"New Approaches to PM Inventory Evaluation and Improvement"

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Regional Planning Organizations(RPO's) have been an important component of development of air pollution planning since the mid 1980's. This role was made more clear with the successes of the Grand Canyon Visibility Commission(GCVC) and the Ozone Transport Assessment Group(OTAG) in the mid 1990's. In 1998 EPA formed 5 autonomous groups to begin addressing regional haze. These organizations include States, Tribes, and Federal Land Managers. Some RPO's have identified chemical transport modeling as a critical step in the development of a understanding of the regional haze problem. A key component of the process is the development of a quality emissions inventory from all the major components of the inventory. The inventory will be used in two important ways, first as an input to the chemical transport models and second as a SIP tracking mechanism. Usually the demands of producing a quality modeling inventory exceed the requirements of a SIP quality inventory so the remainder of this document will focus on evaluation of regional inventories for modeling.

A primary difference between regional inventories and inventories developed for local SIP planning is that there are a greater number of active users of any single state or local inventories at the regional scale. This means that to effectively and correctly use these local inventories as much information as possible must be easily accessible to all the users. Without this access to information users are likely to misinterpret and misuse the inventories. The common misuses of an inventory include:

1. Double counting or failing to count emissions because source categorization is in-correct. This is common for Commercial fuel use and light industrial solvent use.

2. Incorrect temporal allocation of emissions. This is common for sources identified as average day that might in fact be average summer weekday.

To understand how these problems can occur we must first identify the path that an individual piece of inventory data can take before it reaches a policy developers. First state inventory staff will create the inventory, often using spreadsheet programs, Next they must convert that spreadsheet data to something readable by EPA, This can include NEI inventory formats such as version 1.6 or 2.0. Next these files are transferred to a regional office or directly to EPA OAQPS. Next this inventory is transferred to EPA's contractor for incorporation into the National Emissions Inventory(NEI). The NEI is then converted back into NEI version 2.0 files for use by RPO emissions modelers. The emissions models then alter these emissions to reflect emissions on a specific day. At each step in the process data can be altered or compromised.
These are often in-advertent with consequences that might be unseen until much later in the process.

Any solution to the problems has 2 components. The first is to create transparency in the emissions inventory process so that all parties involved in the process can easily understand the following information about every emissions inventory.

Who developed the inventory(Email, Name, Organization)
What is included in the inventory(Categories, pollutants, Methods, Emission Factors, Surrogates)
What is the spatial extent and temporal extent of the inventory
When was the inventory developed and what version is it.

Empowered with this type of information an emissions inventory user can verify a suspicious emissions estimates with the inventory creator, identify alternate methodologies, or examine data gaps in the inventory. Without this data, an inventory user often must rely on simplistic range checks, per-capita emissions estimates, and “eyeballing” the totals. In the event a state appears to use an alternate method from many other organizations email address of the person responsible for making the estimate can be used to track down additional information. The type of errors found using the data above impact institutional issues with data sharing and sources of data and will most directly impact area, biogenic, and mobile sources with less impact on industrial point and electric utility.

The second solution to improving regional inventories revolves around smart identification of those errors that are most likely to result in significant errors in the chemical transport models. In the past, incorrect or missing values for all sources were identified and equal treatment was given to all sources. This lead to an over abundance of warnings and errors reported for each inventory that a state submitted with little concern for the total number of errors and effort a state might undertake to fix these problems. In the worst case historical scenario, states would remove smaller industrial point sources from their submittals because the reporting tools gave to many bad stack parameter and missing SIC code errors. Under the current paradigm those problems that are most likely to cause problems are identified and for all others that are less likely to cause problems, a default value is applied and the process moves forward. A good example of this might be incorrect stack and flow data. Often there has been little attention paid to developing quality stack parameters for small sources including those with less than 1/10 of a ton of NOX or ROG emissions per day. In the past, missing or bad data was identified and lengthy reports for these small sources were sent out. In chemical transport modeling there is usually a surface level that includes all pollution sources with plume heights less than 50 to 100 meters. The net effect of these two facts resulted in states correcting stack information only to have the changes result in no practical change in inventory quality and output. For those interested in improving inventory quality the balance between problem identification and resources to make improvements is difficult.

