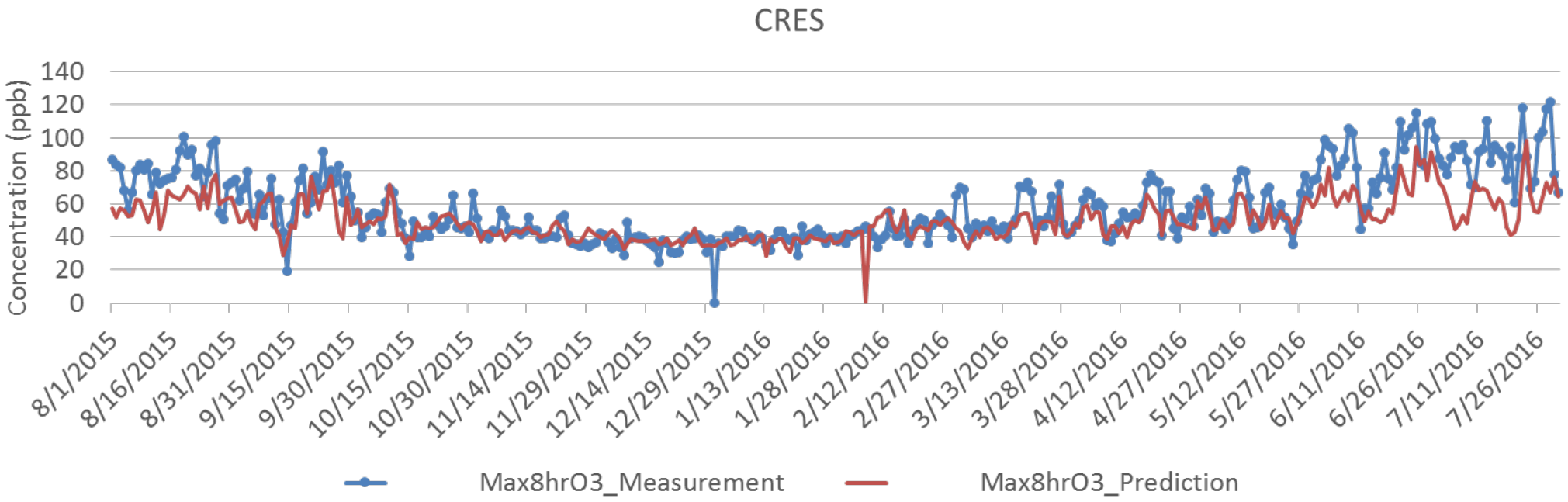
Average 24-hour PM2.5



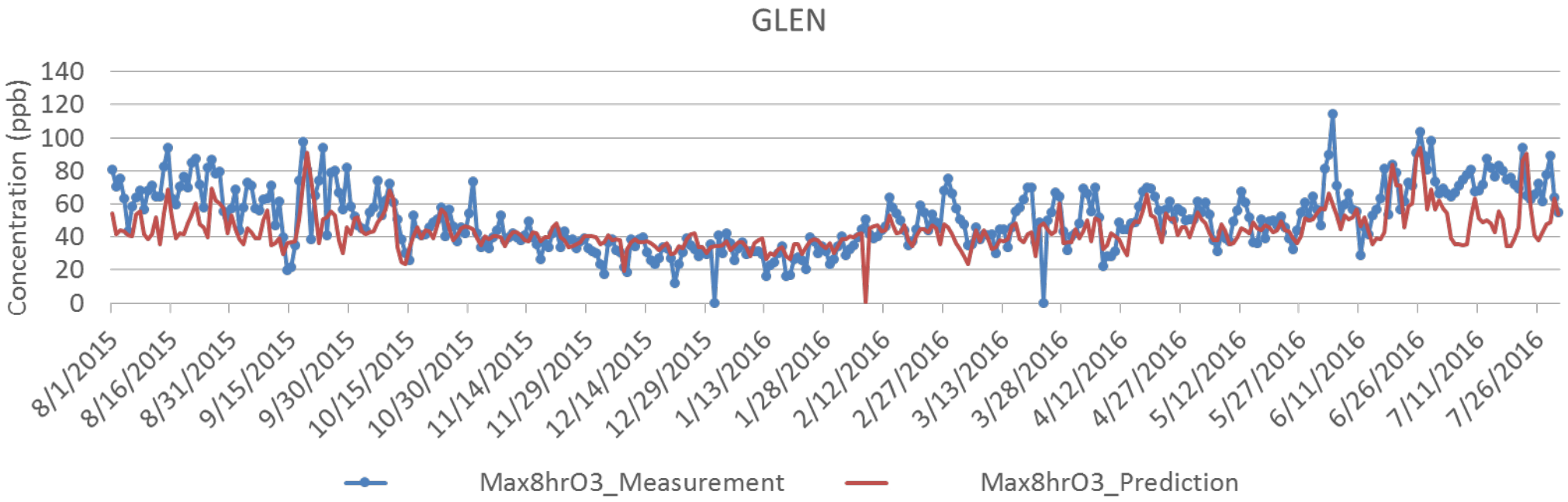
PM2.5 measurements were made with automated Beta Attenuation Method samplers

