GRADIENT

Christopher G. DesAutels, M.S.

Principal Scientist

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(he/him)

Areas of Expertise

- Air Quality
- Air Dispersion Modeling
- Emission Inventories
- Computational Fluid Dynamics (CFD)

Services

- Air Quality Sciences
- Renewables
- Climate Science
- Environmental Justice

Education

- M.S., Geosystems, Massachusetts Institute of Technology
- B.A., Physics, University of Pennsylvania
- B.A., Geology, University of Pennsylvania

Mr. DesAutels has over 20 years of experience simulating the transport of air pollutants, conducting air quality modeling studies, and performing analyses of meteorological data. He is active in applying air dispersion models, including AERMOD, CALPUFF, Computational Fluid Dynamics (CFD), and dense gas models, to complex dispersion problems in support for both regulatory permitting applications and litigation. He has been involved in model development for the CALPUFF air dispersion model and has provided training classes on the proper application and use of CALPUFF. Mr. DesAutels maintains an active interest in air impacts due to emissions from transportation, with project experience covering emissions inventories and air dispersion modeling for road vehicles, shipping, and rail transport.

Selected Projects

Accidental Release Modeling: Performed air dispersion modeling and model evaluation for a short-term accidental aerosol release from a paper production facility. Modeled air concentration and liquid deposition for use in evaluating nuisance and health claims in residential areas.

Dense Gas Modeling: Produced CFD modeling of a vinyl chloride release from a breached railcar.

Environmental Impact Report: Provided support and review of a California Environmental Quality Act (CEQA) Environmental Impact Report air modeling evaluation for a proposed railyard. Performed sensitivity analyses of air quality modeling and emissions calculations.

Meteorological Analysis: Evaluated historical rainfall data from rain gauges and radar analysis to determine the frequency and intensity of events. This evaluation was used as part of litigation concerning construction delays and scheduling.

Fugitive Dust: Modeled historical windblown dust from material storage piles at a closed aggregate material facility. Estimated long-term deposition of chemicals of interest at locations downwind from the facility.

Model Development: Developed new subroutines within the CALPUFF air dispersion model to link CALPUFF with the agricultural spray model AGDISP. Provided a new version of the model code that allows for long-range transport modeling of agricultural spray drift.

Emissions Inventory Development: Developed an emissions model code to estimate vehicle emissions growth, fleet composition, and emission factors over a future 30-year period as part of a regional planning assessment.

Selected Publications

Lewis, RC; Sheehan, PJ; **DesAutels, CG**; Watson, HN; Kirman, CR. 2022. "Monitored and modeled ambient air concentrations of ethylene oxide: Contextualizing health risk for potentially exposed populations in Georgia." *Int. J. Environ. Res. Public Health* 19(6):3364. doi: 10.3390/ijerph19063364.

DesAutels, CG; Ma, Q; Popovic, J. 2016. "Modeling Agricultural Spray Drift Using a Coupled CALPUFF-AGDISP Model." Presented at the 252nd American Chemical Society National Meeting and Exposition, Philadelphia, PA, August 21-25.

DesAutels, CG; Schulman, L; Yocke, M; Popovic, J; Lee, I; Pollack, J; Klausmann, A. 2015. "Exponent's Comments on CALPUFF and AERMOD Modeling Guidance." Presented at the 11th Conference on Air Quality Models, Research Triangle Park, NC, August 12.

Schulman, LL; **DesAutels, CG**; Kolts, B. 2013. "Effectiveness of Wind Fences to Reduce Fugitive Particulate Emissions from Material Piles: A Computational Fluid Dynamics Study." Presented at the Air & Waste Management Association 106th Annual Meeting, Chicago, IL, June.

DesAutels, CG; Schulman, LL. 2010. "Evaluation of the Desert Tortoise Ammonia Field Tests with the FLUENT CFD Model Using Unsteady RANS." Presented at the 5th International Symposium on Wind Engineering, Chapel Hill, NC.