




Jul 11th, 11:10 AM - 11:30 AM

## Air Quality in Urban Areas: Urban Air Pollutants, Combined Exposure Management and Planning

Christos Vlachokostas  
*Aristotle University Thessaloniki*, [vlahoco@aix.meng.auth.gr](mailto:vlahoco@aix.meng.auth.gr)

Nicolas Moussiopoulos  
*Aristotle University Thessaloniki*

Follow this and additional works at: <https://scholarsarchive.byu.edu/iemssconference>

 Part of the [Civil Engineering Commons](#), [Data Storage Systems Commons](#), [Environmental Engineering Commons](#), [Hydraulic Engineering Commons](#), and the [Other Civil and Environmental Engineering Commons](#)

Vlachokostas, Christos and Moussiopoulos, Nicolas, "Air Quality in Urban Areas: Urban Air Pollutants, Combined Exposure Management and Planning" (2016). *International Congress on Environmental Modelling and Software*. 40.

<https://scholarsarchive.byu.edu/iemssconference/2016/Stream-A/40>

This Event is brought to you for free and open access by the Civil and Environmental Engineering at BYU ScholarsArchive. It has been accepted for inclusion in International Congress on Environmental Modelling and Software by an authorized administrator of BYU ScholarsArchive. For more information, please contact [scholarsarchive@byu.edu](mailto:scholarsarchive@byu.edu), [ellen\\_amatangelo@byu.edu](mailto:ellen_amatangelo@byu.edu).

# Air Quality in Urban Areas: Urban Air Pollutants, Combined Exposure Management and Planning

**Christos Vlachokostas and Nicolas Moussiopoulos**

*Laboratory of Heat Transfer and Environmental Engineering, Aristotle University Thessaloniki, Box 483, 54124 Thessaloniki, Greece, +302310994109, e-mail: vlahoco@aix.meng.auth.gr*

**Abstract:** The “urban climate” is characterized by numerous environmental pressures such as air and noise pollution, toxic substances or radiation which give justifiable rise to citizens’ worries about possible impacts on public health. The effort to close the loop between health stressors in urban areas is scientifically of major importance and should be brought forward. This paper supports this initiative and presents an integrated exposure assessment for Thessaloniki, Greece. The approach is based on the application of the Combined Environmental Stressors’ Exposure (CENSE) tool. The area under consideration is a densely populated urban environment and presents high levels of environmental health stressors mainly due to the combination of large numbers of citizens and intense road traffic. CENSE is a tool for environmental integrated management on the grounds of the combined dose and exposure indicators theory for urban spaces. An urban space may be a closed environment (e.g. the interior of a car) as much as an open-air one (such as the saddle of a bicycle, or even the pavement used by pedestrians). The tool incorporates co-exposure indicators and takes into account the potential relative intake of each chemical stressor by considering the physical activities of each citizen (i.e. standing, walking, fast walking, cycling, fast cycling, car riding or motorcycle riding). The presented approach could be characterised as a little stepping stone to bridge the gap between numerous health stressors and to highlight their possible interactions and combined impact. Undoubtedly, the scientific gap and the inherent epidemiological uncertainties are significant, especially when considering combined or synergetic exposure to the complex environmental pollution mix. However, it is concluded that rather than viewing chemical and physical health stressors separately for decision making and environmental sustainability consideration and planning, the possibility of an easy-to-comprehend co-exposure assessment is considered with use of the CENSE application.

**Keywords:** Health stressors; Combined exposure; Micro(environments) characterization; Transport modes; Physical activities.