

WRF-MMIF-AERMET Model Performance Evaluation in support of a PSD permit application

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EPA R10



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Test Sands and



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Ecology

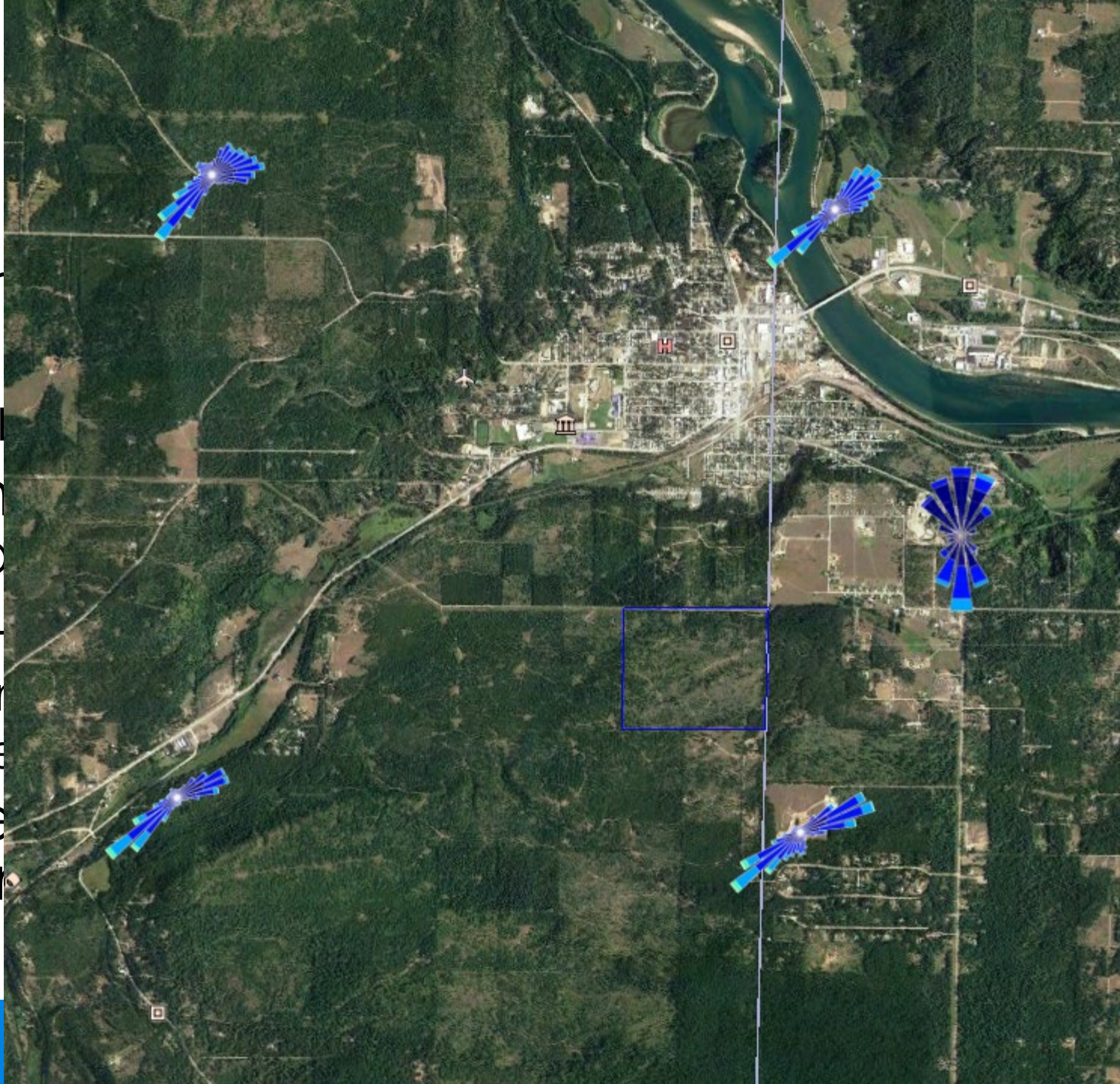


Project basics

- Silica smelter with > 500 tpy SO₂ & >900 tpy NO_x proposed in Newport, WA
- No representative met data nearby (IDT site not QC'd)
- UW 4km WRF forecast archives have continuous verification stats online
- But f12-23 performance at ASOS sites was poor
 - Worse than EPA 12km CONUS WRF!
 - Forecast vs hindcast?
- Decided on analysis-nudged hindcast 4km & 1.33km WRF runs



