



SEAS MASTER'S PROJECT PROPOSAL SUBMISSION FORM

SEAS Master's Projects are applied research projects directed toward addressing a research need or related problem of a professional organization. Keep in mind, projects for this cohort of students will be **completed by April 2022**.

How to Submit a Master's Project Idea:

For full consideration, please email the completed form (below) to: seas-projects@umich.edu.

[Instructions for Potential Clients: Fill Out All Categories Below]

Proposed Master's Project Title/ Topic: Characterizing the Urban Tree Canopy (UTC) to elevate its role in mitigating climate change and creating a healthy and vibrant community in Ann Arbor, MI.

Client Organization: City of Ann Arbor Natural Features Working Group

Client Website: <https://www.a2gov.org/departments/systems-planning/planning-areas/climate-sustainability/Commission/Pages/EnvironmentalCommission.aspx>

Secondary Client Organization (if applicable):

Secondary Client Website (if applicable): http://

Do you have in mind a potential SEAS Faculty Advisor(s)? If so, list Faculty:

Have you secured a Faculty Advisor commitment? If so, list Faculty: Ines Ibanez, Jason Tallant, Shannon Brines, & Dan Katz

Project Contact Information:

- Name: Christopher Graham
- Title (if applicable): Chair AA Natural Features Working Group, Ann Arbor Environmental Commissioner
- City: Ann Arbor
- State or Country: Michigan
- Phone: (734) 975-7800 (O)
- Email: grahamz@umich.edu

Check all that apply:

I am an SEAS student

I am an SEAS/SNRE alum

I am a member of an SEAS/Erb advisory committee

I am a U-M faculty member, School/Department:

I am a staff member of a potential client organization

Our Organization has been an Master's Project client in a previous year

Other (please specify): A leader in the natural features regulation and protection efforts for the last 3+ decades in Ann Arbor, MI.

Project Location (City, State or City, Country): Ann Arbor, MI

Summary of Project Idea:

Include a brief overview and a detailed response to each of the topics outlined below. Try to be as specific as possible.

- Goals & Objectives: What will this project accomplish? **Create an updated urban tree canopy map for the City of Ann Arbor that classifies trees to genus or species and calculates standing biomass of tree canopy on public and private lands. A key component will be to identify native forest fragments. Materials would be built around these data to inform landowners and land managers about stewardship actions that would support the sustainability goals of the City of Ann Arbor. Two neighborhoods would be used as prototypes, one with many trees and intact native forest fragments and one that has been substantially farmed/disturbed.**
- Theoretical Justification, Social Benefit, or Significance: Why is this research important? What is the real-world impact of the proposed research? **The justification for this project is that the City greatly needs updated and comprehensive urban tree GIS data/layers. That data would then be used in land use and development planning, in informing climate action outreach and education that would show how better stewardship of landscapes would enhance ecosystem services (biosequestration of CO₂, biodiversity protection, urban heat island mitigation, pollinator conservation, stormwater infiltration, etc.) so to further the goals of sustainability across the City.**
- Specific Activities & Duration: What research methodologies are appropriate to tackle the proposed research question? Is the scale of proposed research reasonable for a (part-time) 16-month project for 4-6 students? **The project starts with a remote sensing/geographic information systems focus, but as it progresses the disciplines of landscape design/architecture, environmental policy/planning, and sustainable systems will come into play. Issues of environmental justice and behavior/education/communication also play a large role in understanding how impact is distributed through the community. Areas with a greater number of old trees and native forest fragments are different than areas once farmed, with younger trees and little evidence of native ecosystems.**
- Integrative Approach: How does the proposed research integrate the skills of disparate team members to generate an effective final product/output? **The project creates data sets and a set of planning and outreach materials that will be used by the City in its own planning and development decisions, and in educational efforts to greatly improve the understanding of how to steward the landscape to improve sustainability.**