South Coast
Air Quality Management District

Daily Max 8-hour Ozone at Crestline

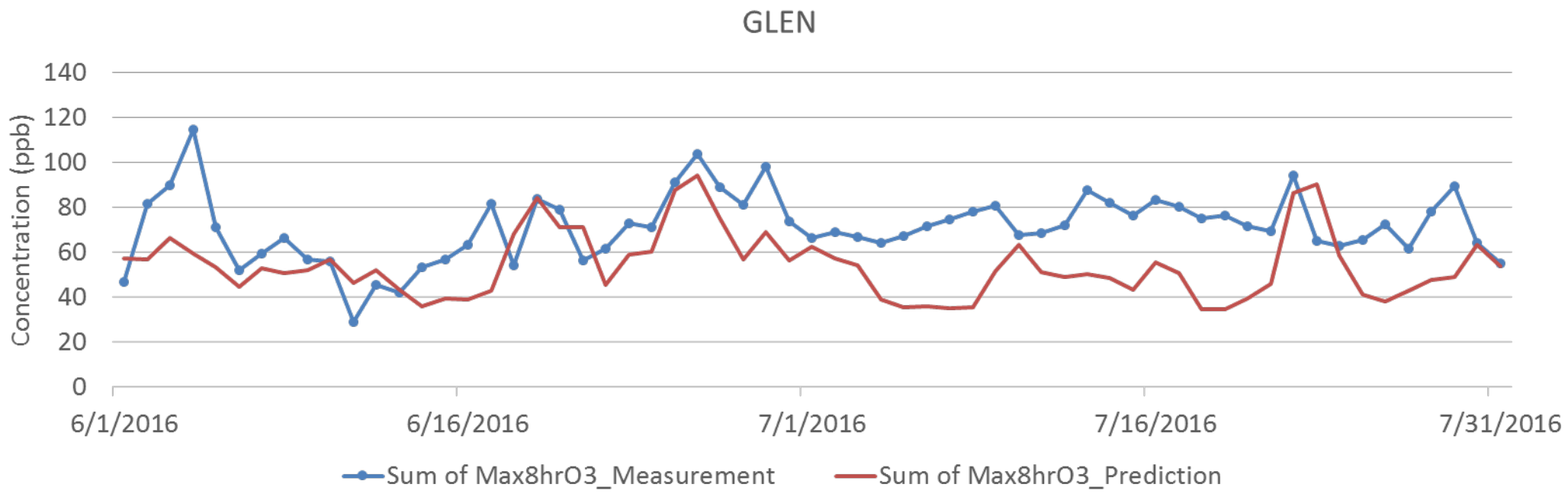


Daily Max 8-hour Ozone at Glendora



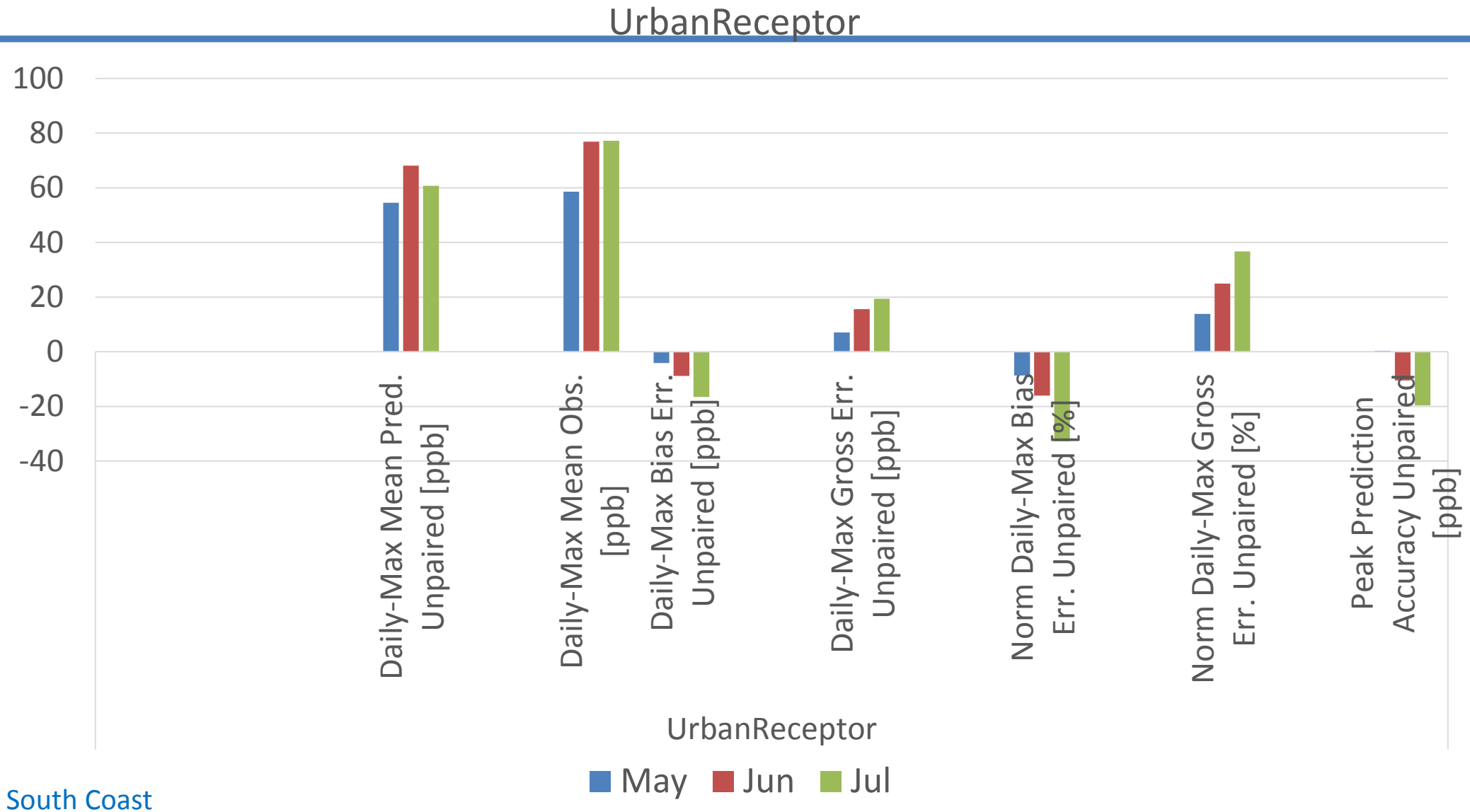
