James Kurt Lein, J Geol Geophys 2017, 6:5 (Suppl)
DOI: 10.4172/2381-8719-C1-0011

On the feasibility of satellite-based waste heat extraction at regional scales to support urban sustainability planning

James Kurt Lein
Ohio University, USA

Assessment and the inherently future oriented nature of sustainability decision making operate in an arena punctuated by uncertainty. As cities strive to reduce the adverse environmental aspects of urbanization there is a need to characterize existing environmental conditions to support effective planning. Urban surface frequently is characterized as an artificial landscape superimposed on the natural system. As urban patterns spread and intensity, the replacement of natural form with urban cover types has been shown to modify and degrade the functioning of natural environmental processes within and surrounding the urban footprint. Reducing the adverse environmental effects of urbanization on the natural system and preserving natural form in an urbanizing region remains a central objective in sustainability planning. One important strategy actively pursued by metropolitan areas involves urban greening. Prioritizing urban green space creation and identifying useful targets that can direct long term monitoring are essential to insure that greening agendas are contributing to the desired outcome. In this paper, remote sensed data is applied to estimate urban waste heat, calculated as a function of land surface temperature. The urban waste heat profile serves as a sustainability indicator that can be projected into the future in relation to observed trends in green space creation. The methodology employed in this study couples remote sensing techniques with cellular-based projections of green development over which waste heat patterns are calculated in a GIS environment. Through this combined methodology, green development scenarios can be critically evaluated over an extended time horizon.

Biography

James Kurt Lein has obtained his Doctorate from Kent State University and is currently Professor of Geography at Ohio University, USA. His research focuses on Applied Geomatics with a concentration in remote sensing, environmental monitoring and land resource analysis. He has published numerous research papers and several books including *Environmental Sensing: Analytic Techniques for Earth Observation* (2012) and *Futures Research and Environmental Sustainability*: Theory and Method (2016).

lein@ohio.edu

Notes: