



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

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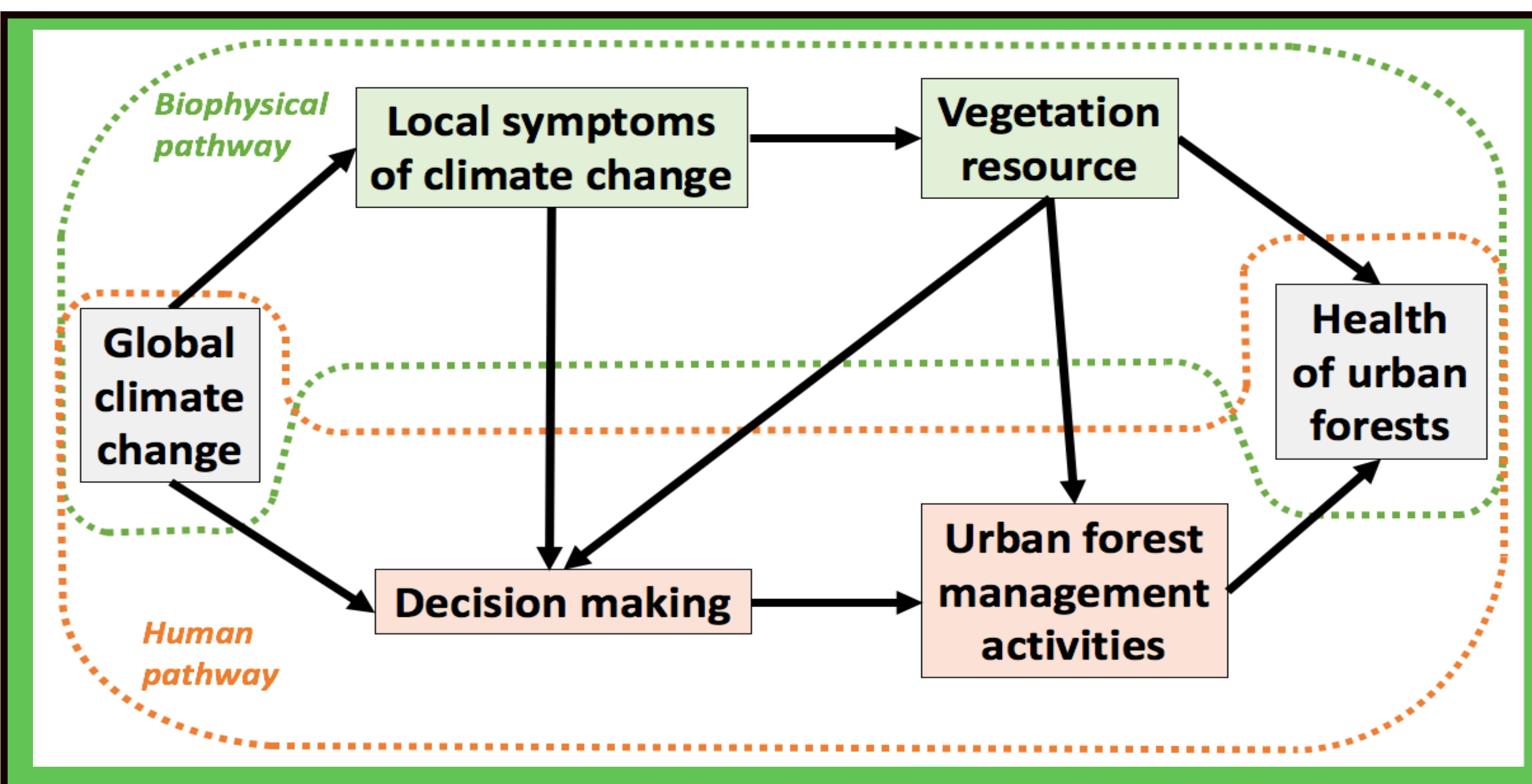
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RESEARCH GOALS