Month to Month Variation

Daily Max 8-hour Ozone at Glendora: June & July 2016



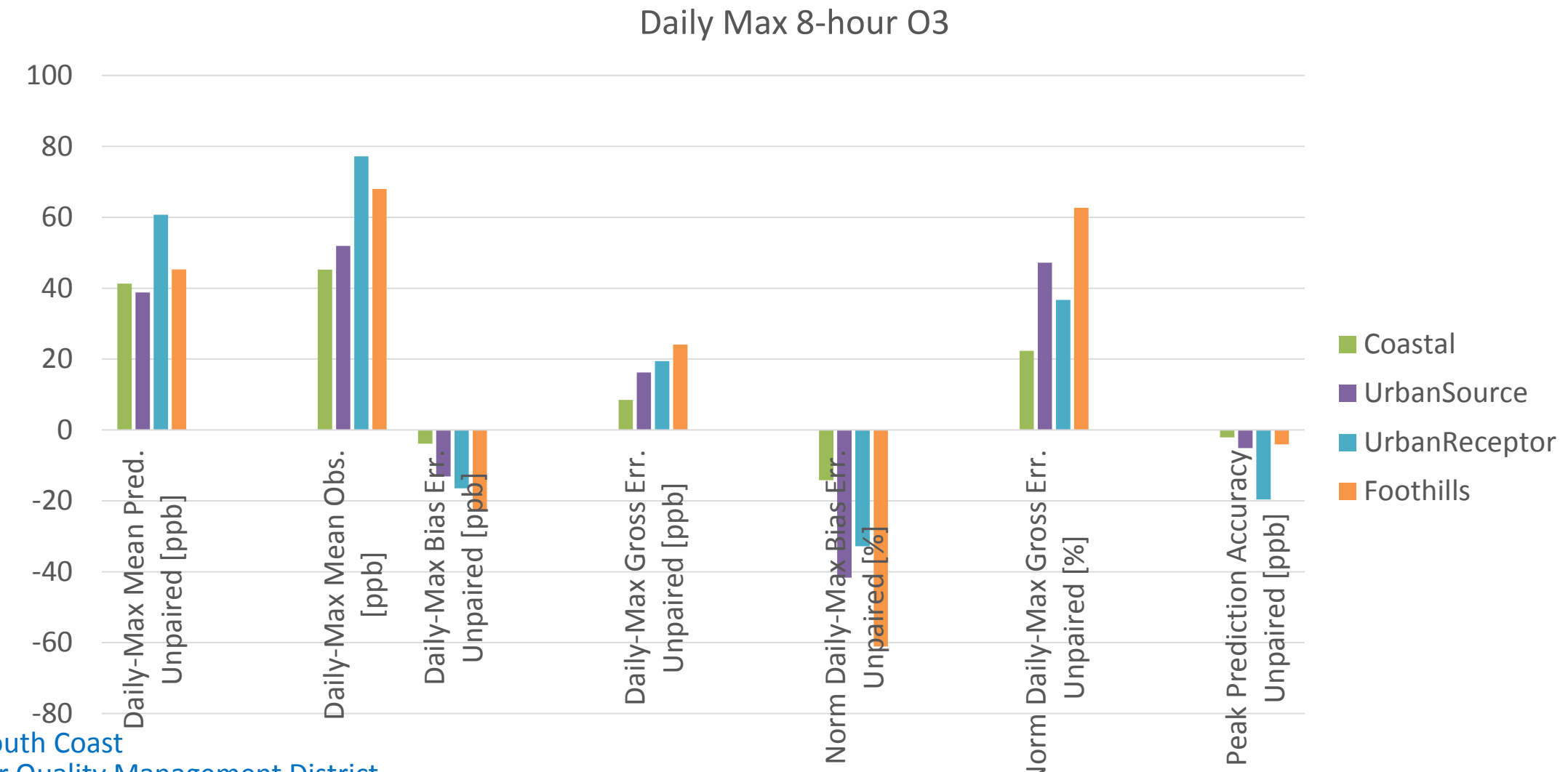
South Coast
Air Quality Management District

