EMORY UNIVERSITY





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Community Resilience Building

Summary of Findings

March 2023

Emory University, 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 severe thunderstorms, hurricanes, tornados, flooding, and more intense and extended heat waves have reinforced this urgency and compelled leading communities and institutions like Emory University 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, Emory University agreed to partner with The Nature Conservancy (TNC) and Second Nature on collaboratively launching a community-based process to assess extreme weather and climate change impacts and to generate and prioritize solutions that improve resiliency, sustainability, and equity within their community. In March 2023, the Emory University 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, faculty, and local municipalities) to define strengths and vulnerabilities and develop priority resilience actions for the greater campus community at Emory University.

Emory University 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 Emory University community benefited from a unique "anywhere at any scale", community-driven process called Community Resilience Building (CRB) (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 Emory University's campuses including the Emory University Framework Plan (2023), Campus Services Interactive Map Platform, and the DeKalb County Hazard Mitigation Plan Update (2022). Using the CRB process - rich with information, 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 Emory's Main Campus in the city of Atlanta. However, some recommendations apply throughout the Emory Enterprise.

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 Emory University 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 Emory University Core Team identified the top hazards for the Emory Enterprise. The hazards of greatest concern included extreme heat and extended heat waves, drought, and flooding from riverine systems as well as localized urban flooding from stormwater runoff during intense precipitation events. Additional hazards highlighted by participants during the CRB Workshop included occasional winter cold snaps, ice storms, and high wind events. These hazards have direct and increasing impacts on the infrastructure, community members (students, staff, faculty, patients, and visitors) and the environment including within the campuses, surrounding neighborhoods, open space/park areas, cultural resources, student housing facilities, transportation, medical facilities, campus facilities and operations (e.g., dining) supportive municipal facilities, social support services, and other critical infrastructure and community assets at Emory University.

Current Concerns and Challenges Presented by Hazards

The Emory University community has several concerns and faces multiple challenges related to the impacts of natural hazards and climate change. Recently, Emory University 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), and periods of extended heat waves each year. Impacts from these events have included widespread riverine flooding from swelled stream and rivers along with localized urban flooding from stormwater runoff as well as high winds causing tree damage and associated power outages. 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 Emory University to proactively improve their resilience.

This recent series of extreme weather events highlights that the impacts from hazards are diverse. In the city of Atlanta and on Emory University's campuses this included riverine and urban flooding (due to stormwater runoff from intense storms and heavy precipitation) of critical infrastructure, buildings, facilities, student housing; and property damage and utility outages (lasting several days or more) from extreme winds. 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 Emory University.

The workshop participants were generally in agreement that Emory University 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 community from infectious disease outbreaks such as Covid-19 pandemic in the context of simultaneous hazards as mentioned above was raised by workshop participants as a significant concern for Emory University.

Specific Categories of Concerns and Challenges

As in any community, Emory University 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:

- Ongoing challenges to achieving resilience due to the complexity of jurisdictions. Emory University was annexed into the city of Atlanta, but is served by DeKalb County for emergency, sewer, and fire services through an agreement with the city. Across the Emory Enterprise there are seven individual Counties that have some form of jurisdiction regarding operations, functionality, and growth of the University, which is often very challenging to coordinate towards a successful completion of projects.
- Emory University's Main Campus fully encompasses the U.S. Center for Disease Control and Prevention (CDC) facility (with 6,000 employees) and a local children's hospital resulting in the potential for dramatic impacts to campus operations in the event of evacuations, traffic gridlock, and/or train derailment ("islands of other institutions within Emory's larger campus footprint").
- Growing concerns about the impacts of drought and heat on elderly and medically challenged residents in neighborhoods adjoining Main Campus and across the city of Atlanta, which can result in greater need and use of health care facilities and hospitals in the Clifton Corridor.
- Consistent communications to new students regarding all the sustainability initiatives along with the announcement of opportunities for student involvement is limited, currently.
- Workforce development on Main Campus and along the Clifton Corridor has become strained due to the complexity and barriers presented by the failing transportation system to and from places of employment ("hard to attract and retain an adequate workforce").
- 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.

Specific Categories of Concerns and Challenges (cont'd)

- Ongoing challenges associated with systemic racism on campus and in the greater Atlanta area.
- 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.

Emergency Management and Preparedness:

- Geographic footprint of Emory's Enterprise intersects many cities and counties all with different ways of communicating and responding to emergencies which can lead to confusion about roles and responsibilities.
- Lack of adequate emergency management communications system which currently does not integrate well with DeKalb County, city of Atlanta, and the CDC facility and the children's hospital encompassed by the Main Campus.
- Many of the hospitals owned and operated by Emory University are in different cities each with different jurisdiction, protocols, and procedures during emergency situations.
- Lack of mass transit options for the campus community results in the need to use limited capacity surface streets for evacuation in advance of ice and snowstorms resulting in traffic gridlock. The two to four lane roads around campus inhibit the thousands of people from leaving Main Campus safely all at the same time.
- Recent increases in deferred maintenance by the County and City have resulted in concerns about the safety of the road system around the campus as well as the safety of several bridges including Briarcliff Road bridge (rebuilding plan in place) and Houston Mill Road bridge (no rebuilding plan in place).

Credit: Emory University

Credit: Emory University

Credit: Wiki

Specific Categories of Concerns and Challenges (cont'd)

- Due to the location of Main Campus in a suburban neighborhood there are limited access and egress points coupled with the growing challenges of traffic congestion to and from campus which presents not only a daily concern but also a concern during major events requiring evacuation ("high density campus in a suburban area").
- Transient student populations (4-years on Main Campus; 2 years on Oxford Campus) leads 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.
- Riverine flooding concerns concentrated in Wesley Wood where there is a geriatric hospital, retirement community, and research facilities all located in the flood zone.
- Substation owned and operated by Georgia Power (off Oxford Road) is located in a flood zone but has never lost power despite three separate occasions when flood waters entered the facility.
- CSX Rail line bisects campus and runs directly adjacent to the Main Campus Central Steam Plant and the CDC facility as well as along several creeks and streams. Flooding from these water courses has become so severe that the CSX Rail line is now in potential jeopardy in several locations. Also, growing concerns about the implications to campus and local environment from a HAZMAT spill associated with a train derailment in the vicinity of critical infrastructure.
- Hospitals require access to water and steam to sterilize equipment whose supply can be compromised during power outages.

Campus Buildings & Facilities:

- New health care facility has no renewable or back-up power generation strategy, currently.
- Concerns about previous incidents of mold in building on campus and the potential for new occurrences related to ventilation challenges and increasingly higher temperatures.