- Silica sr
propos
- No rep
- UW 4km
verifico
- But f12-
 - Wor
 - Fore
- Decide
WRF run



O_x
 not QC'd)
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 x 1.33km



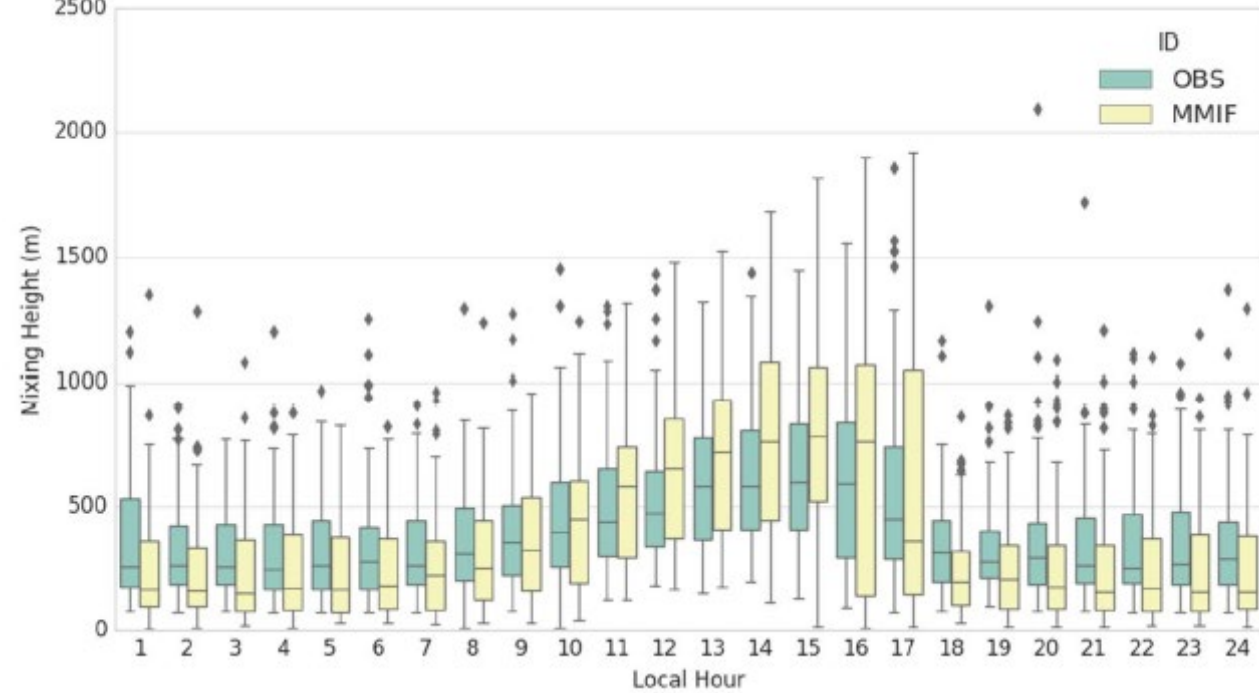
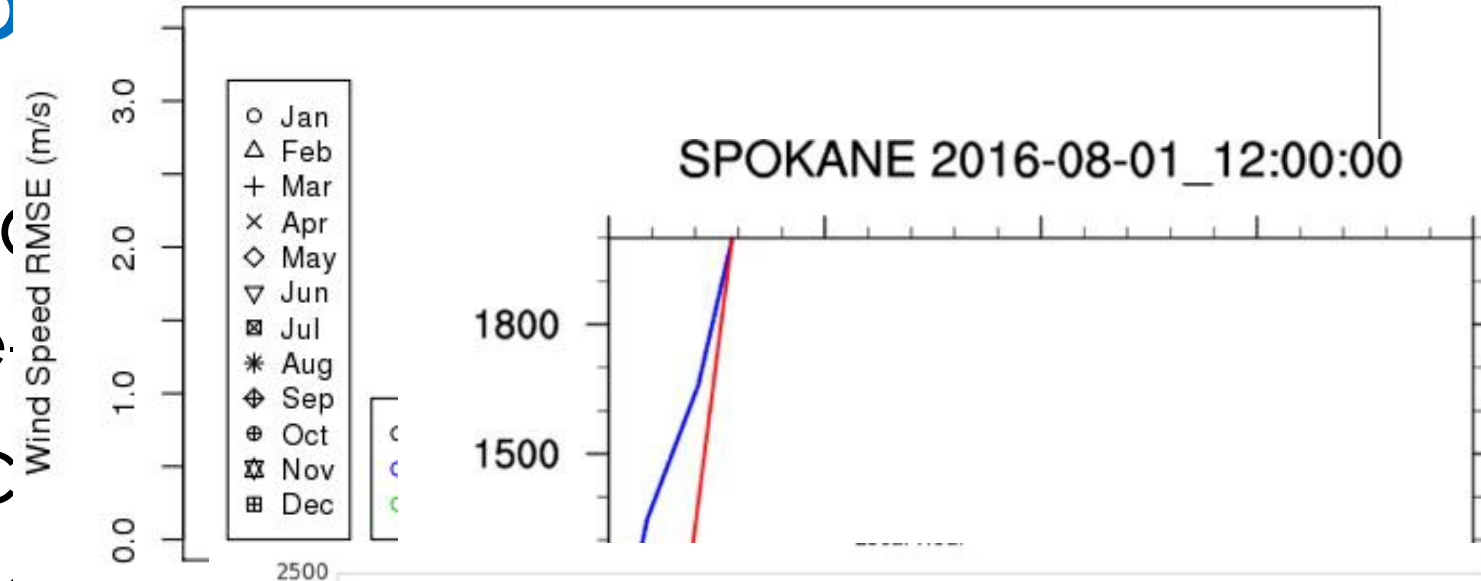
Model Performance Evaluation