Tier Based Diagnostics

For the Midwest RPO the first line of defense in identification of inventory problems are emissions models. These tools are used to calculate specific day inventories based on average day inputs. Emissions models spatially and temporally resolve the inventory to whatever chemical transport models need. One of the most important tasks the emissions models do is quality assurance and visualization of emissions estimates. There are several new tools LADCO uses to identify problems in the inventory. The first are the new “Tier” based reporting schemes in the new point and area source models. These reports identify problems with the inventory and place them in reports based on the importance of that problem. Additionally sources with large emissions mass are printed higher in the report than lower emissions sources. Each test is assigned to a tier. The tiers are classified as follows:

Tier 1. **Severe problems** likely to cause emissions mass to be lost.
Example: No SCC codes, No State or County ID

Tier 2. **Important problems** likely to cause emissions to be altered significantly, but which will be applied a default value to mitigate the loss of emissions
Examples: Missing Temporal data, Coordinate Missing, No default stack parameter data available, or No facility/stack/process ID.

Tier 3. **Moderate Problems** that do not change emissions mass but might impact modeling results.
Examples: Stack parameter problems. Minor coordinate problems

Tier 4. **Minor problems** that will not result in emissions loss and probably not directly effect the emissions modeling process but could make it difficult to understand the output
Examples: Bad SIC Code, Stack parameter out of range

In general LADCO does not continue with a run as long as there are Tier1 and Tier2 errors in our own states. As we move further away from our receptor regions we relax those requirements. We examine the Tier 3 and Tier 4 errors for signs of potentially larger problems but we do not attempt to solve them unless they indicate a bigger issue.

Additionally EMS-2001 generates various emissions reports intended for World Wide Web publication. These reports are included as Attachment A and include state, county, and SCC based reports as well as per-capita reports by state and county.

Advanced Stack Diagnostics.

Another Tool LADCO uses to identify inventory problems is the Advanced Sack Diagnostics Tool (ASD). The model is the result of years of inventory evaluation and codified heuristic tests. If we define Heuristic as: Pertaining to the use of the general knowledge gained by experience, sometimes expressed as "using a rule-of-thumb." The test in the ASD are not black or white rules but indicators of potential problems that will impact the modeling. The successful design of the ASD resulted in a significant number of sources identified that are incorrect and need repair. The method is necessitated by the demands of states who became tired of long reports of errors where most records were actually correct or identified insignificantly small sources. The tool uses several "rules of thumb" The first is to order all errors from largest emitting sources to smallest and the second is to generate reports with no more than 20-30 records per state per error. Here is an outline of the reports ASD generates. Since the conference this report will be presented at is in Atlanta, We will examine the Georgia report.

Report 1 and 2.(Attachment B) is a list of the Largest NOX and ROG sources in the state. States would use this report to verify that the largest sources identified in the report are correct. This report can be used to identify sources which appear on the list but are low emitters and those that are high emitters but are not on the list.

Report 3. Automated stack repair. This report identifies those sources that were “fixed” by the ASD stack repair utility. The utility examines sources with short stack heights less than 33 meters where the effective plume height is greater than 100 meters. For all sources where NOX and ROG emissions sum to less than 1 ton per day the stack parameters are adjusted to put that source into the surface layer when it fails 2 or more of the following tests.

1. Emissions/flow greater than 20 grams / SCFM (EGU=40)
2. Emissions/flow less than .5 grams / SCFM
3. Calculated flow rate 20% different from the reported flow
4. Velocity greater than 100 feet/ second (EGU=140)
5. Flowrate greater than 1 million SCFM (EGU=3 million)
6. Plume Height greater than 3 times stack height

There are different tests for Electric Generating Utilities(EGU’s) listed in parenthesis. The report summarizes the number of sources corrected and the tests that they failed. The results for Georgia are very good since only 2 stacks in the entire states failed 2 tests and amounted to only .05 Tons per day.

Report 4 examines large sources with low effective plume heights. In general most permitting processes should not allow sources to emit large quantities of emissions to sources with low effective plume heights. This report can indicate a large source with bad stack parameters or a small source which has bad emissions estimates and has more mass than it should. In the past this report has shown many examples of state emissions estimates that have been modified from small numbers < 40 kilograms per day to over 40 Tons/Day.