Specific Categories of Concerns and Challenges (cont'd)

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

- Increases in the need to manage stormwater without adequate availability of green stormwater infrastructure (i.e., bioswales, rain gardens, etc.) on campus.
- Concerns about the health and safety of people and the environment due to the discharge from sewer overflows directly into local creeks.
- Given the age of the sanitary sewer pipe system, increased precipitation led to the infiltration of the system and created the equivalent of a combined sewer overflow (CSO) system in Atlanta and in DeKalb County.
- 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.
- There is only one water filtration plant for all of DeKalb County which present a concern to consumers in the event this single plant is compromised, despite having back-up power generation at the facility.
- Lack of back-up power generation in the form of a microgrid due to resistance by the utility (Georgia Power) may result in catastrophic impact on the Main Campus to human life, critical hospital infrastructure, business activity and basic operations in the eventuality of power and water supply interruptions. The proximity of three Emory University hospitals, a children's hospital, assisted living and day care facilities, health clinics, Veterans Administration hospital, student campuses, and the CDC facility within a one-mile stretch (60,000 people present during business hours) would result in massive consequences if power and water were interrupted without back-up power from power generation, supply, and distribution infrastructure such as microgrids.
- Localized, privately-operated, power generation alternatives could be lifesaving, particularly for children's hospitals, family clinics, research facilities, and daycare facilities. A petition by Emory University has been made for a microgrid to serve a hospital, main data center, police station, neighboring high schools, CDC facility to the Public Service Commission.
- Aboveground power lines combined with mature urban forest canopy and street trees and high wind events leads to vulnerabilities of power outages. Without alternate sources of localized energy generation, the impacts of power outages on campus and city neighborhoods were prolonged.

Specific Categories of Concerns and Challenges (cont'd)

Open Space, Natural Systems, Forests, Trees:

- Ongoing erosion of streambank buffers on campus primarily due to urban flooding which degrades this critical natural infrastructure.
- Ability of the City and County to remove trees for infrastructure projects (i.e., sewer system maintenance) without oversight or control by Emory University is a concern because it can impact the campus commitments to tree canopy goals.

Credit: Emory University

Current Strengths and Assets

Just as certain locations, facilities, and groups at Emory University 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 Emory University. Ongoing collaboration between leadership, colleges, and departments, among other entities on campus as well as with the city of Atlanta and DeKalb County 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 major events and therefore, represent a crucial form of resiliency at Emory University. Employee retention is viewed as a key part of maintaining and increasing campus resiliency.
- Emory University community demonstrated a significant desire and ability to get involved and help one another during the recent pandemic resulting in a broad wealth of expertise and knowledge about the campus and community's strengths and vulnerabilities. Engaged community and leadership that place value on the ability to honestly discuss issues and find agreeable solutions.
- Emory University has a great deal of institutional self-awareness and focus on communications judging by the engagement of the University as well as city of Atlanta and DeKalb County during this Community Resilience Building process.
- University leadership have been responsive to student-led climate activism on campus and comparative to other similar sized universities is a leader in sustainability.
- Emory University adopted its first Sustainability Vision for Emory in 2006 and adopted a new and updated Sustainability Vison and Strategic Plan, 2025 in 2015 which provides goals across all levels of the institution.

Current Strengths and Assets (cont'd)

- Ongoing commitment by Emory University leadership to advance and achieve bold and ambitious sustainability standards across the Emory Enterprise.
- Emory University is recognized as a sustainability leader and was ranked #4 in the Princeton Review's 2023 Guide to Green Colleges.
- US News and World Report has repeatedly ranked Emory University Hospital as the #1 hospital in the state of Georgia.
- Emory Healthcare is a large employer in Atlanta and the surrounding areas with 24,100 employees.
- Close working partnership with the Carter Center which is a non-profit organization that is part of Emory University.
- Emory University has invested in multi-use bike, walk, and run trails to encourage use and associated wellbeing benefits as well as multi-modal transportation options while on campus.
- Active land use classification plan (see Appendix A) helps with the consideration of land use and tree canopy coverage as it relates to new development and redevelopment of buildings and spaces on campus.
- Emory University Engineering Department operates with a deep understanding of the current infrastructure and systems on campus which allows for forward thinking about improvements and innovations.
- Shuttle transportation system is a private university bus system that is very effective and efficient at moving the university population across campus providing an alternative to and reducing the need for travel by single occupancy vehicle..

Emergency Management and Preparedness:

- Emory University was the first university in the state of Georgia to receive a "StormReady" designation from the National Weather Service.
- Emory University has an Emergency Notification System that helps alert students, faculty, and staff of emergencies.

Current Strengths and Assets (cont'd)

- Except for a few locations in Wesley Woods, there isn't an issue with flooding of most building on campus despite having a creek/stream network flowing through campus.
- Traffic signals across Clifton Corridor are monitored by the Clifton Corridor Transportation Management Agency (CCTMA) which helps to reduce idle times, keep traffic flowing, and increase the responsiveness during emergencies.
- On-campus conference center hotel served effectively as housing for quarantined students which was preferred over contracting with a local, off-campus hotel chain. The on-campus hotel provided housing in proximity to access points for student health services. The on-campus hotel space frequently provides shelter for students, staff, and faculty during severe weather events that prevent safe commuting home from campus.
- Emory University's community has a great deal of specific expertise in public health and acute health crisis management, vaccine distribution, health policy execution and implementation, risk management, and research that can be accessed readily during interim periods of preparedness as well as during disaster response and recovery.
- Integrated university and healthcare system that is enterprise-wise which provides critical services for all community members, particularly during periods of extended heat waves and other major events.
- Strong and supportive relationships between county, city, state, and campus emergency management professionals in terms of planning, resource and recovery, communications, and resource sharing.
- State emergency management professionals will often reach out to counterparts at Emory University ahead of major, foreseeable events (hurricanes, heat waves, etc.) to discuss securing needed supplies and equipment.
- Monthly meeting of the Emergency Support Functions (ESF) team consisting of city and campus emergency management staff to increase coordination structure and collaborative relationships. The ESF is credited with putting out very timely and useful alerts about impending natural disasters.

Current Strengths and Assets (cont'd)

Campus Buildings & Facilities:

- Forty or more LEED-certified buildings on campus all constructed since 2002 with the newest consisting of first year dorms, chemistry building, and student center. Emory University had at one time the most LEED-certified building on any campus in the nation.
- Health Sciences Research Building (phase 2) and Campus Services Building C is the most recent building on campus to obtain full back-up with standby power for life safety systems in the event of power outages. Campus Services Building C houses many of the key servers for campus.
- Research laboratory on campus linked to co-gen natural gas back-up system with the intent of adding solar panels soon to further diversify power generation and stability of the overall system.
- Currently working to build-out the Student Center to help achieve a difficult net-zero standard.
- Ventilation systems (HVAC) in new buildings are now optimized to maximize ventilation rates that can be controlled with automation systems based on need. This allows buildings to more effectively meet air handling quality protocols established because of the recent pandemic. New buildings have also been designed with better space ratios of academic classrooms to hallway/egress points to assist with emergency management.