Comp

- METSTAT soccer pl
- Domainwide & site
- WRF vs PRISM prec
- Interpolated obs d
- Vertical T & WS prc
- AERMET PBL from MMIF
- Windroses on terrain

PacWest Newport WRF d04 Wind Speed Performance
FINAL - all



AERMOD results: MMIF vs onsite

- AERMET with on-site vs MMIF at same location
 - Check if prognostic data leads to lower DVs than obs
 - AERMET calculates mixing heights, not WRF or MMIF
 - Used hypothetical sources
 - Q-Q & boxplots, Robust High Concentration
- Overall, MMIF more conservative
 - WRF predicted more stable and unstable hours and less neutral hours compared to observations
 - WRF's persistence of WDs at low speeds generally results in more conservative concentrations



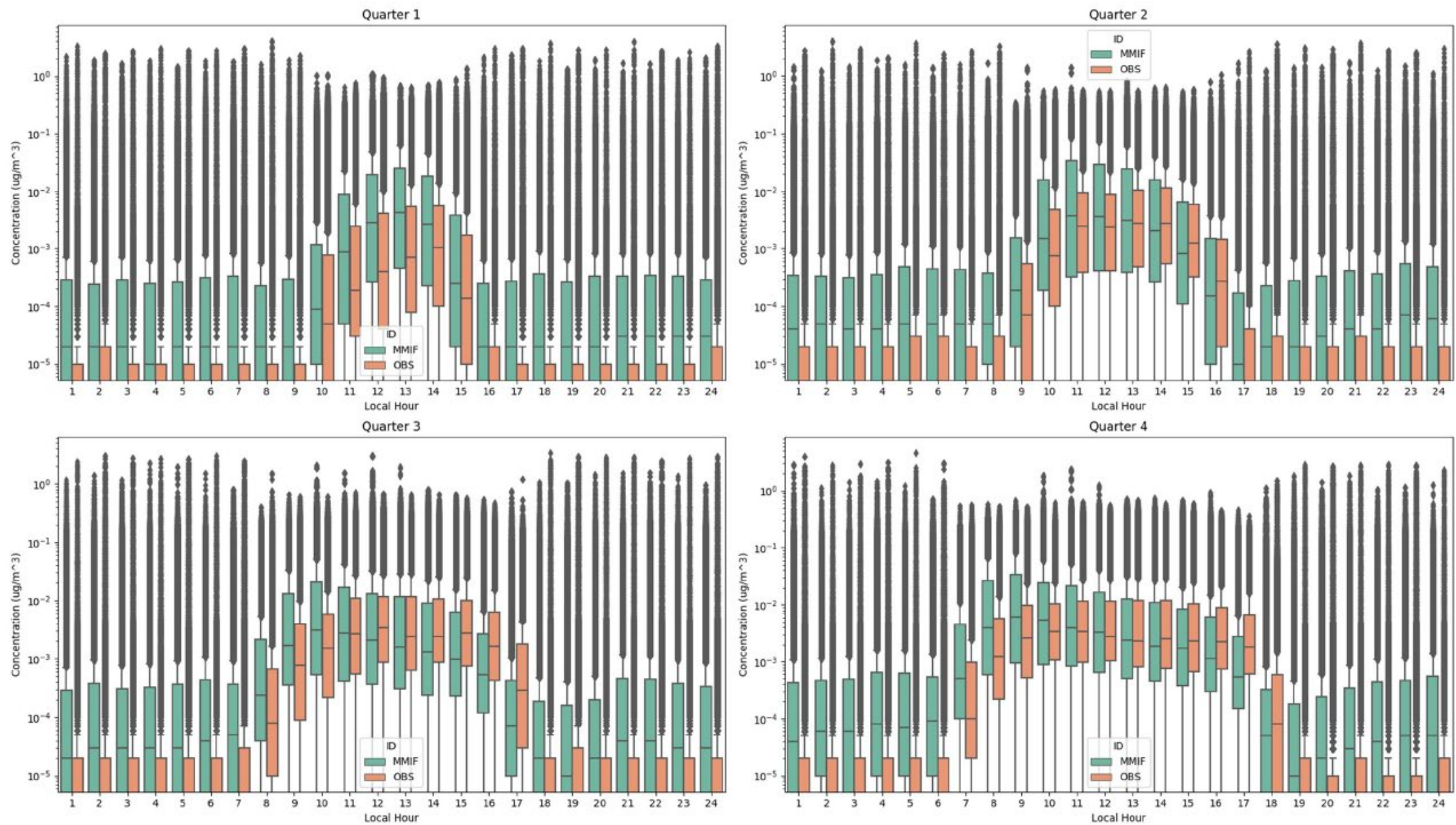


Figure 7-23. Distribution of Concentrations from 45-m Stack at HOOI1 - Observed vs. Modeled Meteorology (2014 - 2016)