Performance Statistics by Month



South Coast
Air Quality Management District

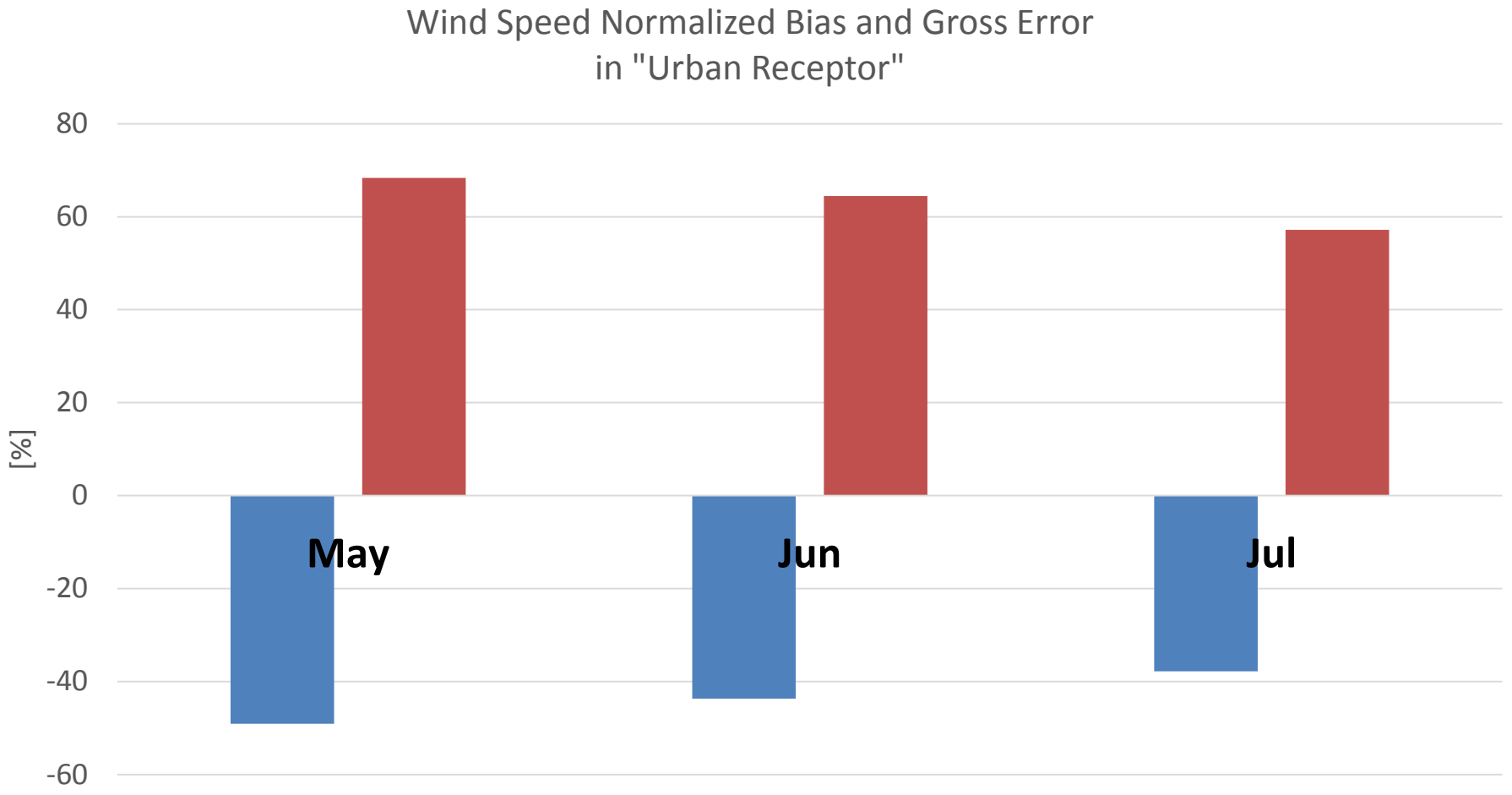
Geographical Variation



South Coast
Air Quality Management District