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

- On-campus WaterHub reclamation system to help alleviate the water demands during periods of drought. This includes using non-potable water for air conditioning (HVAC) systems in building, dorms, facilities, and laboratories at Emory University as well as recycling wastewater for toilets, and rainwater cistern projects.
- Stormwater reclamation cisterns have been installed in various places on campus and can provide two days' worth of irrigation water.
- Blackwater reclamation system (Water Hub) that reallocates 400 gallons per day to be used in utility plants and for flushing of toilets. System also provides an emergency water reserve (up to 50,000 gallons) in case of water availability disruption or reduction during a major event.

Current Strengths and Assets (cont'd)

- Central Steam Plant provides heat via underground distribution to all the campus and hospitals.
- On-campus chilled water system with district plants connected to each section via underground piping that serves most of the facilities on campus.
- Deep understanding of sewer system and occasional failure locations due to robust flow monitoring system run by DeKalb County. Public communications and alerts about high sewer flows is valued by the community members in Atlanta.
- DeKalb County consent decree in place that requires the repair of the sewer system, particularly within South Fork Peachtree Creek sewer system.
- Outstanding power provisioning system on campus with substation onsite as well as back-up power generation and redundancies built in. The effectiveness of this system results in a remarkably low incidence of power loss on campus regardless of the environmental conditions and extreme weather events despite the frequent power outages in the greater Atlanta area. Attention has been directed to improving this system with an exploration of microgrid installation feasibility despite resistance by the utility (Georgie Power).
- Emory substation and Georgia Power substation have not experienced any issues with flooding to date.

Open Space, Natural Systems & Trees:

- Environmental strengths on campus include Lullwater Preserve which provides one of the largest forested areas on campus.
- Enterprise-wide "no net tree loss" canopy policy requires the replacement of trees that come down for development of capital or facilities projects which helps reduce heat island effects on campus.
- Oxford and Main Campuses are recognized by Tree Campus USA with tracking of tree canopy changes over time. Tree canopy was at 61% in 2002 but declined to 53% due to the impacts of storms. Current tree canopy percentage stands at 58% representing an upward trajectory.

Current Strengths and Assets (cont'd)

- Emory University currently is moving to a "net-positive tree policy" in 2025. The Emory Tree Master Plan is part of the Campus Master Plan and has been overlaid with the city of Atlanta Tree Plan.
- DeKalb County Watershed Management is using flow monitoring tools, reporting mechanisms, and standard procedures consistently which helps to assess failures in water and sewer systems and restorative steps to prevent future impacts of the similar type.
- Candler Lake (8-10 acres in size) considered a back-up water supply for fire suppression, heat sink, and with the ability to draw down the water level in advance of major storms to help increase stormwater runoff storage and prevent flooding elsewhere on Main Campus.

Credit: Emory University

Credit: Emory University

Credit: Emory University

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 Emory University'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/counties community building);
- **Infrastructure improvements** (i.e., buildings/facilities/clinics/laboratories, electric grid & power supply, sanitary systems, stormwater management systems, green stormwater infrastructure, mass transit, roads/bridges, multiuse trails);
- **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, Clifton Corridor, coordination (campus, city, counties)).

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

Priority Actions

- Look to advance and fund a robust resilience plan that provides detailed actions for the campuses across the Emory Enterprise and is also integrated with ongoing work within the city of Atlanta and DeKalb and Fulton County. Use the Community Resilience Building Summary of Findings herein as a foundation for further prioritization, sequencing, and operationalization of actions that reduce risk and improve resilience for Emory University as well as coordinated long-range planning in collaboration with City and respective Counties.

Priority Actions (cont'd)

- In coordination with existing Planning Coordinator, conduct an annual tabletop exercise with external partners and executive leadership of foreseeable emergency situations with a full-scale event every two years. Exercises and events would help to identify vulnerabilities in current plans, better logistics management steps, address current challenges due to traffic congestion, space for sheltering and staging, and enhance effective and timely communications.

- Look to develop and provide definitions of resilience and sustainability and what it means for individuals and the larger campus community in hopes of bolstering support for further investments in priority actions designed to reduce risk and improve campus-wide resilience ("resilient mindset").

- Coordinate long-term infrastructure planning with City and Fulton and Dekalb County including the exchange of plans, visions, and expectations.

- Look to find ways for Emory University to be directly involved with helping to advance the Clifton Corridor Study that is looking to bring high capacity and more rapid transit to the Corridor. The Study is currently in the alternatives assessment phase in hopes of assisting with economic stability and emergency management operations.

- Work to bring the city of Atlanta's transit system (MARTA) to campus. This should include augmenting the three MARTA bus lines that are currently not rapid or of high enough capacity to be effective at moving the number of passengers looking to use the system. Clifton Corridor requires more robust evacuation infrastructure including better roads and bridges to assist with emergency evacuations of Main Campus and the CDC facility.

- Continue Emory University's focus on providing a variety of alternatives for the campus community to evacuate campus effectively and safely. Without additional mass transit options, emphasis should include improving the trail network on campus so people can get off campus via bike or on foot (i.e., multi-modal access and egress from campus).

Priority Actions (cont'd)

- Explore with partners from across the state of Georgia advocacy approaches to increase the education and awareness of the Public Service Commission on the need for alternative power generation and supply models in hopes of establishing new rules and policies that will allow alternative, off-grid, life-saving energy generation systems such as microgrids.

- Continue to work to improve the amount of redundant self-reliant power infrastructure on campus including solar and back-up generators.

- Support the increase in redundant utility infrastructure for power and water through the utilities, City, and Counties.

- Advance plans to construct a dry hydrant at Candler Lake at low water elevations to ensure access to back-up water supply for chilling purposes across various information technology centers and facilities on campus.

- Look to expand the Water Hub connect to the hospitals and information technology chilling system.

Credit: Emory University

Additional Actions

- Accelerate the engagement of students in climate action and resilience planning via ongoing community input sessions for students, faculty, staff, and alumni along with offering further participation on the Climate Action Taskforce. Look to expand the current scope of the Taskforce to include resilience-related actions highlighted within this Summary of Findings as well as those generated by the campus community and the city of Atlanta and DeKalb County.

- Work to increase exchange and engagement to help with alignment between city of Atlanta's Department of City Planning and Emory University on resilience planning with specific emphasis on available resources and collective strengths.

- Strengthen communications and partnership with local employers in proximity to campus and look to include their perspective into resilience planning at Emory University

- Review routinely the policies and procedures in place on campus that provide the blueprints to guide actions to reduce vulnerabilities and advance improvement given ongoing experience and understanding of the effects of hazards and climate change on campus. Look to modify or update policies and procedures accordingly with a focus on improving resilience across the Emory Enterprise.

- Increase the communications to the student body and larger campus community regarding the work being conducted at Emory University 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.

Additional Actions (cont'd)

- Continue to develop methods to provide students with feedback opportunities through campus websites in hopes of better understanding how students perceive concepts of resilience including connections to mental health, safety, and wellbeing. Explore in partnership with campus Chief Resilience Officer, Counseling services, Office of Sustainability, Emergency Management Office, and Psychology Department the responses and comments generated for intersections that may provide opportunities for improved services on campus for the student body.

- Create a building standard for all new construction on campus that requires all buildings and facilities be prewired to receive and handle back-up power generation.

