



# GEORGIA



# INSTITUTE OF TECHNOLOGY



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# Community Resilience Building Summary of Findings

## December 2024



# Georgia Institute of Technology, Atlanta, Georgia

## Community Resilience Building

### *Summary of Findings*

#### **Overview**

The need for academic institutions, municipalities, regional planning organizations, states, and federal agencies to increase resilience to extreme weather events and a changing climate is strikingly evident amongst the communities across the state of Georgia. Recent events such as freezing conditions, winter storms, severe thunderstorms, tornados, hurricanes, flooding, and more intense and extended heat waves have reinforced this urgency and compelled leading communities and institutions like Georgia Institute of Technology to proactively collaborate on planning and develop actions that mitigate risk and enhance resilience. Ultimately, this type of leadership is to be commended because it will reduce the vulnerability and reinforce the strengths of people, infrastructure, and ecosystems and serve as a model for other communities in Georgia and across the Nation.

Recently, Georgia Institute of Technology (“Georgia Tech” or “Campus”) agreed to partner with The Nature Conservancy (TNC) and Second Nature on collaboratively conducting a community-based process to assess extreme weather and climate change impacts and to generate and prioritize actions to help improve resiliency, sustainability, and equity within their community. In December 2024, the Georgia Tech Core Team hosted a workshop as part of their Community Resilience Building process that was facilitated by TNC and Second Nature. The core directive of this effort was the engagement with and between community members (i.e., students, staff, and faculty) to define strengths and vulnerabilities and develop priority resilience actions for the greater campus community at Georgia Tech.

Georgia Tech Community Resilience Building Workshop’s central objectives were to:

- Define top local, natural, and climate-related hazards of concern.
- Identify existing and future strengths and vulnerabilities.
- Identify and prioritize actions for the community.
- Identify opportunities to collaboratively advance actions to increase resilience across the community, and beyond.

The Georgia Tech Campus community benefited from a unique “anywhere at any scale”, community-driven process called Community Resilience Building (CRB) ([www.CommunityResilienceBuilding.org](http://www.CommunityResilienceBuilding.org)). The CRB’s tools, reports, other relevant planning documents, and local maps were integrated into the workshop process to provide both decision-support and visualization around shared issues and existing priorities across the Georgia Tech Campus including the Georgia Tech Draft Climate Vulnerability Assessment (2024), Georgia Tech Comprehensive Campus Plan (2023), and the DeKalb County Hazard Mitigation Plan Update (2022). Using the CRB process - rich with information, local experience, and dialogue, the participants produced the findings presented in this Summary of Findings. This includes an overview of the top hazards, current concerns and challenges, existing strengths, and proposed actions to improve resilience to hazards and climate change on campus, today and in the future. The focus of this CRB was on Georgia Tech’s Campus within the City of Atlanta.

The summary of findings transcribed in this report, like any that concern the evolving nature of risk assessment and associated action, is proffered for comments, corrections, and updates from workshop attendees and other stakeholders alike. The leadership displayed by Georgia Tech on community resilience building will benefit from the continuous and expanding participation of all those concerned.

## **Summary of Findings**

### **Top Hazards and Vulnerable Areas for the Community**

Prior to the CRB Workshop, the Georgia Tech Core Team identified the top hazards for the Campus. The hazards of greatest concern included extreme heat and extended heat waves, intensive precipitation events with associated localized flooding from stormwater runoff, and freezing conditions and winter storms. Additional hazards highlighted by participants during the CRB Workshop included drought (resulting in reduce quality and quantity of drinking water for Campus from the City), hurricanes, tornadoes, and other types of high wind events. These hazards have direct and increasing impacts on the infrastructure, community members (staff, faculty, students, and visitors) and the environment including Campus, surrounding neighborhoods, open space/park areas like the EcoCommons, student housing facilities, transportation, Campus facilities and operations (e.g., dining) supportive municipal facilities, social support services, and other critical infrastructure and community assets at Georgia Tech.

## **Current Concerns and Challenges Presented by Hazards**

The Georgia Tech Campus community has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. Recently, Georgia Tech has experienced a series of highly disruptive and damaging weather events including winter storms (2014 – “Snowpocalypse”), Hurricane Florence (Sept. 2018 – Cat 4), Hurricane Michael (Oct. 2018 – Cat 5), severe thunderstorms (Sept. 2019), Tropical Storm Zeta (Oct. 2020), polar vortex (Dec. 2022), multiple tornados (Jan. 2023), extreme precipitation events (Sept. 2023), and an intense heat wave in 2024. Impacts from these events have included localized flooding from stormwater runoff, high wind event knocking down trees and loss of power, pipe ruptures and disrupted service due to freezing conditions, and canceled classes and delayed operations on Campus. The magnitude and intensity of these events and others in the greater Atlanta area and across Georgia have increased awareness of natural hazards and climate change, while motivating communities such as Georgia Tech to proactively improve their resilience and sustainability.

This recent series of extreme weather events highlights that the impacts from hazards are diverse. In the City of Atlanta and on Georgia Tech Campus this urban flooding (due to stormwater runoff from intense storms and heavy precipitation) of critical infrastructure, buildings, facilities, student housing, parking lots; and property damage and utility outages (lasting several days or more) from extreme winds and freezing conditions. Longer periods of elevated heat, particularly in July and August, have raised concerns about vulnerable segments of the Campus community and adjoining neighborhoods. The combination of these issues presents a challenge to preparedness and mitigation priorities and requires comprehensive, yet tailored actions for specific locations and/or areas at Georgia Tech.

The workshop participants were generally in agreement that Georgia Tech is experiencing more intense and frequent weather events that are being amplified by ongoing changes in the climate. Additionally, there was a general concern about the increasing challenges of being prepared for the worst-case scenarios at any time of year (e.g., major thunderstorms, tornados, and hurricanes (Cat-3 or above)) particularly in the late summer and in the fall/winter months when more intense storms coincide or overlap with colder weather. The complications and complexity presented to the Campus from simultaneous hazards was raised by workshop participants as a significant concern for Georgia Tech going forward.

## ***Specific Categories of Concerns and Challenges***

As in any community, Georgia Tech is not uniformly vulnerable to hazards and climate change. Certain locations, assets, and groups have been and will be affected to a greater degree than others. Workshop participants identified the following items as their community's key areas of concern and challenges across several broad categories.

### **Infrastructure, Societal, & Environmental Concerns and Challenges**

#### **University Functions, Operations & Growth:**

- Financing the execution of multiple plans with large goals coupled with the reality of larger projects taking many years to execute, which could create longer-term disruptions to campus life. Plans include Campus Comprehensive Plan, North x Northeast Sector Plan, South x Southwest Sector Plan, EBB/South Central Sector Plan, North Avenue Sector Plan, Stormwater Management Plan, and Northside Drive – Georgia DOT Plan.
- Campus bus transportation is impacted by flooding on North Avenue between Northside Drive and Tech Parkway with particularly impactful flooding under the bridge on North Avenue. Georgia Tech does not own or maintain these roads which is the responsibility of the City of Atlanta.
- No onsite fueling stations for Campus transit buses with the reliance on refueling trucks coming on to Campus. Fleet runs 100% on diesel. Maintenance of bus fleet is contracted out with no maintenance capacity on Campus.
- Extreme heat and cold temperature impact the reliability of Campus vehicles (vehicle starting) and increase the maintenance costs (battery life and cost).
- No current centralized file storage or communications across departments and divisions on Campus.
- City of Atlanta domestic drinking water system is a vulnerability with major failures in the recent past with complete dependence of Campus on water supplied by the City. Downstream effects due to frequent interruptions in water supply because bulk of cooling on Campus is reliant on consistent supply and specific quantities of water.
- Quality of drinking water is poor because of degraded water distribution system within and across the City of Atlanta due to dependence on surface water collection versus groundwater/aquifer source wells (“There is no diversity in our drinking water sources”). The City has had “water boiling” announcements because of the water supplied is unsafe to consume.
- Concerns regarding drinking water shortages and outages with the largest international student body on Campus for all of Georgia that are not able to easily relocate off Campus.

## ***Specific Categories of Concerns and Challenges (cont'd)***

- Large international student population that will need to be housing during pro-longed emergency events.
- Concerns about the fact that the largest municipality in Georgia (Atlanta) is dependent on the smallest, single watershed in the country (Chattahoochee) for reliable drinking water supply. The greater Atlanta area is totally reliant on surface water with little available groundwater resources in most locations.
- Many essential workers reside well away from Campus which presents challenges in getting them there during extreme weather events.
- Concerns for the hundreds of staff that conduct their jobs outside sometimes during extreme weather and temperatures.
- Potential food insecurity issues due to the fact that the Campus does not produce food and is fully dependent on outside sources for day-to-day needs. In the event transportation networks are shut down there would be a limited ability to provide for the Campus community over the short-term, let alone over an extended period of a week or more.
- Atlanta Regional Commission conducts high level resilience planning however the regional planning efforts are not granular enough to be valuable for more localized challenges and opportunities to reduce risk and improve resilience.

## **Emergency Management and Preparedness:**

- Growing concerns regarding the general uncertainty about the extreme nature of hazards and how they will change over time as the environment shifts to higher extreme and average temperatures in Georgia. This uncertainty presents a challenge for emergency management professionals despite active scenario planning exercises and updated hazard mitigation plans (“we still do not know what we don’t know”).
- Potential for “cascading failures” due to more intense hazards such as droughts that result in intense heat that cause rolling blackouts. Planning for these types of cascading issues has not been conducted on Campus, across the City of Atlanta, or at the county level, as of yet.
- Lack of available water due to interruptions in supply via the City’s system can create fire watch issues with select building being unprotected due the inability to suppress fire without City water. This can lead to the cancelation of events and hygiene concerns as well in those “unprotected” buildings.
- Growing concern within Health Services on the potential for more extreme disease outbreaks due to increasing temperatures and presence of more pests and pathogens.

## ***Specific Categories of Concerns and Challenges (cont'd)***

- Transient student populations lead to short-term engagement, and limited familiarity with emergency procedures and support.
- Disabled, lower income, and international students remain vulnerable during emergencies and require special consideration and assistance.
- City of Atlanta receives on average 50 inches of rainfall annually with recent trends indicating that annual amount will significantly increase leading to more intense concentrations of rainfall over 24-hour periods.

### **Campus Buildings & Facilities:**

- Ongoing concerns about low-lying areas on Campus susceptible to localized flooding and intrusion into adjacent building during more intense and longer duration precipitation events.
- Routine flooding of areas around the 80-acre EcoCommons that runs through Campus including the Ferst Center for the Arts, Smithgall Student Services Building, Peters Parking Deck, President's House in the Glades, and other buildings in the EcoCommons zone.
- Chilled water outages in the Campus cooling systems during the summer months makes buildings more susceptible to mold, which can present a health concern to the Campus community. Chilled water distribution system had an alarming failure during the summer of 2024.
- Recent increases in expenses associated with impacts on facilities and grounds in certain areas of Campus due to intense precipitation events leading to large volumes of stormwater runoff.

### **Stormwater, Waste Systems, Drinking Water Supply & Power Systems:**

- Various Sector Plans address the core of the Campus (and are integrated in the Comprehensive Campus Plan) however, the Stormwater Master Plan (2014) only looks at the basins in the north and western portions of Campus.
- Most if not all drinking water pipes and associated system components are City of Atlanta water lines that deliver water to Campus.
- Cold snaps often lead to water main breaks due to the antiquated piping infrastructure and monitoring systems within the City of Atlanta. Recently, 14 large water main breaks occurred across the City of Atlanta and DeKalb County during a cold weather event leading to an advisory to boil before drinking any water from a public water source.

