



Exponent[®]
Engineering & Scientific Consulting

Jelena Popovic

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Professional Profile

Ms. Popovic has 20 years of experience in conducting meteorological and air dispersion modeling to examine the impacts of a range of pollution sources. She develops and evaluates air dispersion model components and other software used for processing and analyzing large data sets. Ms. Popovic has performed a great number of air quality modeling studies using CALPUFF and AERMOD in support of air permitting of industrial facilities. She has also provided litigation support on cases involving air quality impacts from a variety of source types including aerial spray drift, dust emissions caused by wind erosion, accidental leaks of chemicals from pipes or other structures, fugitive emission of asbestos from the industrial facility, a fertilizer decomposition following the explosion in a warehouse, as well as stacks, piles, conveyor belts and other elements and processes within industrial facilities.

She has modeled the active aeration of pesticide fumigation chambers, as well as the air emissions associated with the VOC evaporation and recovery and remediation operations in connection to a hypothetical offshore oil spills. She analyzed meteorological data for a number of clients' needs, including the meteorological impacts on solar panels, batteries in cars, LNG facilities, and siting of air quality monitoring instruments. Ms. Popovic has conducted more than 50 visibility studies, some needed for Best Available Retrofit Technology (BART) requirements.

Academic Credentials & Professional Honors

M.S., Atmospheric Science, Massachusetts Institute of Technology (MIT), 1999

B.S., Meteorology, Belgrade University, Yugoslavia, 1994

Prior Experience

Project Manager, Atmospheric Science Group, TRC, 2006-2011

Project Meteorologist, Atmospheric Science Group, Earth Tech, 1999-2006

Professional Affiliations

Air & Waste Management Association

Languages

Serbian

Publications

Strimaitis D, Scire J, DesAutels C, Popovic J. Roadway Module in CALPUFF Version 7. Extended Abstract for A&WMA's 108th Annual Conference, 2015.

Popović J, Scire J, Strimaitis D, Wu Z-X. Evaluation of CALPUFF with the CAPTEX Tracer Dataset, Aerosol and Atmospheric Optics. Proceedings, Visibility and Air Pollution Specialty Conference, 2012.

Scire JS, Strimaitis DG, Wu Z-X, Klausmann AM, Popovic J. Assessment of EPA's evaluation of long range transport models. A&WMA Annual Conference Proceedings, 2012.

Popović J. Recommendations for source characterization. Proceedings and presentation at the 19th International Clean Air and Environment Conference, Perth, Australia, September 2009.

Popović J, Escoffier-Czaja C, Scire J. CALPUFF Modeling for BART sources in VISTAS Region. Presentation at the 11th Annual Energy & Environment Conference, Tucson, AZ, January 2008.

Popović J. Breath of life. AmCham Perspective, Magazine of the American Chamber of Commerce in Serbia 2006; 16:36-37.

Popović JM, Plumb RA. Eddy shedding in the upper troposphere. Journal of Atmospheric Science 2001; 58:93-104.

Popović JM, Ničković S, Gavrilov MB. Frequency of quasi-geostrophic modes on hexagonal grids. Meteorology and Atmospheric Physics 1996; 58:41-49.

Dacić M, Telenta B, Ničković S, Popović M, Popović J. Modeling of atmospheric flow field: A transport case study. Proceedings, Chemistry and the Environment 1995; 383-386.

Project Experience

Performed air dispersion modeling to assess the air quality impacts from a variety of sources: drift from aerial spraying, wind erosion from piles of fly ash, fugitive emission of asbestos from an industrial facility, accidental leaks of chemicals from pipes or other structures, fertilizer decomposition following the explosion in a warehouse, active aeration of pesticide fumigation chambers.

Completed a modeling study of a hypothetical oil spill in the Red Sea which included VOC evaporation from the oil surfacing on the sea, as well as other air emissions associated with the recovery and remediation operations. This included smoke plumes from in-situ burning, emissions from response vessels in the vicinity of the spill, oil and gas flares, and emissions of the secondary organic aerosols which form as a result of reaction of less volatile hydrocarbons with the atmosphere.

Analyzed meteorological data and helped provide expert opinions on meteorological conditions for a number of clients' needs, including the meteorological impacts on solar panels, batteries in cars, LNG facilities, and siting of air quality monitoring instruments.

Modeled air quality impacts in British Columbia associated with emissions from permitted industrial facilities, wood stoves, motorized traffic and fugitive dust.

Developed Fortran modules for terrain and meteorological data processing within CALPUFF system.

Performed air quality assessments of several industrial and energy facilities in Saudi Arabia.

Evaluated CALPUFF model using the ETEX and CAPTEX tracer data sets. Compared with the results of 5 other long range transport models. Developed scripts for graphical comparison of the modeled and

observed plume paths of the tracer gas. Examined the model performance through the standard set of statistics parameters, and looked at the statistical significance of differences among various models and different model runs using bootstrapping.

