Sensitivity of AERMOD to AERMINUTE-Generated Meteorology

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Purpose of Analysis

To demonstrate the differences in maximum concentration estimates between AERMET and AERMINUTE-AERMET data sets for various source types

AERMET Version 11059

AERMINUTE Version 11325

Met Data Sets

- **AERMET** refers to data sets based on using straight NWS data (ISHD, CD144, 3280, etc) data for the surface meteorology as available from the National Climatic Data Center (NCDC) along with upper air soundings in the FSL or 6201 formats as obtained from the National Oceanic and Atmospheric Administration website http://www.esrl.noaa.gov/raobs/.

- **AERMINUTE/AERMET** refers to data sets based on using 1-minute running 2-minute average winds from NOAA at ftp://ftp.ncdc.noaa.gov/pub/data/asos-onemin/ along with NWS data for the surface meteorology as available from NCDC along with upper air soundings.

Data Sets

Surface/Upper Air Sites	Surface Data	Ice Free Winds Start Date	Upper Air Data
Harrisburg, Dulles	KMDT, NWS 14711, ISHD	August 22, 2008	KIAD, NWS 93734, FSL
Cape Girardeau, Springfield	KCGI, NWS 03935, 3280VB	December 16, 2006	KSGF, NWS 13995, 6201FB
Fargo, Aberdeen	KFAR, NWS 27530, CD144	September 26, 2006	KABR, NWS 14929, FSL
Orangeburg, Charleston	KOGB, NWS 53854, ISHD	April 29, 2009	KCHS, NWS 13880, FSL
Gainesville, Jacksonville	KGNV, NWS 12816, ISHD	March 9, 2007	KJAX, NWS 13889, FSL

Comparison of Cape Girardeau Wind Roses

Figure 1. KCGI AERMET

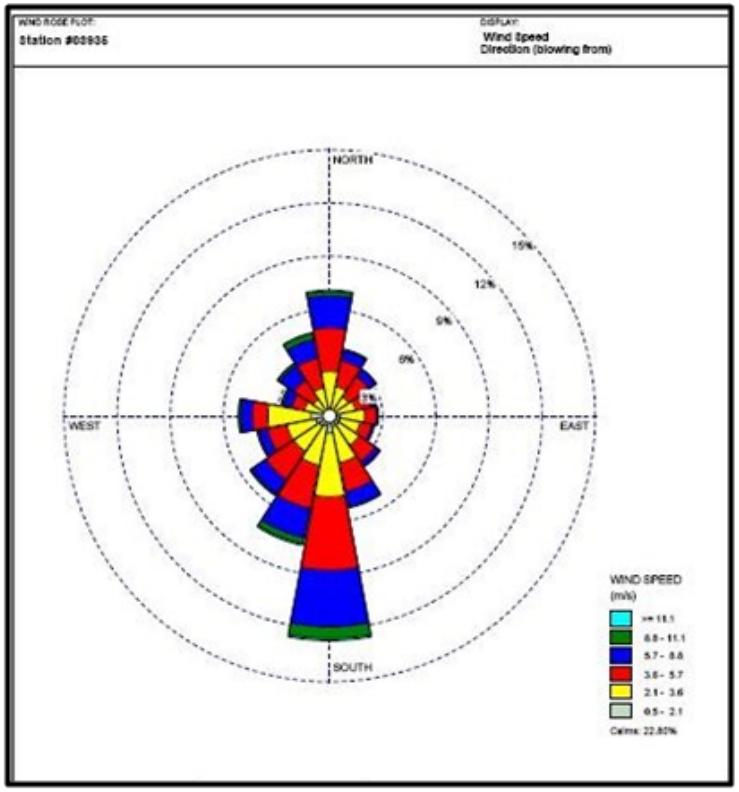
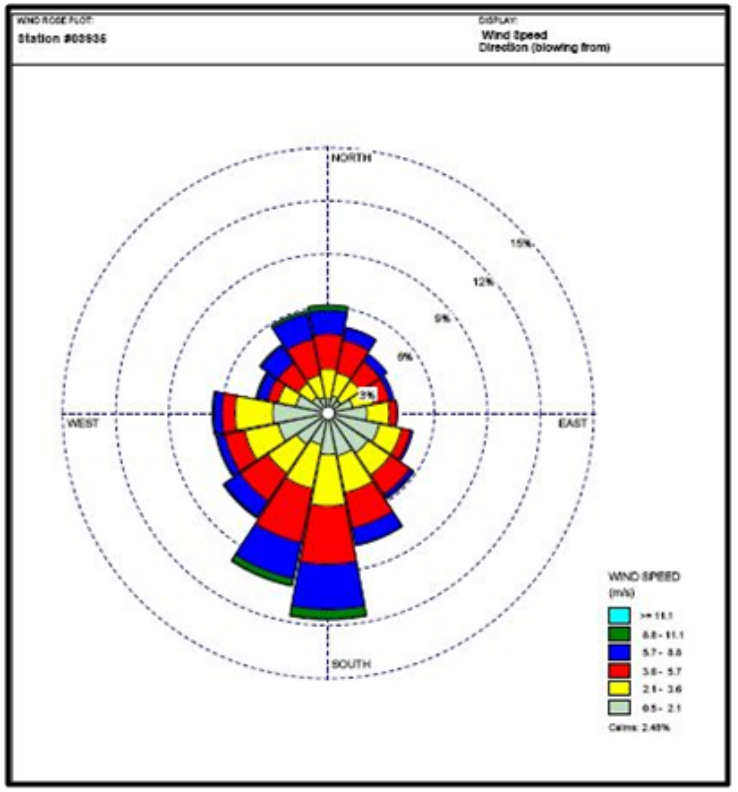