## ***Specific Categories of Concerns and Challenges (cont'd)***

- Increases in the need to manage stormwater without adequate availability of green stormwater infrastructure (i.e., bioswales, rain gardens, etc.) on Campus.
- Steam system and boilers were built and installed back in the 1950s and may be approaching a realistic end of their life cycle.
- Concerns that uncontrolled development in the greater Atlanta region will place greater and greater stress on the water systems and subsequent impacts to the electrical grid since ninety percent of electrical power relies on water for generation (“If we mismanage of water resources, we lose power as well.”).
- Ninety-nine percent of the energy needed on Campus is imported from outside sources. There are not enough back-up power generation or renewable energy production options (i.e., microgrids) on Campus to handle major outages or disruptions in external supply and distribution. Generally, there is an over dependence on the external electrical grid on Campus.

### **Open Space, Natural Systems, Forests, Trees:**

- Concerns about loss or decline in the health of the Campus tree canopy due to extreme heat waves independent of or coupled with major precipitation events that soften the ground and make trees susceptible to blowing over.



Credit: Georgia Institute of Technology

## **Current Strengths and Assets**

Just as certain locations, facilities, and groups at Georgia Tech stand out as particularly vulnerable to the effects of hazards and climate change, other features are notable assets for resilience building. Workshop participants identified the following items as their community's key strengths and expressed interest in centering them as the core of future resilience building actions.

### **University Functions, Operations & Growth:**

- Clearly, the responsive and committed engagement exhibited by leadership, staff, faculty, and students is a very appreciated strength within and across Georgia Tech. Ongoing collaboration between leadership, colleges, divisions, and departments, among other entities on Campus as well as with the City of Atlanta on priorities identified herein will help advance comprehensive, cost-effective, community resilience building actions.
- Staff (including essential employees) possess deep institutional knowledge and technical understanding of how to manage routine to major events and therefore, represent a crucial form of resiliency at Georgia Tech.
- Outstanding faculty that are committed to ensuring Georgia Tech remains a world class Campus with cutting edge research being conducted.
- Committed, passionate, and engage student body is a clear and ongoing strength of the Georgia Tech Campus community as well as the greater Atlanta area.
- Current emphasis by staff and leadership to accelerate the pace of project development and implementation to make Georgia Tech more sustainable, self-reliant, and resilient.
- Existing plans on Campus operate in complement with each other and have been built up from one another over the years since the original planning in the early 2000s.
- Utility Master Plan process is currently in full planning mode with the intention of addressing some of the issue of failing infrastructure on Campus along with helping to ensure long-term continuity and functionality of utility systems on Campus.
- Two distinct heating and cooling plants on Campus are front and center considerations in the current development of a Utility Master Plan for Georgia Tech, which will include back-up contingency plans looking out over the next 25 years.
- North Avenue Sector Plan represents over a billion dollars of work that is underway, which is split into several projects.

## **Current Strengths and Assets (cont'd)**

- Current resiliency in the heating systems in the event of freezing conditions via multiple pathways and sources (i.e., natural gas, stored propane, electricity). Plentiful and readily available equipment to help with the deployment of various heat sources, although a bit outdated (circa 1952).
- Campus Services has contracts in place with vendors to provide basic needs to the Campus community in the event the Campus is not able to do so. Partners include family assistance centers, corporations such as Coca Cola, Inc., City of Atlanta, and adjacent academic institutions in the greater Atlanta area.

### **Emergency Management and Preparedness:**

- Emergency management preparedness group is a strength for campus-wide, response and recovery activities.
- A risk mitigation planning process was just initiated with the Office of Emergency Management.
- Robust campus-wide emergency communication system in place and fully operational.
- Strong and supportive relationships between State, County, City, and Campus emergency management professionals in terms of planning, resource and recovery, communications, and resource sharing.
- Existing Campus plans have identified needs and actions to remedy localized flooding issues on Campus.
- The Campus has two designated sheltering locations for use during natural disasters.
- Existing relationships and partnerships, established during the COVID-19 pandemic, with hotels near Campus for sheltering of students in times of need.
- Mutual aid agreements in place with University of Miami and Tulane University to support housing and sheltering needs of student in the event of disasters that require moving students off the Georgia Tech Campus for extended periods of time.
- Facilities has on-call service contracts with tree removal companies to ensure a quick response to downed trees and safety issues on Campus due to storm events.

## **Current Strengths and Assets (cont'd)**

### **Campus Buildings & Facilities:**

- Georgia Tech is looking to establish Resiliency Hubs in strategic locations on Campus that would provide additional support and convening centers primary for students in Campus housing during natural disasters. Resiliency Hubs would need to be connected to electrical and water services as well as food provisioning services to viably support the Campus community for short- and long-term use. The current utilities master planning effort are working to integrate concepts and programming for Resiliency Hubs on Campus. Areas of Campus under consideration include near the Exhibition Hall, Campus Recreation Center, and/or the Campus Health Center.
- Onsite fuel services for smaller vehicles used for facilities management.
- Overlay on map of EcoCommons has been prescribed to allow for improvements that reduce localized flooding of key building within the EcoCommons zone that currently experience flooding issues including the Ferst Center for the Arts and Smithgall Student Services Building, among others. Activities to reduce flooding at these locations will need to address the shifts in historic drainage patterns that were modified during on-campus development over the decades.
- Living building on Campus serves as model where surplus of energy is generated, treats stormwater water runoff for re-use, and where the building is completely off grid.
- Facility condition assessments and rating for most if not all building on Campus with new buildings and other recent major renovations built with standards the meet and exceed code minimums (yellowbook).

### **Stormwater, Drinking Water Supply & Power Systems:**

- South Central Sector plan among other portions of Campus plans address stormwater runoff issues in W21 parking lot all the way down the Hempville Corridor.
- Number of cisterns across Campus that assist and support stormwater management as well as potentially suppling water for re-use applications in the future.
- Site for a micro water treatment facility has been identified and discussions are underway to explore the reuse of water from cooling towers on Campus.
- Majority of power cables and conduits are already underground resulting in power systems being the more resilient utility on Campus, currently.

## **Current Strengths and Assets (cont'd)**

- Net metering is common however, there is a relatively small amount of energy currently produced on Campus.
- Georgia Tech Campus has a reliable and resilient electrical system.

### **Open Space, Natural Systems, Landscaping & Tree Canopy:**

- Campus-wide landscape planning and execution over the last 20 years has transformed the Campus to a more beautiful, ecological, and resilient place with emphasis on use of natural system to manage stormwater runoff and provide tree canopy and open space such as the EcoCommons that enhance the wellbeing of the Campus community.
- Landscape improvements have helped to enhance the tree canopy coverage on Campus, which has been shown to be helpful during extreme heat wave events by cooling the ambient air temperatures and thus reducing the impact on students, staff, and faculty. City of Atlanta also invests in protecting and improving tree canopy coverage, which compliments the work on the Georgia Tech Campus.
- Campus Master Plan and the Campus Stormwater Master Plan include descriptions of the EcoCommons and associated flooding hazards with highlights of goals and actions to reduce issues within the highlighted corridors. These actions include ensuring that tree canopy cover improvements, pervious surfaces reduction, and capacity of cisterns exceed existing amounts and practices.
- Facilities and Landscape Services actively shred and mulch between 15-20 loads of leaves picked up from the vacuum trucks and disperse in select areas (Kendeda Building) over existing landscaping resulting in greater infiltration and less stormwater runoff along with cooler soil temperatures during drought conditions. This is an example of proactive landscaping project to help increase the resilience of Campus in the face of more intense precipitation events as well as drought conditions.



Credit: Georgia Institute of Technology



Credit: Georgia Institute of Technology



Credit: Georgia Institute of Technology

## **Recommendations to Improve Resilience**

A common theme among workshop participants was the need to continue community-based planning efforts focused on developing adaptive measures to reduce Georgia Tech's vulnerability to extreme weather, climate change and other common concerns raised. To that end, the workshop participants helped to identify several priority topics requiring more immediate and/or ongoing attention including:

- **Long-term vision and growth** (i.e. responsible/sustainable/resilient growth, environment/conservation, safety & wellbeing, students, staff, and faculty, communication systems, campus/city/county community building);
- **Infrastructure improvements** (i.e., buildings/facilities/clinics/laboratories, electric grid & power supply, sanitary systems, stormwater management systems, green stormwater infrastructure, bus transit);
- **Quality of life improvements** (i.e., housing/dorms, safety, open space & tree canopy, accessibility/transportation, sustainability, mental health & medical care);
- **Emergency management** (i.e. communications, tabletop exercises, education, evacuation, coordination (campus, city, county)).

In direct response, the Community Resilience Building workshop participants developed the following actions and identified, but not organized, them as priority or as additional actions. Maps from various Campus, City, and County sources that were provided during the workshop are provided in Appendix A for cross reference with actions presented herein.

### **Priority Actions**

- Conduct a cost/benefit analysis of a proactive resilience and project capitalization approach versus a reactive “wait and see” approach to managing natural disasters on campus as identified in the recently completed Campus vulnerability assessment. Look to incorporate findings into the current Hazard Mitigation Plan update being conducted by Campus Emergency Management staff.
- Build an immediate and long-term business case for greater energy generation and storage capacity on Campus.

## Priority Actions (cont'd)

- Work to ensure that the entire Campus community is aware of the multitude of published Campus plans by aggregating and posting them on the Campus website along with a wide-ranging communications effort across Campus. Incorporate information about various Campus plans and guides into new employee and staff orientation processes and procedures – perhaps in a more condensed and digestible format.
- Look to elevate the level of readiness for extreme weather events across the Campus community through broad awareness communications coupled with the provisioning of “Go Bag Kits” to all students that are equipped with information and items deemed key to increase individual resilience.
- Explore the potential for establishing a micro-water treatment facility on Campus to help with current and future water provisioning needs across the Campus community. The treatment facility could focus on treating all or a portion of the over 400,000 gallons used every day for the cooling towers and be modeled after The WaterHub at Piedmont Atlanta Hospital (250,000 gallons per day). Look to see if that City of Atlanta would be interested in joining as a partner in the initial assessment and potentially as future owners and operators of the facility on Campus. There is currently space available on Campus to support this type of facility.
- Explore ways to increase the capacity and acceptable use of rainwater harvested in the current catchment basin system beyond irrigation and flushing of toilets. Recycling water on Campus would help to reduce the potential impacts of loss or interruption of water supplied by the City of Atlanta.



