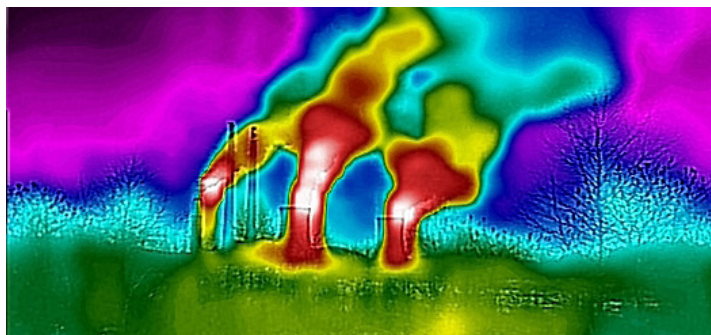


Air Quality Modeling



AECOM has successfully assisted in the development of hundreds of air quality permits for industrial facilities.

Areas of Expertise

- Regulatory Applications
- Accidental Release Modeling
- Proposed Modeling Refinements
- PSD
- Model Research and Development
- Model Evaluation
- Expert Consulting



Overview

Computer modeling of the atmospheric transport, fate and dispersion of pollutant emissions from industrial facilities is the primary tool used by regulatory agencies to determine compliance with ambient criteria and to develop individual plant and regional emissions control strategies. In today's permitting for new and modified sources, air quality modeling is very often the critical element of the air quality regulatory approval process.

AECOM's atmospheric modeling experts understand the science behind the models, and thus the limitations of the input, computer calculations and output. AECOM has the expertise to ensure that the model applications and interpretations of results are done in the context of good science, realistic assumptions, and in accordance with EPA modeling guidance.

Our Approach

AECOM provides leading-edge technical and regulatory expertise for air quality issues. For the past 50 years, we've assisted hundreds of facilities to develop and negotiate cost-saving solutions that achieve environmental compliance and meet business goals.

Our extensive experience and qualifications span all aspects of air quality modeling. Over several decades, our expert scientists have conducted modeling studies for permit applications, environmental impact statements, air toxics compliance and risk assessments.

AECOM has a long history of designing, developing, evaluating, and improving air quality models. This experience gives us a unique ability to provide expert consulting in the use and refinement of regulatory models to provide our clients with optimal strategies for their permitting needs.

AECOM experts helped to develop the following currently accepted United States Environmental Protection Agency (EPA) dispersion models, such as:

- AERMOD
- CALPUFF
- CTDMPUS
- The Buoyant Line and Point (BLP) source model
- The Offshore and Coastal Dispersion (OCD) model and others

Areas of Expertise

REGULATORY APPLICATIONS. AECOM maintains a complete library of the most advanced and scientifically accepted dispersion models for regulatory applications.

Our experience with short-range (< 50 km) modeling includes a diversity of emission sources, including tall stacks, cooling towers, building vents, tank farms, landfills, fugitive dust and indirect transportation sources, data centers, and offshore applications for wind farms. The contexts for these modeling studies include major source permitting, compliance with air toxics regulations, environmental impact assessment, and risk assessment. In these

applications, we have also developed better technology (e.g., special displays and debugging modeling information) that provide us with deep insights into the modeling results and simplify regulatory interpretation.

ACCIDENTAL RELEASE MODELING. AECOM has extensive experience in apply non-standard models in the context of accidental release and risk management planning. These application often require the consideration of models capable of handling, dense gases, jet releases, explosions, and/or evaporating liquid pools.



Air Quality Modeling *(continued)*



PROPOSED MODELING REFINEMENTS. AECOM has worked with the EPA and states to introduce the modeling refinements that are likely to reduce model overprediction bias. Some of the areas these addressed are:

- Emissions characterization, especially for intermittent cases of high emission rates.
- Source characterization techniques to account for industrial heat releases, adjacent stacks in a line, or excess moisture in plumes.
- Use of optimal meteorological data input, including prognostic meteorological data.
- For SO₂, NO₂, and primary PM_{2.5}, use of advanced AERMOD model technical features, including low wind speed options and consideration of industrial heat sources for urban-like local dispersion and liftoff effects that mitigate building downwash effects.
- For secondary PM_{2.5} and ozone, EPA guidance recommends use of photochemical grid models (e.g., CAMx) or advanced Lagrangian models such as SCICHEM for a refined Tier 2 analysis if the precursor emission rates are above the Model Emission Rates for Precursors (MERPs). However, existing modeling information can be used in a screening Tier 1 analysis even if emissions are above the MERPs.
- Selection of limited additional sources to include in AERMOD modeling, and use of actual emissions for modeling impact from background sources.
- Selection of unbiased regional background concentrations for AERMOD modeling.

MODEL RESEARCH AND DEVELOPMENT. AECOM has performed numerous air quality research and development programs for industry associations, joint government consortiums, state agencies, national labs and private industrial clients. Through both independent and sponsored research, AECOM has been in the forefront in the development, evaluation, and implementation of refined air quality models. Current areas of research include:

- Building Downwash
- NO₂ Modeling Techniques
- Highly Buoyant Plumes
- Low Wind Speed Conditions

MODEL EVALUATION. AECOM's dispersion modeling experts have also evaluated and refined state-of-the-art models. This step is critical when new modeling techniques are introduced because it ensures not only that sound science is being applied but that the advanced science actually results in improved model accuracy. AECOM has performed evaluation studies for several models, noted above, which have been adopted by EPA. AECOM has performed evaluation studies for several models (including AERMOD) which have been adopted by EPA.

EXPERT CONSULTING. AECOM has a long-standing reputation for developing and applying specialized modeling approaches to address unique situations that are not amenable to standard modeling solutions. These situations often arise when assisting a client in litigation regarding routine or accidental airborne emissions. These models address how to characterize the release rate to the atmosphere, how emissions disperse in the atmosphere and indoor

environments, physical and chemical transformations that take place during transport, and removal mechanisms that reduce airborne concentrations. In many instances, such expert consulting has led to AECOM scientists being asked to serve as expert witnesses in legal proceedings. In addition, AECOM scientists are active in the professional community, sharing these advanced techniques through technical presentations, papers and publications.

