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Volume 159 Issues 8-9 2011

SPECIAL ISSUE: Selected papers from the conference Urban Environmental Pollution: Overcoming Obstacles to Sustainability and Quality of Life (UEP2010), 20–23 June 2010, Boston, USA

Introduction

- 1963 Urban environment: Defining its nature and problems and developing strategies to overcome obstacles to sustainability and quality of life**
W.J. Manning

Keynote Speaker

- 1965 The study of urban metabolism and its applications to urban planning and design**
C. Kennedy, S. Pincetl, P. Bunje

This paper presents a chronological review of urban metabolism studies and highlights four areas of application.

Characterizing the Urban Environment

- 1974 Novel urban ecosystems, biodiversity, and conservation**
I. Kowarik

This paper reviews the ways in which biodiversity is affected by urbanization and argues for expanding urban conservation approaches.

- 1984 Effects of vehicle exhaust emissions on urban wild plant species**
J.N.B. Bell, S.L. Honour, S.A. Power

Vehicle exhaust emissions produce a range of adverse effects on a selection of urban native plant species.

- 1991 Bioindication of atmospheric trace metals – With special references to megacities**
B. Markert, S. Wuenschmann, S. Fraenzle, A.M. Graciana Figueiredo, A.P. Ribeiro, M. Wang

Bioindication is a relevant technique for observing the atmospheric deposition of chemical elements of the environment in megacities.

- 1996 Anatomy of an urban waterbody: A case study of Boston's Muddy River**
M. Mathew, Y. Yao, Y. Cao, K. Shodhan, I. Ghosh, V. Bucci, C. Leitao, D. Njoka, I. Wei, F.L. Hellweger

Monitoring and data analysis are combined with mathematical modeling to understand the water quality of an urban river.

- 2003 Source, concentration, and distribution of elemental mercury in the atmosphere in Toronto, Canada**
E. Cairns, K. Tharumakulasingam, M. Athar, M. Yousaf, I. Cheng, Y. Huang, J. Lu, D. Yap

Buildings serve as sources of gaseous elemental mercury and research is needed to quantify the emission and to assess the impact of indoor air on outdoor air quality and human health.

Urban Environment and Human Health

- 2009 Spatial and temporal variability in urban fine particulate matter concentrations**
J.I. Levy, S.R. Hanna

Fine particulate matter can vary spatially within large urban areas, in spite of the significant contribution from regional atmospheric transport.

- 2016 Impact of local traffic exclusion on near-road air quality: Findings from the New York City “Summer Streets” campaign**
T.H. Whitlow, A. Hall, K.M. Zhang, J. Anguita

Traffic exclusion had variable effects on local particle concentrations and biomarker induction that were inconsistent with the simple expectation that air would be cleaner without traffic.

- 2028 Determination of PM₁₀ deposition based on antimony flux to selected urban surfaces**
M. Langner, M. Kull, W.R. Endlicher

Antimony is used as a tracer element to calculate dry deposition velocities of PM₁₀ particles to selected urban surfaces.

