

Overview Midwest RPO Inventory Activities

Mark Janssen

Midwest RPO/LADCO

Technical Conference

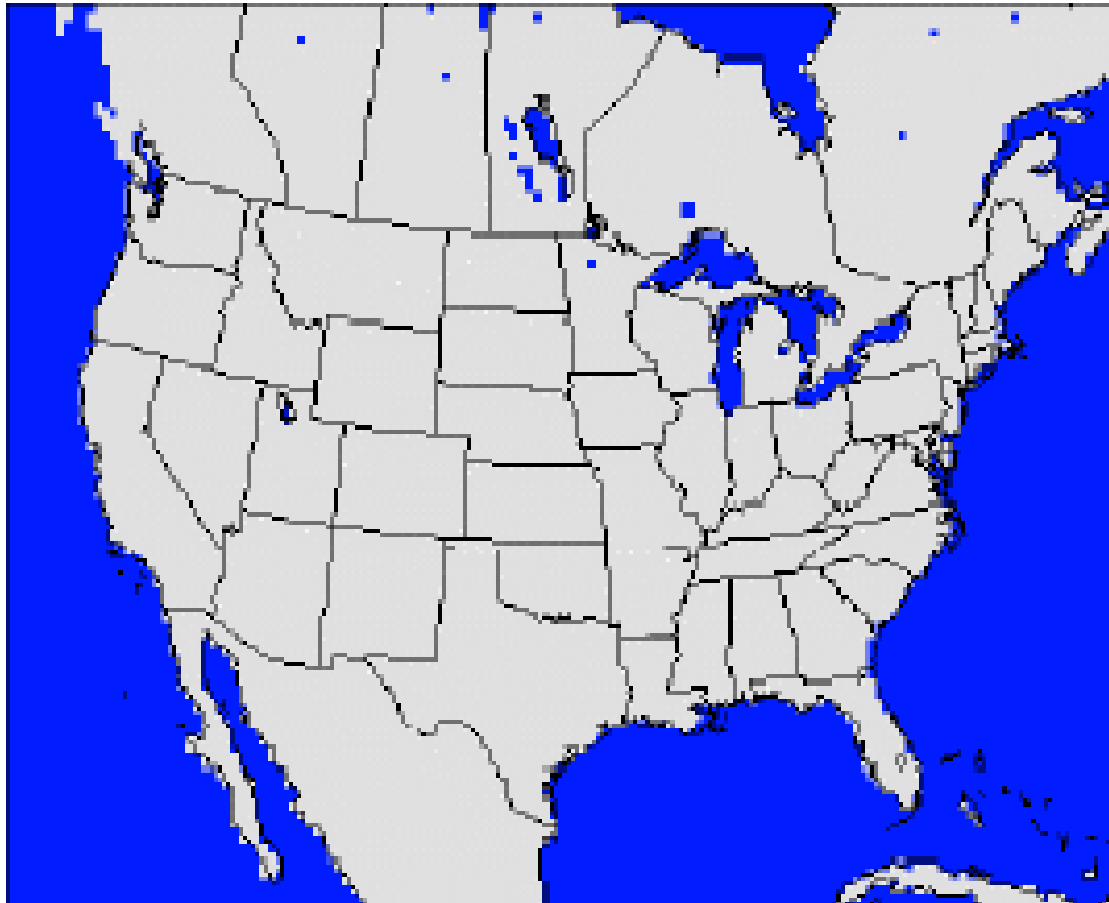
December 3th, 2002

Dallas Texas

“Preliminary Modeling”

- Test the Photochemical, Emissions, Meteorological modeling systems
- Do sensitivity runs for weak links
- Test Model Performance(Individual species, periods Short time)
- Evaluate Candidate Models
 - (REMSAD, CMAQ,PM-CAMX, SMOKE, EMS, MM5)

Modeling Domain



Periods

- August 1999
- January 2000
- July 2001

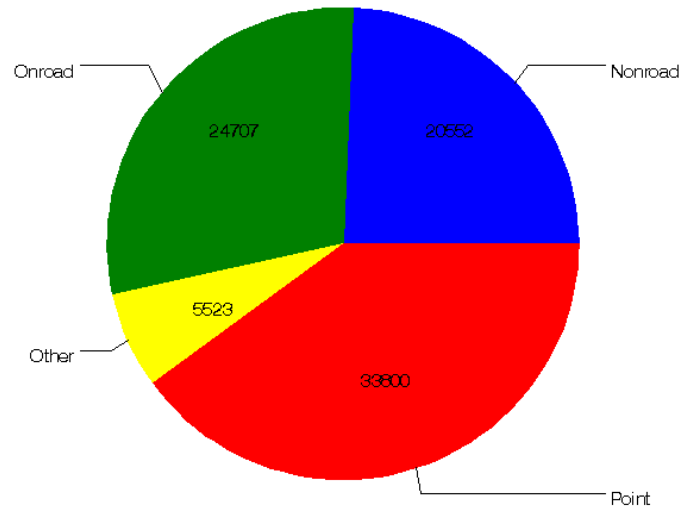
Emissions

- Anthropogenic emissions based on USEPA's 1999 National Emissions Inventory
 - Other Area, Point Ver 2.0 Draft
 - Mobile Ver 1.5(No estimates in Draft 2.0)
 - Offroad Ver 1.5 (1/2 Files empty)
 - No Soil NH₃, Wildfires, Canada, Mexico Inventories
 - NH₃ adjusted 15,20,45,25 by season(EPA)
 - Significant QA Problems with NEI

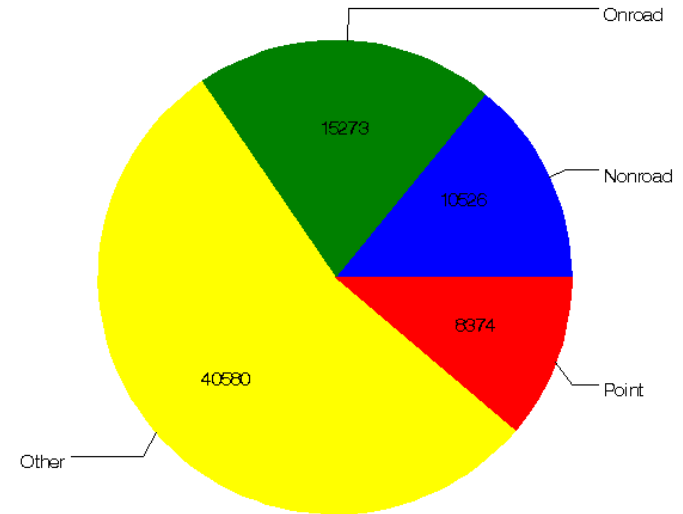
NEI Issues

- MDB(access files) very difficult to use
 - Results in ad-hoc tools/rules to convert
 - EPA has agreed to release future version in ASCII
- Point Sources
 - State and CEM/ORIS Matching
 - Coordinates, Many bad values
 - Temporal, Flat
 - Unit problems in Florida and Missouri
 - Blank SCC's for EGU sector(Process ID?)

National NOX Emissions (Tons/Day) National ROG Emissions (Tons/Day)

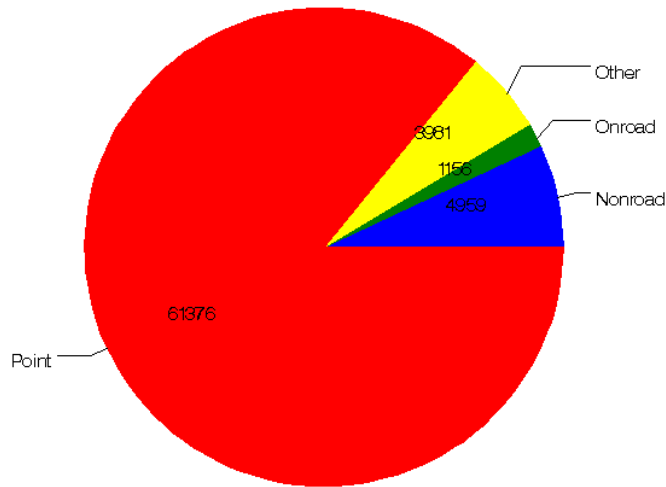


Created with EMS—2001 on November 11,2002

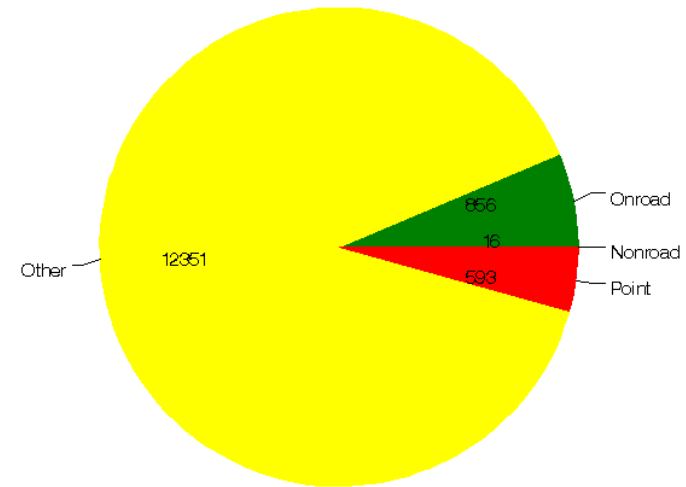


Created with EMS—2001 on November 11,2002

National SO2 Emissions (Tons/Day) National NH3 Emissions (Tons/Day)