Conducted a cumulative impact assessment of the carrying capacity in air, water, and land in Bahrain. Compiled the emission inventory for all major pollution sources such as power plants, oil refinery, aluminum plant, and water desalination plants, as well as emissions from the mobile sources, including airport, ships, and vehicle fleet in Bahrain. Helped manage other elements of the EIA work with wastewater as a major component, and navigation, solid and hazardous waste, ecology, and noise as secondary elements of the study. Modeled the air quality impact of facility's expansion using AERMOD and BLP in near field and two Class I areas. Performed cumulative impact assessment from the background sources for NAAQS and PSD compliance. Evaluated the predicted SO₂ and NO₂ concentrations vs. monitored values. Performed concentration gradient analysis to help with the selection of background sources to be included in the 1-hour cumulative impact analysis. Evaluated the impact of the change of the building downwash treatment in AERMOD for stack heights above the GEP formula heights. Examined the effect of the Ozone Limiting Method (OLM).

Modeled the impact of wind erosion from grassland treated with herbicides to farmlands located a few tens kilometers downwind. Characterized a large surface-area source affected by wind erosion for modeling in CALPUFF.

Modeled drift of pesticides applied on rice farms to the farms with sensitive crops located 10-100 km away. Performed CALPUFF modeling coupled with AGDISP, a model for aerial spraying.

Advised another consultant on the most appropriate choice of the CALMET/CALPUFF parameters for use in modeling the visibility impacts from two BART eligible power plants on five National Parks in Utah. Reviewed available ammonia data measurements and assessed the spatial and temporal variability of ammonia concentrations.

Modeled air quality impacts evolving from an oil spill in the Gulf of Mexico. Produced daily forecasts of VOC, NO_x, CO, SO₂, and PM₁₀ concentrations.

Helped forecast weather for the Sydney-Hobart sailing race (December-January 2000/2001) in preparation for the Volvo Ocean Race. Created SURFER scripts to graphically present wind and pressure fields for three MM5 domains used in the modeling.

Developed regional CALMET modeling domain on a 12-km horizontal resolution covering all VISTAS (Visibility Improvement State and Tribal Association of the Southeast) states. Ran CALMET in no-observation mode for three modeling years, 2001-2003. Analyzed the meteorological fields produced by these regional model runs. Developed five subregional CALMET modeling domains with higher resolution of 4 km, each covering 1-3 VISTAS states and surrounding Class I areas. Ran CALMET in refined mode on subregional domains for the same three years. Performed screening and refined CALPUFF modeling of the sources that are subject to Best Available Retrofit Technology (BART). Examined the impacts of more than 100 BART sources on the Class I areas within 300 km from the sources in the VISTAS states (total of 24 Class I Areas). Studied the particle speciation of primary particulate matter, PM₁₀.

Developed a set of 16 CALMET domains for use in CALPUFF modeling of the prescribed fires in the southeastern U.S. Recommended the best combination of all available meteorological observations and prognostic modeling data for this purpose. Recommended the most efficient and most cost-effective horizontal resolution for each of the domains. Used nesting feature of the CALMET modeling system.

Conducted CALMET/CALPUFF modeling to assess the ambient air quality impacts in the near field of the facility and in the Cape Romain National Wildlife Refuge. Assessed the impacts of particulate matter, nitrogen oxides, carbon monoxide, hydrogen fluorides, and a number of toxic air pollutants. Evaluated the effects of these pollutants on visibility, air quality, and deposition in the Class I area. Performed both

National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increment analysis in the near field. Modeled extensive set of background sources, along with the numerous sources from the facility. Shown equivalence between the AERMOD and CALPUFF model in the steady state. Performed additional analysis in the hot spots — areas of high impact — and demonstrated that the facility was not contributing significantly in those areas.

Studied the effects of air pollution from the industrial sources to the Class I Areas within 300 km of the facilities. Studied the effects of terrain resolution on the model's performance and found that the horizontal resolution in the complex terrain areas can dramatically influence the plume path and, hence, the final modeling results. Carried out the Cumulative Impact Analysis for the PSD sources. Performed the lake acid neutralizing capacity (ANC) analysis to examine the impact of the proposed facility on the lakes in the Class I areas where sulfur and nitrogen deposition exceed the threshold values.

In estimating impacts on visibility, applied the refined analysis that employs the boundary condition module of CALPUFF to account for the NH₃ limitation effect. Examined effects of natural fog, rain, and snow on days with predictions of extinction changes above 5%. Performed cumulative PSD increment impact analysis for SO₂.

Performed CALPUFF modeling to assess the air quality impacts of emissions of polycyclic aromatic hydrocarbons (PAHs).

Planned a field experiment in a steep-walled river valley. Conducted CALPUFF modeling to determine the optimal positions for receptors of the SF₆ tracer as part of planning the field experiment. Performed quantitative evaluation of the proposed methods for analyzing the results of the experiment.

Developed a standard data set for air quality modeling in the Gulf of Mexico area and in the eastern half of United States. Standard data set include surface and upper air stations, buoy and precipitation data, and ozone data. Developed FORTRAN routines to process data.

Performed AERMOD modeling for a number of industrial facilities and fugitive sources. Developed SURFER scripts to graphically present the results.

Performed complex-terrain modeling using the CTSCREEN model, in support of a permit application. Conducted Class I impact analyses.

Performed SACTI modeling for evaluating the salt deposition from cooling towers.

Analyzed atmospheric data by applying a variety of statistical techniques to vector time series (correlation analysis, empirical orthogonal functions, spectral analysis, data filtering). Developed an analytical model for the atmospheric modes of the North Atlantic Oscillation. Developed computer programs for modeling mathematical and physical problems that can be applied to the atmosphere.

Developed numerical algorithms and software as a part of the research project on modeling of the atmosphere on global, synoptic, and meso scales.