Report 5. Shows large sources within 500 meters of the county centroid. This is due to historical practice of putting sources in the county centroid when facility coordinates were bad or missing. The result of this is to concentrate emissions at one point instead of spreading them out like the occur in reality.

Report 6. Stack not located within county of FIPS code. This problem identifies those sources where the source appears to be outside the county by more than 500 meters. The 500 meter buffer is given so that minor errors due to map projection and differences in county coverage quality do not result in mis-labeling as problem sources.

Report 7 shows the use of invalid SCC codes. SCC codes are critical to the emissions modeling process because they are the basis of many of the temporalization and speciation steps within the emissions models. If a state chooses to invent SCC codes they must understand that there are consequences within the emissions modeling process.

As you can see from the reports, It is not possible to construct reports that are both comprehensive and concise reports but a balance can be made whereby there are a limited number of problems identified while still assuring the biggest problems do get fixes. You can find reports for all the states at www.ladco.org/emis/asd2/index.html

Future Plans

In the future we will need to examine more heuristic methods to identify problems so that limited state resources can be used wisely to improve inventories and make them transparent to most potential users. In the future we will be looking to RPO's, states, and tribes to include more information that will make it easier for those far removed from their own inventory development process to understand their data, methods, and contact information. At LADCO that debate has included discussion of building a simple grading scheme for state point, area and mobile source data. This scheme would give more points to a state for including more data about their methods and data. Each additional piece of data would be weighted based on the emissions mass of the source so that improved data for a high emitting source would result in higher points scored than improvements at low emitting sources. So here's how the system would work for area sources. Each source would be tested in 3 areas, modeling inputs, methods/contact data, and raw data and inputs. Each broad group would count roughly equal.

- Modeling Inputs
    - SCC Code Correct 10%
    - All Emission source categories included, Completeness 10%
    - Temporal data (Days/Week, Hours/day, monthly Profiles included) 13%
- Methods/Contact Data
    - Document including page number for estimation method(AP42 Page12-4)10%
    - Email address for inventory preparer(Not supervisor) 13%
    - Emissions Calculations Equation 10%
- Raw Data
    - Emission factor 10%
    - Emission factor units 8% (example: lb/person/year)
    - Surrogate data used (Population)8%
    - Surrogate units 8%(HP hours/year)
    - Additional credit for additional background data(HP hours/vehicle etc.)

Each record in the inventory would be graded from 0% to 100% based on the fractions listed above. And then a weighted average by pollutant would be given for the entire inventory. These scores would then be assigned a ranking of Excellent, Good, Average, Poor based upon state and RPO/state/tribe consultation. Finally and most importantly, the system would provide automated guidance on where a state might improve their inventory to most quickly improve their score. This might take the form of written statements such as.

1. Including emission factor and surrogate data for Commercial Consumer solvents(SCC=2402001000) would improve the score for that category by 23% and improve your overall score by 2%.

2. Including temporal data and email contact address for Marine Vessels, Pleasure Craft (SCC=2282005010) would improve your score for this category by 26% and improve your overall score by 5%.

We think it is critical to give states a priority list of areas that could be improved. So that they can be directed to those areas that would most quicky improve their score and more importantly provide more transparency into the emissions development process.

Attachment A.

Point Source Emissions by State
Utility Sources are all records with SCC = 101XXXXX or 201XXXXX
File Used For Summary: ems_run.ptemis
Date: 960719 Case: unified_96_netv4