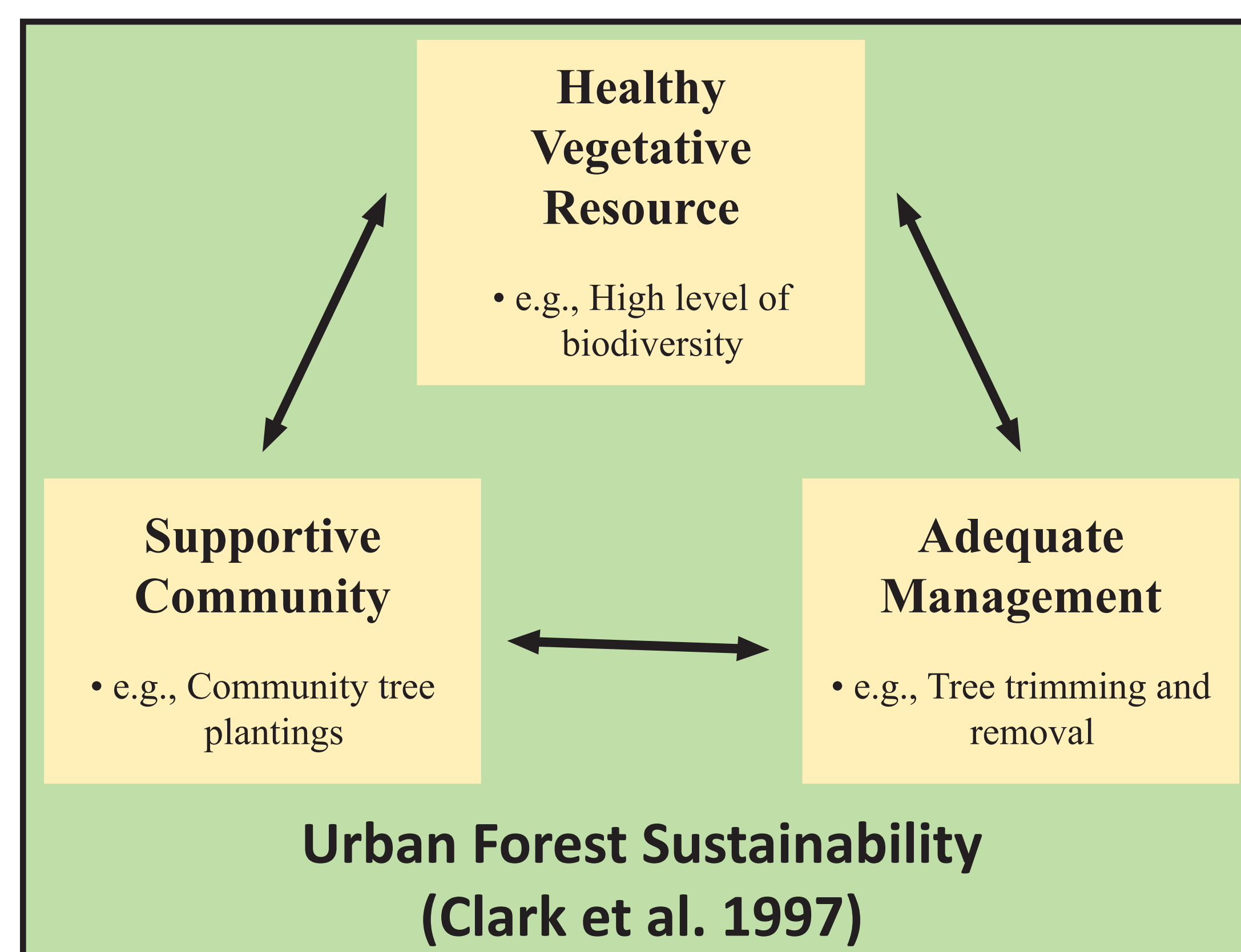
1. **Create a new model** of urban forest sustainability that incorporates climate change, based off of the Clark et al. (1997) model
2. **Create a research protocol** that any municipality in the Chicago area could use to **evaluate the sustainability and adaptability** to climate change of their urban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