Key Words/Themes (Topic descriptors to be highlighted in online project database): **Urban Tree Canopy, Ecosystem Services**

Please identify specific SEAS program areas where expertise would be helpful. To meet SEAS standards for an interdisciplinary project, your proposal must include substantive work from multiple fields of study. For specific details about these areas, visit: <http://seas.umich.edu/academics/ms>

Conservation Ecology (Aquatic Sciences, Terrestrial Ecosystems, and Conservation Biology)

Environmental Policy and Planning

Behavior, Education, and Communication

Environmental Informatics

Environmental Justice

Sustainable Systems

Landscape Architecture

Role (Please briefly describe the role for each area of expertise selected above. Include 2-3 sentences for each discipline you selected. Include all key skills/expertise necessary for a master's project team to successfully complete this project):

Environmental Informatics/Conservation Ecology: Key skills of this project would be in remote sensing, image interpretation, and "python." Field validation of data products would be important. Other skills would involve digital and graphic communication products which model ones to be used in neighborhood meetings about how to know, understand and improve the stewardship of their environment through the eye of the City's natural features, especially trees, native plants, and stormwater retention.

Landscape Architecture/Sustainable Systems/Environmental Policy and Planning: Skills to provide useful GIS layers for the City of Ann Arbor to use in sustainability, outreach, and planning activities. This work would be a "Design on the Land" effort, only with local (neighborhood) detail and intent. Invented would be ways to encourage, facilitate, educate people on the wide range of improvements to landscapes that would transform them into far more sustainable ones.

Environmental Justice/Behavior, Education, and Communications: There is a wide diversity of landscapes in Ann Arbor, especially notable in the presence of larger trees, especially native forest fragments. Trees increase property value, so where there are fewer trees property values can be less, landscapes less interesting and certainly less shaded. In part this effort will look at the differences between example neighborhoods, what to do to enhance treed ones with more native species and what to do to restore less treed neighborhoods to greater interest and sustainability. In all cases, a key goal would be to strongly encourage less turf grass.

Professional Career Development Benefits (Identify skills, knowledge, and contacts that students can expect to develop by working on this project, as well as any other potential career-related benefits—such as opportunities to present findings at a professional conference or meeting, professional networking opportunities with client and partner organizations, individual/group publications, etc.): **Remote sensing, geographic information synthesis, presentation graphics "digital and print materials", field identification of natural features including native forest fragments, waterways and water courses, wetlands, specific plant species, comparative analysis of neighborhood ecosystem services present and suggested.**

Funding Sources (Note if potential or confirmed as well as the amount, if known. SEAS internal funding may be available to support a limited number of projects, with preference given to non-profit project clients): **In kind contribution of data and imagery. Use of city resources to make printed materials. Possible grants and City funded internships during the summer of 2021 via A2Zero Climate funding. Sustaining AA Grant, other sources.**

Privacy Considerations (Optional: if you have specific privacy concerns related to your proposed research topic, please indicate below)

My organization has its own IRB and/or rules about doing internal research.

Identify Expected Products:

Include a detailed description of the final output of the project team and its value to the client organization.

- **Deliverables:** What documents/products/reports will the team deliver upon completion of this project?
 - **Urban Tree Canopy (UTC) map for the City**
 - **Above ground biomass estimate for UTC**
 - **A map of turf grass areas in the City**
 - **Community planning and outreach materials in support of better land stewardship via best practices for neighborhoods, property owners and land managers.**
- **Implementation:** How will project outputs be used by your organization? Will the project team's recommendations be shared with a broader network/audience? **Core information for the city's natural features sustainability efforts and A2 Zero climate efforts in Ann Arbor.**

Values and Diversity, Equity & Inclusion Statements

Please provide here any Corporate Social Responsibility (or similar) Statement from your organization, or provide as a link or attachment: **City of AA**

Please provide here any Diversity, Equity & Inclusion (or similar) Statement from your organization, or provide as a link or attachment: **City of AA**