State FIPS ID	State	ROG Utility Emissions (Tons/Day)	ROG Non-Util Emissions (Tons/Day)	ROG Total Emissions (Tons/Day)	NOX Utility Emissions (Tons/Day)	NOX Non-Util Emissions (Tons/Day)	NOX Total Emissions (Tons/Day)
1	Alabama	3.208	271.53	274.73	703.90	259.38	963.28
5	Arkansas	2.440	57.91	60.35	174.13	102.15	276.28
9	Connecticut	1.396	36.01	37.41	46.36	149.04	195.39
10	Delaware	0.442	25.45	25.89	50.89	32.01	82.89
11	District of Columbia	0.070	0.00	0.07	1.10	0.94	2.04
12	Florida	8.082	50.90	58.98	887.57	120.22	1007.79
13	Georgia	3.190	88.70	91.89	592.14	172.16	764.30
17	Illinois	5.990	528.03	534.02	874.23	366.12	1240.35
18	Indiana	4.957	135.56	140.52	1042.45	173.94	1216.38
19	Iowa	1.623	37.76	39.39	228.99	71.79	300.78
20	Kansas	3.625	73.98	77.61	298.62	241.22	539.84
21	Kentucky	3.792	186.54	190.34	1092.51	96.58	1189.08
22	Louisania	5.460	375.58	381.04	305.32	804.05	1109.37
23	Maine	0.081	14.91	14.99	3.22	42.65	45.87
24	Maryland	2.005	26.60	28.61	327.43	67.07	394.50
25	Massachusetts	2.564	32.50	35.06	114.60	52.38	166.98
26	Michigan	3.680	242.31	245.99	557.20	322.71	879.91
27	Minnesota	1.715	120.32	122.04	245.67	204.46	450.12
28	Mississippi	2.330	115.87	118.20	206.28	224.67	430.95
29	Missouri	3.929	174.18	178.11	582.31	72.02	654.33
31	Nebraska	1.051	30.54	31.59	149.99	35.20	185.19
33	New Hampshire	0.463	18.86	19.32	51.28	14.00	65.28
34	New Jersey	13.438	270.80	284.24	220.11	140.21	360.32
36	New York	6.310	161.89	168.20	346.00	208.42	554.42
37	North Carolina	2.689	267.99	270.68	889.89	190.12	1080.01
38	North Dakota	2.240	0.80	3.04	290.08	16.96	307.04
39	Ohio	5.394	292.48	297.87	1573.73	292.49	1866.23
40	Oklahoma	3.921	159.75	163.68	289.29	321.39	610.68
42	Pennsylvania	4.210	10.52	14.73	747.73	129.32	877.05
44	Rhode Island	0.050	18.52	18.57	0.59	2.40	2.99
45	South Carolina	1.233	126.21	127.44	372.54	129.60	502.14
46	South Dakota	0.250	3.14	3.39	55.38	1.85	57.23
47	Tennessee	3.176	366.16	369.34	804.44	282.17	1086.61
48	Texas	23.139	625.26	648.40	1252.68	1088.59	2341.27
50	Vermont	0.048	4.32	4.36	1.30	1.70	3.00
51	Virginia	2.057	218.37	220.42	323.46	233.07	556.53
54	West Virginia	2.810	49.30	52.11	771.15	157.05	928.20
55	Wisconsin	2.278	176.36	178.64	295.07	153.31	448.38
75	Canada	0.000	0.00	0.00	0.00	0.00	0.00
99	Off Shore	0.000	0.00	0.00	0.00	0.00	0.00
		===========	============	==========	===========	============	==========
		135.334	5395.93	5531.27	16769.60	6973.39	23743.00

ROG Emissions by ASCT Code for the OTAG Modeling Domain
ASCT Descriptions Have Been Truncated For Space Considerations.

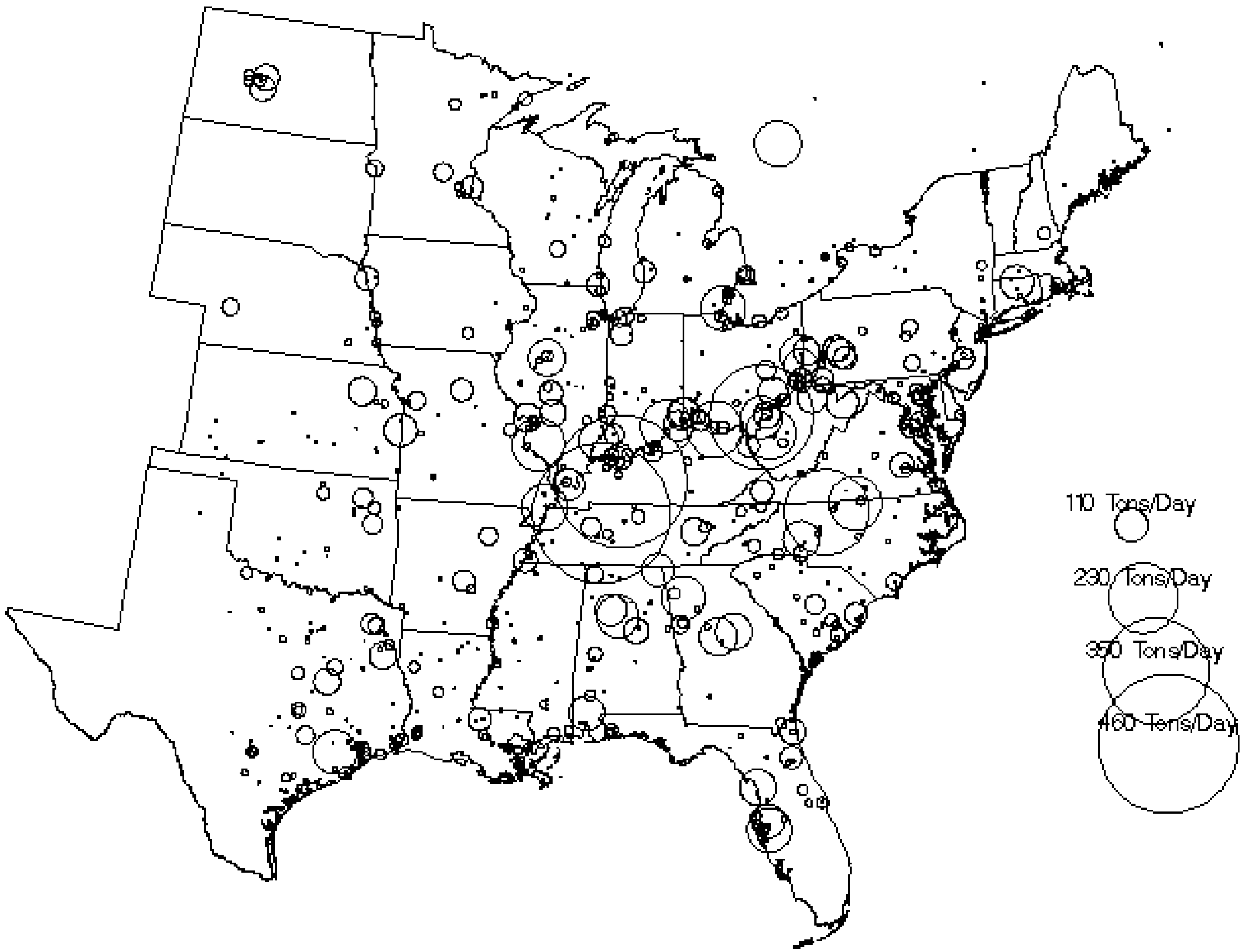
OBS	SCC_W_O_A	Emission Estimate (Tons per Day)	Major ASCT Description	Submajor ASCT Description	Minor ASCT Description	Subminor ASCT Description
1	2101004000	0.0069	Stationary Source Fu	Electric Utility	Distillate Oil	
2	2101004001	0.0001	Stationary Source Fu	Electric Utility	Distillate Oil	
3	2101006001	0.0002	Stationary Source Fu	Electric Utility	Natural Gas	
4	2101010000	0.0005	Stationary Source Fu	Electric Utility	Process Gas	
5	2102001000	0.0037	Stationary Source Fu	Industrial	Anthracite Coal	
424	2810001000	1260.4564	Miscellaneous Area S	Other Combustion	Forest Wildfires	
425	2810003000	0.0022	Miscellaneous Area S	Other Combustion	Cigarette Smoke	
426	2810005000	192.9109	Miscellaneous Area S	Other Combustion	Managed Burning, Slash - (Use	
427	2810010000	1.4131				
428	2810015000	32.2702	Miscellaneous Area S	Other Combustion	Managed Burning, Prescribed	
429	2810025000	3.1201	Miscellaneous Area S	Other Combustion	Charcoal Grilling	
430	2810030000	41.4305	Miscellaneous Area S	Other Combustion	Structure Fires	
431	2810035000	0.0034	Miscellaneous Area S	Other Combustion	Firefighting Training	
432	2810050000	0.0677	Miscellaneous Area S	Other Combustion	Motor Vehicle Fires	
433	2810060000	0.3633				
434	2830000000	11.2101	Miscellaneous Area S	Catastrophic/Accidental Releases	All Catastrophic/Accidential	
435	2830001000	0.1018	Miscellaneous Area S	Catastrophic/Accidental Releases	Industrial Accidents	
436	2850000010	0.1569	Miscellaneous Area S	Health Services	Hospitals	