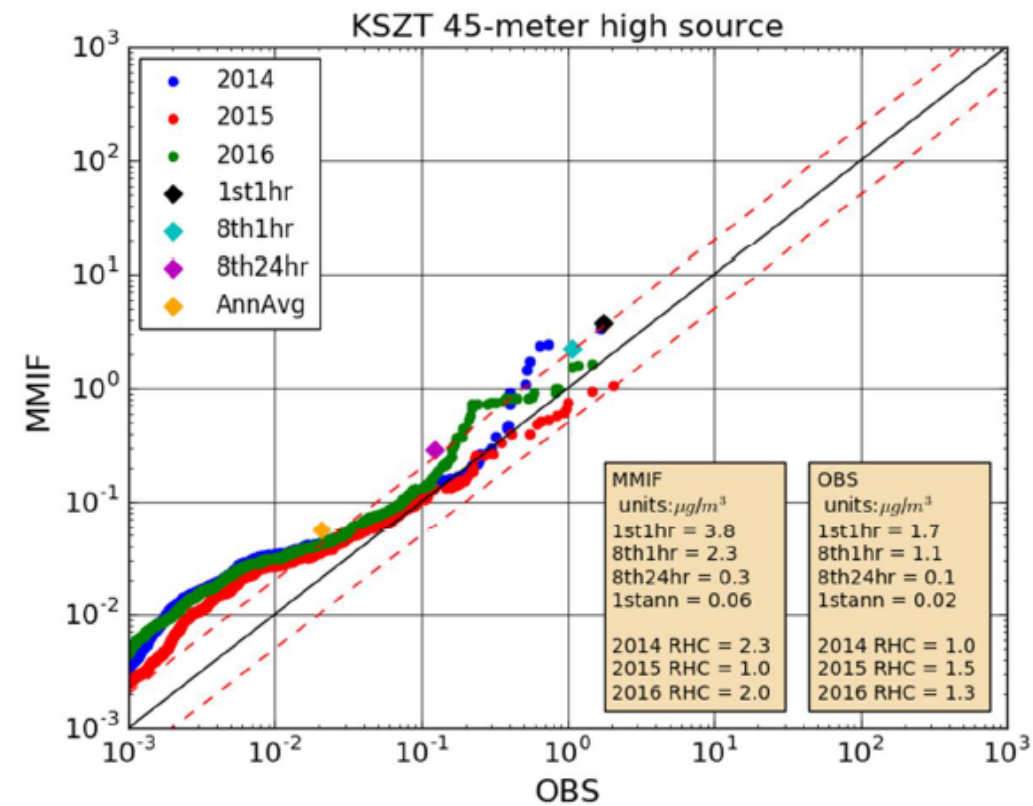
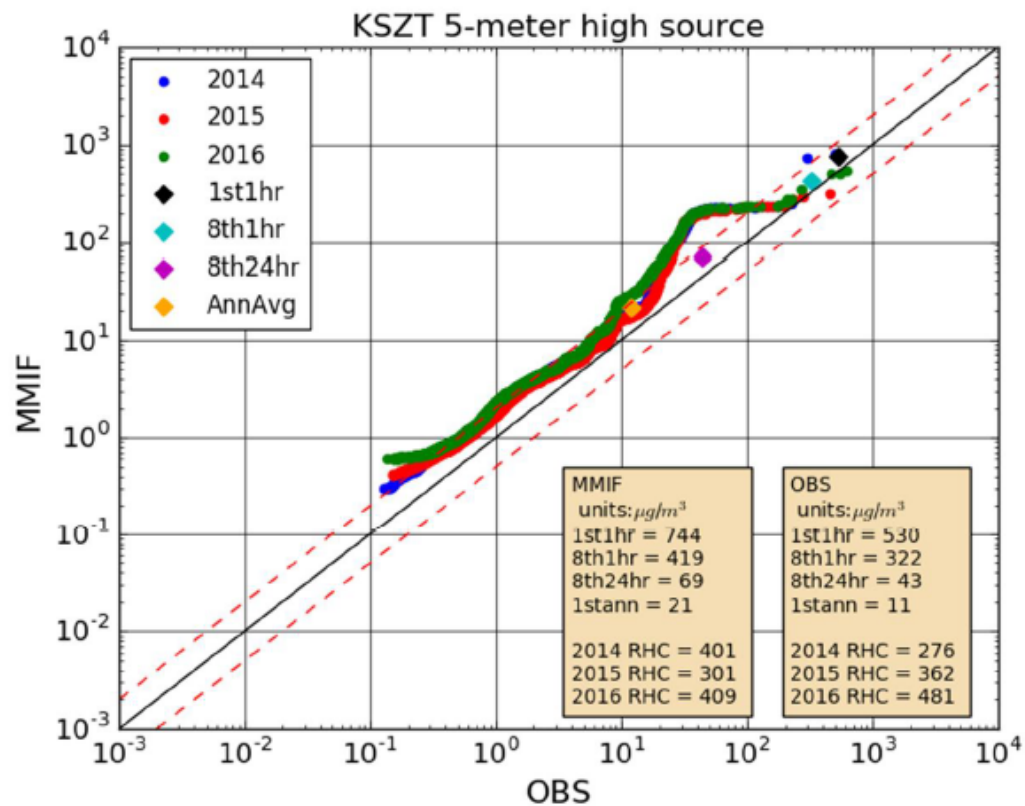


Figure 7-18. KSZT hourly AERMOD Concentrations - 5-m source (left) and 45-m source (right)



Q&A

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