Credit: Georgia Institute of Technology

## Additional Actions

- Look to align all of the various plans with resilience components and actions with a 10-year strategic financing plan to help prioritize and be more realistic about what can be achieved in a decadal time period on Campus.
- Work to establish Resilience Hub on Campus that will provide a place for students to find shelter and support for extended periods during challenging events complete with self-sustaining energy, water, and food supply. Analysis underway to identify potential locations coupled with consideration in the upcoming Utility Master Plan for Campus.
- Complete the Utility Master Plan with a focus on alternate, locally sourced electricity to support a more resilient Campus with more reliable and consistent energy supply. In addition, build out in the Utility Master Plan options for thermal storage, battery storage, and shut offs for buildings during peak to gain better control of supply and use across Campus.
- Continue to advance the ongoing food assessment to determine the distance food delivered to Campus travels in hopes of encouraging more emphasis on buying from more locally grown sources as well as reducing the overall carbon footprint of food systems on Campus.
- Explore options for improving heating and cooling energy generation by increasing onsite renewable sources (i.e., microgrid, solar, etc.) to ensure reliability and local control. Look to explore further local examples of economically feasible approaches to local energy provisioning for Campus systems such as at Agnes Scott College in Atlanta.
- Look to incorporate more green stormwater infrastructure projects (i.e., bioswales, rainwater gardens, etc.) in the ongoing Hazard Mitigation Plan update along with a greater emphasis on enhancement to the tree canopy across Campus as an ambient air temperature reducing action. Conduct assessment of Campus to identify opportunities for the installation of nature-based solutions such as rain gardens and bioswales to help trap and retain stormwater runoff and increase infiltration into the groundwater.

## **Additional Actions (cont'd)**

- Increase communications with the student body and larger Campus community regarding the work being conducted at Georgia Tech to improve sustainability and resilience in hopes of elevating support for expected systems change and to help further instill a culture of resiliency, responsiveness, and preparedness going forward.
- Explore opportunities to educate and empower students to be active in securing their own safety and preparedness through emergency management efforts such as proactive student ambassador program with the Emergency Management Office.
- Assess and provide support for student's needs associated with concerns and anxiety related to their Campus experience given the potential of extreme heat and cold. Ensure that leadership acknowledges these concerns amongst the student body and their respective families that have placed their young adults in the care of Georgia Tech during the academic year.
- Conduct infrastructure outage and emergency management exercises that accounts for different combinations and cascading scenarios. Identify faculty on Campus that could help define a suite of various climate-related conditions or situations over the next 100 years in hopes of improving forward looking emergency tabletop exercises.
- Participate in hazard tabletop planning exercises with not only the consideration of utility interruptions (water, electricity, sewer) coupled with other combinations of hazards in anticipation of future cascading impacts.
- Continue to explore possibilities that would move the Campus away from the current dependence on steam including upgrades to existing piping infrastructure despite the large financial cost over time.
- Explore options to promote greater exchange and openness between divisions via improve file sharing in a centralized way and access processes, procedures, and technology platforms. In addition, utilize the Daily Digest to promote greater awareness and connectivity across the campus community.

## Additional Actions (cont'd)

- Set up a robust measurement and verification program with associated cost projections for projects. Ensure that these tools are public and accessible to help identify when cost efficiencies can be realized (i.e., decrease in price per panel for solar).
- Work to increase exchange and engagement to help with alignment between City of Atlanta's Department of City Planning and Georgia Tech on resilience planning with specific emphasis on available resources and collective strengths.



Credit: Georgia Institute of Technology

## **CRB Workshop Participants: Department/Organization**

Georgia Institute of Technology – Emergency Management and Communications

Georgia Institute of Technology – Institute of People and Technology

Georgia Institute of Technology – Infrastructure and Sustainability

Georgia Institute of Technology – Planning, Design, and Construction

Georgia Institute of Technology – Environmental Health and Safety

Georgia Institute of Technology – Utilities Management

Georgia Institute of Technology – Parking and Transportation

Georgia Institute of Technology – Scheller College of Business

Georgia Institute of Technology – Petit Institute for Bioengineering and Bioscience

Georgia Institute of Technology – Office of Sustainability

Georgia Institute of Technology – College of Engineering

Georgia Institute of Technology – School of Chemistry and Biochemistry

Georgia Institute of Technology - Students

## **Georgia Institute of Technology CRB Core Team**

Jairo Garcia – Office of Sustainability  
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Gregory Spiro – Infrastructure-Facilities-Buildings  
Jennifer Chirico – Office of Sustainability  
William Smith – Emergency Management  
Jason Gregory – Planning, Design, and Construction  
April Kelly – Environmental Health and Safety  
Jermaine Clonts – Sustainability and Building Operations  
Derrick Walker – Campus Transportation  
Allison Bridges - Scheller College of Business  
Vanessa Suarez – Office of Sustainability  
Drew Culright – Office of Sustainability

## **Georgia Institute of Technology CRB Workshop Facilitation Team**

The Nature Conservancy - Adam Whelchel, Ph.D. (Lead Facilitator/CRB Program Lead)  
Second Nature – Steve Muzzy (Small Group Facilitator)  
Second Nature – Cami Sockow (Small Group Facilitator)  
The Nature Conservancy – Erica Anderson (Scribe)  
Second Nature – Meredith Leigh (Scribe)  
The Nature Conservancy – Anjali Khanna (Scribe)

## **Recommended Citation**

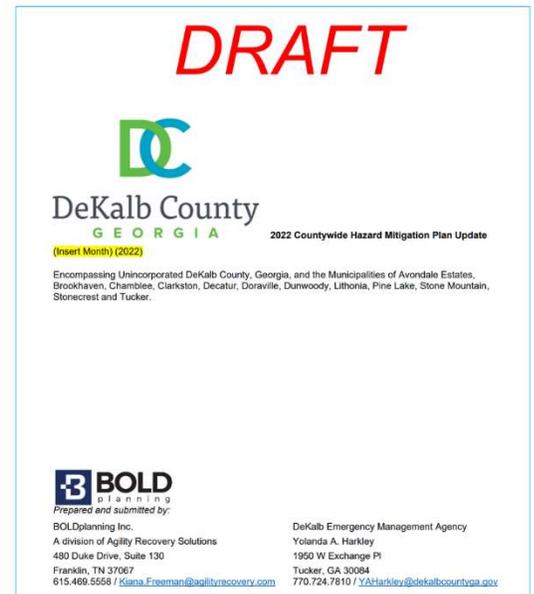
Georgia Institute of Technology Online Community Resilience Building Workshop - Summary of Findings Report. (2024). The Nature Conservancy and Second Nature. Atlanta, Georgia.

## **Acknowledgements**

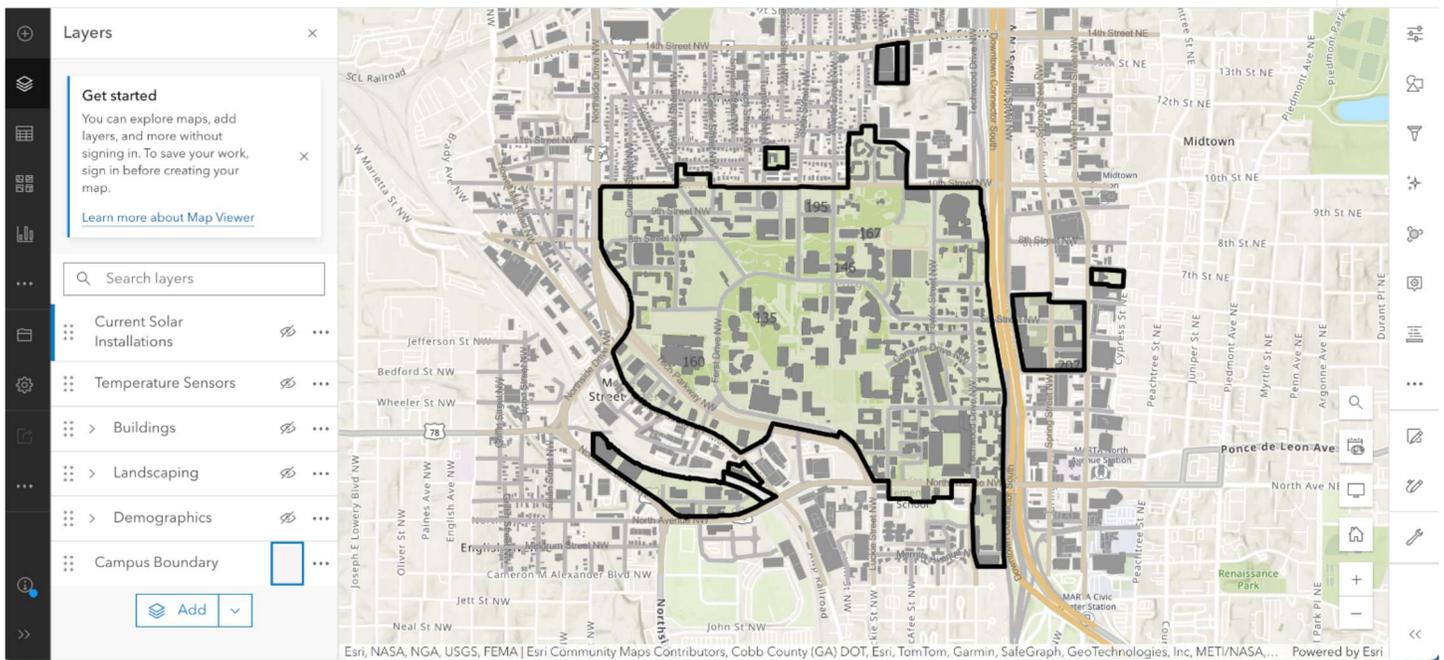
Special thanks to leadership, staff, students, and faculty for their willingness to embrace the Community Resilience Building process in hopes of a more resilient, sustainable, and equitable future for Georgia Institute of Technology. This Community Resilience Building Workshop was made possible through the contribution of the facilitation team members who skillfully conducted the Georgia Institute of Technology Workshop in close partnership with Georgia Institute of Technology Core Team.

# Appendix A

## Georgia Institute of Technology Map Resource Packet\* Used During Workshop



\*Maps gathered from the DRAFT Georgia Tech Climate Vulnerability Assessment (2024) and the DeKalb County 2022 Countywide Hazard Mitigation Plan Update.



**Campus Context Today**

The Georgia Tech campus is uniquely situated at the seam of some very distinct and evolving urban neighborhoods. The eastern edge of campus is flanked by the interstate (I-75/85) and the extremely dense corporate-commercial neighborhood of Midtown. This area has seen tremendous growth over the past decade, anchored by Georgia Tech's development of Tech Square. North of the campus is Home Park, a dense residential neighborhood that is home to many Georgia Tech students.

The western edge borders residential areas (Blandtown, the Marietta Street Artery, and English Avenue) that are in the midst of transformative investments to encourage and stabilize homeownership. Some of these investments have resulted in the adaptive reuse of existing industrial buildings and an uptick in denser, mixed-use developments, particularly along Marietta Street.

Southwest of Marietta Street is a varying mix of institutional, industrial, and commercial uses including the Means Street Historic District, workshops and makerspaces (NARA-North Avenue Research Area), and the ongoing development of a mixed-use research community at Science Square.