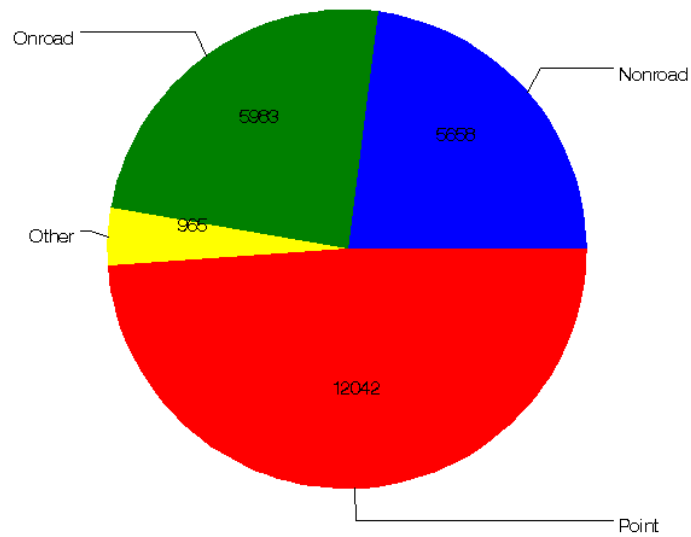


Created with EMS—2001 on November 11,2002

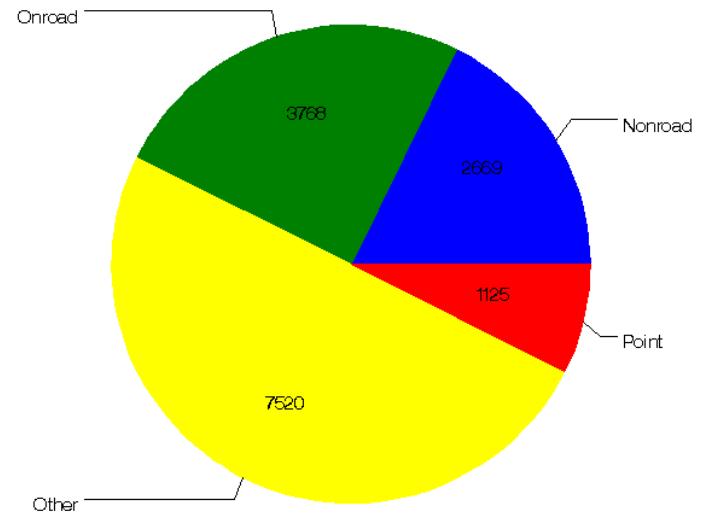


Created with EMS—2001 on November 11,2002

Midwest NOX Emissions (Tons/Day) Midwest ROG Emissions (Tons/Day)

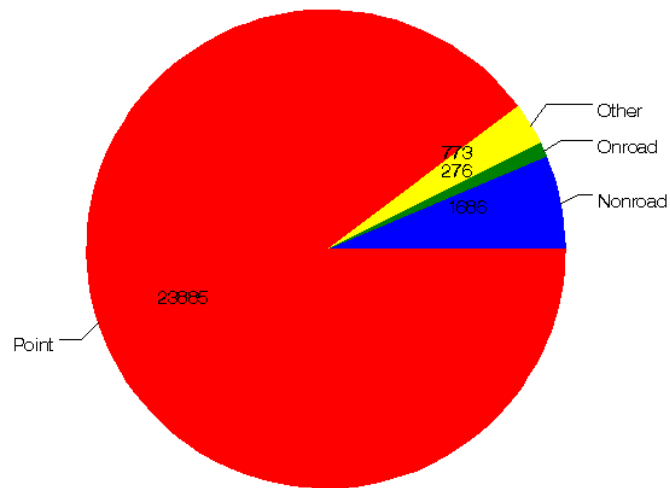


Created with EMS—2001 on November 11,2002

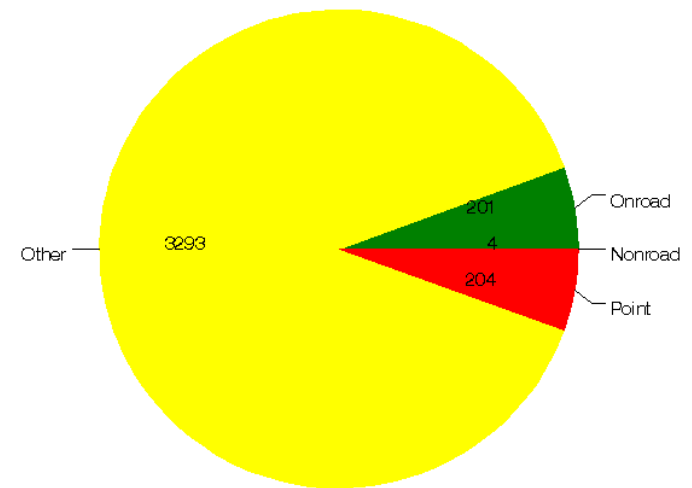


Created with EMS—2001 on November 11,2002

Midwest SO2 Emissions (Tons/Day) Midwest NH3 Emissions (Tons/Day)

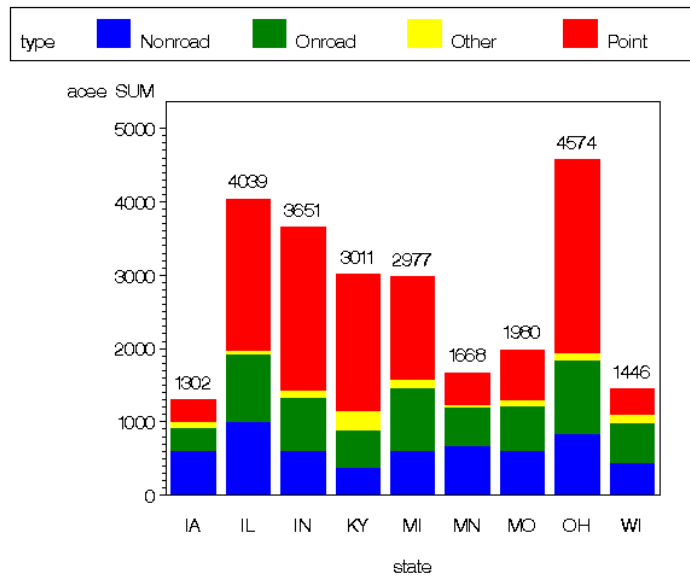


Created with EMS—2001 on November 11,2002

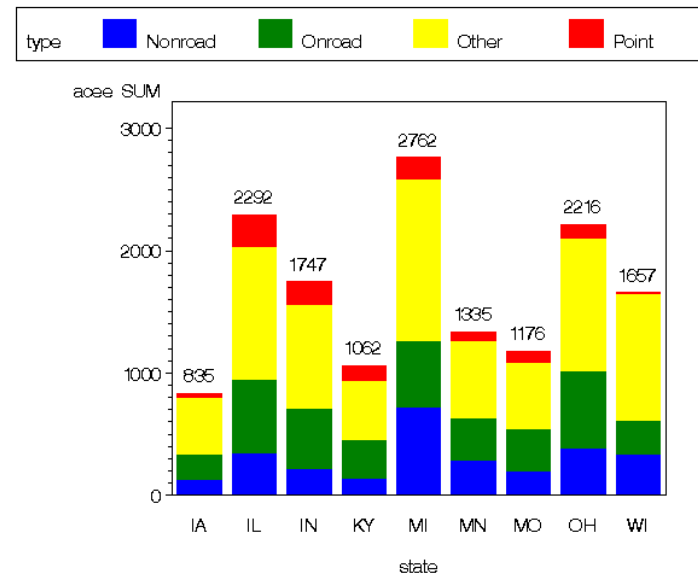


Created with EMS—2001 on November 11,2002

Midwest NOX Emissions By State (Tons/Day) Midwest ROG Emissions By State (Tons/Day)

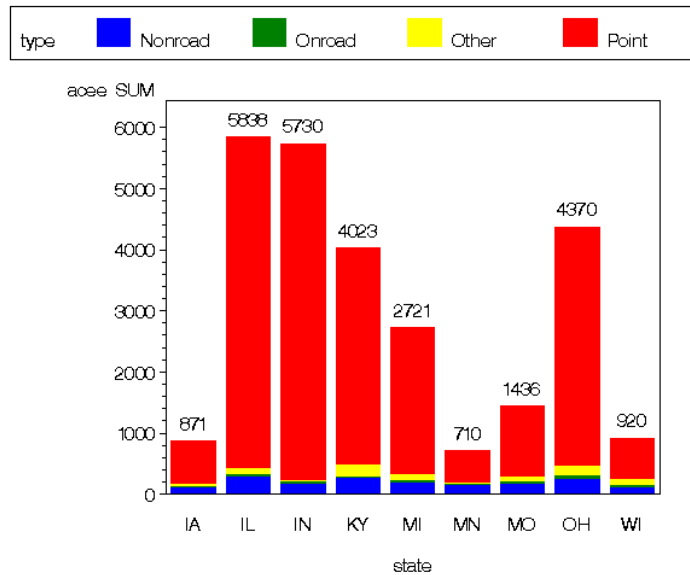


Created with EMS-2001 on November 11,2002

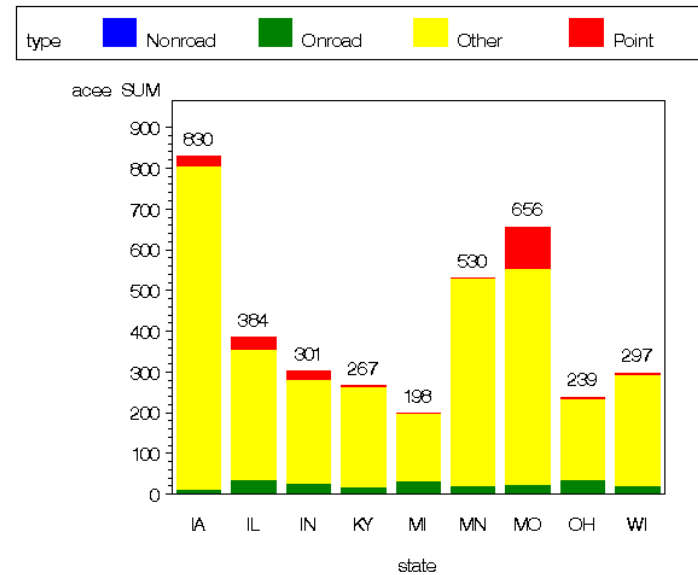


Created with EMS-2001 on November 11,2002

Midwest SO2 Emissions By State (Tons/Day) Midwest NH3 Emissions By State (Tons/Day)