Vehicle Miles Traveled (VMT) by State
File Used For Summary: ems.mvonoff

State FIPS ID	State	Off Network VMT	On Network VMT	Total VMT
1	Alabama	140385653.57	0	140385653.57
5	Arkansas	75989420.38	0	75989420.38
9	Connecticut	76795593.40	0	76795593.40
10	Delaware	20921640.38	0	20921640.38
11	District of Columbia	9050759.17	0	9050759.17
12	Florida	217662999.73	0	217662999.73
13	Georgia	243280615.43	0	243280615.43
17	Illinois	264018457.79	0	264018457.79
18	Indiana	180749442.31	0	180749442.31
19	Iowa	73370096.33	0	73370096.33
20	Kansas	70306110.39	0	70306110.39
21	Kentucky	116237339.10	0	116237339.10
22	Louisania	103973839.90	0	103973839.90
23	Maine	34983275.64	0	34983275.64
24	Maryland	126064291.30	0	126064291.30
25	Massachusetts	136350780.49	0	136350780.49
26	Michigan	246236572.51	0	246236572.51
27	Minnesota	121369056.24	0	121369056.24
28	Mississippi	83418837.51	0	83418837.51
29	Missouri	166377178.98	0	166377178.98
31	Nebraska	42332498.05	0	42332498.05
33	New Hampshire	29989385.54	0	29989385.54
34	New Jersey	170138291.10	0	170138291.10
36	New York	323831365.91	0	323831365.91
37	North Carolina	215448016.94	0	215448016.94
38	North Dakota	18303361.28	0	18303361.28
39	Ohio	281380712.13	0	281380712.13
40	Oklahoma	107450682.57	0	107450682.57
42	Pennsylvania	263790682.80	0	263790682.80
44	Rhode Island	19433157.36	0	19433157.36
45	South Carolina	108508214.98	0	108508214.98
46	South Dakota	20170415.36	0	20170415.36
47	Tennessee	159497152.91	0	159497152.91
48	Texas	443392772.61	0	443392772.61
50	Vermont	17400232.32	0	17400232.32
51	Virginia	194618273.57	0	194618273.57
54	West Virginia	48292695.88	0	48292695.88
55	Wisconsin	144069889.64	0	144069889.64
75	Canada	310967971.20	0	310967971.20
99	Off Shore	0.00	0	0.00
		=============	==========	=============
		5426557732.68	0	5426557732.68

Circle Plot of NOX Sources

CASE: unified12k.960719



Created with EMS-2001 on February 4,2002

Attachment A.

Report 1:EMS-2000 Adv. Stack Diagnostics, Top 20 Largest NOX sources in the State of georgia
Verify that these totals are correct, and that none are missing
State total emissions are 766 Tons/Day NOX and 94 Tons/Day ROG
A complete list of all sources summarized by this report are in georgia_long.lst
State = georgia State FIPS = 13

OBS	STID	CYID	FCID	NAME	NOX TONS/DAY	ROG TONS/DAY
1	13	15	0011	GA POWER CO: BOWEN	145.14	0.80
2	13	207	0008	SCHERER	124.85	0.95
3	13	237	0008	HARLLEE BRANCH	120.03	0.34
4	13	149	0001	GA POWER CO: WANSLEY	58.08	0.35
5	13	115	0003	HAMMOND	38.07	0.15
6	13	77	0001	YATES	34.79	0.21
7	13	151	0025	TRANSCONTINENTAL GAS PIPE LINE	20.21	0.58
8	13	67	0003	GA POWER CO: MCDONOUGH	19.08	0.12
9	13	51	0007	UNION CAMP CORP	18.86	6.27
10	13	103	0003	MCINTOSH	12.52	0.04
11	13	51	0006	KRAFT	12.22	0.08
12	13	21	0002	ARKWRIGHT	11.87	0.04
13	13	39	0001	GILMAN PAPER CO ST MARYS KRAFT	10.61	3.61
14	13	95	0002	MITCHELL	10.38	0.03
15	13	245	0006	INTERNATIONAL PAPER CO	9.17	1.70
16	13	99	0001	GREAT SOUTHERN PAPER WOODLANDS	9.02	2.90
17	13	51	0010	STONE CONTAINER CORP	8.37	1.40
18	13	305	0001	ITT RAYONIER INC	4.92	0.77
19	13	127	0003	BRUNSWICK PULP & PAPER CO	4.61	2.80
20	13	153	0003	MEDUSA CEMENT CO	4.35	0.04
					========	========
					677.15	23.18

