

Development of Agricultural Equipment Allocation Factors for EPA's MOVES Model

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Geographic Allocation Factors for Agricultural Equipment

- Purpose
 - Review of MOVES Nonroad Equipment Spatial Allocation Factors for 2016 Modeling Platform
 - Agricultural and Construction Equipment
- Background
 - NONROAD Model Developed from National Equipment Populations
 - Surrogate Data Used to Allocate Equipment Populations to States/Counties
- MOtor Vehicle Emission Simulator (MOVES) Incorporates Nonroad Model Functionality
 - Geographic Allocation Factors for Agricultural Equipment
 - Total Acres of Crops Harvested
 - 2002 County-Level Bureau of Census
- Identify/Analyze Potential Alternatives
 - County-Level
 - Recentness
 - Better Indicator of Agricultural Equipment Population and Use?



Agriculture Sector Fuel Expenditures Data

• Farm Production Fuel Expenditure Data Available from USDA for Target Year (2016)

| | | 2016 Farm Production Expenditures: |
|---------------|----------------|------------------------------------|
| Region | State | Fuel (million \$) |
| Atlantic | North Carolina | 290 |
| | Other States | 1,100 |
| South | Arkansas | 400 |
| | Florida | 230 |
| | Georgia | 250 |
| | Other States | 600 |
| Midwest | Illinois | 480 |
| | Indiana | 300 |
| | Iowa | 660 |
| | Minnesota | 530 |
| | Missouri | 340 |
| | Wisconsin | 330 |
| | Other States | 580 |
| Plains | Kansas | 450 |
| | Nebraska | 550 |
| | Texas | 790 |
| | Other States | 980 |
| West | California | 1,120 |
| | Washington | 230 |
| | Other States | 1,090 |
| United States | | 11,300 |



Agriculture Sector Fuel Expenditures Data

Data Sources

2016 Farm Production
Expenditures

2012 Census of Agriculture – Fuel expenditures

2012 Census of Agriculture – Machinery Asset Value

2012 Census of Agriculture – Farm Sales data

2002 MOVES Allocation data

Allocation Steps

Allocate regional expenditures to state level using 2012 Census of Agriculture fuel expenditures

Alaska and Hawaii are not included in "Farm Production Expenditures" – compile and adjust fuel expenditures from the 2012 Census of Ag in order to estimate AK & HI data

Compute County Allocation Factors for each State from:

- 1. 2012 Census county fuel expenditures (where available)
- 2. Withheld counties: farm machinery asset values, or if not available, farm sales values

Use Puerto Rico and U.S. Virgin Islands county allocation percentages from 2002 MOVES

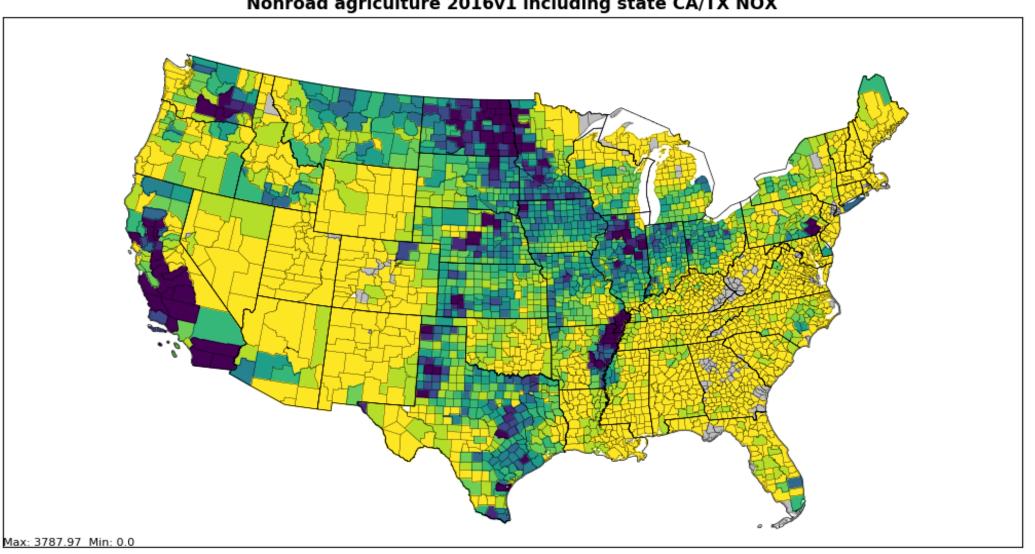
Compile all state fuel expenditure data

Use state fuel expenditure data and county allocation factors to calculate county fuel expenditure data



2016 Platform Agricultural Sector NOx Emissions

Nonroad agriculture 2016v1 including state CA/TX NOX



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