Created with EMS-2001 on November 11,2002

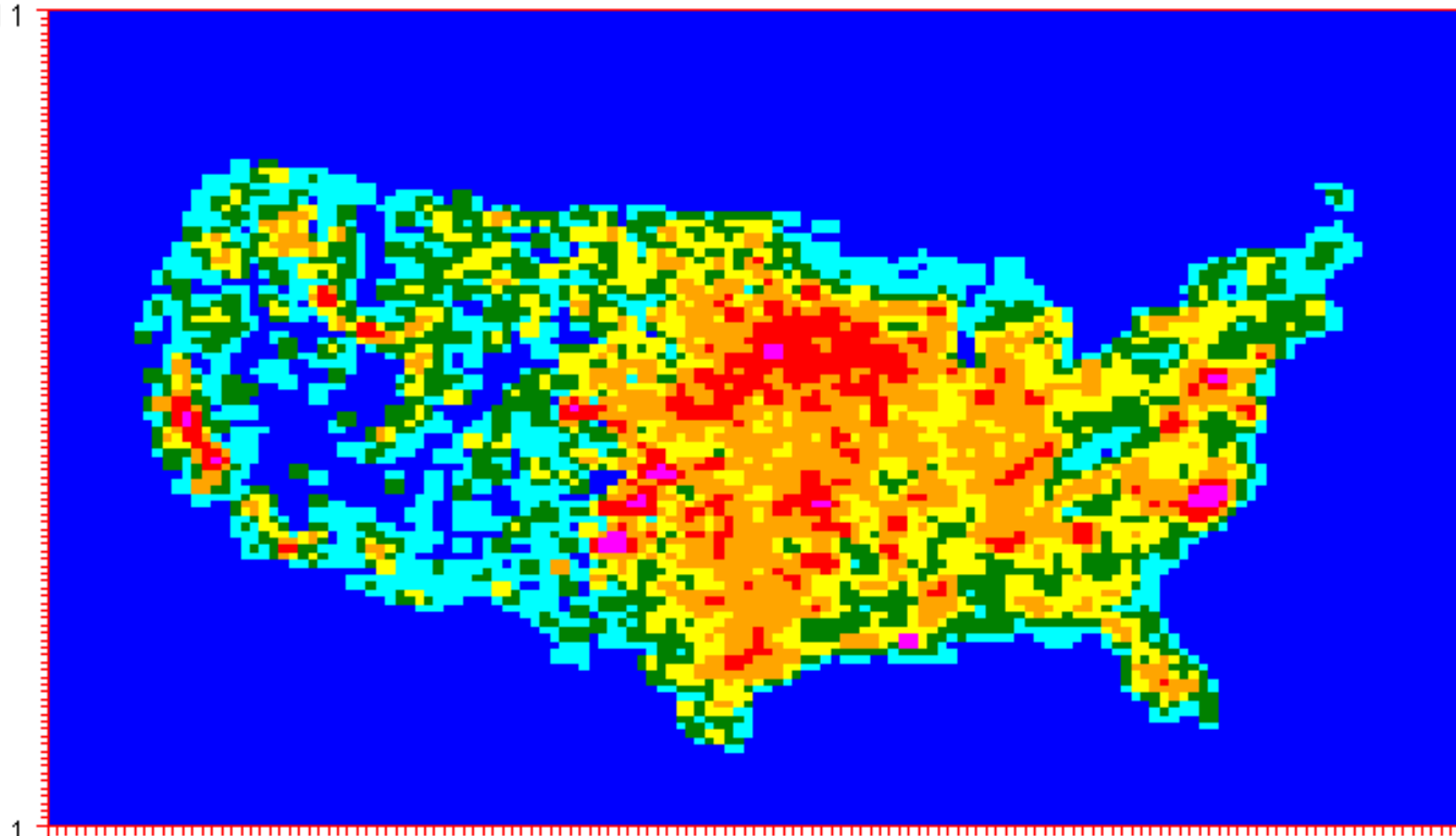


Created with EMS-2001 on November 11,2002

SECTOR TONS FOR , 07/15/01

POLID = NH3 TYPE = Other Total: 12116.40767

jcell
111










1

1

147

icell

CELLTOT		0.0000		0.0905		0.9095		1.7836