- Higher Density Neighborhood
- Medium Density Neighborhood
- Emerging Medium Density Neighborhood
- Lower Density Neighborhood

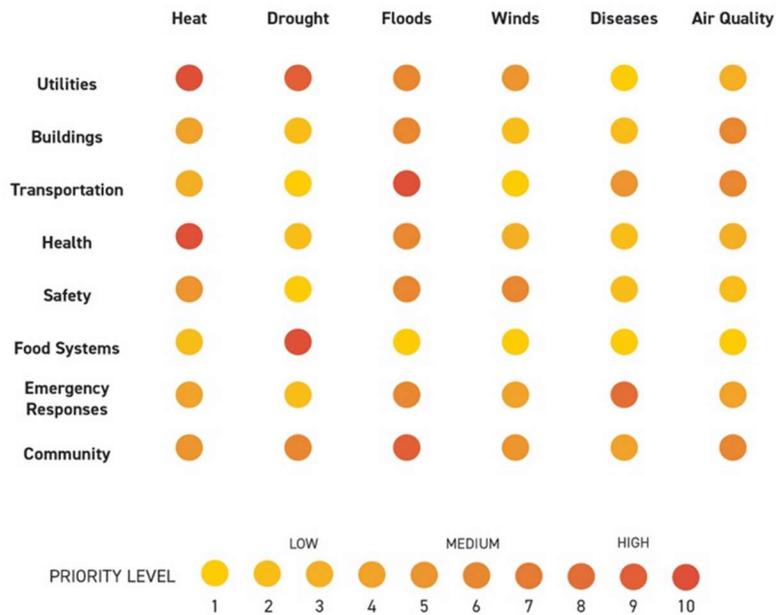
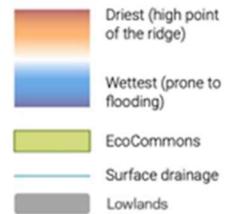
Georgia Tech campus neighbors and surrounding densities.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)



◀ The campus is roughly 50/50 highlands to lowlands with large topographic slope occurring in the transition between the two.

Tech Parkway is a large, flat, level drainage pattern at the top of the watershed. Large junctions of natural drainage patterns occur at Tech Green, Hemphill Ave & 8th Street, Peters Parking Deck, and Ken Byers Tennis Complex.



Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

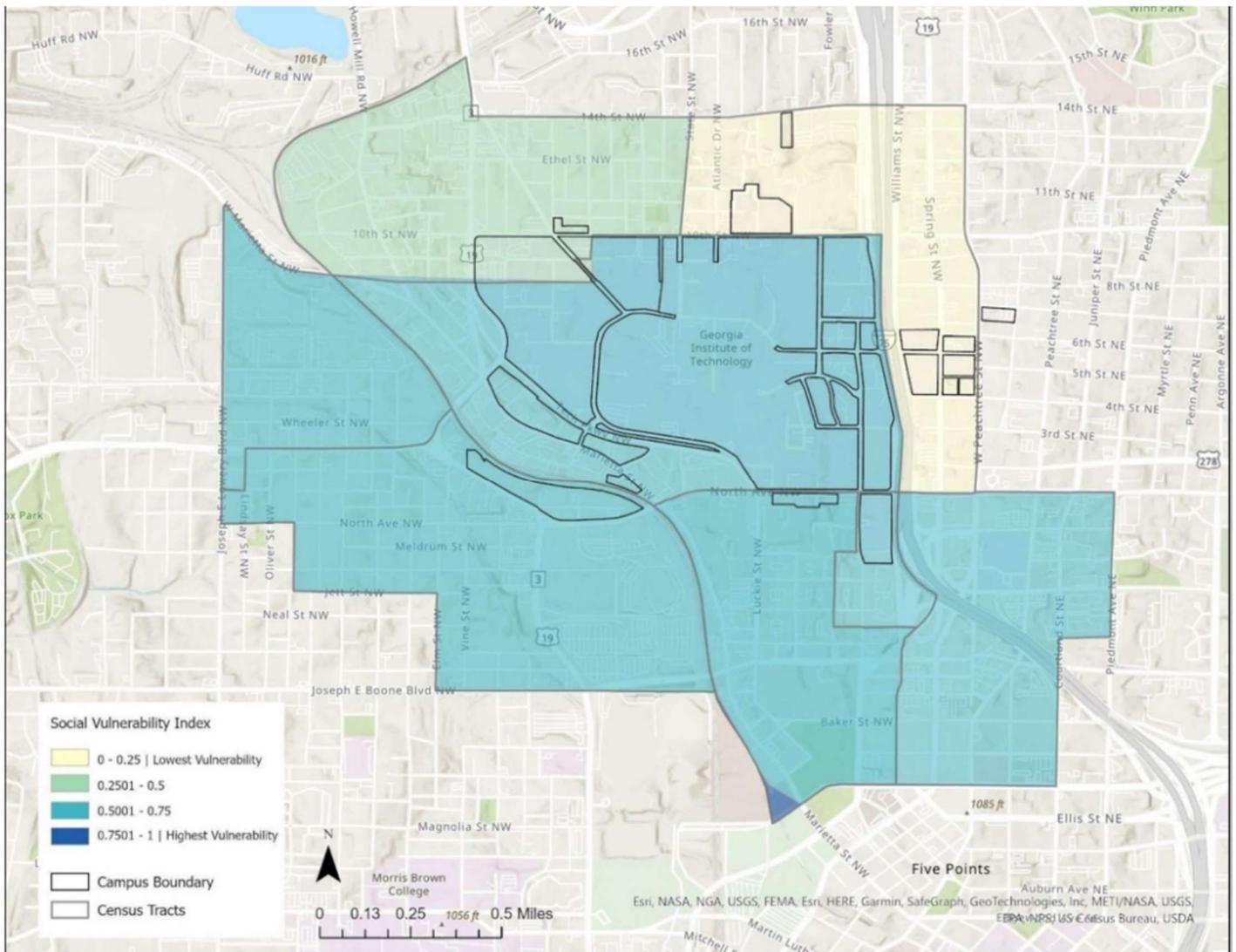


Figure 2. Social Vulnerability index. Social vulnerability index by census tract for Georgia Tech campus and surrounding communities.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

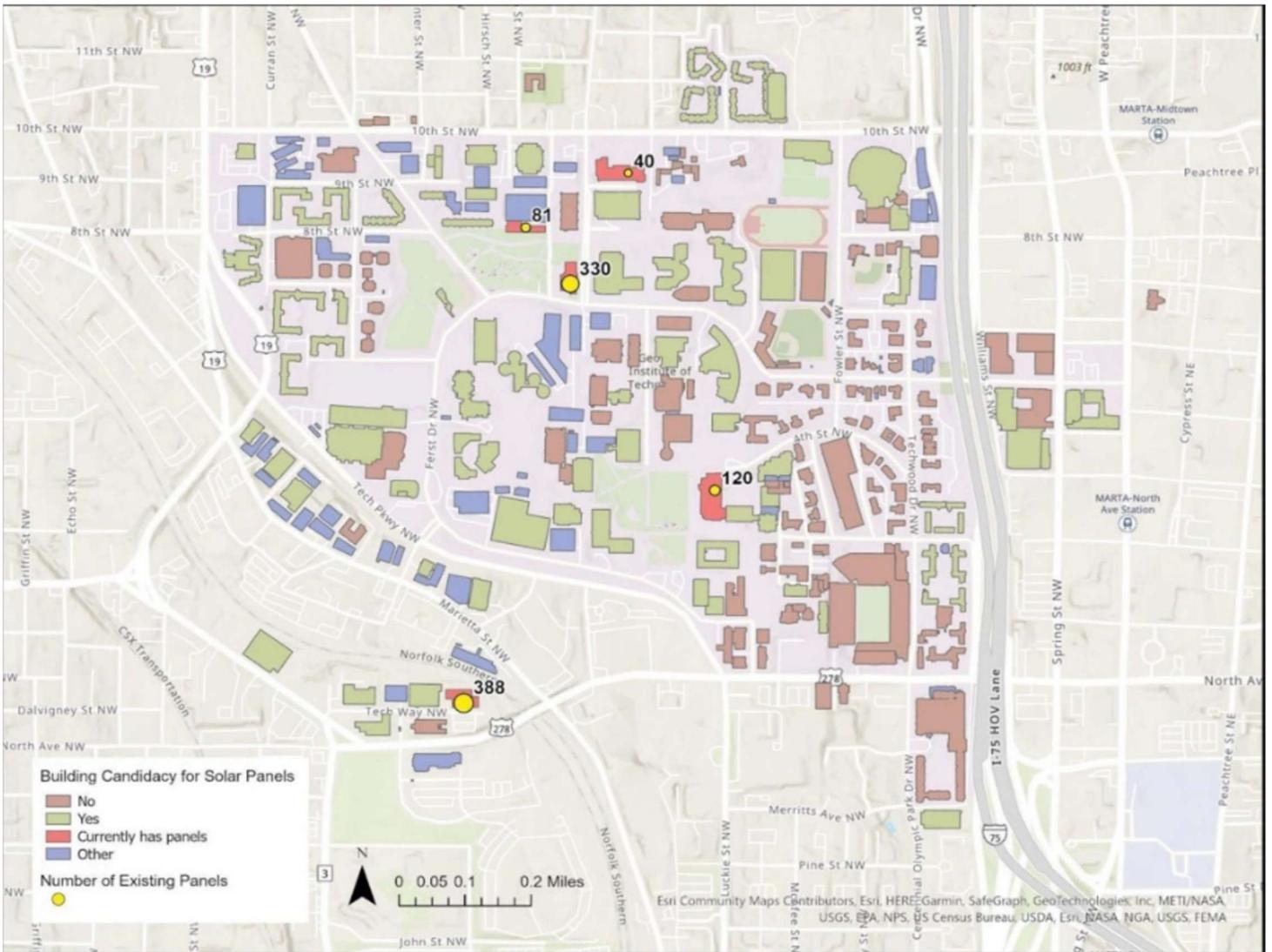
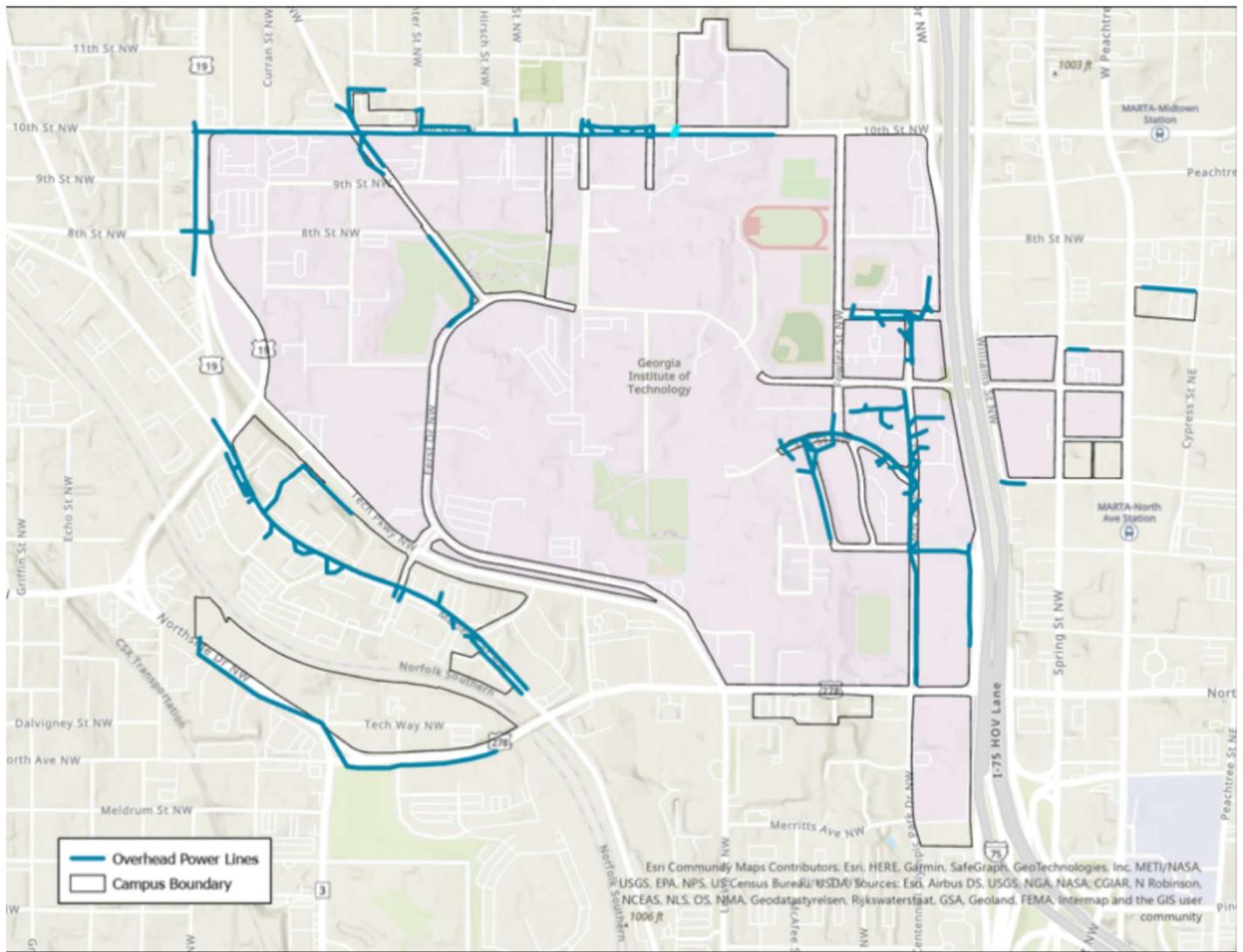