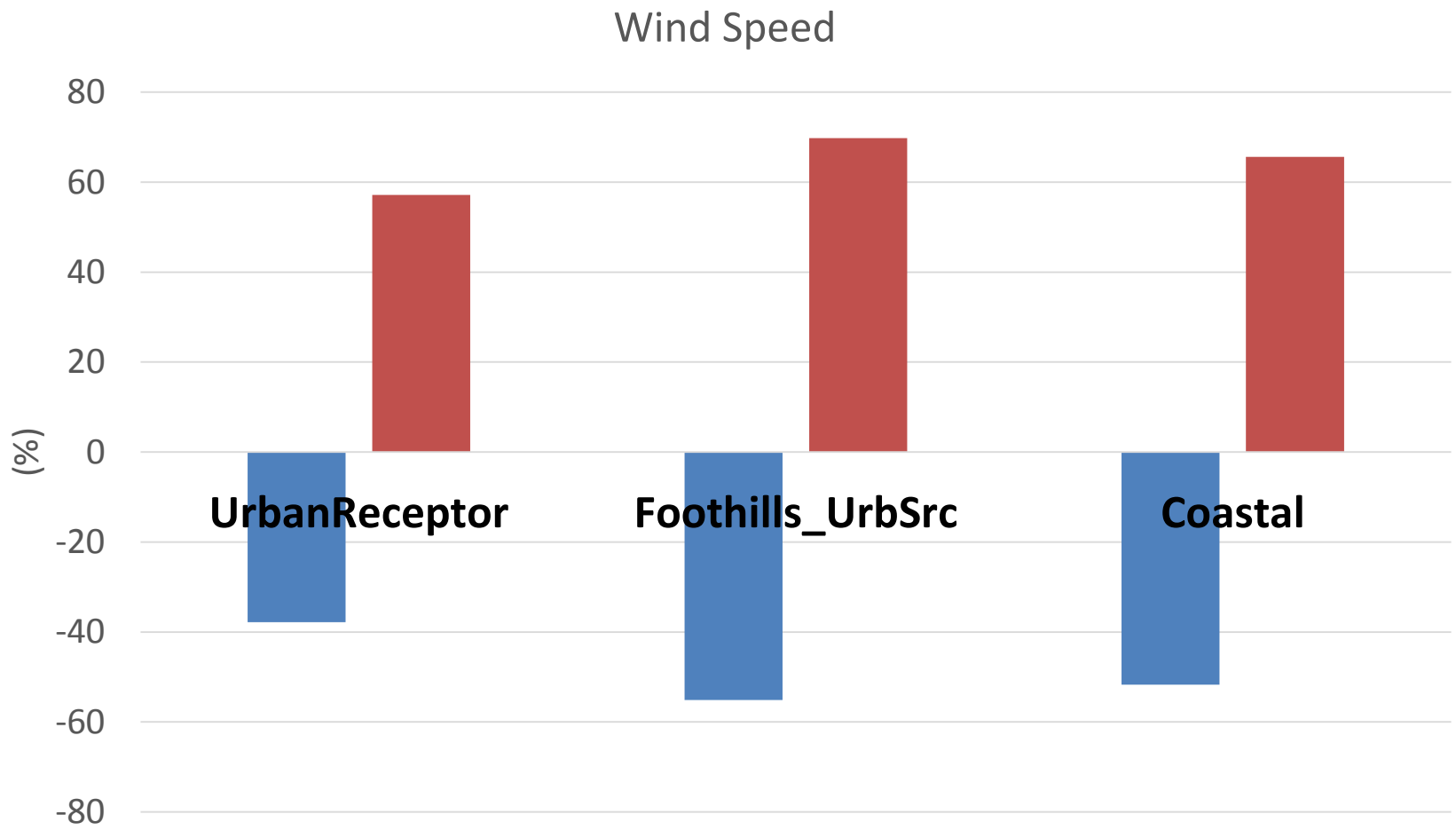
METEOROLOGICAL FACTOR

Wind Speed Prediction Performance: Monthly



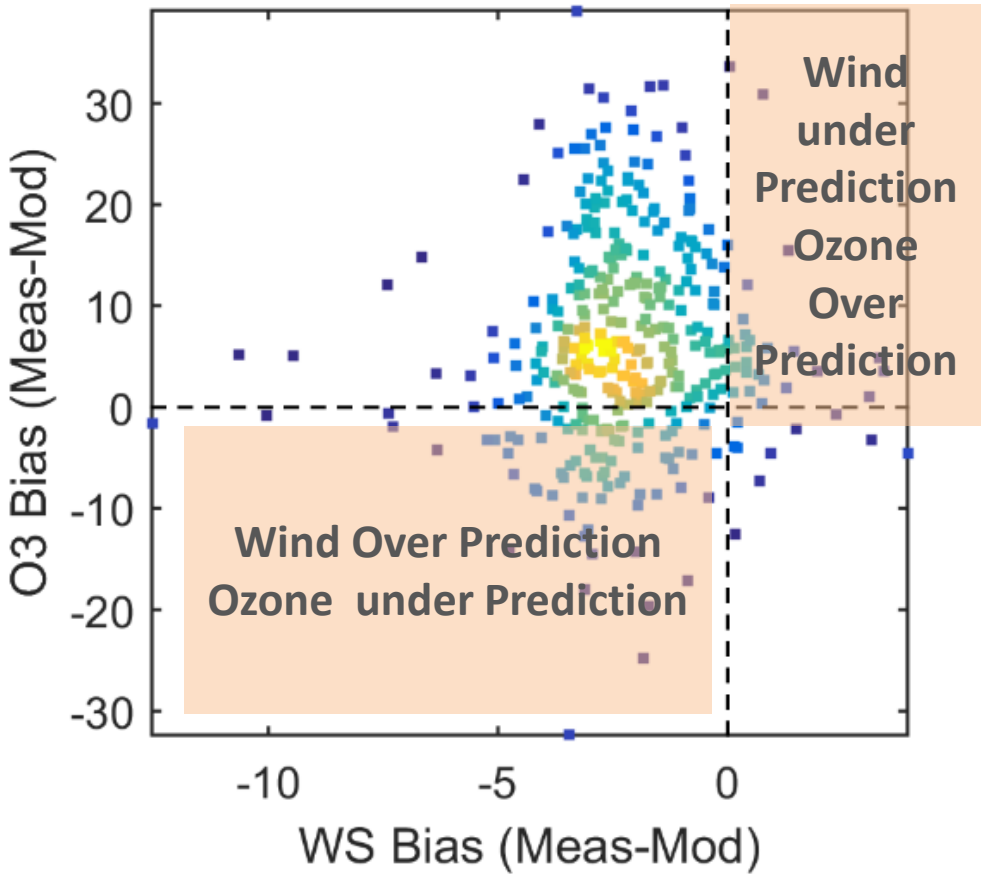
South Coast
Air Quality Management District