		3.1401		7.1140		17.2789		

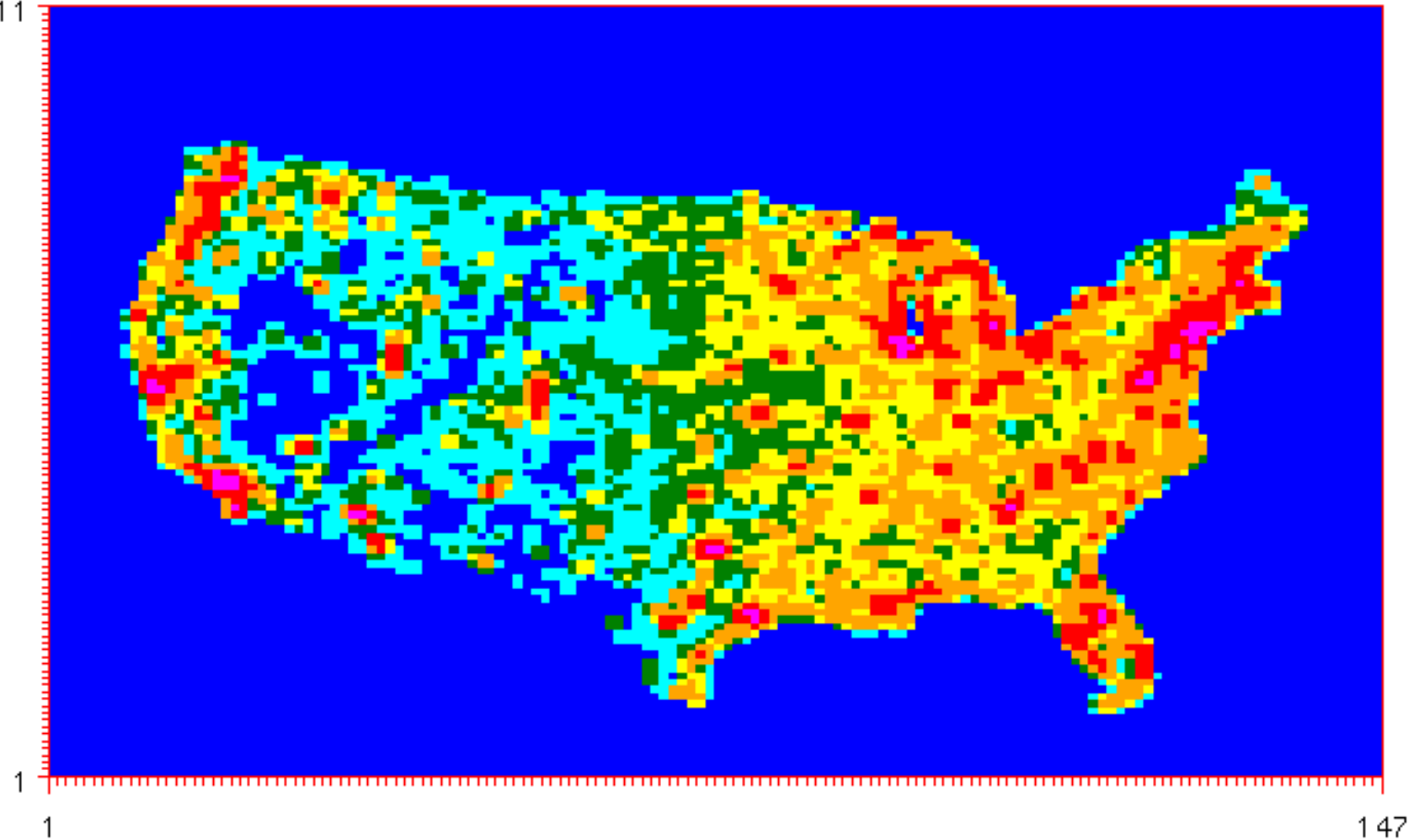
WHERE: CELLTOT = ACEE/907.185

Plot Generated on 06/11/02








SECTOR TONS FOR , 07/15/01

POLID = ROG TYPE = Nonroad Total: 10525.625584

jcell
111

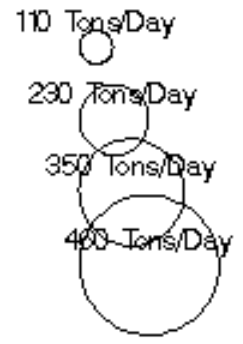
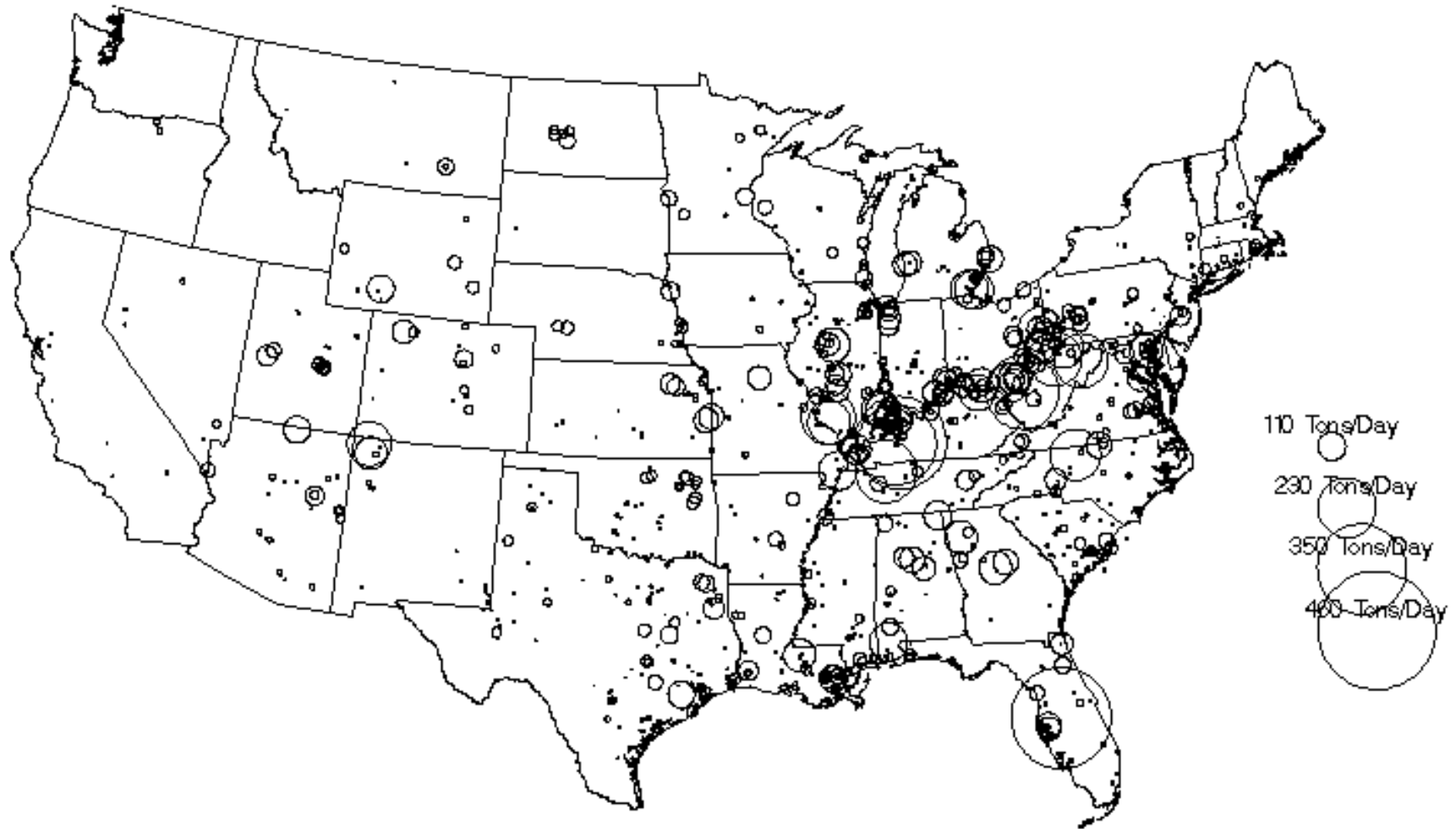


