Detailed Step by Step Analysis of

Nonroad Emissions Inventory Data Compiled for the 2008 ozone NAAQS Maintenance SIP (for an overview see document “Nonroad mobile sources Overview of Method and Files” instead of this)

Emissions for Nonroad Mobile Sources (not including locomotives, aircraft, and shipping) can now be estimated using the MOVES model. The newest version of MOVES available today is MOVES2014a which builds upon MOVES2014’s expansion into a NONROAD option by including further non road features, including updated allocations. In this readme file is a description of the methodology and the files included in the Appendix of the SIP that involves the non-road sector (not including locomotives, aircraft, and shipping).

After clicking on the folder for the Appendix addressing nonroad (folder A7), one will see the following folders and files:

1. “Inputfiles”: MOVES2014a’s new features are more advanced than any local data available for this sector so the model was run with national defaults with only one exception. Meteorology from Hartsfield Jackson International Airport for 2014 was collected. When clicking this folder you will see an input MOVES database titled “nrjananydaysipscc2014\_in”. When using the MOVES runspecs we provided, this input database will be accessed when the run is executed in MOVES non-road for 2014 emissions. For 2030, there are input databases “nrjananydaysipscc13cnty” and “nrjananydaysipscc2cnty” that contain fuel supply/formulation tables as well. It was intended to address issues with “Georgia Gasoline” removal which after 2016 would vary across the 15 county NAA.
2. “MRSFILES”: Click on this folder and there are 36 monthly runs. As you can see from viewing the run specifications, all vehicle types, fuel types, daytypes and one single month were chosen for years 2014 and 2030. In the case of 2014, all 15 counties could be including in one MOVES runspec because there is no variation in fuel. For 2030, separate runs were required between the 13 and 2 county areas so there are double as many MOVES runspecs for 2030 (12 for 2014 for each month, 24 for 2030 for each month and county area). MOVES2014a nonroad runs’ lowest time resolution is “Days”.
3. “Outputfiles”: Contains the output databases “nranydayforsipscc15cnty2030\_out” and “nranydayforsipscc2014\_out2” which include all of the output from all 36 MOVES runs (12 for 2014 and 24 for 2030).
4. “ScriptsandQueries”: Click on this folder and there is a list of MySQL queries available to use:
   1. “AnnualPollutantTotalByCounty2014.qbquery”/ “AnnualPollutantTotalByCounty2030.qbquery”: with the output database supplied in this package, provides annual emissions total by county for each year from “emissions” table, one for 2014 data, the other for 2030
   2. “AnnualPollutantTotalByCountyandSCC2014.qbquery”/ “AnnualPollutantTotalByCountyandSCC2030.qbquery”: same as above except splits down to county and SCC level
   3. “AnnualPollutantTotalBySCC2014.qbquery”/ “AnnualPollutantTotalBySCC2030.qbquery”: same as above except splits just down by SCC, aggregated over the whole 15 county area
   4. “createemissionstable2014.sql/”createemissionstable2030.sql”: This is for your information only. This will not be needed for review. Final calculations already in the output database. This MySQL script creates a table in the output file that allows one to upload post processed non-road data that was converted from emissions by day to annual. One for 2014, other for 2030. See section 4c.below for more details.
   5. “RawOutputFileEmisByYrCntyPolMthDaySCC2014.qbquery”/ “RawOutputFileEmisByYrCntyPolMthDaySCC2030.qbquery”: To obtain raw output from the MOVES runs, this provides data all the way down to county, SCC, month and day type. This is needed to extract and put in excel/.csv file for post processing (need to do that to go from day resolution to month and annual and have it in ready to use excel format). One for 2014, other for 2030. For more details see section 4a below.
   6. “UploadAnnualDataforfinalanalysis2014.sql”/ “UploadAnnualDataforfinalanalysis2030.sql”: This is for your information only. This will not be needed for review. Final calculations already in the output database. This script takes the post processed data that is in .csv format and puts it into the new “emissions” table in the output database. One for 2014, other for 2030. See section 4c. below for more details.