- Continue to build new infrastructure to the highest standards (LEED or otherwise) with alternate renewable energy sources as well as considering how each new development can contribute to the overall resilience of the campus ("highest quality buildings that increase overall campus resilience").

- Replace and retrofit aging infrastructure on campus via capital investments in building systems, emergency generators, and green stormwater infrastructure to help alleviate existing and projected localized flooding issues.

- 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.

- Continue to support work by the County to proactively address drinking water distribution system vulnerabilities including water main breaks that affect campus operations as well as along the Clifton Corridor.

- Explore feasibility of potential for access to groundwater resources as a back-up source of water on campus during periods of extended drought.

Additional Actions (cont'd)

- To help reduce strain on the sanitary system, coordinate and plan new development and associated surges in student populations and expected use of the system with the County.

Credit: Emory University

CRB Workshop Participants: Department/Organization

Emory University – Sustainability, Resilience, Economic Inclusion
Emory University – Environmental Health and Safety
Emory University – Critical Events and Preparedness
Emory University – Student Government Association
Emory University - Transportation
Emory University – Office of Sustainability Initiatives
Emory University – Office of the Chief Resilience Officer
Emory University – Student Case Management and Intervention
Emory University – Engineering
Emory University – Sustainability Engineering
Emory University – Planning, Design, and Construction
Emory University – Master Planning
Emory University – Climate Coalition
DeKalb County – Emergency Management
City of Atlanta - Planning Department

Emory University CRB Core Team

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Second Nature – Cami Sockow (Small Group Facilitator)

The Nature Conservancy – Kai Lo Muscio (CRB IT Manager & Scribe)

Second Nature – Shaina Maciejewski (Scribe)

Second Nature – Windley Knowlton (Scribe)

The Nature Conservancy – Matthew Thorne (Scribe)

Recommended Citation

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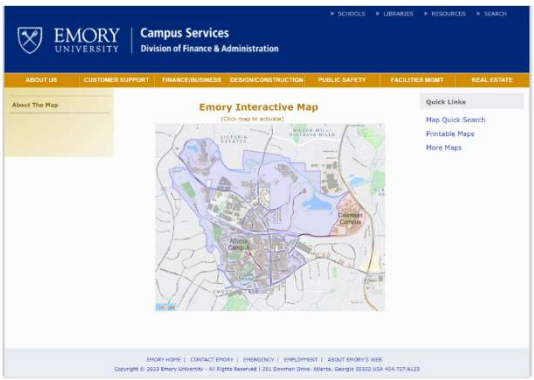
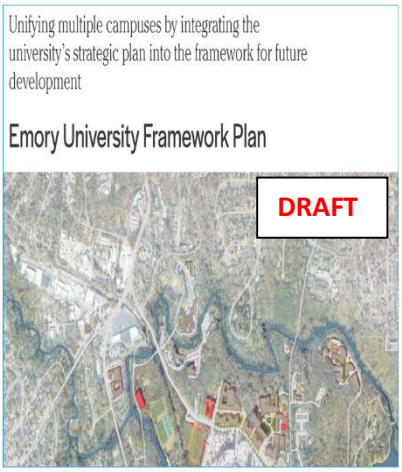
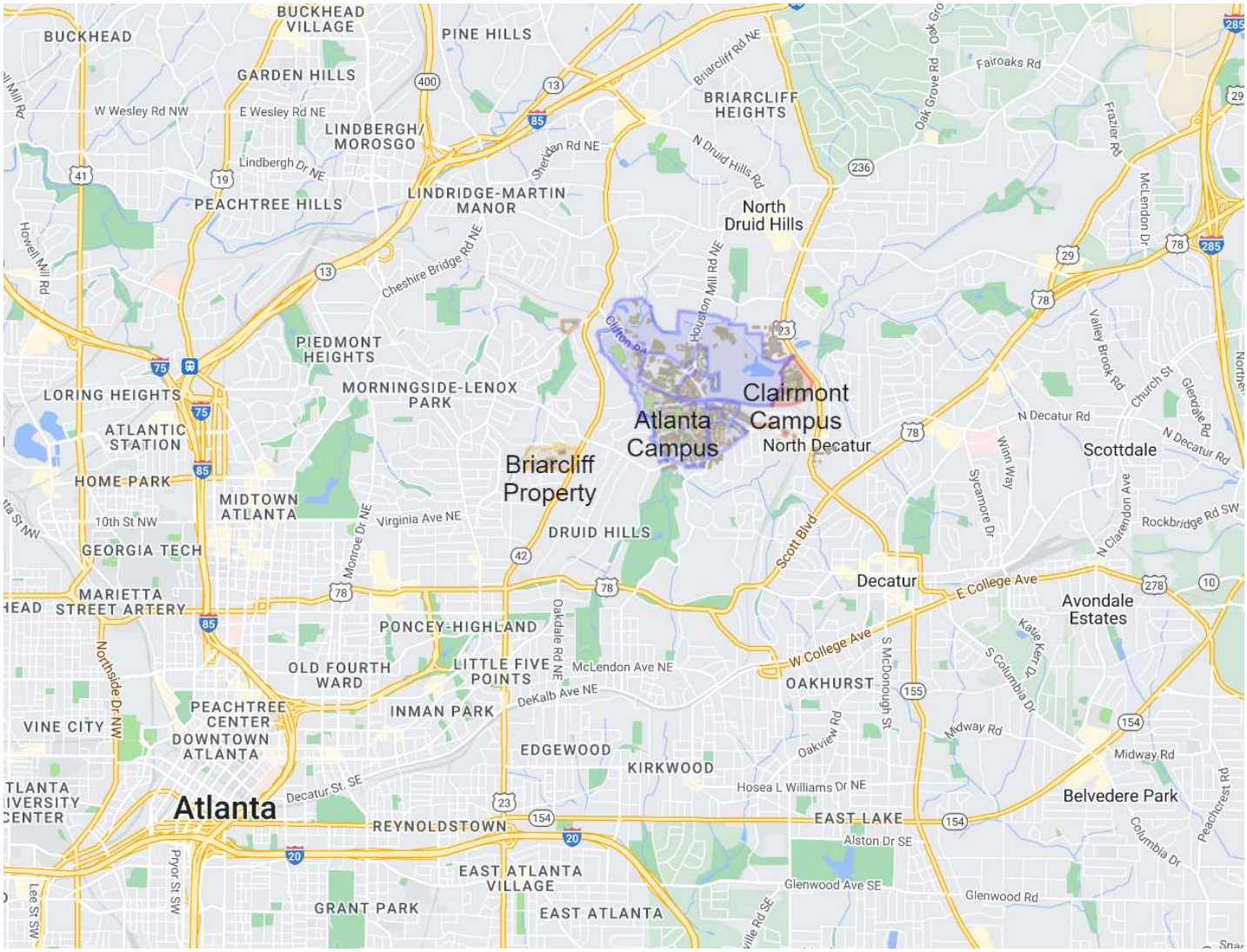
Appendix A

