GEORGIA’S CHANGING LANDSCAPE:
APPRECIATING AN URBANIZING POPULATION AND LAND USE

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Georgia is a great state. It continues to be one of the leaders of our nation in many aspects, including quality of life, community development, natural resource conservation, urban and rural forest sustainability, and intelligently managed change into the future. To better understand community forest resource management now and into the future, examining the current state of Georgia and some of its impending changes, are critical.

Community natural resource managers, citizens projecting their community’s current and future health, and organizations examining their position and role within a productive future within Georgia all need to appreciate our continuing changes. Here is presented a highly limited and summarized review of a few current aspects, as well as some general expectations into the future, for Georgia. Note that listed here are just a few general concepts of what exists now and what changes are projected to occur, and not detailed depictions covering all social and resource areas.

GEORGIA’S PEOPLE

Georgia’s great strength has always been its people. Georgia’s population, based upon growth projections from the last census, reached 10,508,057 people in 2017. This makes Georgia the 8th most populated state in the United States, and makes Georgia the 10th fastest growing state with roughly +1.2% population growth per year. In addition, Georgia is the 18th largest state in population density (population versus land area). Georgia is projected to reach a population of 14.7 million by 2030, or a 40% increase. Figure 1 provides a projection of population growth in Georgia from 1980 into 2030.

Looking at Georgia counties, some have strong population growth while other are losing population. Figure 2 shows increasing population (blue circles) and decreasing population (red circles) counties. There is a belt roughly southwest to northeast-central across Georgia where populations by county are declining. Rapidly increasing populations are found in counties concentrated near metropolitan Atlanta and near Savannah. Figure 3 provides a regional view across Georgia of population rate increases and decreases.

Figure 4 demonstrates where counties with the smallest populations are located, in this case in numerical order of the 15 smallest counties. All of these counties have populations under 6,900 people. Note how many of these low population counties are in southwest Georgia. Figure 5 shows Georgia counties with populations in numerical order for the largest 15 counties. All of these counties have populations greater than 137,000 people. Note how these top 15 counties are concentrated in the Atlanta, Augusta, Macon, Columbus and Savannah areas.

Diversity!

Georgia is a diverse state in many ways. Figure 6 provides the racial and ethnic make-up of Georgia’s population. Remember these labels are provided by the people themselves, and represent how they identify themselves. White and Black Americans comprise roughly 93% of Georgia’s population, with Latino, Asian, and Native Americans making up most of the remaining population. Note the percentages add up to 106.7% because some people identify as multiracial.

There is a double counting of people identifying as Latino Americans because Latino ethnicity occurs in various combination within White, Black, Asian and multiracial Americans. Latino Americans...
could be listed within each racial group, or in multiple racial groups. Figure 7 provides a simple breakdown of the mixed ethnic Latino American population within different racial groups in Georgia.

The ancestry of Georgia’s people are derived from many countries and regions around the world. Figure 8 shows most of the population of Georgia derived from colonial Americans, and more recent immigrants from Ireland, England, and Germany. Latino American immigrants are primarily from Mexico, Central / South America, and the Caribbean. All these groups listed above together represent about 46% of Georgia’s population ancestry.

Figure 9 provides a breakdown of the population by gender. The female / male division is close to even (varies by 2%), with small differences by race and ethnicity. Median gender ages of Georgia’s population is 36 years old for females and 34 years old for males.

Further demonstrating Georgia’s diversity and rich cultural background is the numbers of languages spoken. Figure 10 provides a list of the top 8 languages spoken by Georgia residents. English is spoken by most people with a number speaking a different language at home or among friends. English and Spanish comprise about 97% of all languages spoken. There is a diversity of languages which can be found within enclaves and families in Georgia.

Religion also demonstrates Georgia’s diversity. The largest five religions of Georgia is dominated by Christian (~79%). Figure 11 shows religious groups in Georgia. Note that 18% of the population declared no religious affiliation.

Georgia is a well-educated state. About 85% of the population has a high school education or more. College graduates account for roughly 28% of the population.

Money!

Figure 12 shows the personal income of Georgians. The median household income is almost $50,000, with per person income at just over $25,000. Poverty afflicts more than 18% of the population, although this value varies by how poverty levels are measured. Georgia also has just under 9% of the population listed as disabled.

Average state-wide values for housing can be misleading because the poorest counties are combined with the most affluent counties. Figure 13 provides average home values in the state, and the average monthly mortgage payment ($1,388). The average monthly rent payment for housing is just over $870 per month. These housing values represent an average household occupancy of almost three people. Figure 14 shows regional home values divided between high home values and low home values for Georgia.

Cities!

