

Minnesota Air, Water, and Waste Environmental Conf.

Air Modeling – Training (8am-noon)
Sheraton Bloomington Hotel, Atrium 7

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Chris Nelson & Dennis Becker
Minnesota Pollution Control Agency

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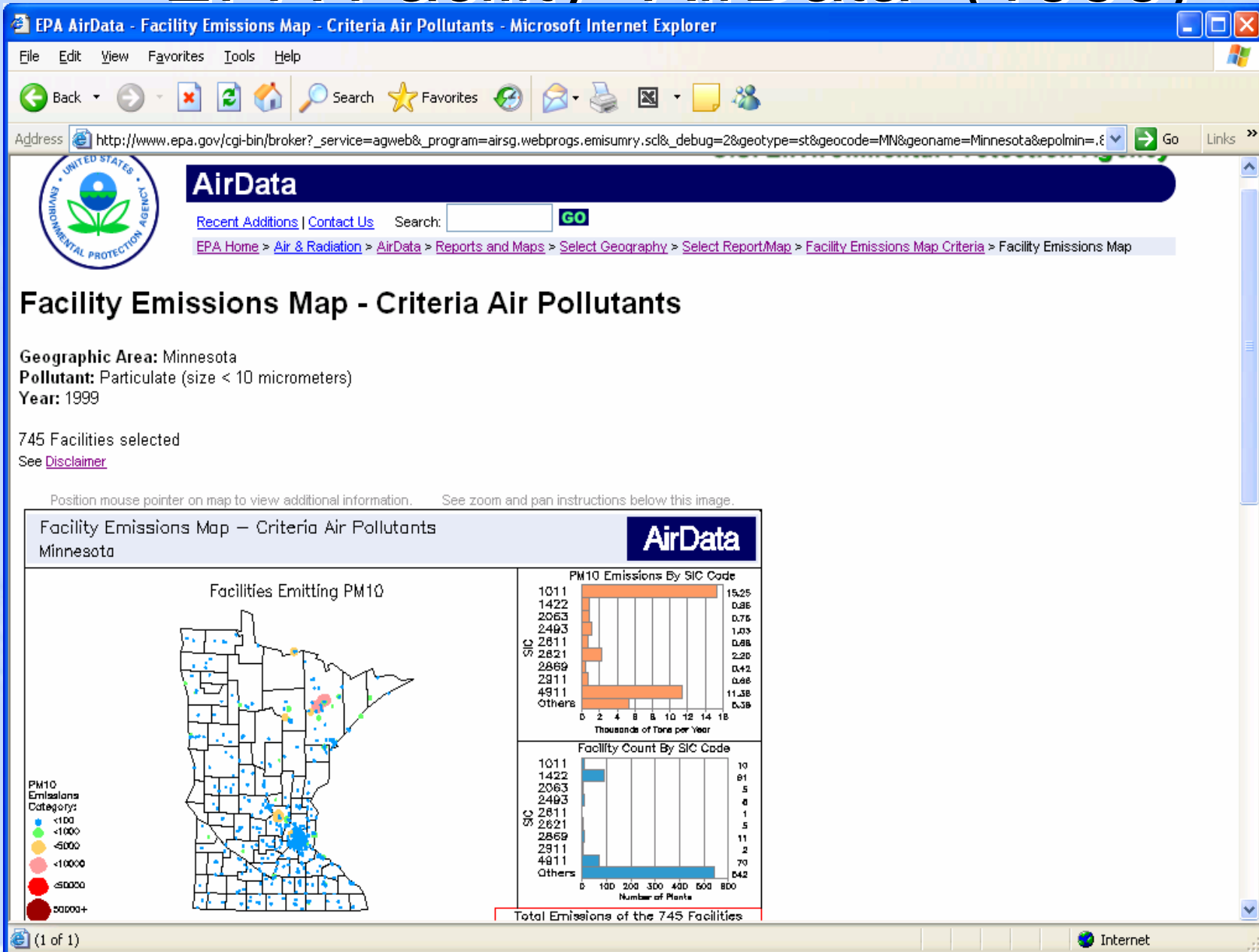
Air Modeling (98 Slides)