Figure 5 Solar Panels on Campus.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)



Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

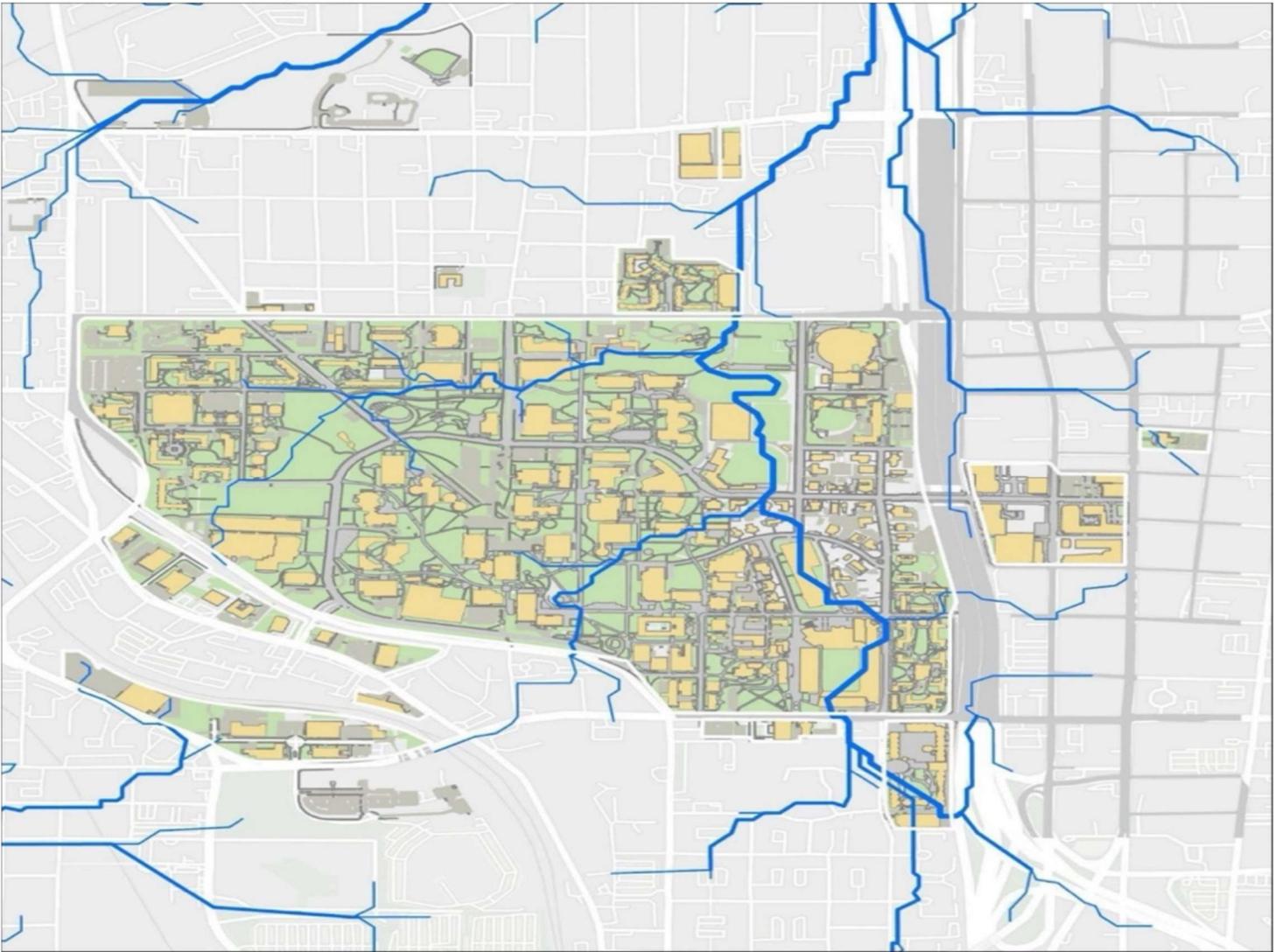


Figure 9. Stormwater Runoff Streams Around Georgia Tech's Campus.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

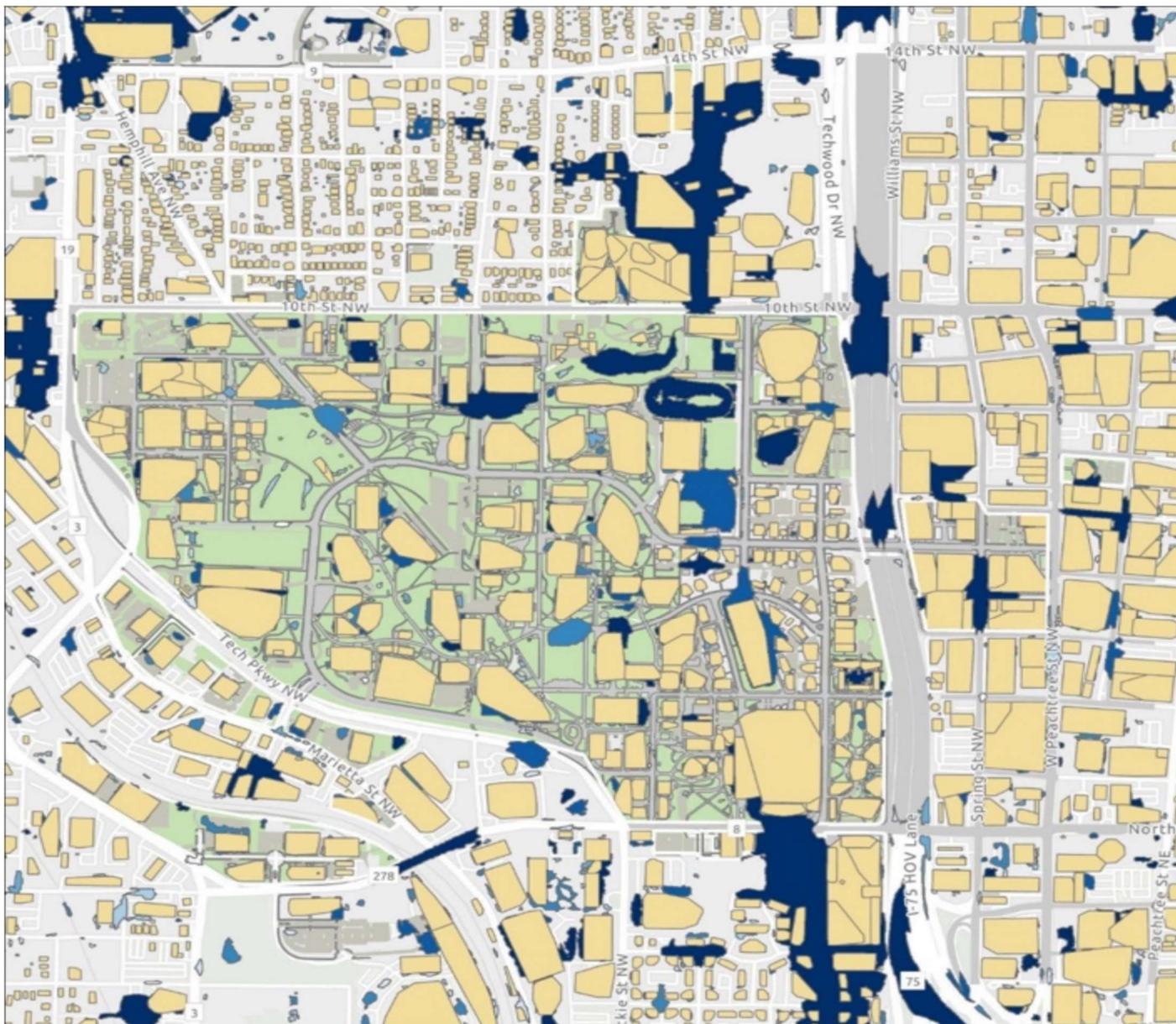


Figure 10 Bluespots Around Georgia Tech’s Campus, colored by fill level.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

