



Project Summary

The 1985 NAPAP Emissions Inventory: Overview of Allocation Factors

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This report documents the development of temporal, spatial, and species allocation factors for the 1985 NAPAP anthropogenic point and area source emissions inventories. These allocation factors are used to apportion annual emissions totals into gridded, hourly, speciated emissions estimates suitable for use as input to atmospheric transport models such as the Regional Acid Deposition Model (RADM).

Allocation factors are statistical representations of the spatial and temporal distribution of annual emissions, or representative speciation profiles for particular source types. Factors are generally applied to NAPAP annual emissions records on the basis of point source SCC or NAPAP area source category.

The temporal, spatial, and species allocation factors are discussed in detail in separate report sections. Each section contains a description of the methodology for application of the factors, a discussion of data sources, and documentation of the activities undertaken to create the allocation factor data sets used in the 1985 NAPAP resolved modeling inventories.

This Project Summary was developed by EPA's Air and Energy Engineering Research Laboratory, Research Triangle Park, NC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Temporal Allocation Factors

In support of modeling applications, the annual emissions totals must be resolved temporally into 24 hourly totals for a typical weekday, Saturday or Sunday in each of the four seasons of the year. To accomplish this resolution, the NAPAP temporal allocation factors were developed.

Temporal factors were created for U. S. point and area source emissions categories in the NAPAP inventories. Factors for the 1985 NAPAP inventory were derived primarily from temporal factors developed for the 1980 NAPAP effort. They reflect data from a variety of sources, which include previous modeling studies, as well as enhancements deemed necessary as part of the ongoing development of the NAPAP inventories.

Factors were developed for each of the 102 area source categories reported in the 1985 inventories. In most cases, temporal allocation of point source data is accomplished using operating schedule information provided with the emissions records. However, given the magnitude of emissions from electric utilities, process-level (fuel and state specific) factors were developed to more accurately characterize these sources.

Efforts to enhance the accuracy of temporal allocation are ongoing. Factor normalization has eliminated summation errors which previously resulted when temporally apportioned emissions were reaggregated. Other modifications included the incorporation of data sources which enhance the accuracy of temporal allocation.

Spatial Allocation Factors

Spatial allocation factors were developed to apportion area source emissions from counties to individual grid cells as required for modeling applications. The actual spatial distribution of emissions is estimated according to the distribution of surrogate indicators. Fourteen such indicators were developed for use with the NAPAP inventory based on housing, population, and land-use data. For the 1985 NAPAP application, 6 of the 14 surrogates are used for spatial allocation.

To ensure the quality and representativeness of the spatially resolved 1985 area source inventory, extensive quality control (QC) checks were performed on the existing spatial factors. QC procedures were both data and software intensive. Data analysis focused

on evaluating spatial factors at the county level and ensuring the quality of national-, state-, and SCC-level gridded emissions totals. Software-intensive evaluations included reviewing computer code and implementing modifications to the spatial factor software for other applications. Based on the results of the QC procedures, the spatial factors and computer programs were adjusted. Once the adjustments were made, QC checks were performed to assure the quality of the modified spatial factors.

Speciation Factors

Several of the pollutants in the 1985 NAPAP annual inventory represent composites of various individual species. To accommodate RADM requirements,

annual hydrocarbon emissions estimates are split into 32 chemical species classes, annual NO_x estimates are divided into NO₂ and NO, and TSP emissions are resolved into 15 classes based on alkalinity and size fraction.

An updated EPA air emissions species manual served as the basis for the 1985 NAPAP speciation files for total hydrocarbons and particulate matter. Specific species-class assignments were developed by the National Center for Atmospheric Research (NCAR), while percentage splits for NO and NO₂ were taken from the 1980 NAPAP inventory without significant modification. Hydrocarbon species data were also used to create files for the preprocessing of VOC and THC to account for the lack of formaldehyde and methane in some NEDS emissions estimates.

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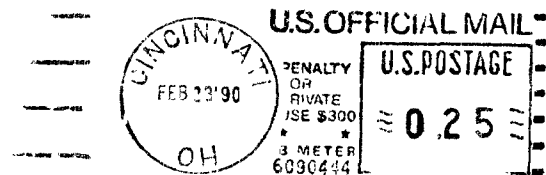
The complete report, entitled "The 1985 NAPAP Emissions Inventory: Overview of Allocation Factors," (Order No. PB 90-126 012/AS; Cost: \$23.00, subject to change) will be available only from:

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