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Advancing New Technology

REDUCED-FORM MODELS, CITIZEN SCIENCE SENSORS, AND LOCAL KNOWLEDGE: INFORMING LOCAL DECISIONS ABOUT TRANSPORTATION-RELATED AIR POLLUTION

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Reduced-form models and citizen science sensors are emerging technologies that can inform decisions about transportation-related air quality in communities. Coupled with local knowledge and expert advice, these tools can help to characterize existing conditions as well as impacts of future scenarios. The Community Line Source modeling system (C-LINE) maps near-road air quality concentrations for local scale areas across the country. It includes traffic and meteorological datasets for the community of interest, and is streamlined to perform what-if scenarios, such as the relative impacts of additional traffic or detours through a residential area. Citizen science sensors are available for a host of mobile source pollutants, and offer local residents the opportunity to collect measurements and assess trends and high-concentration areas affected by transportation corridors and activity. Even though both reduced-form models and citizen science sensors are becoming available, their value is based largely on the overall goals of the project. These tools are not designed to support regulatory decisions, and so the information they provide is largely used to assess the relative risk of transportation-related air quality in the context of multiple community concerns, and to prioritize actions to either 1) improve air quality, or 2) reduce personal exposures. We applied C-LINE and citizen science sensors to multiple community case studies in Newport News, Virginia; Newark, New Jersey; Charleston, South Carolina; and Portland, Oregon in order to not only inform local decisions, but to compile examples of best practices of their use and application, so that other communities across the country can learn from these examples. This presentation includes a summary of results to date, how they were used to guide decision-making, and lessons learned (i.e., benefits and limitations) for their general use in community-scale applications.