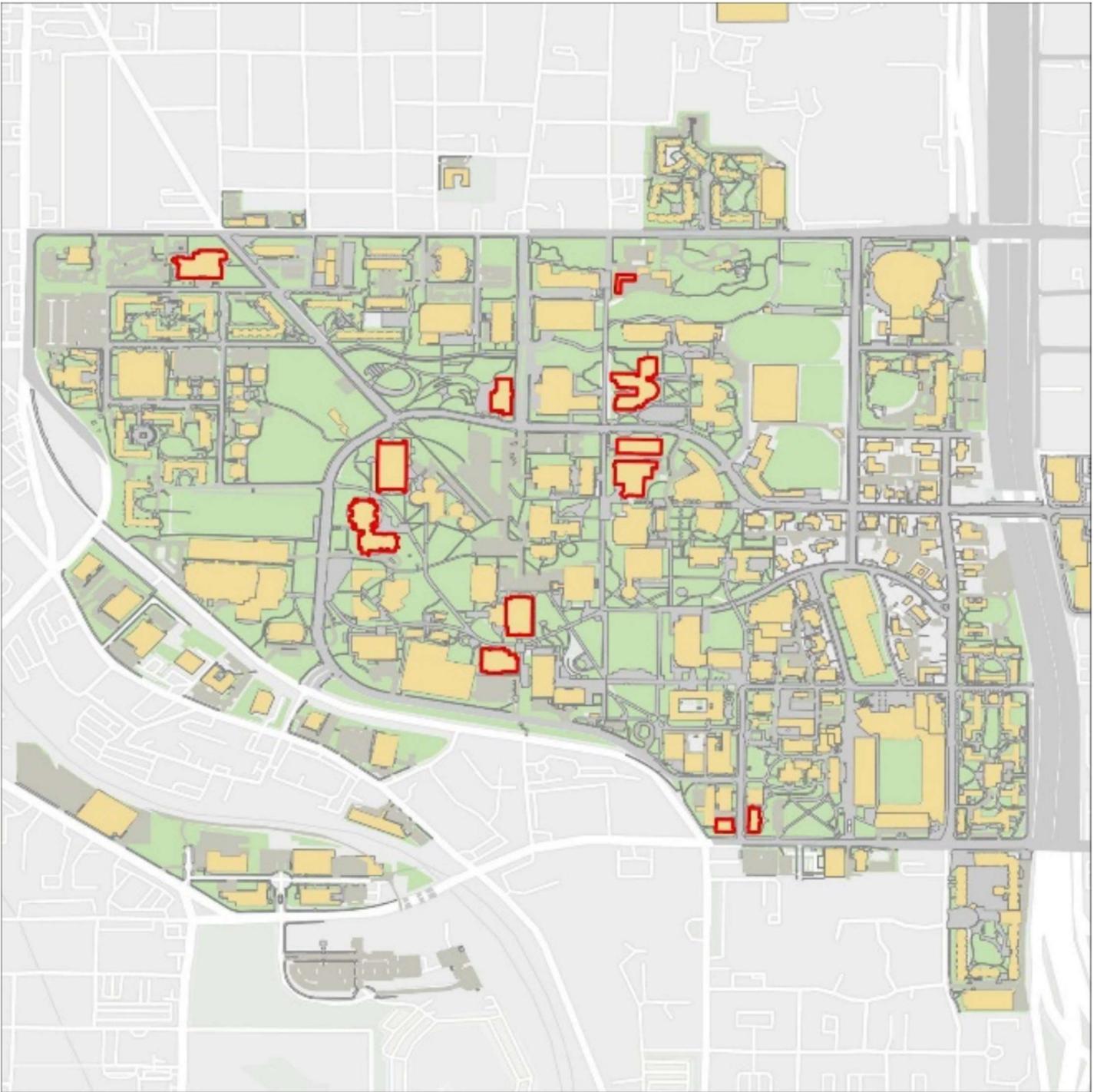


Figure 11 Georgia Tech Building Flooded in Storms on September 14, 2023.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

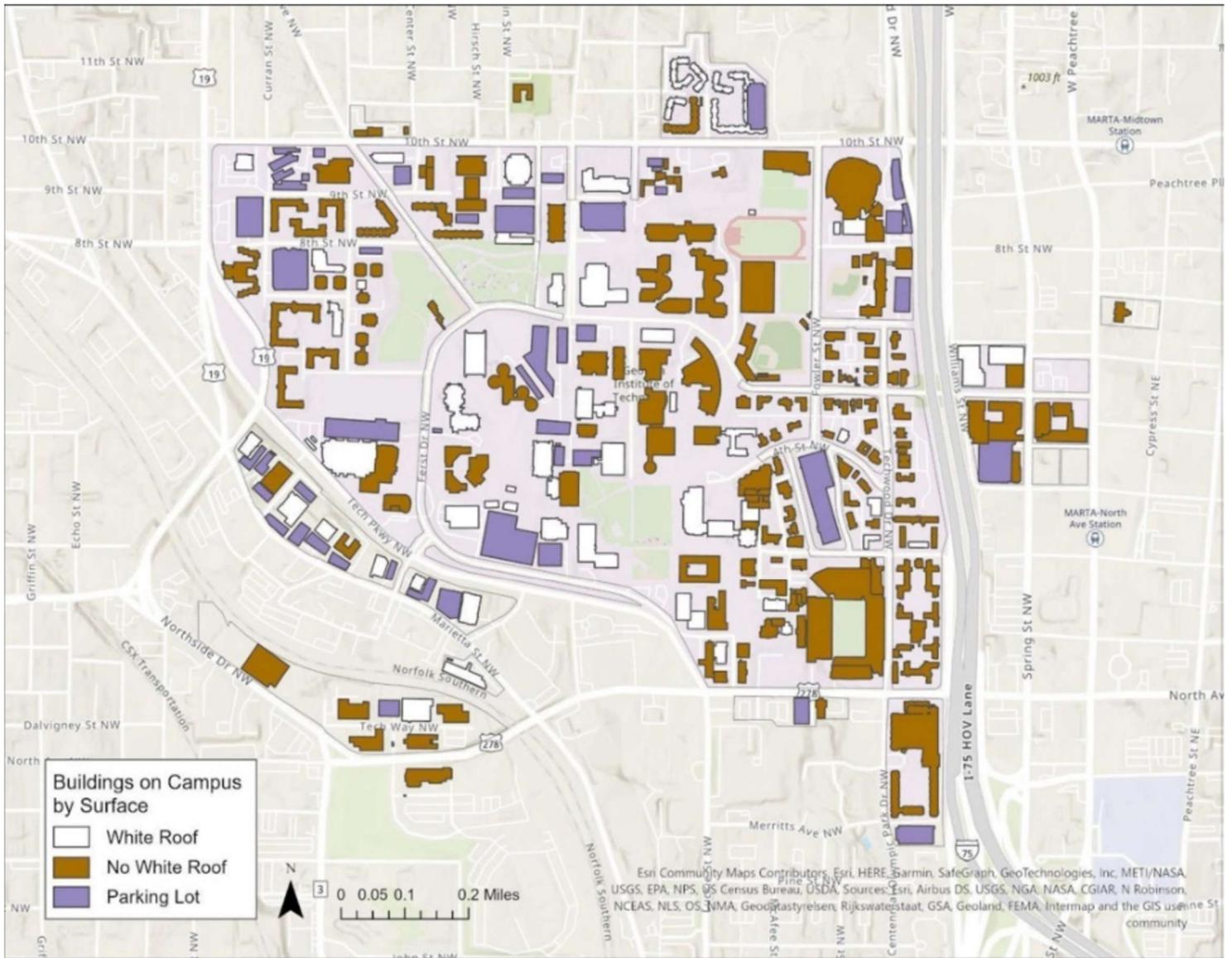


Figure 12 White Roofs on Campus.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

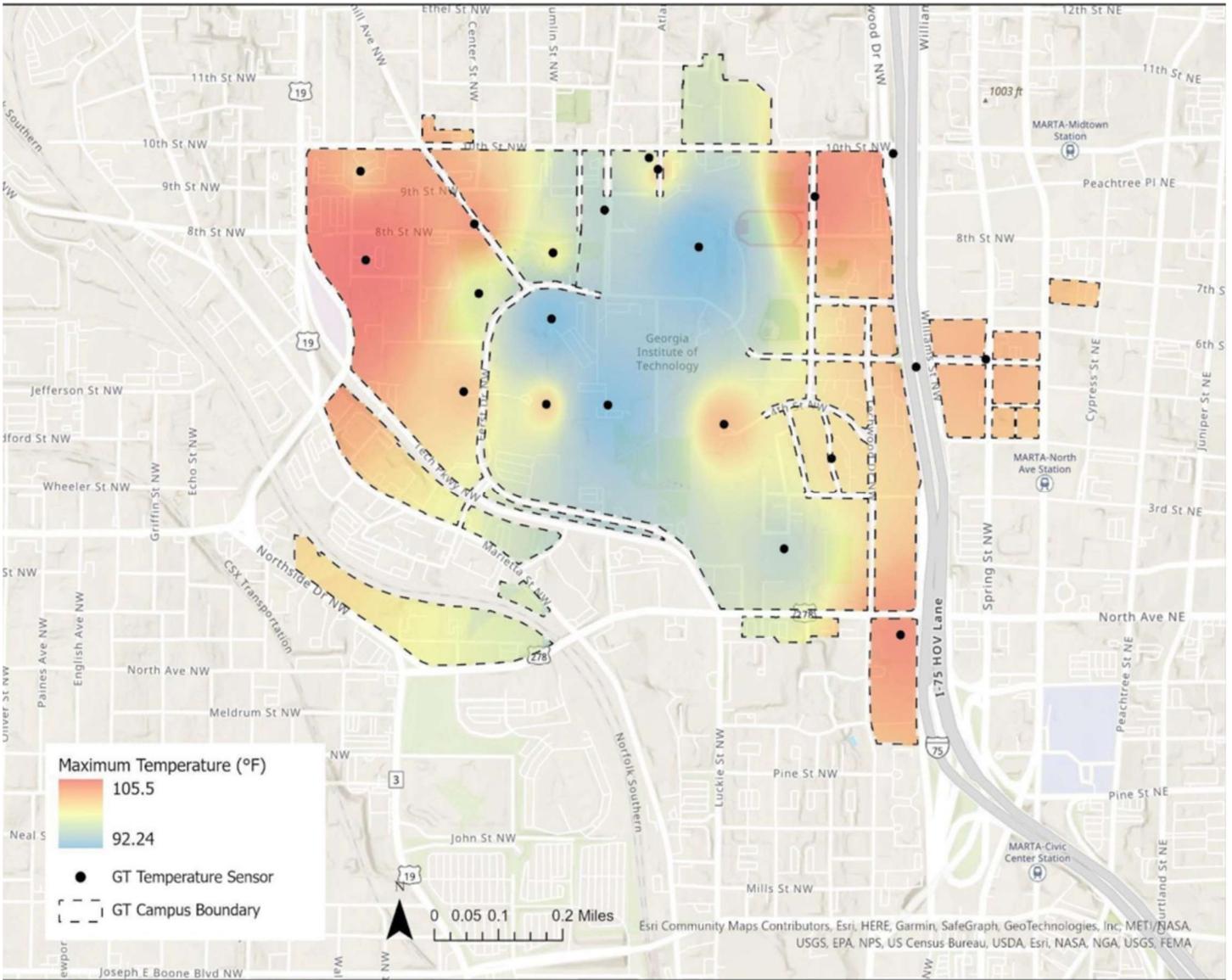
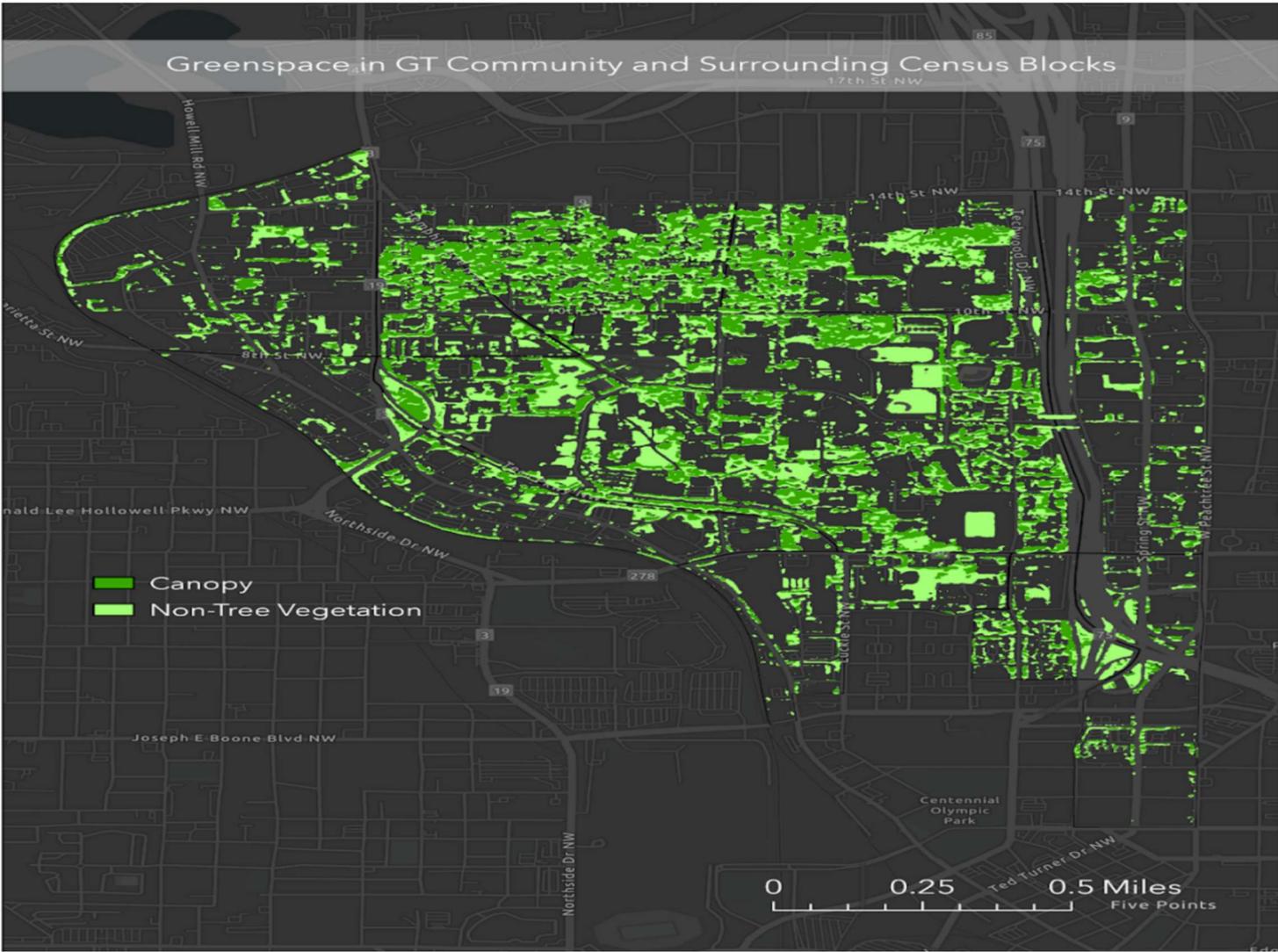