icell

CELLTOT		0.0000		0.0850		0.4403		0.8282
		1.7321		6.8080		32.1131		

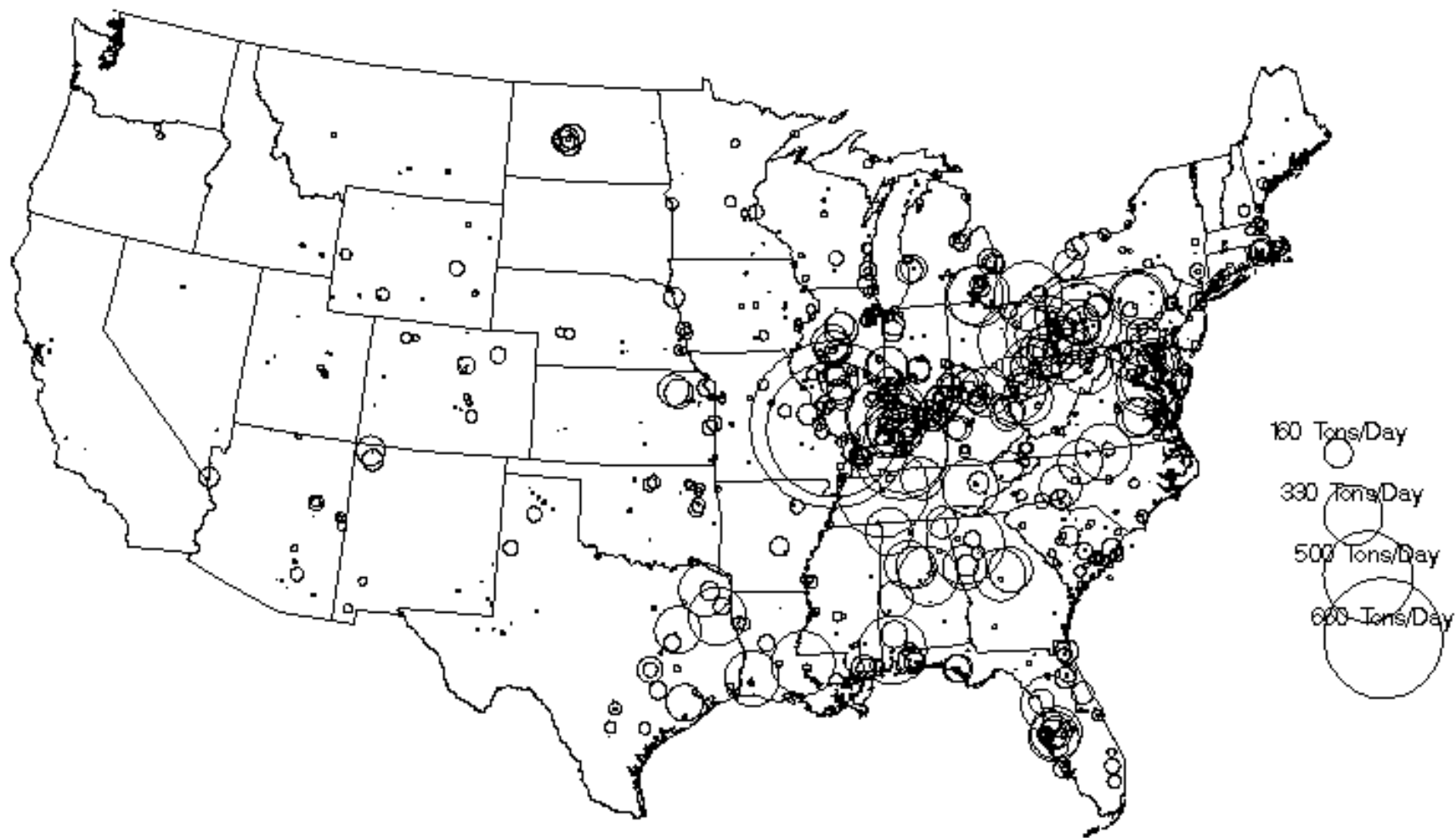
Circle Plot of NOX Sources

CASE: 99nei_test



Circle Plot of SO2 Sources

CASE: 99nei_test



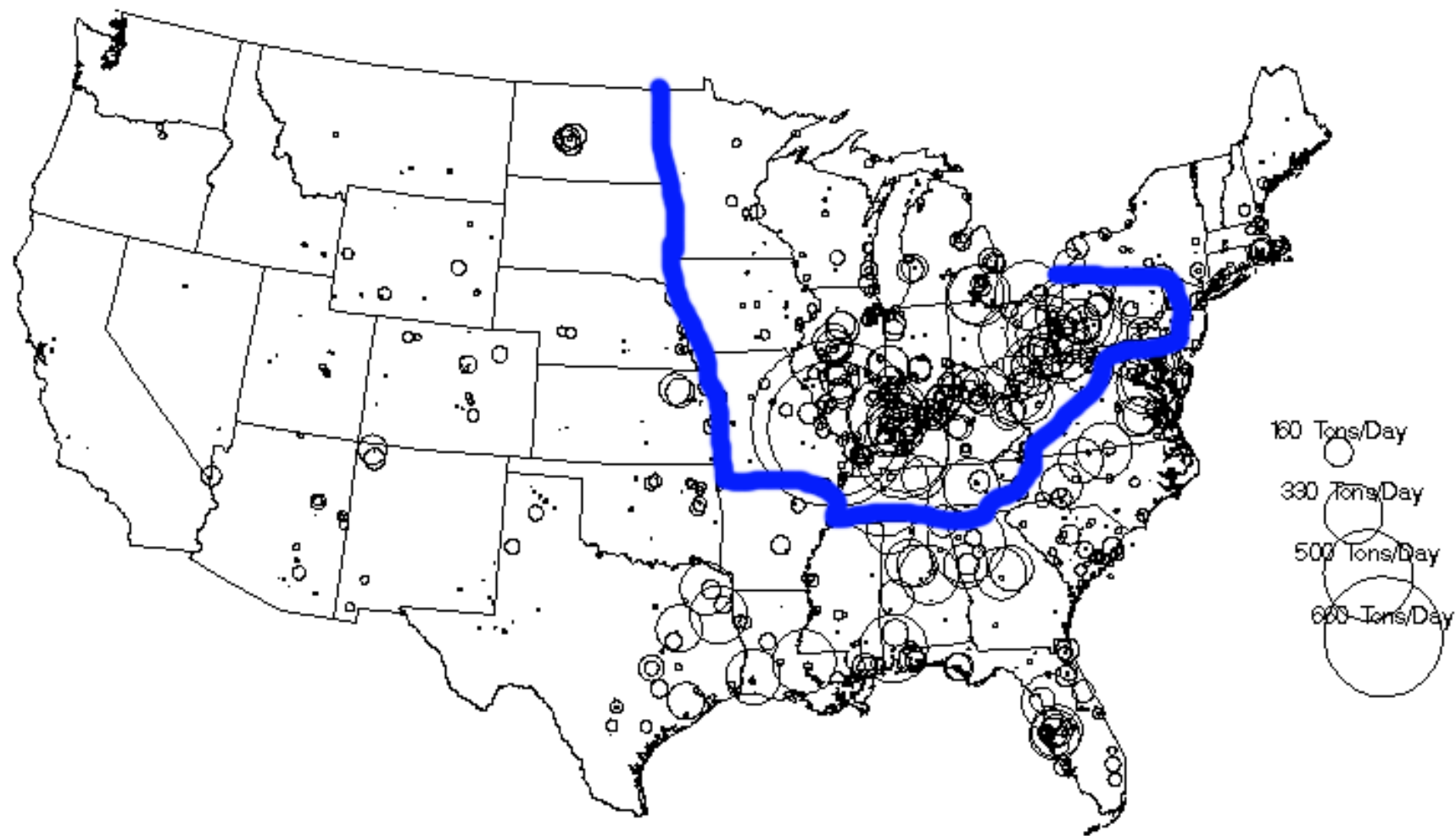
Emissions Inventory :

Utility CEM

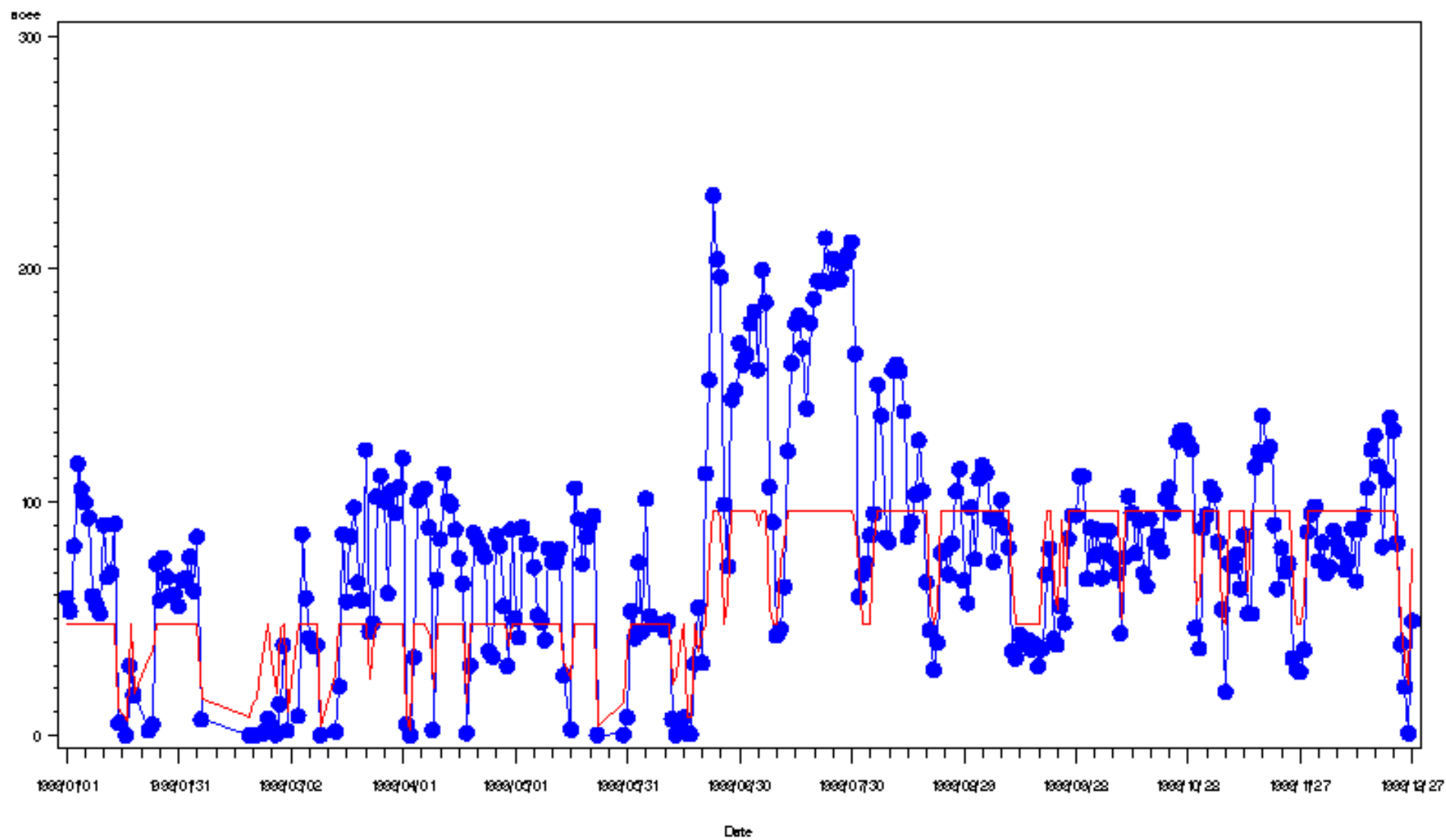
- Prepare NIF2.0 model-ready point source emission files based on 1998 - 2000 CEM data
 - Need to match ID's with 1999 NEI locally
 - Huge 14Gig per year in NIF.
- What to do about Missing or Zero Data
 - A blank emission record means no operation.
 - Unmatched ID's do not get used.