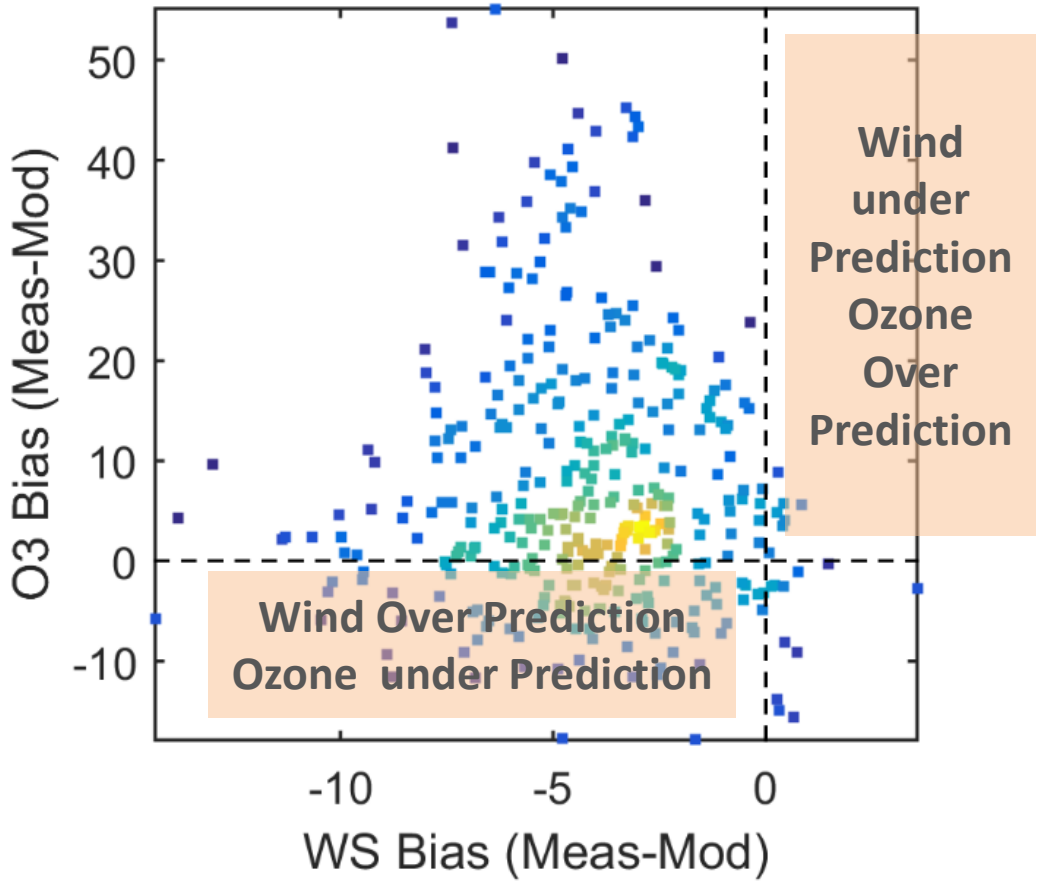
Wind Speed Prediction : Geographical Variation



South Coast
Air Quality Management District

Anaheim and Crestline



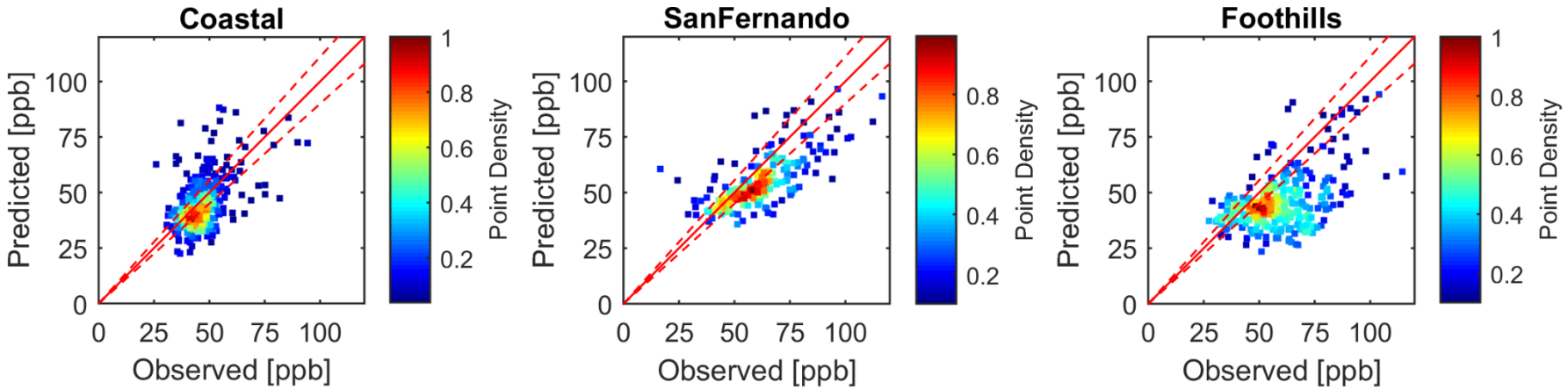


NOAA VS. SOUTH COAST AQMD

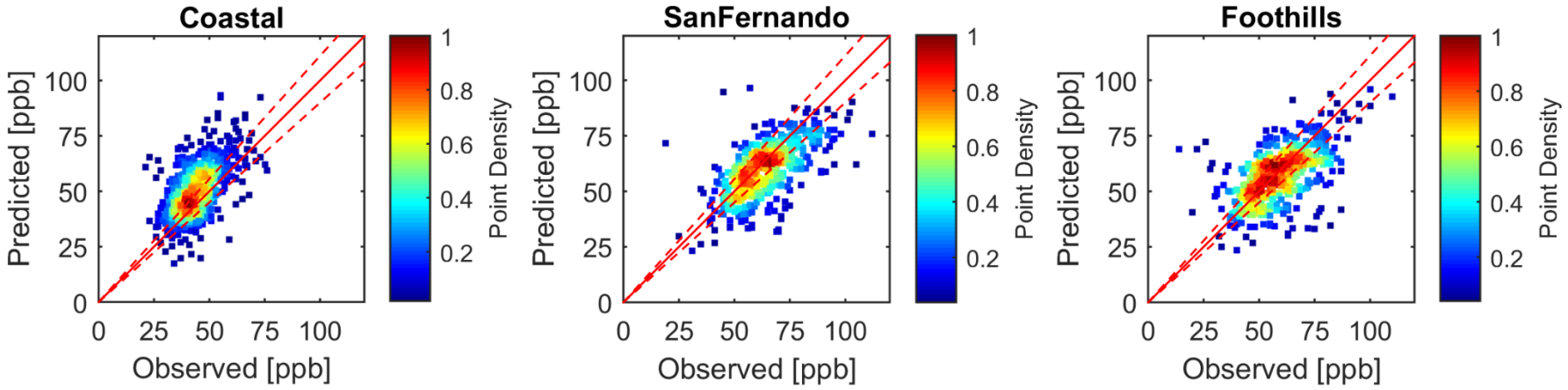
- ✓ Spatial Grid resolution
- ✓ WRF Forecast vs. Hindcast
- ✓ Chemical mechanism
  - > SCAQMD uses SAPRC07

NOAA vs. SCAQMD Predictions

NOAA



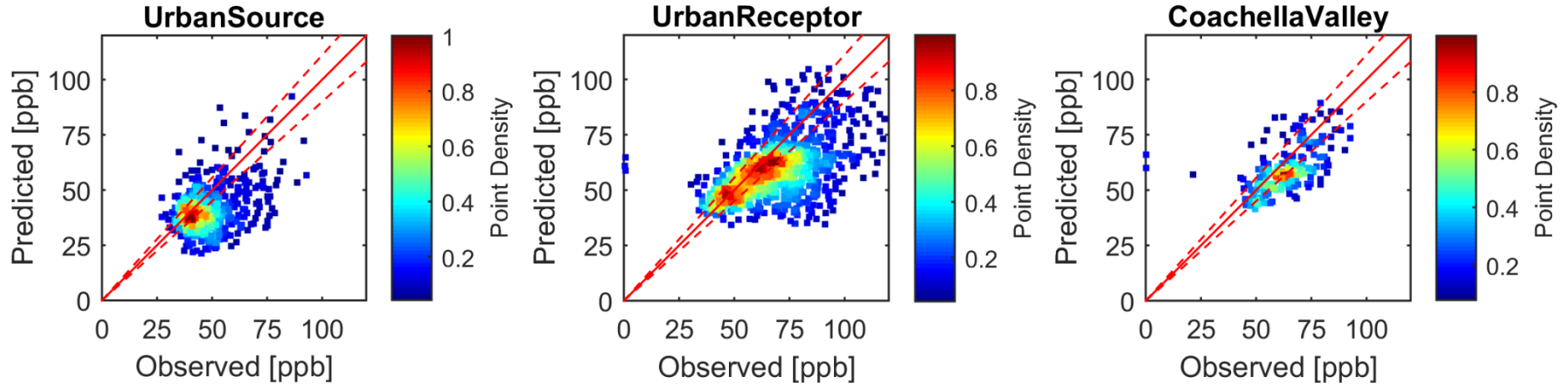
SCAQMD



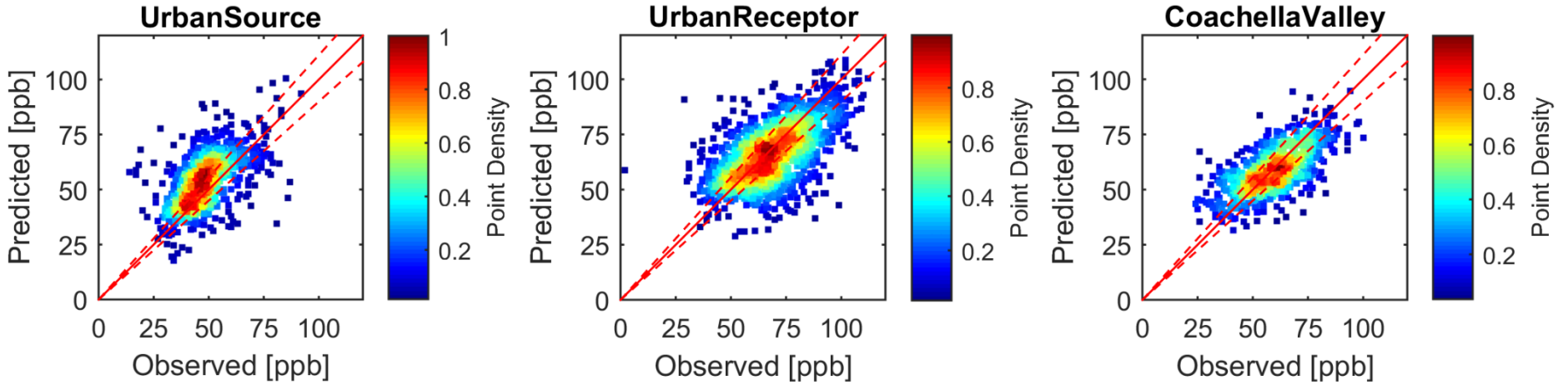
South Coast
Air Quality Management District