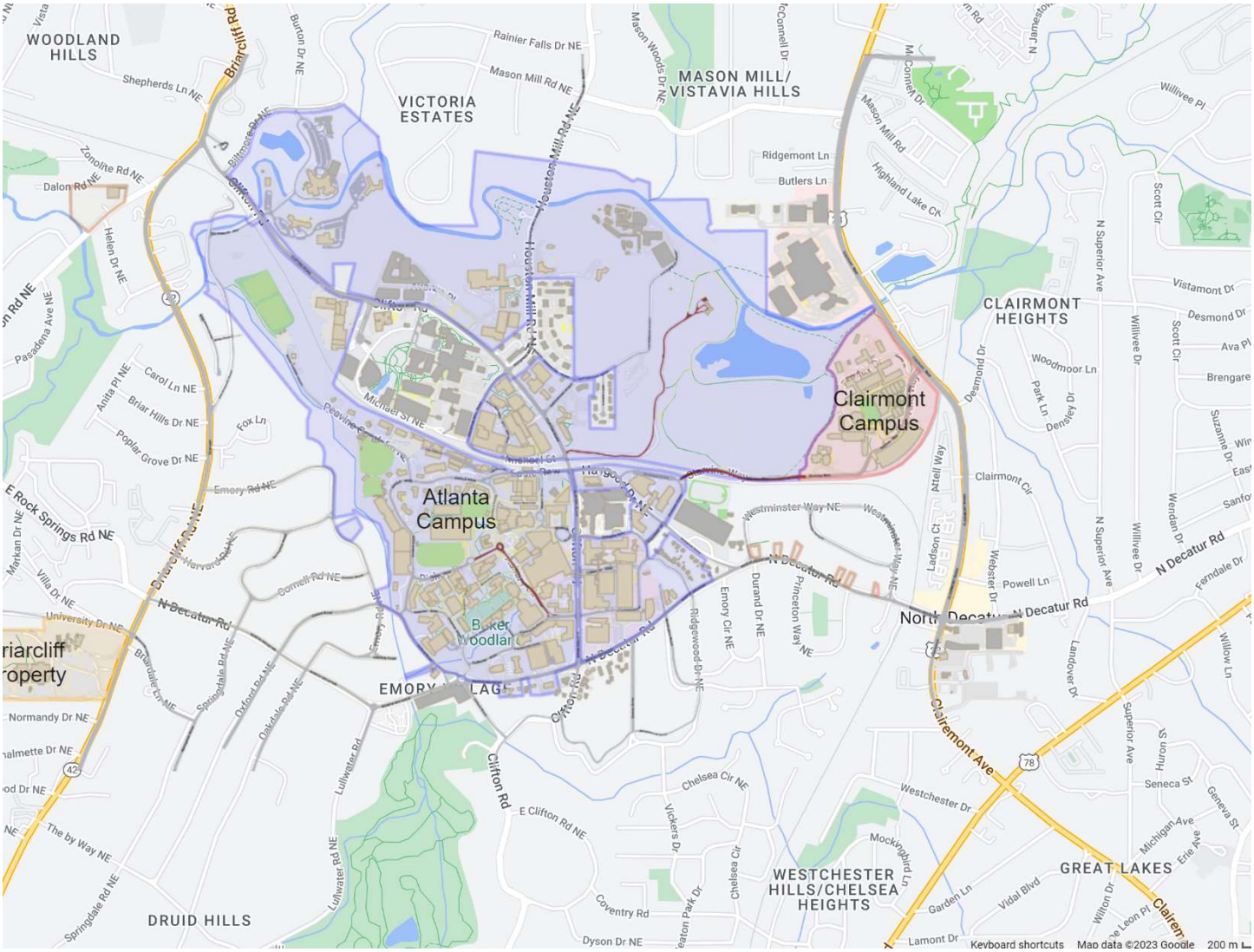
Emory University
Map Resource Packet*
Used During
Workshop

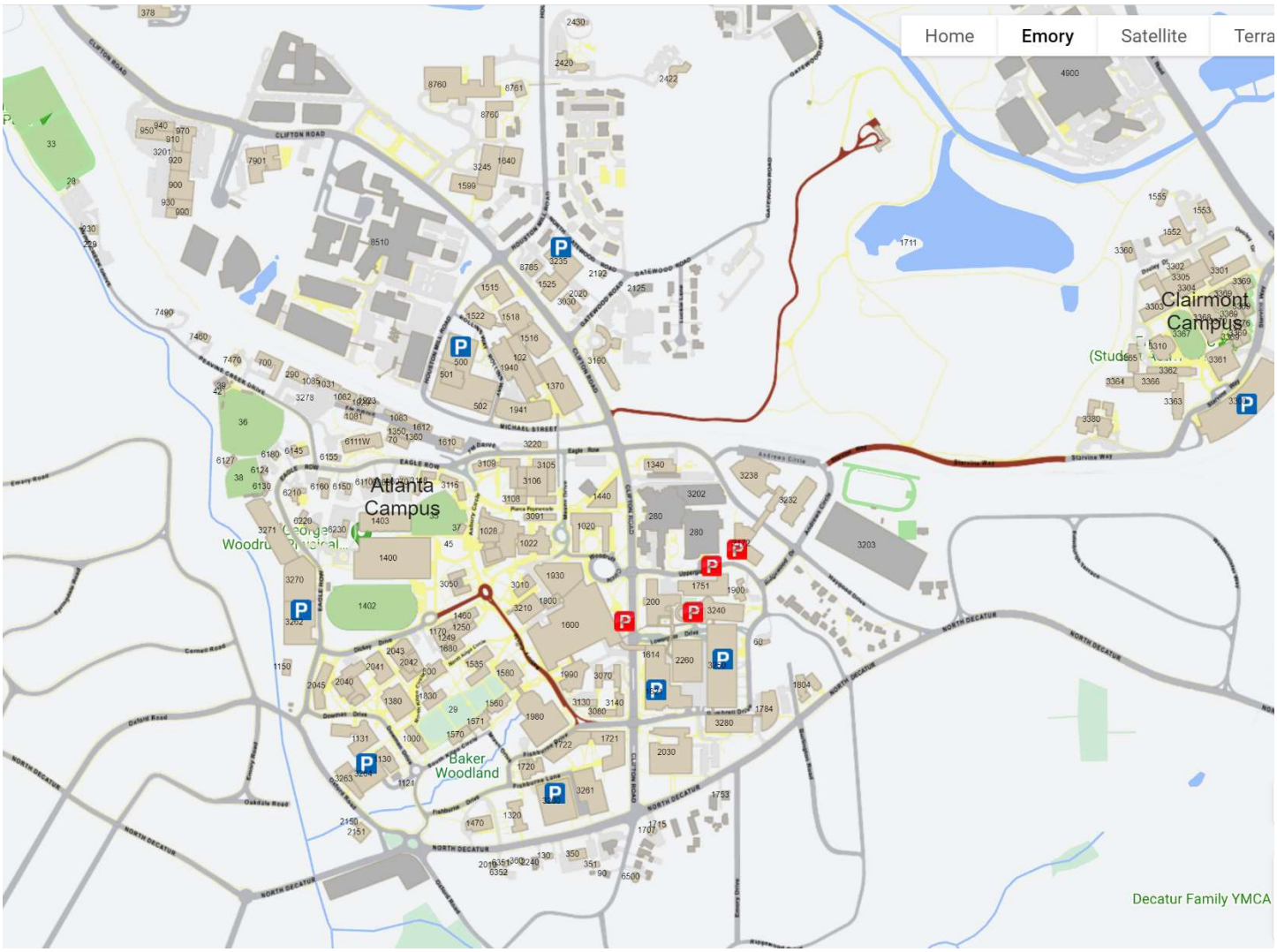




*Maps gathered from the DeKalb County 2022 Countywide Hazard Mitigation Plan Update, Emory University Campus Services Interactive Mapper, and DRAFT Emory University Framework Plan (2022).