Circle Plot of SO2 Sources

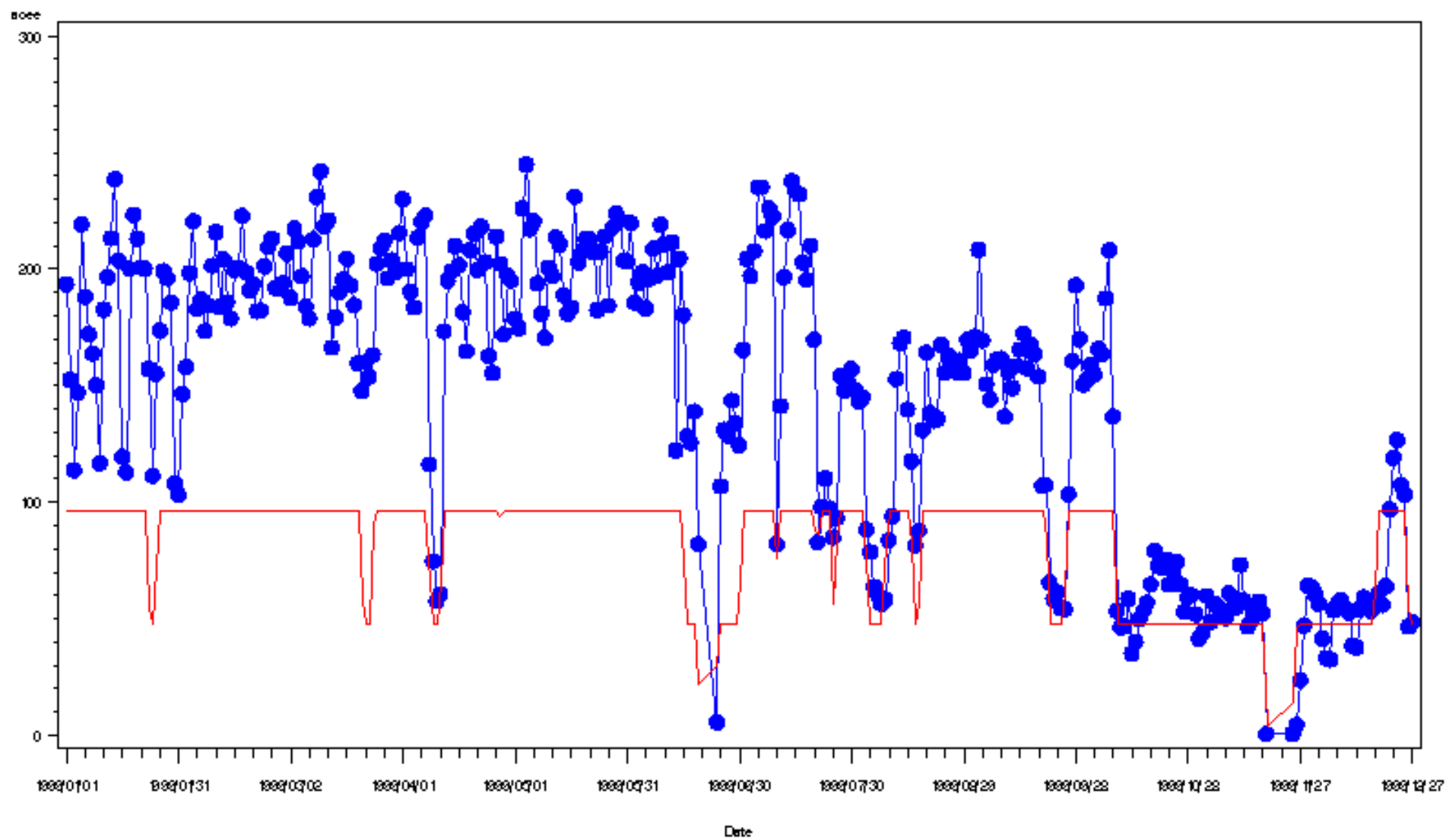
CASE: 99nei_test



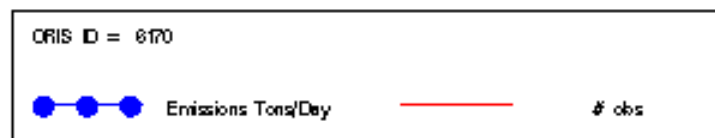
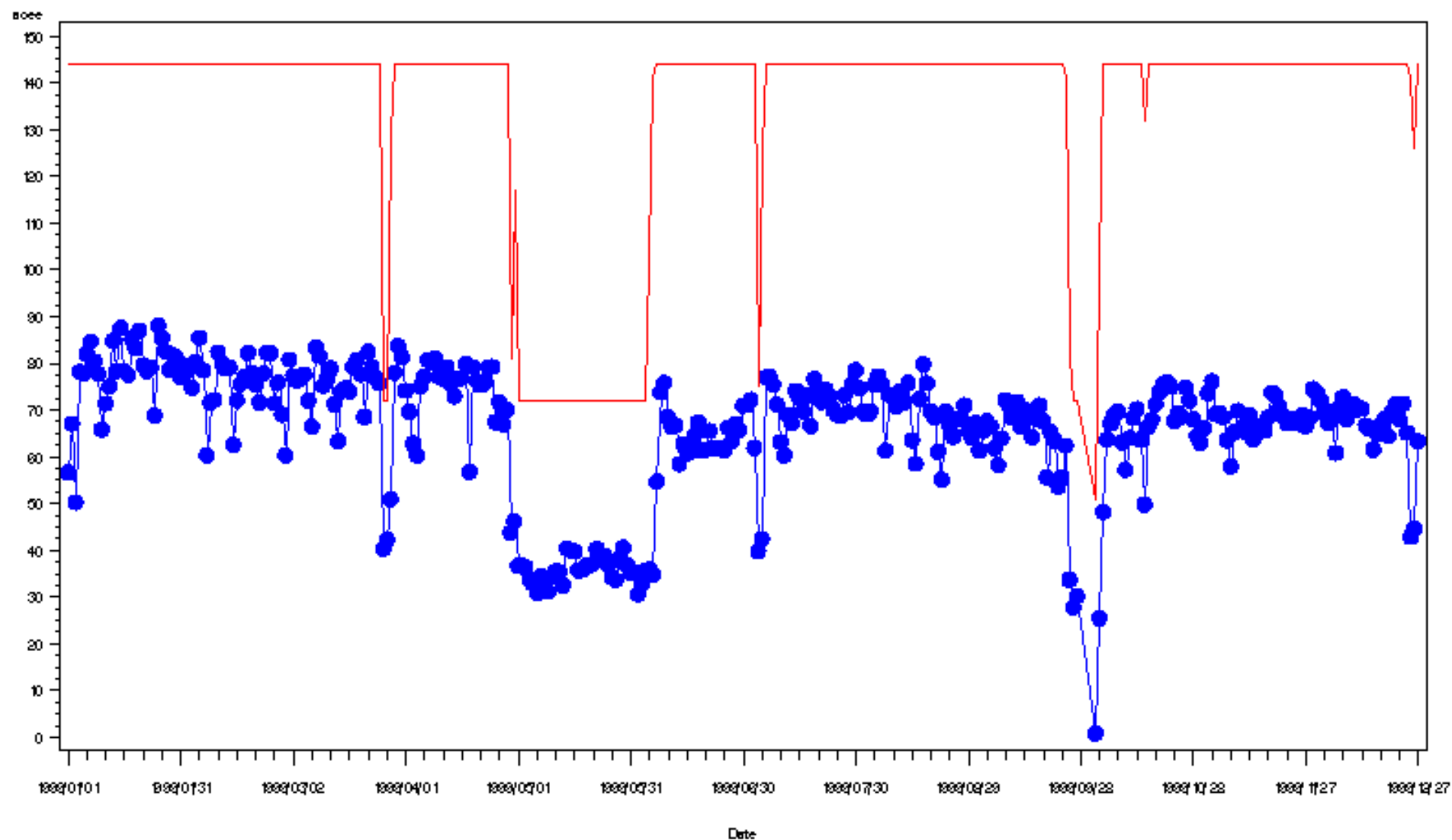
Daily Emissions for KINCAID ORIS ID : 876



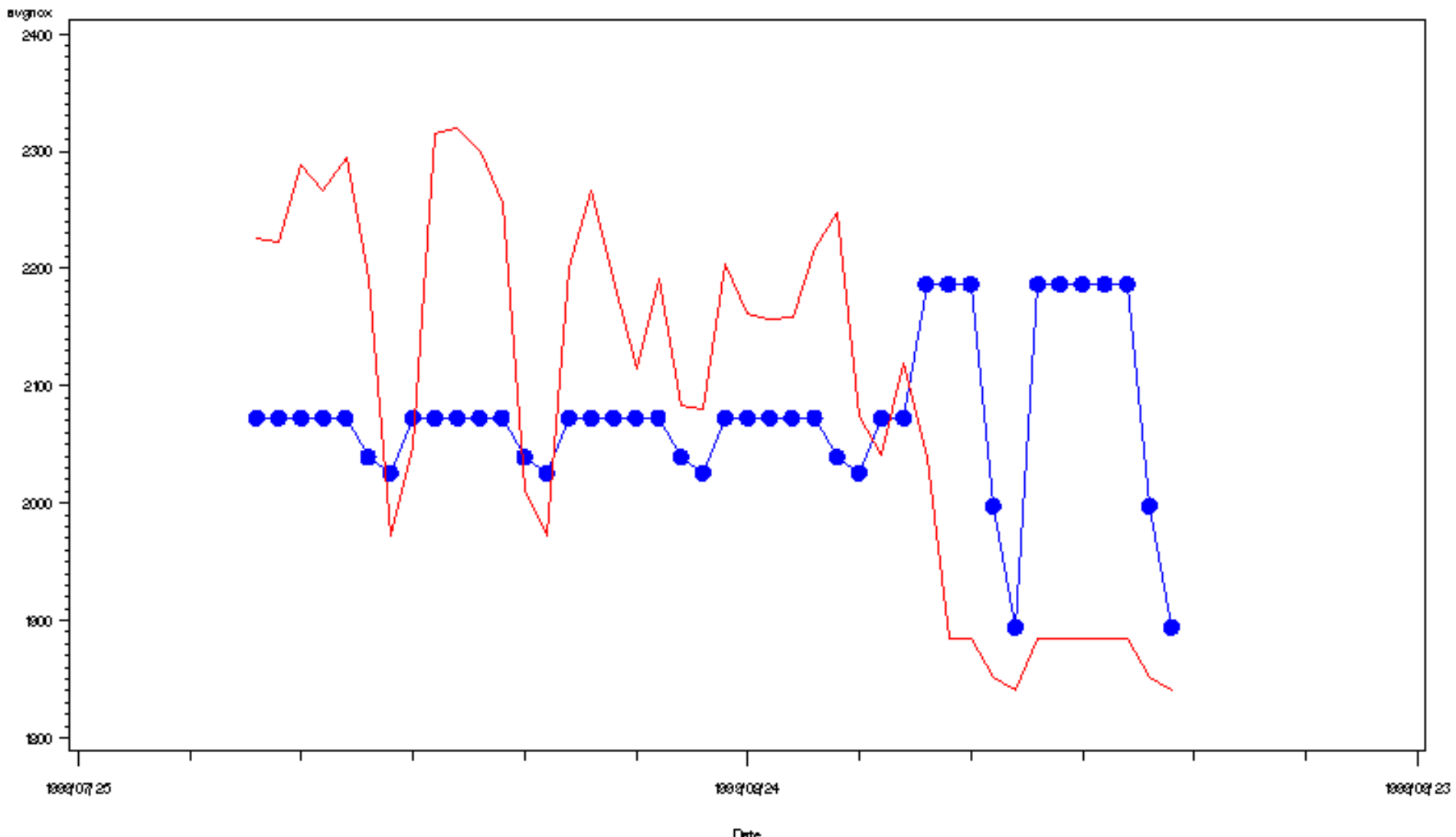
Daily Emissions for GENJMGAVIN ORIS ID : 8102