NOAA vs. SCAQMD Predictions

NOAA

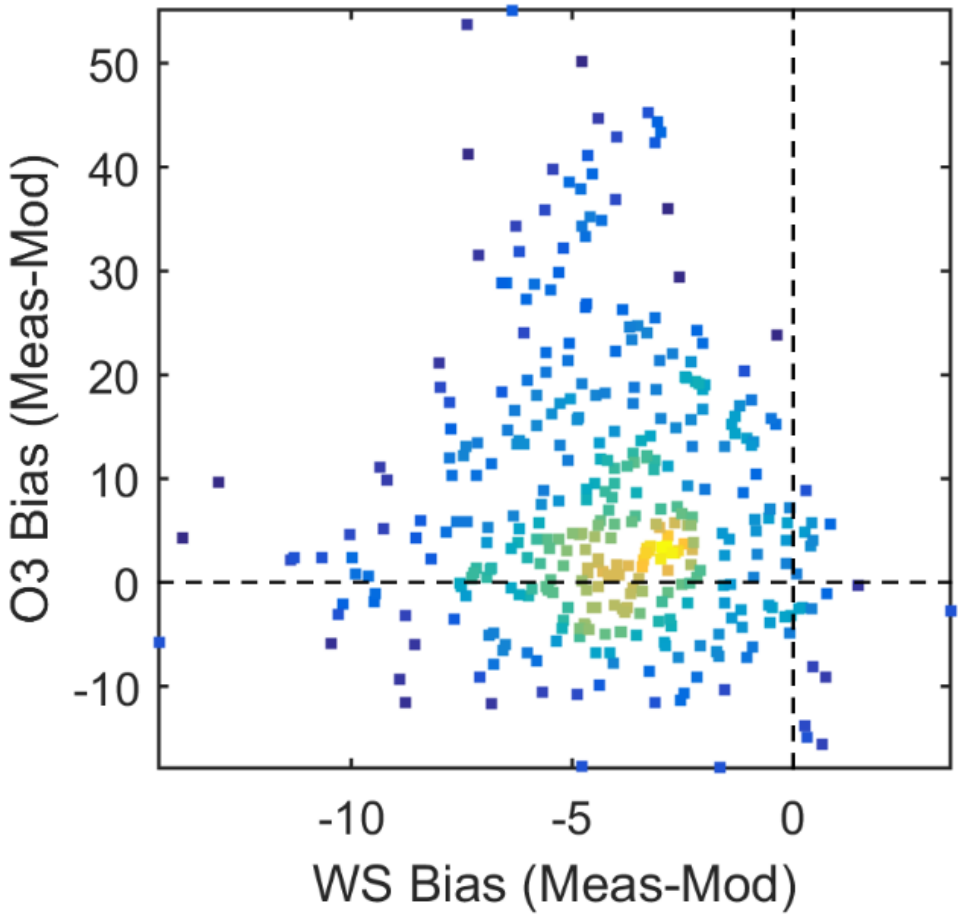


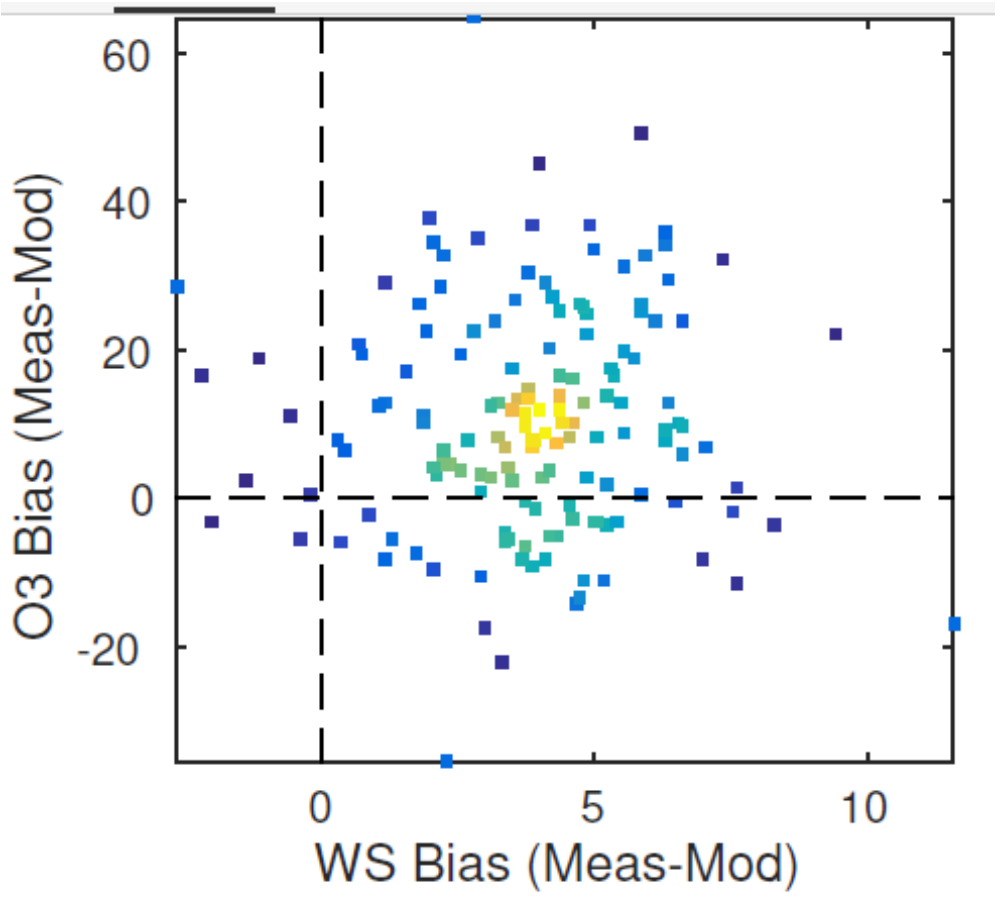
SCAQMD



South Coast
Air Quality Management District

NOAA vs. SCAQMD at Crestline site





South Coast
Air Quality Management District

Summary and Conclusions

- NOAA forecast still tends to under-predict high ozone episodes in the Basin especially urban receptor areas where the peak concentrations are recorded.
- The bias grows bigger in June and July. However, meteorological prediction does not show the same trend.
- The errors in ozone prediction do not correlate with wind prediction bias directly. (i.e. wind under prediction appeared in ozone under prediction)
- SCAQMD's modeling product which has higher spatial resolution, improved WRF predictions, and SAPRC-07 chemical mechanism shows reasonably good performance to capture high ozone episodes and meteorology vs. chemistry correlation.