Figure 2. KCGI AERMET/AERMINUTE



Comparison of Calms and Speed

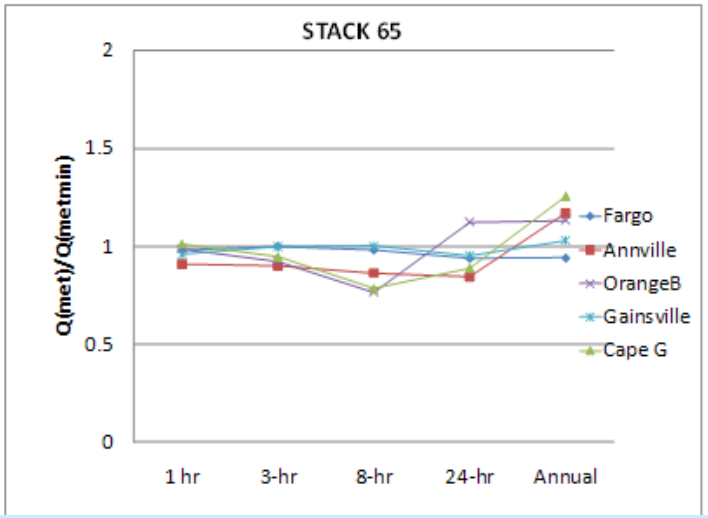
Surface/Upper Air Sites	AERMET Calms, %	AERMET Average Wind speed, m/s	AERMINUTE /AERMET Calms, %	AERMINUTE /AERMET Average Wind Speed, m/s
Harrisburg, Dulles	23.5%	3.33	10.89%	3.41
Cape Girardeau, Springfield	22.8%	3.28	2.48%	3.43
Fargo, Aberdeen	5.72%	4.79	1.18%	5.03
Orangeburg, Charleston	23.18%	2.81	12.1%	2.90
Gainesville, Jacksonville	23.63%	2.85	12.56%	2.93