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ENVIRONMENTAL POLLUTION

CONTENTS—Continued from outside back cover

- 2035 The effect of atmospheric thermal conditions and urban thermal pollution on all-cause and cardiovascular mortality in Bangladesh**
K. Burkart, A. Schneider, S. Breitner, M.H. Khan, A. Krämer, W. Endlicher
Mortality in Bangladesh is strongly affected by thermal atmospheric conditions with particularly urban areas facing excess mortality above a specific threshold temperature.
- 2044 Urban and rural mortality rates during heat waves in Berlin and Brandenburg, Germany**
K.M.A. Gabriel, W.R. Endlicher
During periods of severe heat stress the pattern of mortality rates in Berlin and Brandenburg was found to correlate well with the distribution of sealed surfaces.
- 2051 Traffic exposure in a population with high prevalence type 2 diabetes – Do medications influence concentrations of C-reactive protein?**
C.L. Rioux, K.L. Tucker, D. Brugge, D.M. Gute, M. Mwamburi
Among people with diabetes, individuals on insulin appear to be most vulnerable to the effects of traffic exposure. Diabetes medications may modify the response to traffic.
- 2061 Truncated Lévy flights and agenda-based mobility are useful for the assessment of personal human exposure**
U. Schlink, Ad.M.J. Ragas
Truncated Lévy flights and agenda-based mobility are useful for the assessment of personal human exposure.
- 2071 Soil intervention as a strategy for lead exposure prevention: The New Orleans lead-safe childcare playground project**
H.W. Mielke, T.P. Covington, P.W. Mielke Jr., F.J. Wolman, E.T. Powell, C.R. Gonzales
Within hours, at a cost of about U.S. \$100 (2010) per child, it is feasible to transform exterior play areas at childcare centers from Pb contaminated to Pb-safe with a large margin of safety.
- Role of Trees and Vegetation in Moving Toward Sustainability**
- Mitigation of Pollutants*
- 2078 Urban forests and pollution mitigation: Analyzing ecosystem services and disservices**
F.J. Escobedo, T. Kroeger, J.E. Wagner
Environmental managers should analyze ecosystem services and disservices when developing urban forest management alternatives for mitigating urban pollution.
- 2088 The tree BVOC index**
J.R. Simpson, E.G. McPherson
A tree BVOC index is presented that calculates reduced BVOC emissions from planting lower-emitting urban tree species that has potential application for SIP compliance.
- 2094 A vegetation modeling concept for Building and Environmental Aerodynamics wind tunnel tests and its application in pollutant dispersion studies**
C. Gromke
Avenue trees in urban street canyons affect the pollutant dispersion and result in increased traffic exhaust concentrations.
- Green Roofs*
- 2100 Green roofs as a means of pollution abatement**
D.B. Rowe
Green roofs can help mitigate air pollution, carbon dioxide emissions, sequester carbon, conserve energy, reduce the urban heat island, and improve water quality.
- 2111 Amending greenroof soil with biochar to affect runoff water quantity and quality**
D.A. Beck, G.R. Johnson, G.A. Spolek
In this controlled laboratory experiment, greenroof soil was amended by the addition of biochar, which reduced the water runoff concentration of nitrogen, phosphorus, and organic carbon.
- 2119 Positive effects of vegetation: Urban heat island and green roofs**
T. Susca, S.R. Gaffin, G.R. Dell'Osso
Vegetation has positive effects both on an urban scale, mitigating the urban heat island effect; and on a building scale, where albedo, thermal insulation and biological activity of plants play a crucial role.
- Modelling the Role of Trees and Vegetation in Sustainability**
- 2127 Water, heat, and airborne pollutants effects on transpiration of urban trees**
H. Wang, Z. Ouyang, W. Chen, X. Wang, H. Zheng, Y. Ren
Heat and water related environmental variables affected transpiration of urban trees and ozone was an added yet minor stress factor.
- 2138 Modelling the influence of peri-urban trees in the air quality of Madrid region (Spain)**
R. Alonso, M.G. Vivanco, I. González-Fernández, V. Bermejo, I. Palomino, J.L. Garrido, S. Elvira, P. Salvador, B. Artífano
Peri-urban forests contribute to ameliorate ozone air pollution.

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2148 Carbon savings resulting from the cooling effect of green areas: A case study in Beijing

W. Lin, T. Wu, C. Zhang, T. Yu

An integral equation for the calculation of energy conservation and carbon savings; Showing that carbon savings is partly influenced by green areas' features.

2155 Quantifying air pollution attenuation within urban parks: An experimental approach in Shanghai, China

S. Yin, Z. Shen, P. Zhou, X. Zou, S. Che, W. Wang

Crown volume coverage (CVC) and pollutants diffusion distance had been proved as key predictors influencing attenuation effect on levels of air pollutants in urban parks.

Water Management and Sustainability

2164 Analysis of the ability of water resources to reduce the urban heat island in the Tokyo megalopolis

T. Nakayama, S. Hashimoto

This study indicates that effective management of water resources would be powerful for ameliorating the heat island and recovering sound hydrologic cycle in urban area.

2174 Life cycle implications of urban green infrastructure

S. Spatari, Z. Yu, F.A. Montalto

The benefits of low impact development and green infrastructure in cities can be modeled using life cycle assessment to understand and guide decisions for meeting sustainability goals.

Urban Planning to Increase Sustainability

2180 Mapping urban climate zones and quantifying climate behaviors – An application on Toulouse urban area (France)

T. Houet, G. Pigeon

This paper presents an automated approach to classify sample areas in a UCZ using landscape descriptors and demonstrate that climate behaviors of UCZ differ.

2193 Agricultural and green infrastructures: The role of non-urbanised areas for eco-sustainable planning in a metropolitan region

P. La Greca, D. La Rosa, F. Martinico, R. Privitera

Characterization of non-urbanised areas in metropolitan regions is crucial for land-use planning aimed at environmental pollution minimization.

Involving the Community

2203 Open Air Laboratories (OPAL): A community-driven research programme

L. Davies, J.N.B. Bell, J. Bone, M. Head, L. Hill, C. Howard, S.J. Hobbs, D.T. Jones, S.A. Power, N. Rose, C. Ryder, L. Seed, G. Stevens, R. Toumi, N. Voulvoulis, P.C.L. White

Research is enriched where the public and scientists work together.