Detailed Step by Step Analysis of

Nonroad Emissions Inventory Data Compiled for the 2015 ozone NAAQS Maintenance SIP (for an overview chose document “Nonroad mobile sources Overview of Method and Files” instead)

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 MOVES3 which continues to use, with a few slight adjustments, MOVES2014b’s substantial updates and improvements with the NONROAD option by including further non road features, including updated allocations, growth factors, new controls, and rates. 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”: MOVES3 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 2018 was collected. When clicking this folder you will see an input MOVES database titled “2015ozonemaintenance7cnty\_in”. When using the MOVES runspecs we provided, this input database will be accessed when the run is executed in MOVES non-road for 2018 and 2033 emissions. MOVES3 allows for running all months and daytypes and even multiple years in one run (past issues with this have been resolved). So only this input database is needed along with defaults and this input database only has the meteorology data which is the only local data needed.
2. “MRSFILES”: Click on this folder and there is one run specification: 2018\_2033Nonroad2015OzoneMaintSIP.mrs. As you can see from viewing the run specifications, all vehicle types, fuel types, daytypes, months, and two years were chosen for years 2018 and 2033. MOVES3 nonroad runs’ lowest time resolution is “Days”.
3. “Outputfiles”: Contains the output databases “2015maintenancesip7county\_out” and “ 2015maintenancesip7countyallmonthsyears\_out” which include the output for July weekend emissions (“typical summer weekday”) and for annual emissions, respectively (the latter provides emissions for each month and daytype which is scaled up to one year (annual) by multiplying each daytype in a month by number of weekend days (if daytype=2) or weekdays (daytype=5) and then adding all monthly totals).
4. “ScriptsandQueries”: Click on this folder and there is a list of MySQL queries available to use:
   1. “queryannualbycntybymonthday2015ozonemaintplannonroad.sql”: with the output database supplied in this package, provides annual emissions total by county for each year from “movesoutput” table, 2018 and 2033
   2. “querybyctyallmonthdayssccfor2015ozonemaintplannonroad.sql”: same as above except splits down to county and SCC level
   3. “queryannualtotalbymthdayscc2015ozonemaintplannonroad.sql”: same as above except splits just down by SCC, aggregated over the whole 7 county area
   4. “queryannualtotalbymthday2015ozonemaintplannonroad.sql”: same as above except provides annual emissions total over whole 7 county area for each year from “movesoutput” table, 2018 and 2033
   5. “createemissionstableifneedscript.sql”: This is for your background 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.
   6. “querytypicalbycntytotalsumwkday2015ozonemaintplannonroad.sql”: with the output database supplied in this package, provides typical summer July weekday emissions total by county for each year (2018 and 2033) from “movesoutput” table.
   7. “querybycntytypicalsumwkdaysccfor2015ozonemaintplannonroad.sql”: same as above except splits down to county and SCC level (2018 and 2033).
   8. “querytypicaltotalsumwkdaysccfor2015ozonemaintplannonroad.sql”: same as above except splits just down by SCC, aggregated over the whole 7 county area (2018 and 2033).
   9. “querytypicaltotalsumwkday2015ozonemaintplannonroad.sql”: same as above except provides typical summer July weekday emissions total over whole 7 county area for each year from “movesoutput” table, 2018 and 2033.
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:
   1. Pick a script for your needs and resolution (by county, scc, both or neither for an overall emissions number) and run it in the Heidi SQL or other tool. All data will come out by month and daytype, weekend or weekday. So you will get emissions for “January, weekday”, “January, weekend”, “February, weekday”, “February, weekend”, etc. by county, scc, both, or all aggregated depending on script choice.
   2. If run script for emissions broken down by county for annual emissions will get output similar to “emissionsbycounty2018\_2033.csv”. With this data, can obtain annual emissions by county from each month day emission combination by determining the number of weekdays and weekends in the relevant month and multiplying the emission number by number of weekdays (if emission is daytype=5) and or weekend days (if emission is daytype=2) and then adding all of these together for a monthly total. Repeat for all 12 months and add together.

Note: You can use this to get typical July weekday by picking out the emissions for each county and year that link to “July (monthid= 7) and weekday(daytypeid=5). The file “emissionsbycounty2018\_2033annualandsumday.xlsx” demonstrates how to go from this data to annual and typical July summer day total emissions by county. Final annual results ready for inclusion into the SIP narrative is provided in the file “MaintenanceSIP\_ATL\_annual\_summary.xlsx” and by typical summer July weekday in the file “MaintenanceSIP\_ATL\_ozone\_summary.xlsx”.

* 1. If run script for emissions broken down by scc will get output similar to “nremissionsbysccforsipmysql2018\_2033.csv”. Similar steps as with step b except will obtain annual emissions by scc. The file “nremissionsbysccforsipmysql2018\_2033.xlsx” demonstrates how typical July weekday data is extracted from this dataset while “nremissionsbysccforsipmysql2018\_2033annual.xlsx” demonstrates the steps used in step b to go from day level emissions to annual emissions. Final typical summer July weekday emssions by scc can be found in the file “MaintenanceSIP\_ATL\_ozone\_summary.xlsx” under the “NONROAD model” tab. SCC number with the description down to “Level Four” is provided by the EPA on its websites (including the EIS system for emissions inventory). Further details on this process of filtering out emissions by SCC and providing descriptions of each SCC for typical summer July weekday is provided in “atl\_2018\_2033\_final\_osd\_sccmaintsip.xlsx” and aggregating emissions by SCC into annual emissions with detailed SCC description can be found in the file “atl\_2018\_2033\_final\_annual\_sccmaintsip.xlsx”
  2. The one local variable in the input database, meteorology, was collected from the CDO (climate data online) database from the National Climatic Data Center (part of NOAA) and is in the file “nrmeteorology2018for2015sip.csv”. The weather station used for the data was Hartsfield-Jackson Atlanta International airport.

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