Report 1:EMS-2000 Adv. Stack Diagnostics, Top 10 Largest ROG sources in the State of georgia
Verify that these totals are correct, and that none are missing
State total emissions are 766 Tons/Day NOX and 94 Tons/Day ROG
A complete list of all sources summarized by this report are in georgia_long.lst
State = georgia State FIPS = 13

OBS	STID	CYID	FCID	NAME	NOX TONS/DAY	ROG TONS/DAY
1	13	51	0007	UNION CAMP CORP	18.86	6.27
2	13	121	0364	FORD MOTOR-ATLANTA ASSEMBLY PL	0.06	5.09
3	13	39	0001	GILMAN PAPER CO ST MARYS KRAFT	10.61	3.61
4	13	99	0001	GREAT SOUTHERN PAPER WOODLANDS	9.02	2.90
5	13	127	0003	BRUNSWICK PULP & PAPER CO	4.61	2.80
6	13	193	0013	WEYERHAEUSER COMPANY FLINT RIV	3.54	2.62
7	13	121	0021	OWENS CORNING	1.62	2.32
8	13	115	0021	INLAND PAPERBOARD & PACKAGING:	3.10	1.98
9	13	127	0002	HERCULES INC	2.28	1.90
10	13	21	0001	RIVERWOOD INTERNATIONAL	3.84	1.86
					========	========
					57.54	31.35

The Model will re-assign these elevated stacks to the surface layer if the Active-ASD processor is run
(all have less than 1 TPD NOX, stack height less than 33 Meters(108 feet) and a plume height greater than 100 meters)
A complete list of all sources summarized by this report are in georgia_long.lst 16:31 Tuesday, July 3, 2001
State = georgia State FIPS = 13

OBS	FIPS State	STNAME	Number Of Stacks	Number of Failed Tests	Tests Failed	NOX TONS/DAY	ROG TONS/DAY
1	13	Georgia	2	2	e H	0.05	0.03
			=========			========	========
			2			0.05	0.03

NON-EGU Tests E=Emis/flow > 20 G Nox/acfm e= Emis/flow < .5 G NOX/ACFM C=calculated flow rate Problem V=Velocity gt 100 ft/sec
F=Flow rate > 1000000 ACFM H = Plume height 3X stack height
EGU Tests E=Emis/flow > 40 G Nox/acfm e= Emis/flow < .5 G NOX/ACFM C=calculated flow rate Problem V=Velocity gt 140 ft/sec
F=Flow rate > 3000000 ACFM H = Plume height 3X stack height

Report 4:EMS-2000 Adv. Stack Diagnostics, Large sources with low effective plume heights. (all >1 TPD)
Problems might include bad emissions estimates or stack parameters
State = georgia State FIPS = 13

