

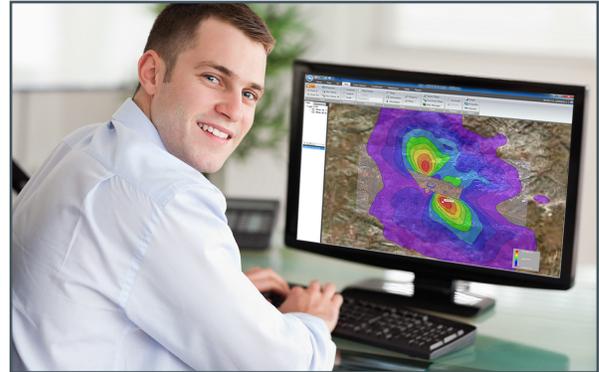
REGULATORY ASSISTANCE

> Air Dispersion Modeling

For more than 40 years, Trinity Consultants has performed air dispersion modeling for industrial facilities, utilities, and government agencies. Trinity is recognized nationally and internationally for our skills and advanced modeling software/infrastructure, enabling Trinity to formulate and conduct dispersion modeling studies for numerous applications.

With the implementation of new, state-of-the-science dispersion models, and more companies realizing the value of dispersion modeling as a planning tool to assess the feasibility of major capital projects, optimize operations, and mitigate risk, Trinity provides unparalleled expertise and service for regulatory situations as well as specialized, often technically challenging scenarios:

- > Assessing impacts of air emissions from a single site or cumulative sites to demonstrate compliance with ambient air quality standards and other air quality-related values (acid deposition, visibility, regional haze, etc.) utilizing U.S. EPA preferred models (e.g., [AERMOD](#)) and beta-version [AERCOARE](#) (the marine environment version of AERMOD)
- > Assessing impacts of offshore emissions on the air quality of coastal regions using the Offshore and Coastal Dispersion ([OCD](#)) model
- > Assessing visible plumes, icing, and fogging impacts due to high water-content air emissions using specialized models such as [FOG](#), [SACTI](#), and [CALPUFF](#)
- > Performing off-site consequence analyses for risk management planning and meeting state and local air toxic modeling requirements using EPA dispersion, fire, and explosion models included in [BREEZE Incident Analyst](#)
- > Evaluating individual and cumulative human and ecological risk, and performing probabilistic risk analyses using various modeling tools including [BREEZE Risk Analyst](#) and other risk modeling tools
- > Conducting off-site impact and deposition studies to support litigation activities
- > Performing fatal flaw analyses for siting considerations
- > Predicting the impact of roadway air emissions with [MOVES](#) and AERMOD (EPA is proposing to replace CALINE as a preferred roadway model)



- > Conducting regional modeling studies with the Community Multi-scale Air Quality ([CMAQ](#)) model and the Comprehensive Air-quality Model with extensions ([CAMx](#), a photochemical model) for regional haze analyses, control strategy evaluations, ozone/ $PM_{2.5}$ impact assessments, and inter-pollutant credit demonstrations in support of nonattainment new source review permitting
- > Conducting odor concentration modeling and predicting the effect of different abatement strategies using [SCREEN3](#), [AERSCREEN](#), AERMOD, and CALPUFF
- > Analyzing potential risks associated with release of liquefied fuel gas (LFG) and liquefied natural gas (LNG) using [BREEZE LFG Fire/Risk and Incident Analyst](#)
- > Predicting structural damage and personnel injury from the detonation of high explosives and vapor cloud explosions with [BREEZE ExDAM](#), and illustrating setup and results in powerful 3D graphs and animations
- > Processing model-ready meteorological data from surface/upper air observations as well as prognostic meso-scale meteorological models ([WRF/MM5](#)) to support to various dispersion models (AERMOD, CALPUFF, CMAQ, CAMx, OCD, etc.)