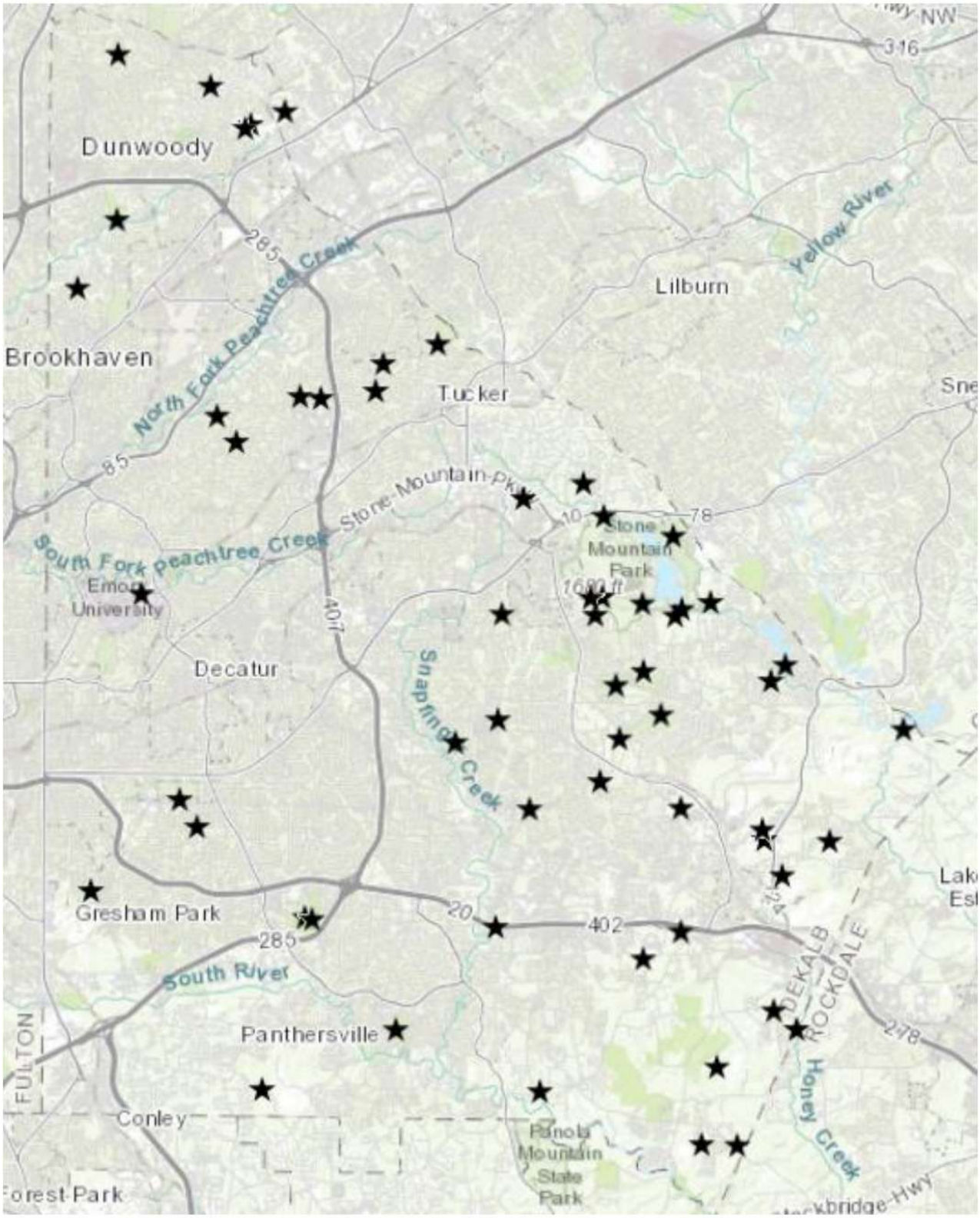

BUCKHEAD
BUCKHEAD VILLAGE
PINE HILLS
GARDEN HILLS
BRIARCLIFF HEIGHTS
W Wesley Rd NW
E Wesley Rd NE
LINDBERGH/ MOROSGO
Lindbergh Dr NE
PEACHTREE HILLS
LINDRIDGE-MARTIN MANOR
Sheridan Rd NE
N Druid Hills Rd
North Druid Hills
Briarcliff Rd NE
Fairoaks Rd
Oak Grove Rd
Frazier Rd
McLendon Dr
Howell Mill Rd
Cheshire Bridge Rd NE
Houston Mill Rd NE
Clifton Rd
PIEDMONT HEIGHTS
LORING HEIGHTS
MORNINGSIDE-LENOX PARK
Clairmont Campus
Atlanta Campus
North Decatur
N Decatur Rd
Scottdale
Valley Brook Rd
Church St
Glendale Rd
ATLANTIC STATION
Briarcliff Property
HOME PARK
MIDTOWN ATLANTA
10th St NW
Virginia Ave NE
Monroe Dr NE
DRUID HILLS
Winn Way
Sycamore Dr
N Clarendon Ave
Rockbridge Rd SW
GEORGIA TECH
Scott Blvd
Decatur
E College Ave
MARIETTA STREET ARTERY
Avondale Estates
PONCEY-HIGHLAND
Oakdale Rd NE
W College Ave
Kate Kerry Dr
S Columbia Dr
S McDonough St
OLD FOURTH WARD
LITTLE FIVE POINTS
McLendon Ave NE
OAKHURST
Northside Dr NW
DeKalb Ave NE
PEACHTREE CENTER
INMAN PARK
VINE CITY
DOWNTOWN ATLANTA
Midway Rd
Oakview Rd
EDGEWOOD
KIRKWOOD
Hosea L Williams Dr NE
Decatur St SE
Atlanta
REYNOLDSTOWN
EAST LAKE
Belvedere Park
Alston Dr SE
Columbia Dr
Peachcrest Rd
EAST ATLANTA VILLAGE
Glenwood Ave SE
Glenwood Rd
Pryor St SW
GRANT PARK
EAST ATLANTA
Lee St SW