CONTEXT OF RESEARCH



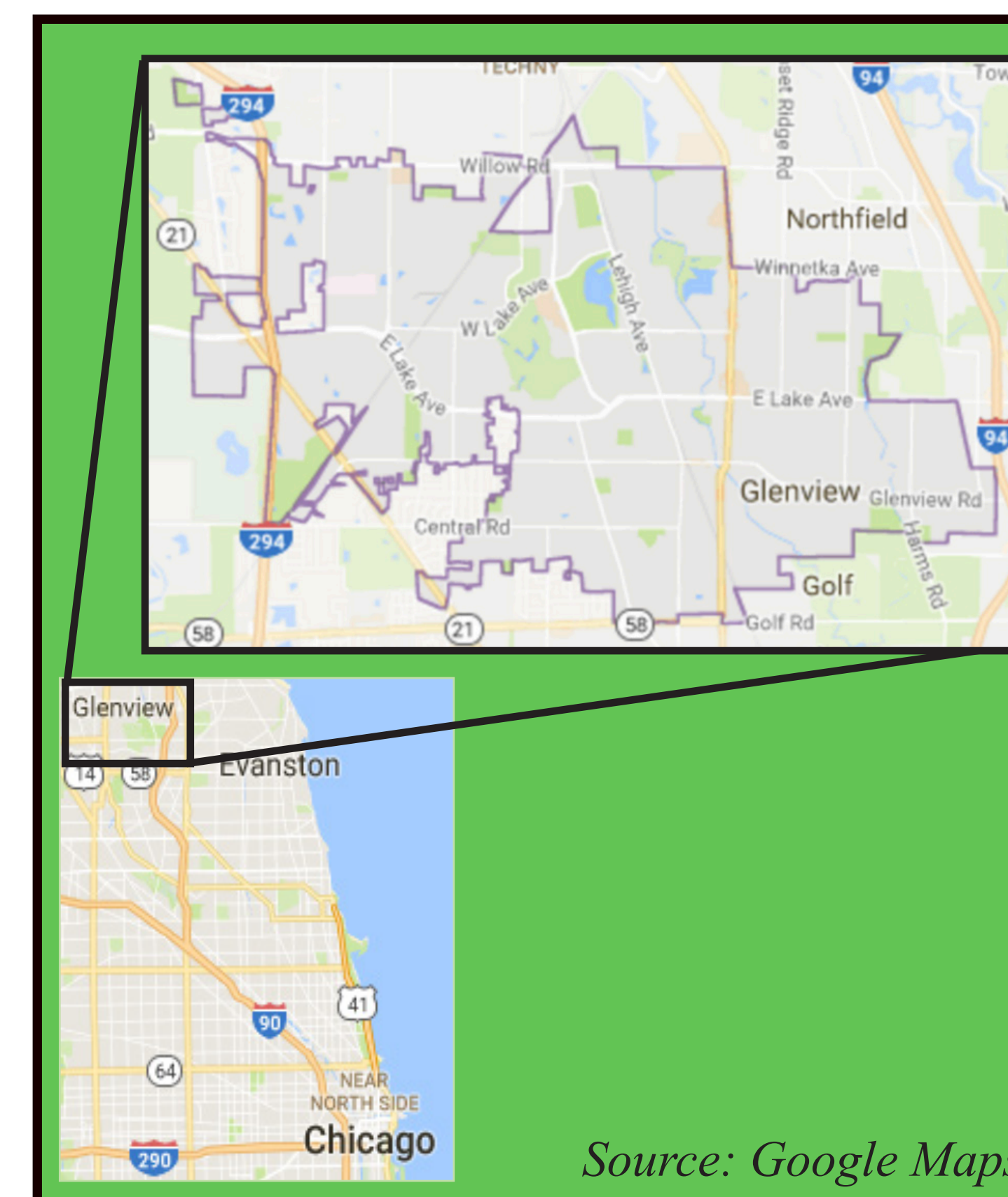
CLARK ET AL. (1997) MODEL

- 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*)



STUDY SITE: VILLAGE OF GLENVIEW, ILLINOIS

- **Population:** 44,692 (U.S. Census)
- Area of **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)

*Interview pending scheduling

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

- Chicago Region Trees Initiative (CRTI). 2016. Glenview Urban Forest Canopy Summary (Personal communication with Lindsay Darling).
- Clark, J.R., N.P. Matheny, G. Cross, & V. Wade. 1997. A model of urban forest sustainability. *Journal of Arboriculture*, 23(1): 17-30.
- Derby Lewis, A., Hall, K.R. and Hellman, J.J. 2012. *Advancing adaptation in the city of Chicago: climate considerations for management of natural areas.*