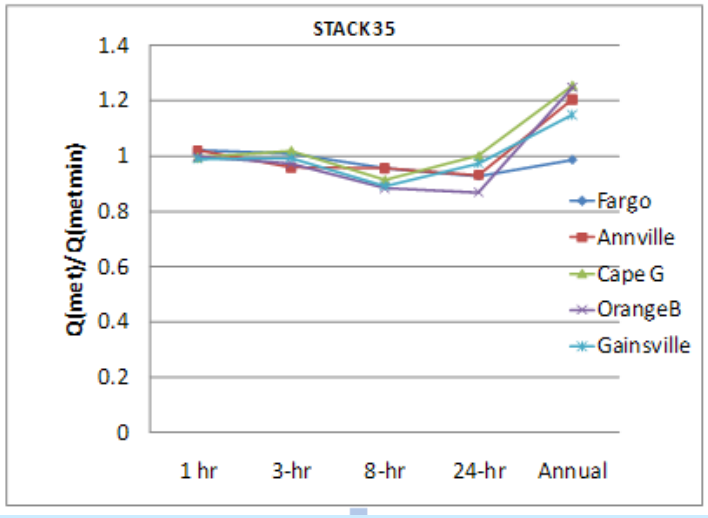
Source Types Reviewed

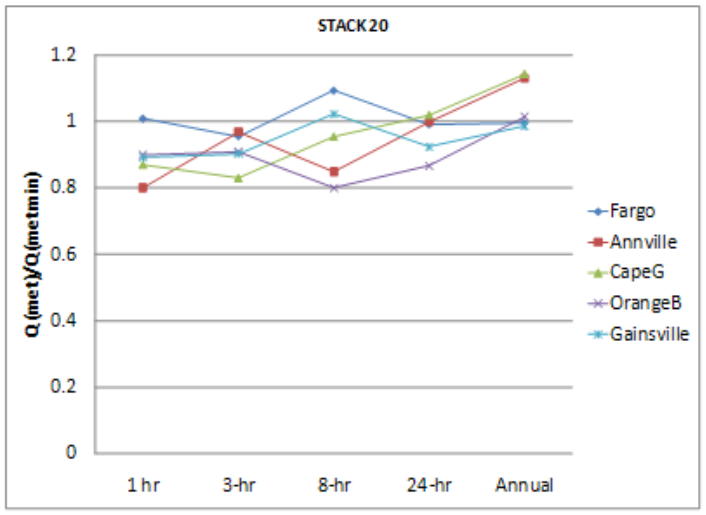
from http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod

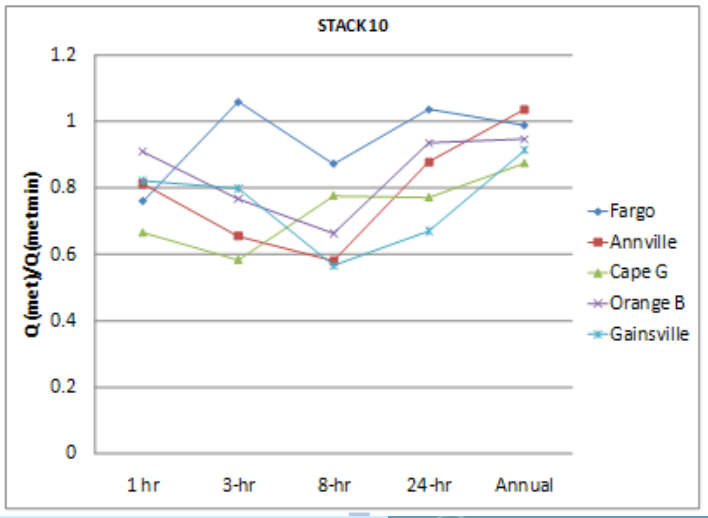
Source Type	Height, m	Diameter,m	Temp, K	Velocity, m/s	Emissions, g/s
Stack	65	5.0	425	15.0	500
Stack	35	2.4	432	11.7	100
Stack	20	1.5	350	7.5	10
Stack	10	0.5	325	4.0	2.5
Area	1	20 = Length	20 = Width	-	0.001
AreaCircle	10	40	-	-	0.1
Volume	1	20 = σ_{zo}	20 = σ_{yo}		0.1

$Q_{aermet}/Q_{aerminute}$ Stacks









$Q_{aermet}/Q_{aerminute}$ Other