WOODLAND HILLS
VICTORIA ESTATES
MASON MILL/ VISTAVIA HILLS
CLAIRMONT HEIGHTS
Clairmont Campus
Atlanta Campus
EMORY VILLAGE
WESTCHESTER HILLS/CHELSEA HEIGHTS
GREAT LAKES
DRUID HILLS
Briarcliff Rd
N Decatur Rd
Clairmont Ave
Houston Mill Rd NE
Clifton Rd
E Clifton Rd NE
Keyboard shortcuts
Map data ©2023 Google
200 m


Home
Emory
Satellite
Terra
Clairmont Campus
Atlanta Campus
Baker Woodland
Decatur Family YMCA
CLIFTON ROAD
GATEWOOD ROAD
NORTH DECATUR
EAGLE ROW
MICHAEL STREET

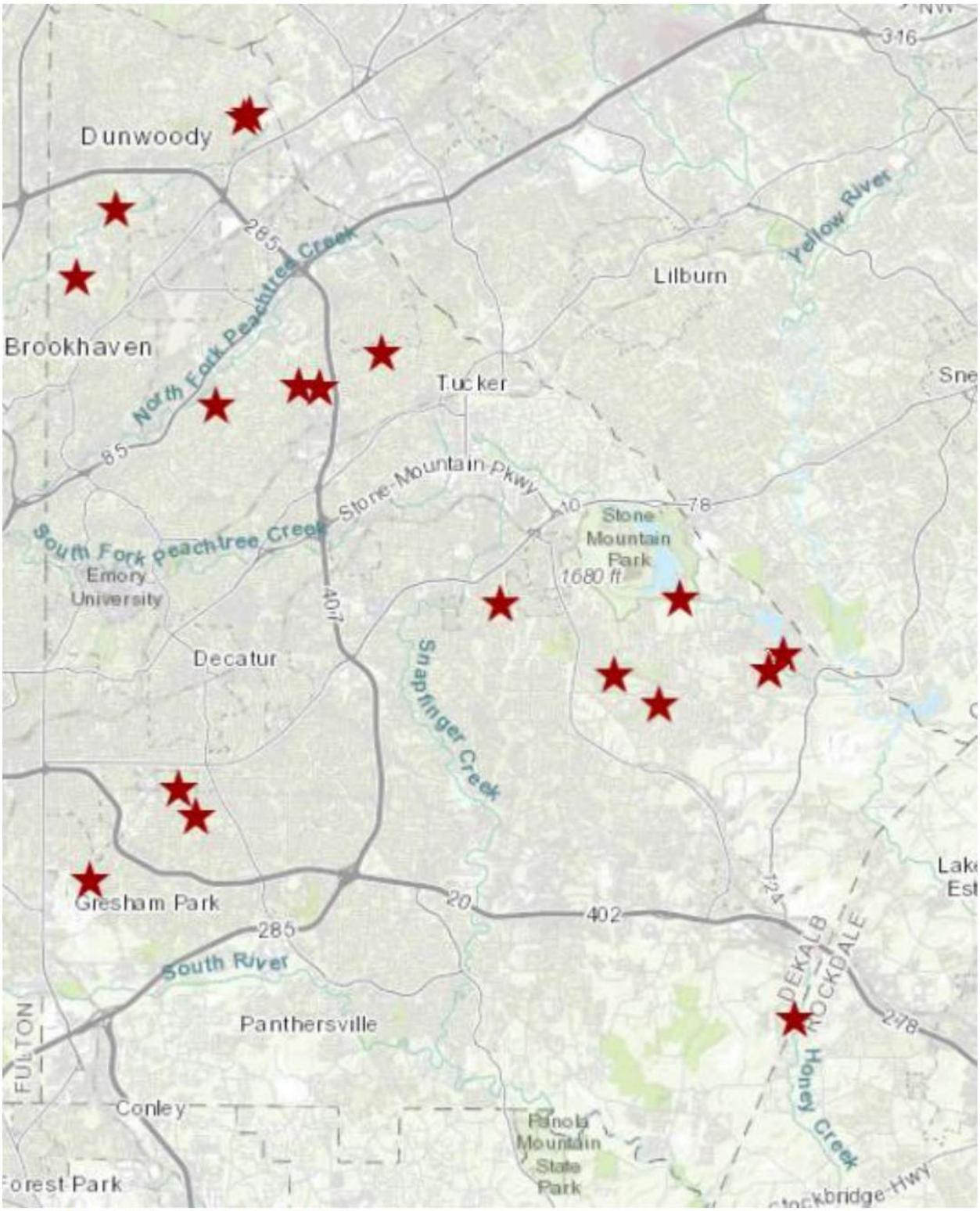

Land Classifications
Preserved Land
44% of Land Area (323,40 acres)
Land that should not be developed due to unique ecological value.
Conserved Land
4% of Land Area (30,20 acres)
Areas valued for their unique cultural history and which forms the visual identity of the campus landscape. From a landuse perspective, areas within this classification have been developed to capacity. Only very limited additional development can be achieved subject to extremely restrictive protocols.
Managed Land
31% of Land Area (231,56 acres)
Areas that can accomodate additonal development or redevelopment. Development of these areas will require restoration of landscape connectivity, preservation of tree canopy, and reduction of stormwater flows.
Developable Land
17% of Land Area (126,745 acres)
Areas preferred for development or redevelopment. The development of these areas will meet Emory University LEED requirements and provide opportunities for enhancement of the campus environment.
Streams and Lakes
4% of Land Area (27,46 acres)
Areas of creeks, lakes, and streams.
Overlay Areas
Restricted Overlay
25% of Land Area (184,11 acres)
Denotes areas such as stream buffers, floodplains, etc. that are by law, ordinance, or covenant restricted from development.
0 250 500 1000
North
Scale: 1" = 500'-0"
Campus Framework Plan
2022 Land Classification Plan
Emory University
Campus Services
Planning Design and Construction
Updated 20 March 2022