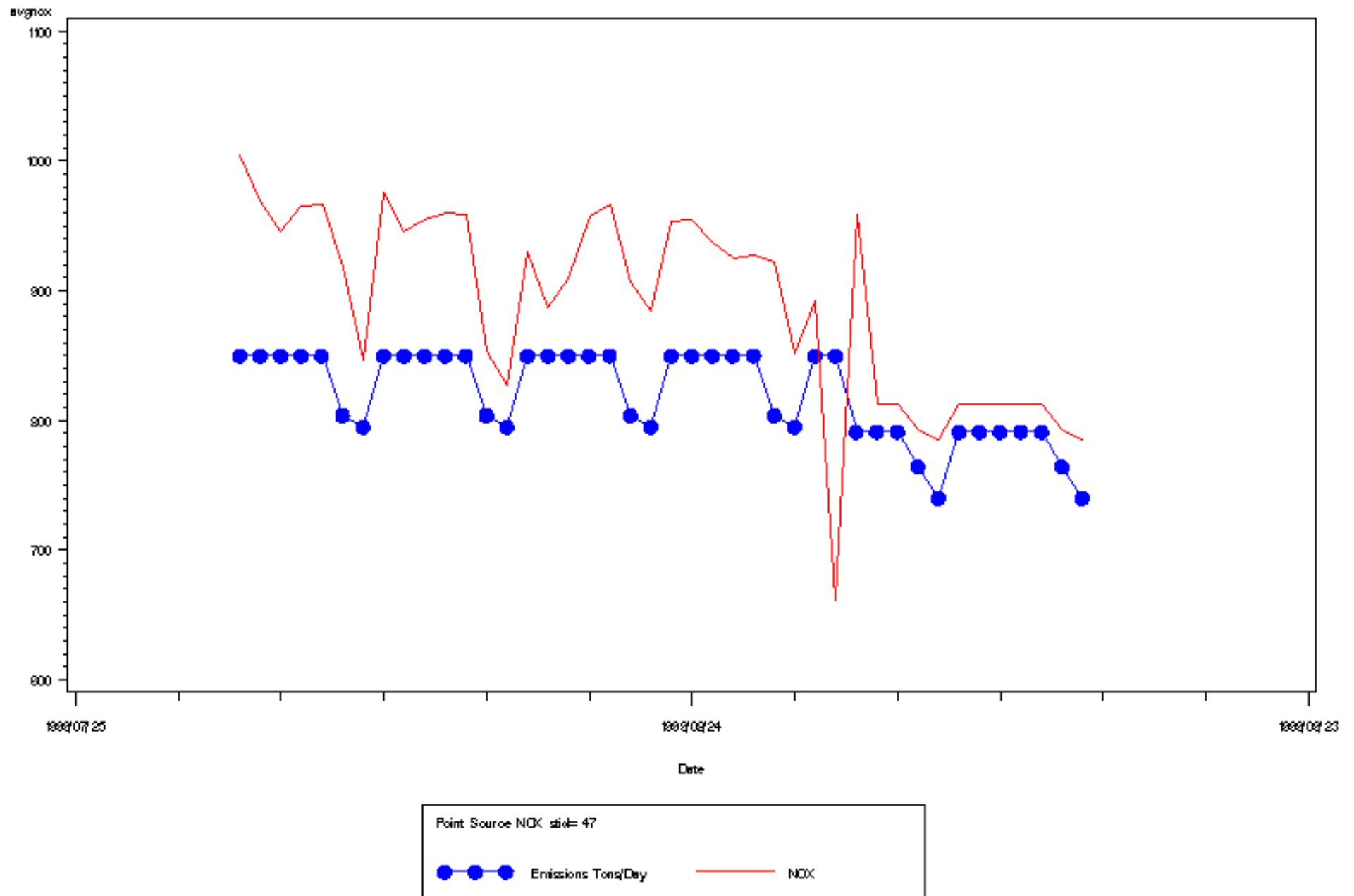
Daily Emissions for PLEASANTPRAIRIE ORIS ID : 6170



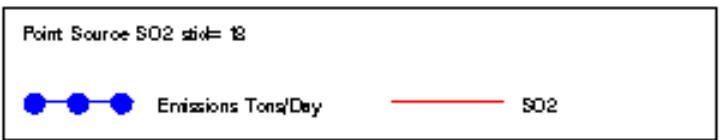
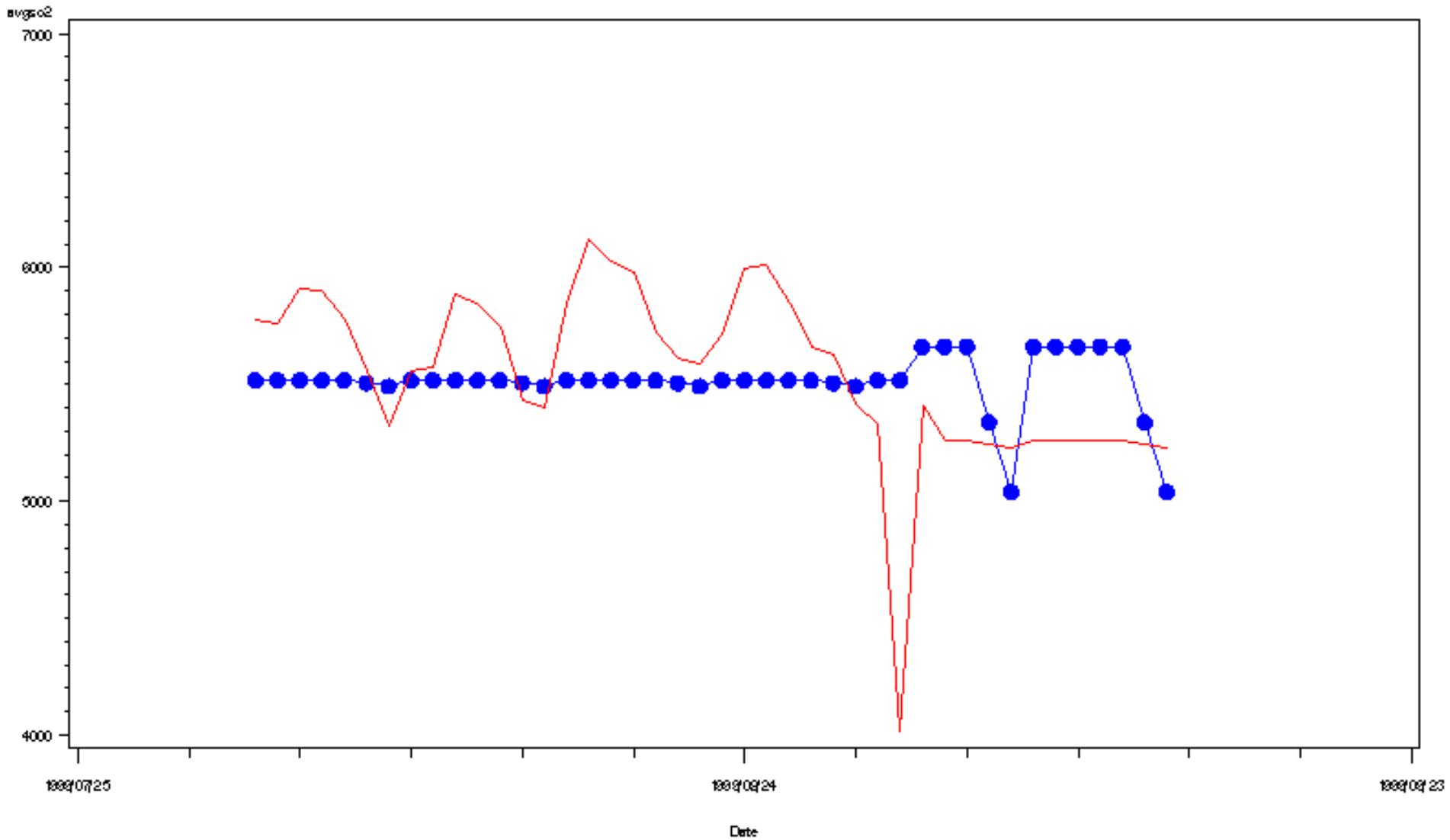
Daily Emissions for Point sources NOX STID= 17



