A Model of Urban Forest Sustainability Under Climate Change & Application to the Village of Glenview, Illinois

S A M  C O N R A D b  a n d  D R .  J E S S  V O G T b

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**RESEARCH GOALS**

1. Create a new model of urban forest sustainability that incorporates climate change, based off of the Clark et al. (1997) model
2. Create a research protocol that any municipality in the Chicago area could use to evaluate the sustainability and adaptability to climate change of their urban forestry program
3. Apply new model to the Village of Glenview, IL

**CONTEXT OF RESEARCH**

- Theoretical model showing what qualities an urban forest must have to be considered sustainable
- An urban forest consists of the trees, shrubs, and greenspace in the communities, towns and cities where humans live and work
- Three core components (figure below)

**CLARK ET AL. (1997) MODEL**

- Healthy Vegetative Resource
  - e.g., High level of biodiversity
- Supportive Community
  - e.g., Community tree plantings
- Adequate Management
  - e.g., Tree trimming and removal

**STUDY SITE: VILLAGE OF GLENVIEW, ILLINOIS**

- Population: 44,692 (U.S. Census)
- Area: 13.95 square miles (U.S. Census)
- 3203.7 people per square mile
- 15.55 miles northeast of Chicago
- A total of 29,183 trees (CRTI, 2016)
- 35% canopy cover (CRTI, 2016)
- 32% vegetation cover (CRTI, 2016)
- Average annual precipitation: 961 mm (usclimatedata.com, 2016)
- Average summer temperatures: 16.1 °C low, 26.8 °C high (usclimatedata.com, 2016)
- Average winter temperatures: -5.3 °C low, 3.3 °C high (usclimatedata.com, 2016)

**DATA COLLECTION - CASE STUDY METHODS**

1. Interviews
   - Conducted in person, semi-scripted, recorded, and transcribed
   - Interviewees:
     - Natural Resource Manager (primary informant)
     - Maintenance Equipment Officers (2 individuals)
     - Public Works Superintendent*
   - Topics:
     - Government & organizations
     - Urban forest management plan
     - Management practices
     - Climate change
2. Documents
   - Expenditures (2012-2015)
   - Applications for Tree City USA (2014 & 2015)
   - Tree Preservation Ordinance (covers both public and private)
   - Work orders & tree removal permits
3. Inventory (pre-existing data)
   - Glenview has a partial inventory, edited real time
   - Map and spreadsheet form (Davey Tree Keeper)

**CREATING CLIMATE CHANGE CRITERIA**

- Climate change should be a fourth core component to the Clark et al. (1997) model
- Similar to the Clark et al. (1997) model, criteria will be organized in a table that can act as a checklist for municipalities or urban forestry practitioners
- Criteria based on the Climate Adaptation Guidebook for Municipalities in the Chicago Region (CMAP, 2013) as well as Advancing Adaptation in the City of Chicago: Climate Considerations for Management of Natural Areas (Derby Lewis et al., 2012)
- Some criteria repeated from the 3 components of the Clark et al. (1997) model for example, Species Biodiversity

**NEXT STEPS FOR MY THESIS**

- Create full list of Climate Change Criteria to be added to Clark et al. (1997) model
- Edit and finalize Interview Script for future research
- Data analysis (applying new sustainability model to Glenview)

**THESIS PRODUCTS**

- 1 page summary for the Village of Glenview
- Manuscript for submission to Arboriculture & Urban Forestry (scholarly journal for field of urban forestry)
- Article for Arborist News (professional/trade publication)

**FUTURE RESEARCH POSSIBILITIES**

- Interview script and research protocol for use in larger project examining urban foresters response to climate change across the Chicago region
- New sustainable model for use by researchers and municipalities in order to evaluate urban forestry programs

**REFERENCES**