Map 38: DeKalb County Dams



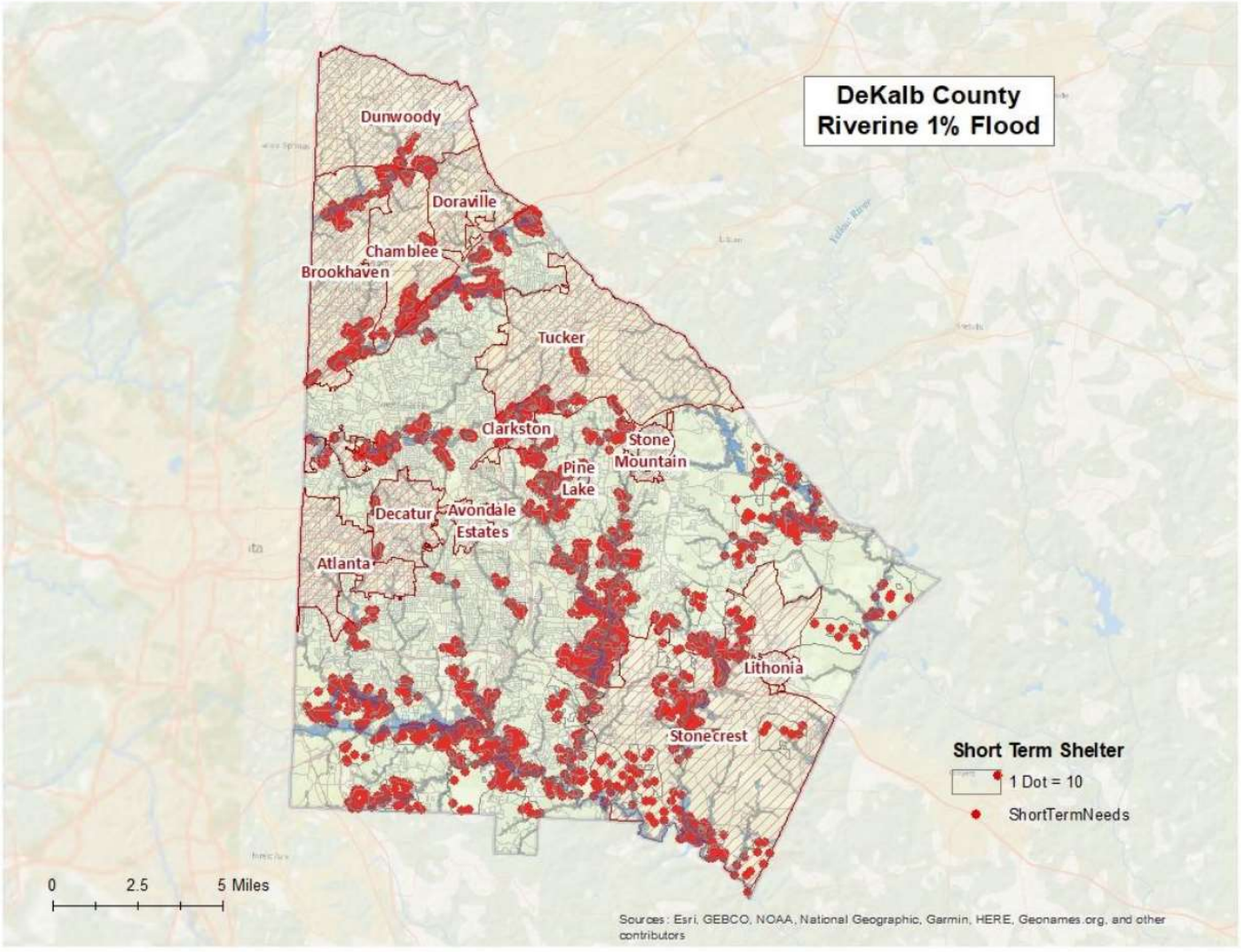
Map Source: National Inventory of Dams

Map 39: DeKalb County High Hazard Dams



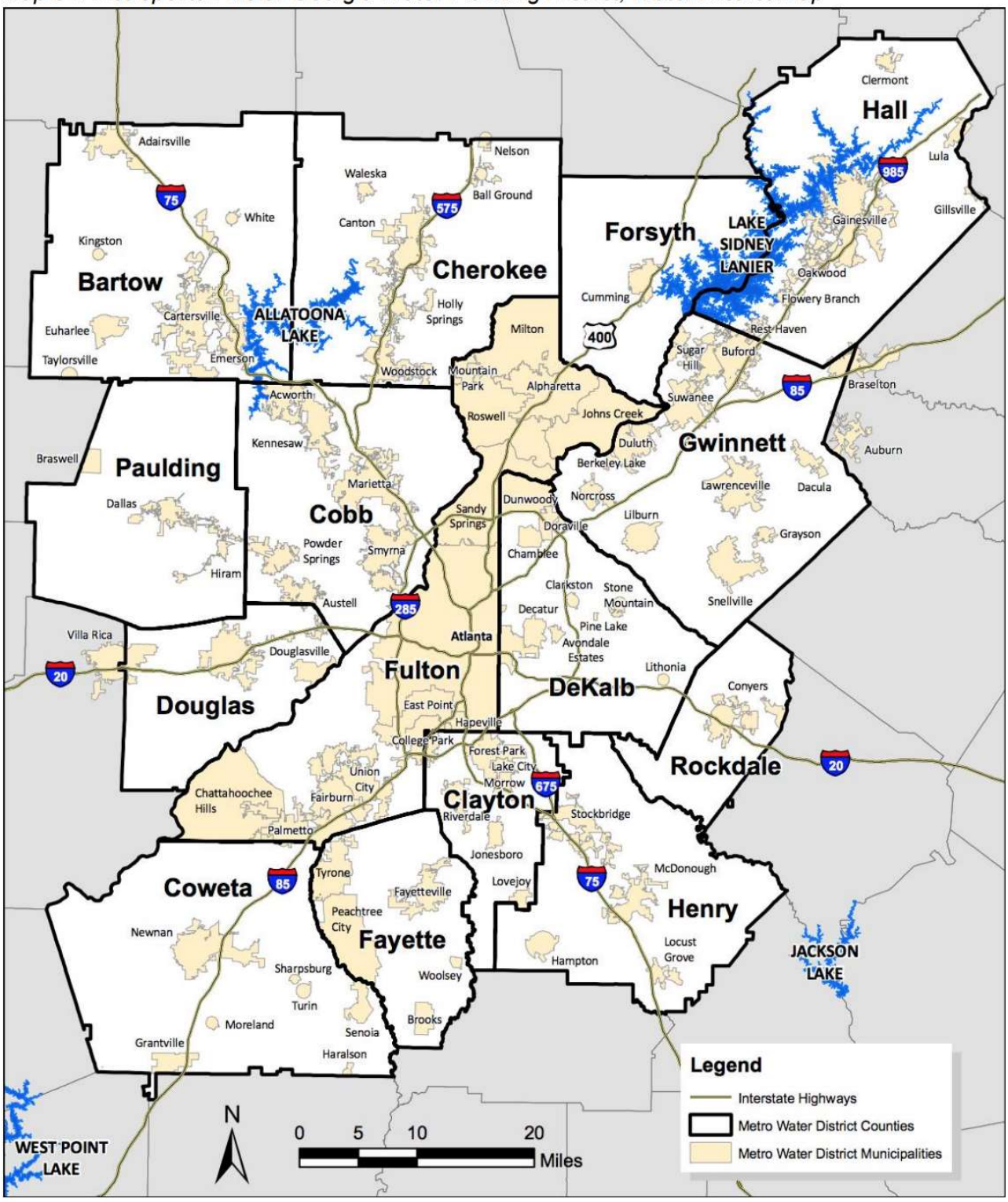
Map Source: National Inventory of Dams

Map 40: DeKalb County Flood Risk Map



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

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/*)*

Map Source: https://northgeorgiawater.org/

www.CommunityResilienceBuilding.org