- AERMOD Status and MPCA “Draft” Data
- AERMOD Urban Modeling Developments
 - Metropolitan Statistical Areas and Micropolitan Statistical Areas
- New MPCA NAAQS/MAAQs Feature: FAR Data
- Break - slide 40
- Rochester and Olmsted County SIP Work
 - RPU-Silver Lake Plant Sensitivity Analyses
- Break - slide 75
- AERA/RASS with supplemental Post-RASS Option
- Fugitive PM₁₀ emissions: roads, cooling towers, etc.
- VISCREEN (Nearby areas v. Class I areas)
- Future Possibilities

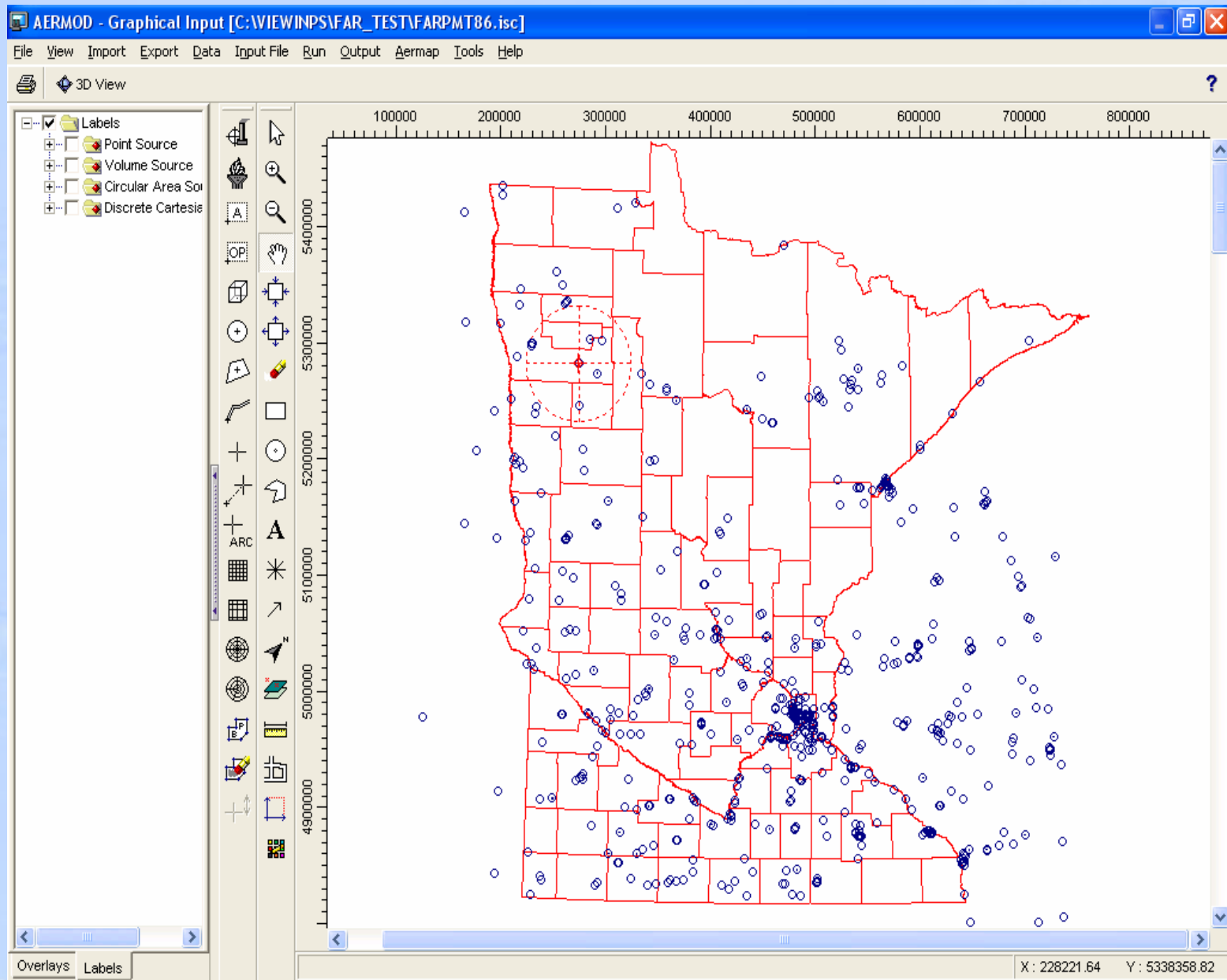
NAAQS Analyses - FAR Ideas

- First-Approximation Run (FAR) Approach
- First-Approximation Regional (FAR) Sources
 - EPA 1999 AirData (PM10, SO2, NOx)
 - 893 facilities: 1 volume source per facility
 - 1 regional/county area source [AREACIRC]
- Lower Background Concentrations
- Process (Tentative)
 - 5-year runs find design receptors w/key FAR sources
 - Event runs find design values with all FAR sources

EPA Facility "AirData" (1999)



MPCA "FAR" Sources



NAAQS Analyses - FAR Ideas

- First-Approximation Run (FAR) Approach
- 893 Facilities (1 volume source/facility)
 - Release Height depends on SO₂
 - Sigma-Y (~20m) and Sigma-Z (~10m)
 - EMISFACT scalars for facilities < 50km
 - Re-computed for each project location!!!
 - No EMISFACT scalars for facilities > 50km
- 1 regional/county area source [AREACIRC]
 - Release Height (~10m)
 - Radius (50,000m)
 - Sigma-Z (0m)
 - No EMISFACT scalars

FAR Release Heights

- 200m for SO₂ greater than 20000 tpy
- 150m for SO₂ from 10000 to 20000 tpy
- 100m for SO₂ from 5000 to 10000 tpy
- 50m for SO₂ from 1000 to 5000 tpy
- 25m for SO₂ from 100 to 1000 tpy
- 20m for SO₂ from 50 to 100 tpy
- 15m for SO₂ from 10 to 50 tpy
- 10m for SO₂ less than 10 tpy

FAR EMISFACT Scalars

- Facilities within 50km of project site
 - EMISFACT varies by averaging time & distance (<50km)
 - Surrogate for maximum allowable emissions
 - Simple, fast, easy (and still under construction)
 - Site-Specific: re-computed for each project site!
 - Beware of close-in facilities – see EMISFACT warning messages (less important to most important):
 - “** SPOT CHK”
 - “** FULL CHK”
 - “** REFINE: ”
- Facilities beyond 50km of project site
 - No EMISFACT scalars

FAR EMISFACT Scalars

- Goal: Estimate maximum allowable emissions
 - Download actual annual average emissions from EPA web site
 - Apply EMISFACT scalar for FAR sources within 50km of project site
 - Vary by averaging time (1, 3, 24-hour, and annual)
 - Vary by distance within 50 kilometers
 - No EMISFACT scalar beyond 50km of project site. Rationale:
 - Various atmospheric removal processes (chemical transformation, deposition, gravitational settling)
 - Various anticipated emission reductions (cleaner fuels, BART, CAIR, MERP)
 - General guidance in GAQM Table 9-1
 - “Other Sources” with reduced operating levels and reduced operating factors
- Calculate distance (km) between project site and each FAR facility

FAR EMISFACT Scalars

- Calculate DISTKM (distance [km] to each FAR facility)
- Calculate EMISFACT
 - $EF01HOUR = 1000.00 / DISTKM$
 - $EF03HOUR = 1000.00 / DISTKM$
 - $EF24HOUR = 500.00 / DISTKM$
 - $EFANNUAL = 100.00 / DISTKM$
- Annual Examples:
 - $EMISFACT = 2.00$ at 50.0 km
 - $EMISFACT = 20.0$ at 5.00 km
 - $EMISFACT = 200$ at 0.50 km

FAR Summary

- Relatively simple, fast, easy
 - Still under construction (work-in-progress)
- Re-compute for each project location
 - EMISFACT scalars
- Possible Improvements:
 - Post 1999 data
 - More pollutants (e.g., CO, Lead, H₂S)
 - More release heights
 - Refined scalars (e.g. by industry sector?)
- Questions?