Air Dispersion Modeling Services

Trinity provides a wide range of air quality modeling consulting services for regulatory applications, emergency planning, and human health assessments.

Regulatory Air Dispersion Modeling

Trinity is a global provider of air dispersion modeling, air quality compliance services, and software solutions to regulated air emissions sources of all varieties. Trinity is a leader in the practical use of AERMOD, CALPUFF, and other dispersion models, and has developed numerous tools to aid in identifying subtle anomalies in modeled results that can often be challenged in a regulatory context.

Class I Area PSD Impact and Regional Haze Analyses

Trinity has performed numerous Class I area analyses in support of Prevention of Significant Deterioration (PSD) permit applications including PSD Class I Increment and Air Quality Related Value (AQRV) analyses, i.e., visibility and acidic deposition using CALPUFF. In addition, Trinity has completed visibility assessments using VISCREEN and PLUVUE and regional haze analyses for Best Available Retrofit Technology (BART) and Reasonable Progress evaluations in support of the Regional Haze Rule with CMAQ/CAMx. CALPUFF and CAMQ/CAMx modeling requires far more sophisticated analysis than typical near-field models. Because CALPUFF may soon be demoted by EPA as a preferred model, Trinity is increasingly using CMAQ/CAMx for BART and Reasonable Progress evaluations. CAMx has gained favor because of its superior consideration of chemical reactivity as well as other options. We are also versed in the use of SCICHEM, another possible alternative to CALPUFF.

Multi-Pathway Risk Assessment Dispersion Modeling

Trinity has assisted industry, regulatory agencies, and trade associations with technical and modeling support to conduct human health and ecological risk assessments. These projects have included National Environmental Policy Act (NEPA) projects such as coal-gasification plants, MACT residual risk assessments, risk assessments to support RCRA facility permitting for hazardous waste incineration or that utilize hazardous waste derived fuel, and other air quality assessment studies with both inhalation and ingestion pathway assessments. These specialized studies employ a combination of BREEZE AERMOD/ISC, BREEZE Risk Analyst, and other risk modeling tools to account for inhalation and ingestion pathways for maximum exposed individuals and overall population impacts.

Emergency Response Planning and Associated Acute Risks

Trinity performs many health effects impact studies for actual and potential releases of toxic and hazardous air pollutants. These studies have included emissions estimations, acute toxicity evaluations for comparison to threshold limit value-based concentration limits, cancer risk assessment, and ambient monitoring studies. Trinity's staff has considerable experience modeling emissions from accidental releases of liquid spills and spills of liquefied gases using dense gas models including DEGADIS, SLAB, ExDAM, VASDIP, and HEXFRAG. Both BREEZE Incident Analyst and BREEZE ExDAM contain a suite of agency-recognized and industry-standard models that can be utilized in various scenarios.

High Performance Computing Solutions

Trinity provides true high performance computing (HPC) solutions for models such as AERMOD and CALPUFF. The BREEZE Remote Modeling System (or BRMS), delivers runtimes up to 100 times faster (e.g., 8 hour runs reduced to 5 minutes) than standard desktop computing. The BRMS for AERMOD operates on a massively parallel computer cluster that harnesses the processing power of multiple multi-core computers. Users can submit data online, anytime, and receive email notification when model results are available. The BRMS utilizes the BREEZE AERMOD Parallel Fortran application, which produces identical results to EPA's public air dispersion model.

Model Development and Training

Since 1983, Trinity has provided market leading PC-based BREEZE® air dispersion modeling software to environmental professionals. Trinity also provides professional training courses in dispersion modeling, taught by senior-level consultants who are dispersion modeling experts. In addition, Trinity develops customized modeling applications and teaches custom courses to meet the needs of individual organizations.

Why Choose Trinity

In short, there's no better choice for your dispersion modeling needs. Our experience is multi-faceted and extensive. Our strategies are innovative, time saving, and cost-effective. Our staff and tools are the best in the business.