OBS	CYID	FCID	NAME	STKID	NOX TONS/DAY	ROG TONS/DAY	DIAM (FEET)	HEIGHT (FEET)	TEMP F	CALCULATED ACFM	FLOW VELOC FEET/SEC	REPORTED ACFM	FLOW Estimated Plume Heit (Meters)
1	151	0025	TRANSCONTINENTAL GAS PIPE LINE	01	20.21	0.00	1.94	25.00	665	177	0.9995	177	10.0519
2	245	0006	INTERNATIONAL PAPER CO	7	7.83	0.00	17.50	199.00	385	7247	0.5022	7247	90.9036
3	51	0010	STONE CONTAINER CORP	1	6.60	0.00	15.00	250.00	300	5324	0.5022	5324	96.7788
4	121	0364	FORD MOTOR-ATLANTA ASSEMBLY PL	01	0.00	5.09	50.00	35.00	800	16666	0.1415	16666	88.9735
5	121	0401	BLUE CIRCLE CEMENT - ATLANTA P	01	3.21	0.00	0.66	9.84	72	269	13.1200	269	3.1432
6	99	0001	GREAT SOUTHERN PAPER WOODLANDS	8	3.20	0.00	12.00	200.00	390	3979	0.5863	3979	80.4025
7	127	0004	MCMANUS	001	2.62	0.00	9.10	185.00	300	267	0.0683	267	58.5716
8	39	0001	GILMAN PAPER CO ST MARYS KRAFT	11	2.58	0.00	8.50	175.00	175	1996	0.5863	1996	59.6687
9	245	0002	PCS NITROGEN FERTILIZER INC	7	2.57	0.00	1.70	104.00	80	164	1.2050	164	31.9157
10	99	0001	GREAT SOUTHERN PAPER WOODLANDS	7	2.46	0.00	12.00	200.00	390	3979	0.5863	3979	80.4025
11	39	0001	GILMAN PAPER CO ST MARYS KRAFT	6	2.44	0.00	7.00	120.00	160	1160	0.5022	1160	40.4070
12	121	0021	OWENS CORNING	01	0.00	2.32	0.66	9.84	72	269	13.1200	269	3.1432
13	39	0001	GILMAN PAPER CO ST MARYS KRAFT	2	2.18	0.00	7.00	120.00	156	1160	0.5022	1160	40.2999
14	127	0003	BRUNSWICK PULP & PAPER CO	8	2.13	0.00	12.00	181.00	350	3408	0.5022	3408	71.4205
15	153	0003	MEDUSA CEMENT CO	4	2.08	0.00	7.00	209.00	230	1613	0.6985	1613	70.6146
16	21	0001	RIVERWOOD INTERNATIONAL	7	2.06	0.00	10.00	300.00	175	2763	0.5863	2763	99.5139
17	55	0001	RIEGEL TEXTILE DIV MOUNT VERNO	001	1.96	0.00	5.00	132.00	125	535	0.4545	535	41.8026
18	211	0013	MADISON PLYWOOD	01	0.00	1.80	6.30	88.00	150	16666	8.9107	16666	53.0384
19	153	0003	MEDUSA CEMENT CO	6	1.77	0.00	10.00	120.00	250	3102	0.6583	3102	48.6245
20	121	0185	PRINTPACK, INC.	01	0.00	1.65	2.60	35.00	350	318	0.9995	318	13.4194
21	121	0021	OWENS CORNING	01	1.62	0.00	0.66	9.84	72	269	13.1200	269	3.1432
22	175	0004	SOUTHEAST PAPER MANUFACTURING	1	1.62	0.00	10.00	155.00	280	2763	0.5863	2763	59.2487
23	251	0008	KING FINISHING CO DIV SPARTAN	3	1.61	0.00	5.00	48.00	500	592	0.5022	592	19.9334
24	157	0014	JM HUBER CORPORATION	01	0.00	1.60	6.00	45.00	254	1696	0.9995	1696	21.4711
25	59	0059	UNIVERSITY OF GEORGIA CENTRAL	01	1.60	0.00	0.66	9.84	72	269	13.1200	269	3.1432
26	87	0002	IMC AGRIBUSINESS INC	2	1.59	0.00	3.00	100.00	185	511	1.2050	511	32.8891
27	233	0029	KIMOTO TECH, INC.	01	0.00	1.52	0.66	9.84	72	269	13.1200	269	3.1432
28	305	0001	ITT RAYONIER INC	13	1.47	0.00	8.00	258.00	450	1515	0.5022	1515	88.8199
29	39	0001	GILMAN PAPER CO ST MARYS KRAFT	1	1.46	0.00	7.00	275.00	400	1160	0.5022	1160	91.6488
30	95	0022	MERCK & CO INC	4	1.43	0.00	8.00	159.00	425	1515	0.5022	1515	58.3458
					========	========							
					78.30	13.98							

Report 7:EMS-2000 Adv. Stack Diagnostics, Use of Invalid SCC Codes by georgia 16:31 Tuesday, July 3, 2001 13
Sources using invalid SCC codes are likely to get bad speciation or temporal factors
Bad speciation can result in loss of %80 of photochemical effectiveness of sources emissions
State = georgia State FIPS = 13

OBS	STID	SCC_W_O_A	# of Processes	NOX	ROG
1	13	30800899	6	0	0
				===	===
				0	0