Chicagoland Urban Foresters’ Response to Climate Change, Drought, and Flooding

ABSTRACT

This purpose of this research is to determine whether or not urban foresters within the Chicagoland area are responding to climate change, and if so, what are they doing to mitigate or adapt to climate change. This research specifically looks to analyze what best management practices, as defined in Clark et al. (1997), urban foresters within the Chicagoland area are implementing, and how they might be responding to drought and flooding.

A survey was designed and distributed to 492 urban foresters within the entire state of Illinois and Northwest Indiana in collaboration with the Community Trees Program of The Morton Arboretum in Lisle, IL. Out of the 70 responses, only one was not within the greater Chicagoland area. Of the survey responses to the question, “Does climate change affect the survival and well-being of the urban forest?” 81% strongly agreed, agreed, or somewhat agreed that climate change impacts the urban forest.

BACKGROUND

Urban centers are particularly susceptible to the effects of climate change. Urban areas experience the urban heat island effect, which makes urban centers hotter than their more rural counterparts. Industry and commercial business create excess heat that contributes the overall temperature of a city. The urban heat island effect is exacerbated by climate change and can lead to unhealthy atmospheric conditions from pollution, and associated exacerbated flooding and drought from lack of permeable surfaces (Clark et al. 1997).

The City of Chicago and the surrounding Chicagoland area is responsible for the production of an estimated 103 million metric tons of greenhouse gases per year (Hayhoe 2008). The creation and maintenance of urban forests are a beneficial and economically viable approach. “Urban forestry is the art, science, and technology of managing trees, forests, and natural systems in and around cities, suburbs, and towns for the health and well-being of all people” (Rusznier et al. 2010). Urban forests within the continental United States sequester about 700 million tons of carbon (Nowak et al. 2002).

Although urban forests provide innumerable benefits to cities and urban centers, they can still be negatively impacted by climate change themselves. In the Midwest, climate change is predicted to account for hotter, drier summers and longer, milder winters. Research regarding urban forest practitioner response to climate change is limited.

REFERENCES


METHODOLOGY

1. Create Survey
   a. Challenge
      • Asking urban foresters about their response to climate change without allowing them to have any bias in answering these questions
   b. Solution
      • Ask urban foresters about their response to more frequent drought and flooding, the most apparent effects of climate change on the Midwest
      • Urban foresters would be filling out the survey without bias because someone that does not know about climate change, responding to a flood or drought may just be another day on the job
   c. Detail/Access
      • Survey needed to gather as much data as possible without being too difficult or lengthy to fill out
   d. Question Sources
      • Clark et al. (1997) Best management practices for a managed urban forest
      • Yale climate survey

2. Survey Administration
   a. Community Trees Program (The Morton Arboretum)
      • Email list with 492 municipal urban foresters throughout Illinois
      • Goal
      Help communities, public and private landowners, land managers, tree professionals, and groups interested in trees to effectively manage and care for our urban and community forest.
   b. Recruitment email sent 3 times over the course of 3 weeks
      • Survey open 9/26 – 11/1
      • The Tailored Design Method (Dillman 2014)

3. Data Analysis
   a. All analysis is currently done in Qualtrics online platform
   b. Future cross-tab analysis will be done in Excel

NEXT STEPS

• Cross tab analysis of responses: In order to determine if urban foresters know that they are responding to climate change induced drought or flooding, individual responses must be compared. An urban forester may be responding to drought, but could be unaware that drought is a symptom of climate change.
• Add the list of the response data to the survey response map
• Overlap different sets of data on map to see check for any geographic patterns in management practices and response to climate change induced drought and flooding.

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