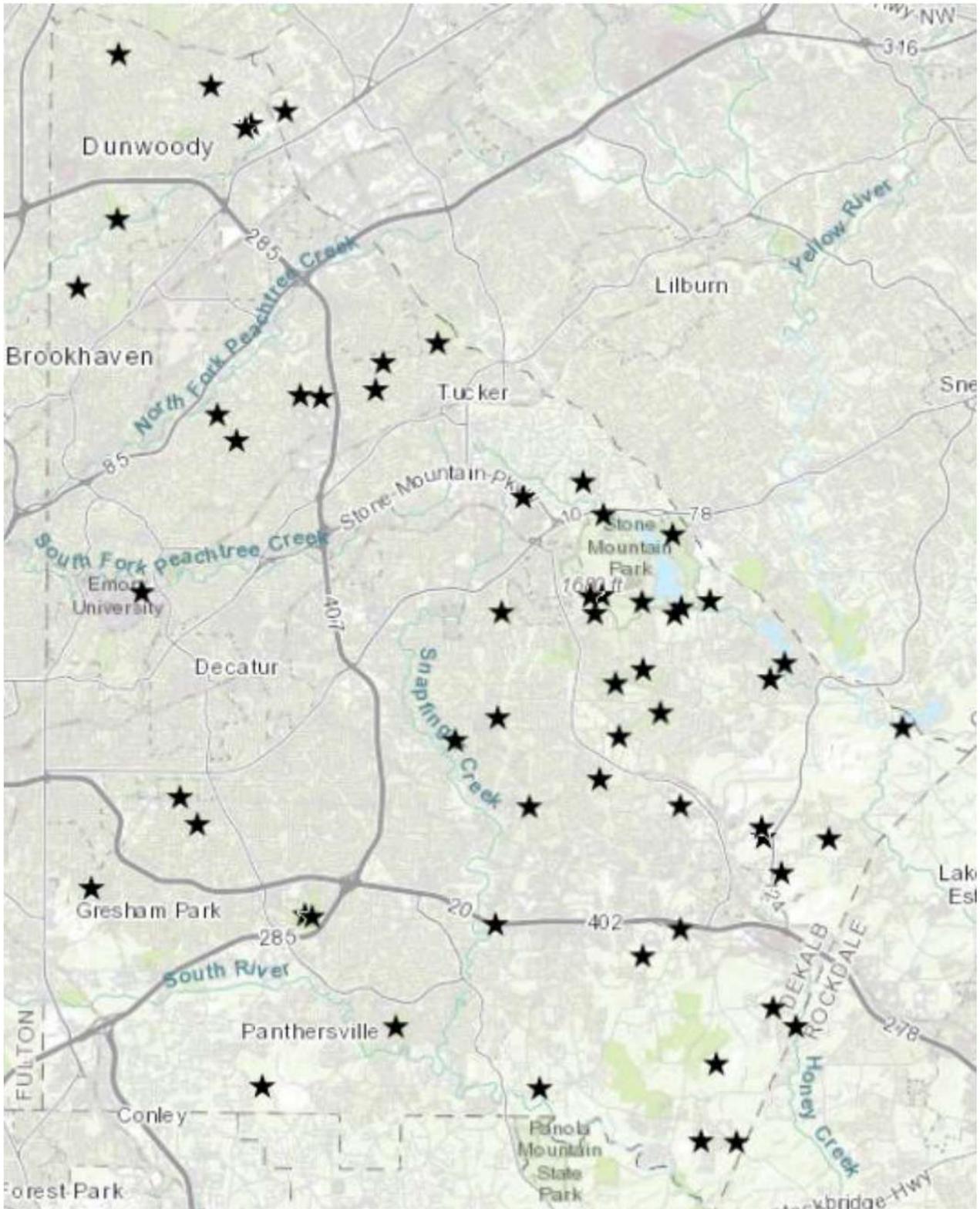
Figure 16 Maximum Temperatures on Campus between June and August 2017 by temperature sensors across Campus.

Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)



Source: DRAFT Georgia Tech Climate Vulnerability Assessment (2024)