   7. “JulyweekdayPollutantTotalByCounty2014.qbquery”/ “JulyweekdayPollutantTotalByCounty2030.qbquery”: with the output database supplied in this package, provides typical summer July weekday emissions total by county for each year from “emissions” table. One for 2014, other for 2030. Notice in the script how results are divided by 22 (since the numbers are monthly totals for whole month of July for all weekdays and there are 22 weekdays)
   8. “JulyweekdayPollutantTotalByCountyandSCC2014.qbquery”/ “JulyweekdayPollutantTotalByCountyandSCC2030.qbquery”: same as above except splits down to county and SCC level. One for 2014, other for 2030. “JulyweekdayPollutantTotalBySCC2014.qbquery”/ “JulyweekdayPollutantTotalBySCC2030.qbquery”: same as above except splits just down by SCC, aggregated over the whole 15 county area. One for 2014, other for 2030.
5. Additional Files below the “ScriptsandQueries” folder: To obtain annual emissions and monthly totals from the output databases, since both weekday and weekends were analyzed, and to have it ready for the SIP in Excel format, there was an extra procedure conducted and the additional files here were involved in this process. The data was first extracted through MySQL queries and scripts in the “ScriptsandQueries” folder, but these additional files address analysis that was conducted in Excel. The procedure was as follows (files in the “ScriptsandQueries” folder highlighted in red, files outside and below the “ScriptsandQueries” folder highlighted in blue):
   1. Obtain raw data from output databases using “RawOutputFileEmisByYrCntyPolMthDaySCC2014.qbquery” and “RawOutputFileEmisByYrCntyPolMthDaySCC2030.qbquery “, and then exporting it to Excel using MySQL Query Browser or Workbench. This is at day resolution, aggregated emissions processes.
   2. Open the “nremisoutputbydaysumtomonth2014.xlsx” and “nremisoutputbydaysumtomonth2030.xlsx” files: This shows how we took the daily emissions and converted it to monthly emissions by SCC, county, month, and daytype (weekday/weekend) and then summed to annual overall emissions over the 15 county area (just annual for the total overall region, emphasis here was getting monthly values) after removing the three SCCs that do not belong in this category (SCC=2265008005, 2267008005, and 2270008005). This is the template for what would be done eventually in the MySQL environment with day emissions aggregated to month. The aggregation is executed with the list of months and number of weekdays and weekends in each month in columns L to P of the “DaySummedtoMonthly” worksheet (tab) for each file. For instance “20302” for month 1 means year 2030, daytype 2 (weekend, it would be 5 for weekday) for January (month 1).
   3. We then took the monthly aggregated data from the two Excel files in step b, created “nremissionsbysccforsipmysql2014.csv” and “nremissionsbysccforsipmysql2014.csv”, and uploaded the information from this file by day and month and county back into MySQL. This was achieved by first:
      1. Creating a new table in each of our output databases in the “Outputfiles” folder through the scripts titled “createemissionstable2014.sql” and “createemissionstable2030.sql”
      2. Then taking the data from “nremissionsbysccforsipmysql2014.csv” and “nremissionsbysccforsipmysql2030.csv”, converting it into MySQL format and placing it into our output databases as “emissions2014” and “emissions2030” tables using the scripts: “UploadAnnualDataforfinalanalysis2014.sql” and “UploadAnnualDataforfinalanalysis2030.sql”.
   4. Now in the MySQL environment, created the queries described in section 4 described above to produce final emissions totals by SCC, county, annual, or monthly for use in the SIP.
   5. If want to just see the results of all these queries and processes, for the emissions inventory summaries, just open the files “Maintenance SIP\_ATL\_ozone\_summary.xlsx” (July weekday) and “Maintenance SI\_ATL\_annual\_summary.xlsx” (annual). This data is provided in further detail by year (2014 and 2030 separate files) in Excel files titled “atl\_2014\_final\_annual\_sccmaintsip.xlsx” and “atl\_2030\_final\_annual\_sccmaintsip.xlsx” for annual emissions. For July weekday, there are “atl\_2014\_final\_osd\_sccmaintsip.xlsx” and “atl\_2030\_final\_osd\_sccmaintsip.xlsx”.
   6. Lastly, the meteorology data obtained from Hartsfield-Jackson International airport used in the non-road runs are located in the file “nrmeteorology.csv”

For further information, contact Gil Grodzinsky at 404-363-7123 or gil.grodzinsky@dnr.ga.gov