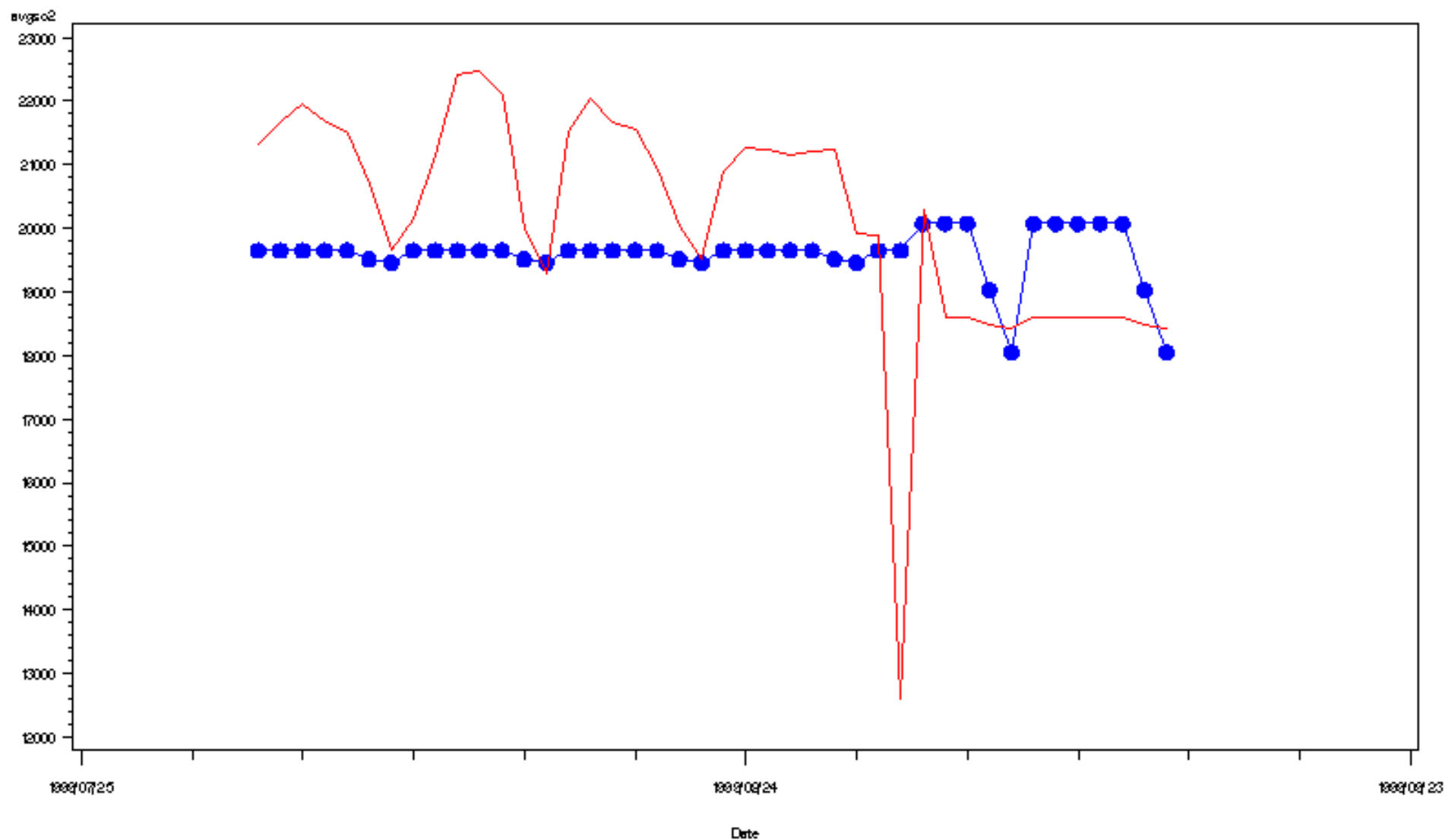
Daily Emissions for Point sources NOX STID= 47



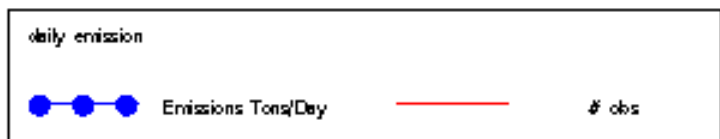
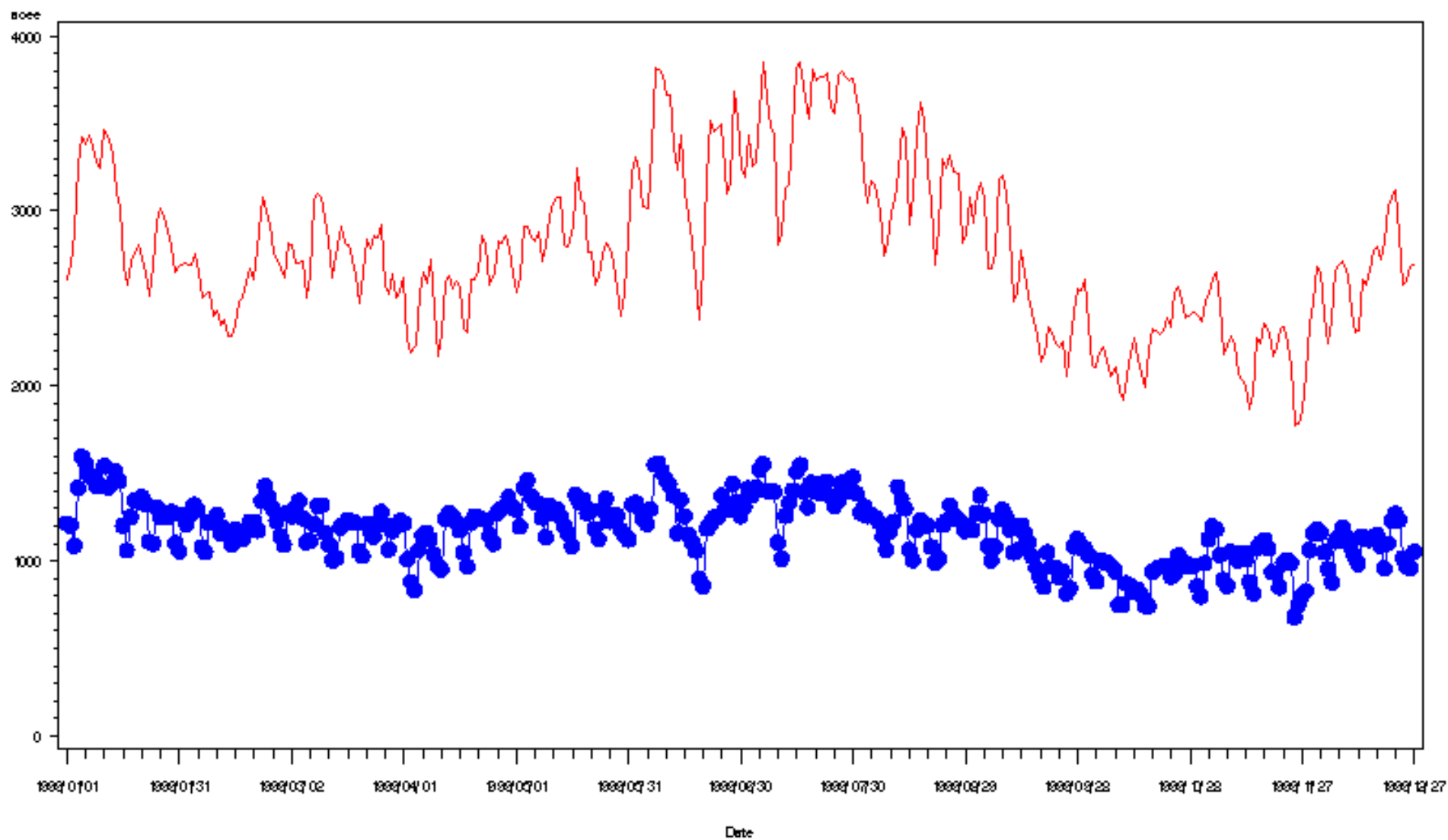
Daily Emissions for Point sources SO2 stid= 18



Daily Emissions for Point sources SO2 midwest



Daily Emissions for State



Next Steps: EGU's

- Pechan recommend temporal/temperature effects
 - Based on 1998 - 2000 CEM data, create day-of-week and hourly profiles, and assess correlation between emissions and temperature
- Run sensitivity run with Pechan Temporal Values
- Review Pechan Results with EGU's/Stakeholders
- Decide what temporal effects should be included
 - Temperature
 - Monthly
 - Daily
 - Hourly
- LADCO implement temperature correction algorithm?
- Test Results in Photochemical Model

Why Not Just Use CEM?

- CEM is great for Base year model validation
- CEM is bad for Future year projections
 - Shutdowns, New plants, Operations shift from peaker to base load.....
- Generate a pattern of activity for base year
- Generate a planned pattern of activity for future year
- Project emissions

Near Term Inventory Improvements

- NEI Version 2 Final
- Nonroad 2002 estimates (40% NOX, ROG)
- CEM profiles
- CMU Model w/ Enhanced Temporal, STI
- Mobile6 Incorporated into EMS(SLOW!)
- Day Specific Historical Fires.
- Canadian Emissions

Long Term Inventory Projects

- Mobile6 Inputs by June 2003
 - LADCO works to define Network Needs
 - VMT inputs by end of 2003?
- Improve Locomotives, Vessels, Rec. Marine, and Agricultural Equipment
- Standard Methodology for Top 15 Area Source Categories

Long Term Inventory Projects

- Evaluate CSEM for Forest Fires
 - Field study to get fuel information
- Update CMU model for Ammonia
 - Improve Raw data (RPO's)
 - Improve Spatial and Temporal Factors
- Agree to use RPO data exchange protocol
- Work with ITEP on Tribal Inventories
- Work with EPA on Spatial and Speciation.
- Pursue New Emissions Model