

Impact of New North American Emissions Inventories on Urban Mobile Source Emissions for High Resolution Air Quality Modeling

Junhua Zhang, Qiong Zheng, and Michael D. Moran

Air Quality Research Division, Environment and Climate Change Canada,
Toronto, Ontario, Canada

On-road motor vehicles are important sources of pollutants that affect air quality, especially in cities. As a consequence, great effort has been put into improving the estimation of the magnitude of on-road mobile emissions and their distribution in space and time. In the past decade, the U.S. EPA has developed a state-of-the-science emission modeling system called MOVES (MOtor Vehicle Emission Simulator) to estimate emissions from on-road mobile sources at the national, county, and project levels. New U.S. and Canadian national emissions inventories (NEIs) are now incorporating MOVES-based on-road mobile emissions. The newest U.S. national inventory, version 2 of the 2011 U.S. NEI, includes on-road mobile emissions from MOVES2014, the newest version of MOVES. In order to process this inventory, however, a number of changes are needed to the emissions processing system. As one example, the Source Classification Codes (SCCs) for on-road mobile sources have been completely changed and all cross-reference files have been rebuilt. For another, a new set of on-road source types, collectively called off-network emissions, has been introduced that requires a new set of spatial surrogates and temporal profiles for emissions processing. But once these technical hurdles have been overcome, it is evident that the adoption of inventories based on MOVES2014 will result in significant changes to the on-road mobile emissions fields used by AQ models. Impacts of these changes to the mobile emissions processed for New York City and Toronto, the largest cities in the U.S. and Canada, respectively, will be discussed and compared.