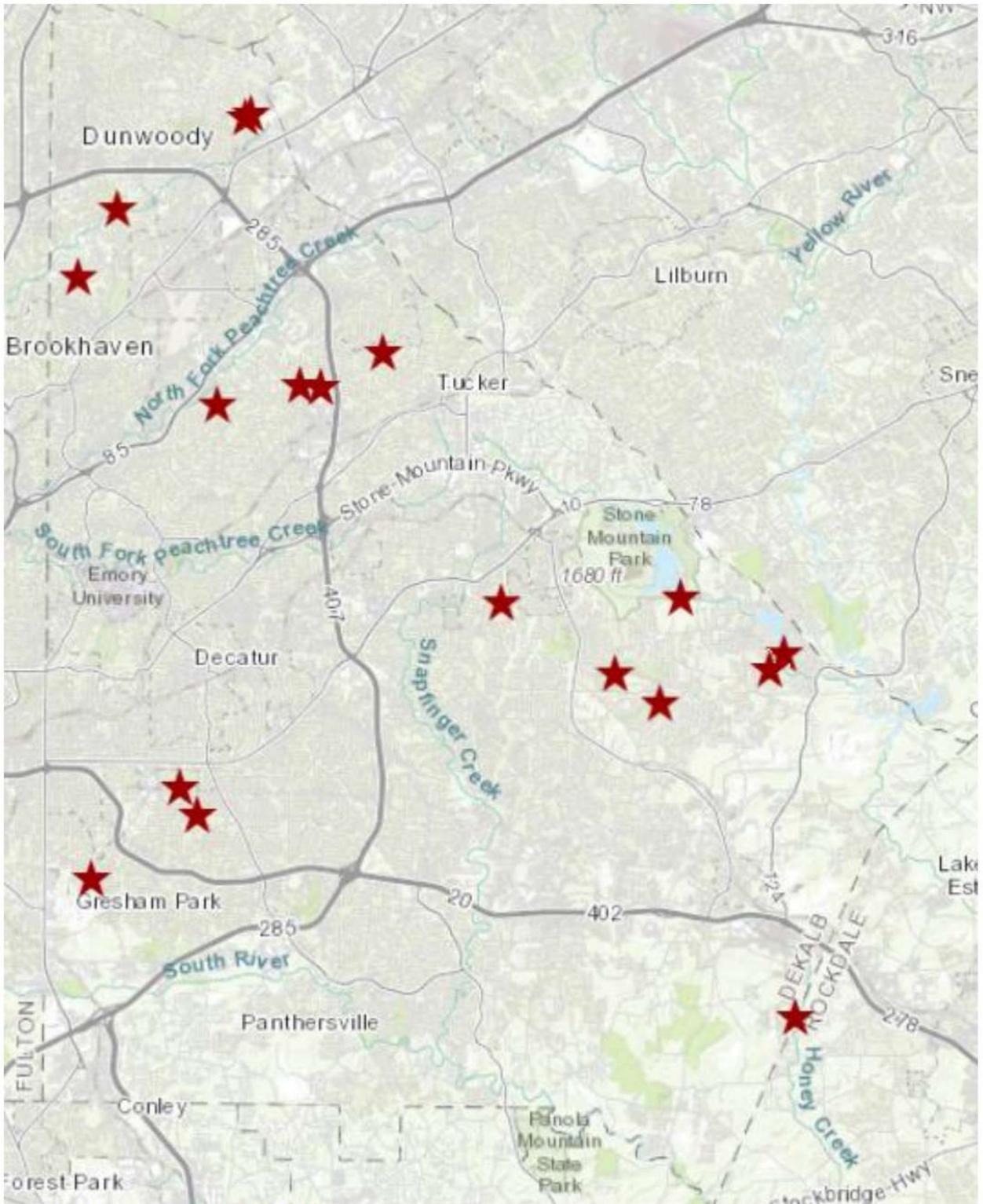
Map 38: DeKalb County Dams



Map Source: National Inventory of Dams

Source: DeKalb County 2022 Countywide Hazard Mitigation Plan Update

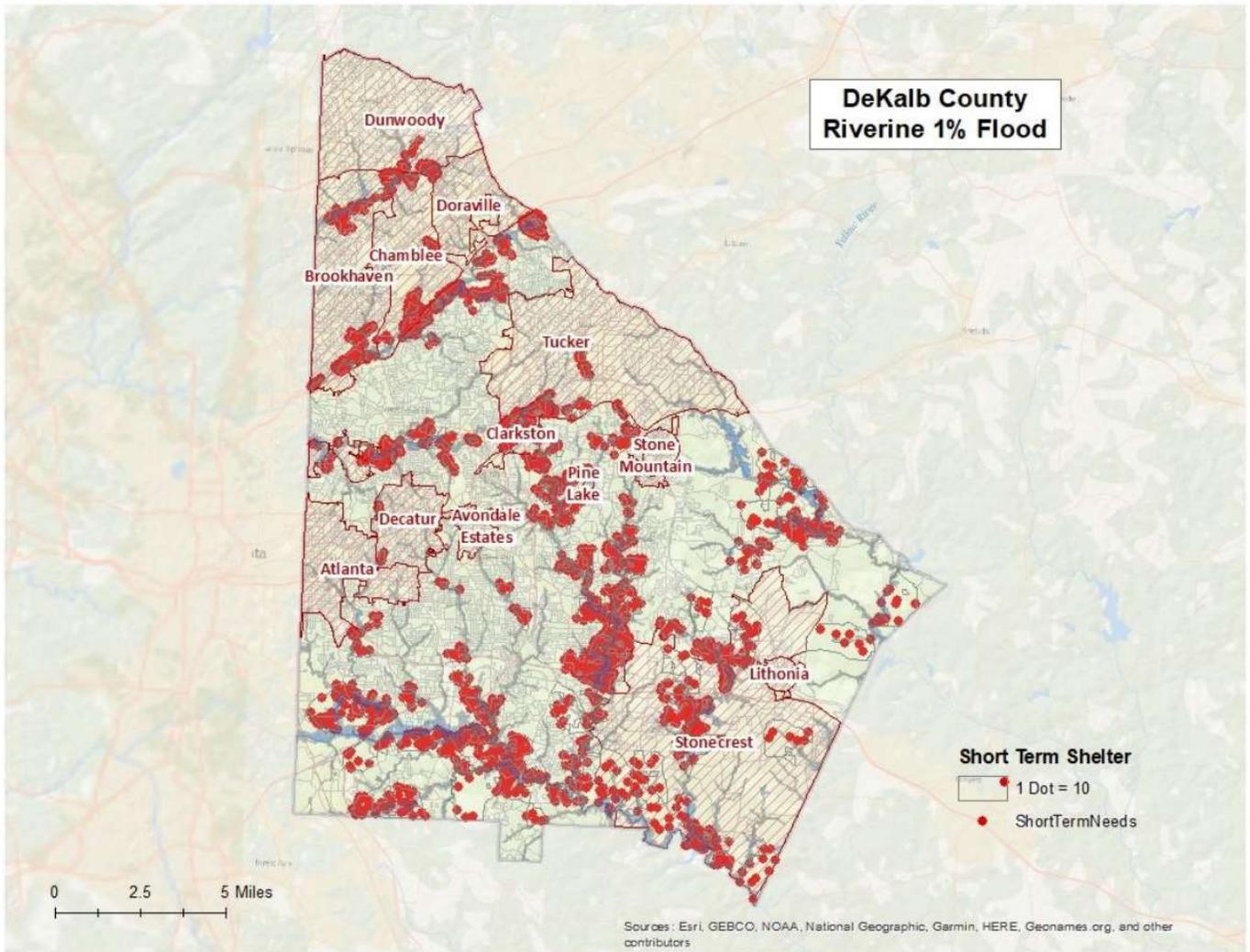
Map 39: DeKalb County High Hazard Dams



Map Source: National Inventory of Dams

Source: DeKalb County 2022 Countywide Hazard Mitigation Plan Update

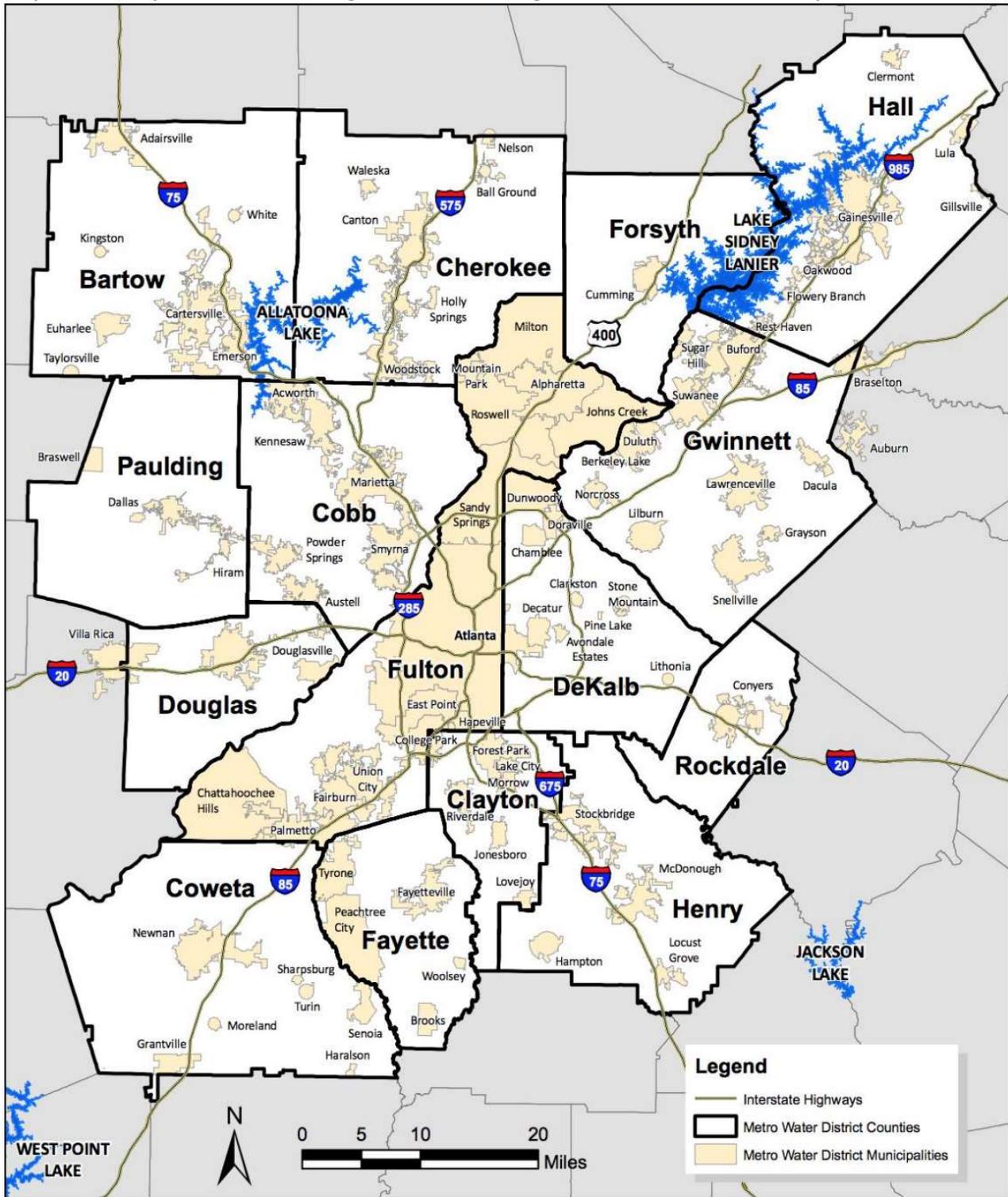
Map 40: DeKalb County Flood Risk Map



Map Source: Hazard Risk Analyses Supplement to the DeKalb County Joint Hazard Mitigation Plan

Source: DeKalb County 2022 Countywide Hazard Mitigation Plan Update

Map 51: Metropolitan North Georgia Water Planning District, Water District Map

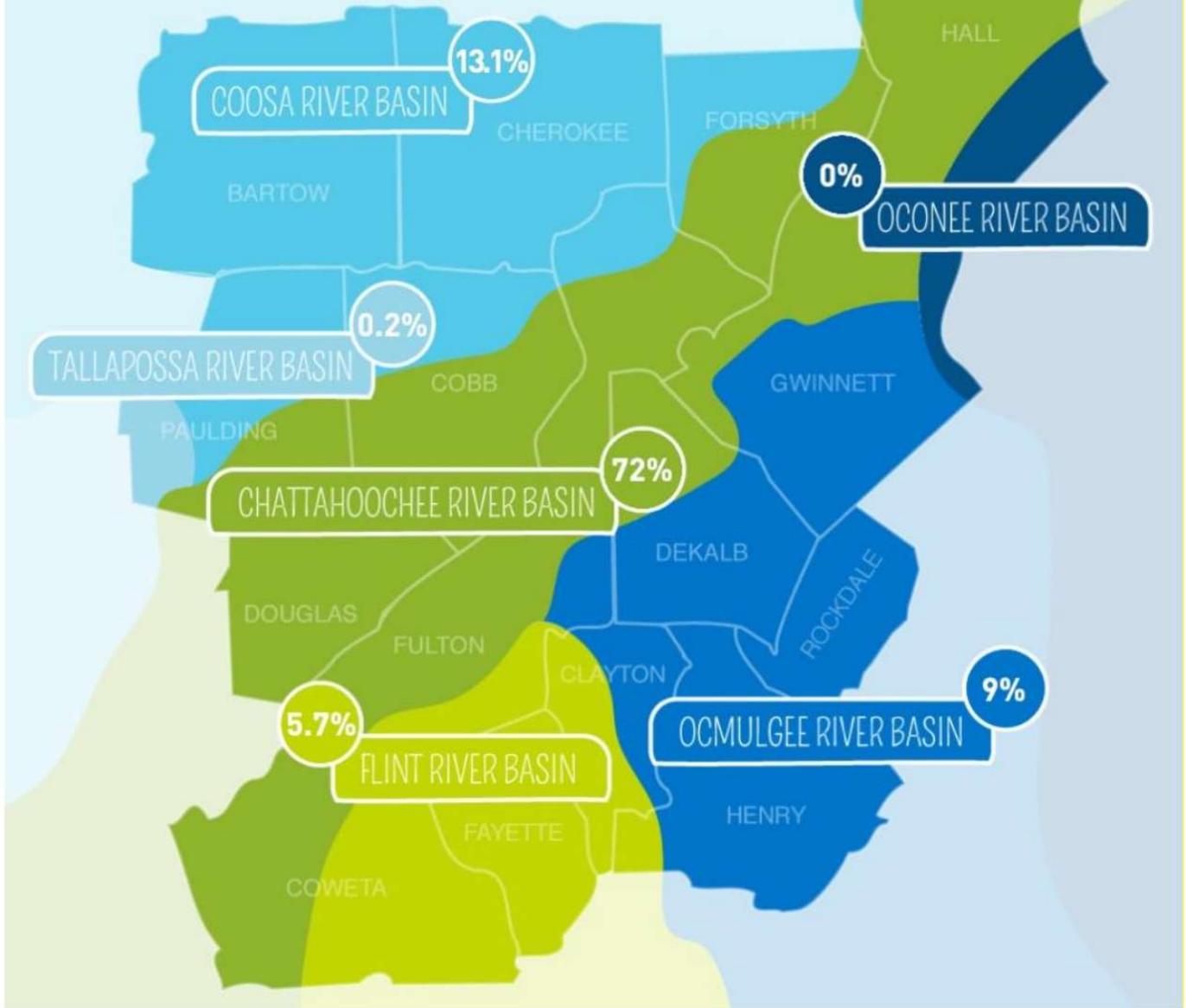


Map Source: Metropolitan North Georgia Water Planning District (<https://northgeorgiawater.org/what-is-the-metro-water-district/>)

Source: DeKalb County 2022 Countywide Hazard Mitigation Plan Update

# WATER WITHDRAWAL IN OUR REGION

## WATER WITHDRAWAL BY SOURCE BASIN IN 2014



Map Source: <https://northgeorgiawater.org/>

Source: DeKalb County 2022 Countywide Hazard Mitigation Plan Update

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