Summaries of Georgia’s population revolve around its cities. Figure 15 provides a list of the 15 largest cities in population for Georgia. City size can be roughly broken into three groups, greater than 120,000, greater than 70,000, and greater than 55,000 people. Note many of these cities are within the metropolitan area of Atlanta. Figure 16 shows the state’s metropolitan census areas, which include urban and suburban areas surrounding major cities.

The metropolitan areas of Georgia account for 8.4 million people. Figure 17 provides the named metro areas, population in millions, and number of counties considered a part of the metro area. Georgia’s 12 metro areas cover 74 counties, some of which are in neighboring states. Atlanta alone accounts for 5.6 million people across 29 counties.

Figure 18 provides a map showing the 12 metro areas and their relative population size. Note Georgia’s population is roughly 80% urban / suburban and 20% rural. Of the 80% urban / suburban population, 67% of these people live in the Atlanta metro area. Figure 19 provides a view of county population variations surrounding Atlanta.
GEORGIA'S DECISION MAKERS

Georgia’s elected legislative officials represent the growing population of Georgia. Figure 20 shows the Georgia State Senate membership by metropolitan area. Note 70% of Georgia State Senators are from urban/suburban districts. Atlanta metro area has 46% of all Georgia Senators. Figure 21 shows the Georgia State House members representing metropolitan areas. In the Georgia House, 68% of members are from urban/suburban districts. Atlanta has 46% of all Georgia House representatives.

In the United States House, 6 of 14 Georgia seats are predominantly urban/suburban, with 3 of 14 seats representing suburban edge or urban interface districts. Figure 22. Combined, 9 of 14 (64%) of Georgia’s seats in the United States House represent urban/suburban, or emerging suburban districts. In the United States Senate, Georgia’s two senators represent a state which is 80% urban/suburban.

To summarize Georgia’s elected legislative officials, Figure 23 provides the Georgia House and Georgia Senate members in each metropolitan area. Note Atlanta has a large proportion of elected legislative officials.

GEORGIA’S LAND

The quality of life for any population rests in the continued productivity of its land and sustainability of its natural resources. For the United States of America, Georgia’s land area is in the middle of all the states, ranking 24th largest in size. Georgia has about 59,483 square miles or 38,068,965 acres of land. Because of river borders and salt marsh/barrier islands changes, these land areas vary slightly over time. Georgia is the largest state East of the Mississippi.

Georgia has eight primary physiographic regions which suggests how the state was formed and generates unique plant and animal communities. Figure 24 provides a view of the eight regions which range from the ridge and valley area of the Northwest, to the forested swamp of the Southeast. Each area has representative native trees and forest types. Across these physiographic regions flow Georgia’s 14 primary watersheds. Figure 25. Watersheds show the drainage patterns of landscapes into major rivers, and suggest surface water resource availability and limits.

Georgia’s land has a diversity of ecological cover types and uses. Figure 26 shows a proportional breakdown of dominant land use across all the square miles in Georgia. Forests, developed land, and crops cover most of Georgia. Forest land accounts for 65% of all land cover in the state. Of these forest acres, Georgia has the highest percent of forest land available for commercial production in the nation (98%). Figure 27 provides a relative level of tree cover across the state.

Forests!

Georgia’s forest cover can be divided into five dominant over-arching types of tree combinations or forest types: (Figure 28) oak/hickory; oak/pine; loblolly pine/shortleaf pine; longleaf pine/slash pine; and, bottomland forests in swamps and along river bottoms. Figure 29 provides a different perspective showing tree species mixes within the native forests of Georgia. Note the longleaf/loblolly/slash pine species group occupy roughly the Southern half of the state, with a Northern in-holding along the Alabama border near the city of Rome.

If commercial, industrial, and land development disturbance were not present exerting ecological change and stress on landscapes, forest types would be different and more widespread. Figure 30 suggests the potential forest cover of the state without human development and intensive disturbance.
Figure 31 demonstrates the changes Georgia’s dominant land uses are undergoing. The trend is for forests and agricultural land to be declining in acreage, while urban/suburban acres are increasing. These trends are expected to continue, accelerating as Georgia’s population grows.

Georgia is blessed with large and productive commercial forests. Figure 32 shows a general distribution of commercial forest acres as a percent of county acres across the state. A value of 90% in this figure represents where 90% of all land is composed of potentially commercial forest land. These values do not represent actual commercial forest land percents currently under management for timber products.

Figure 33 shows forest land ownership patterns in Georgia. Private industrial ownerships account for 56% of all forest lands, with various corporate owners holding 25% of forest lands, and forest industries holding 10% of Georgia’s forest lands.

Combining information about ownerships and commercial forest lands, as well as examining forest land use trends, some future forest resource management intensities can be expected. Figure 34 shows the state divided into five distinct zones: forest lands reserved from commercial use and held for development (North mountains and Southeast Coast); quickly developing lands; areas where forest management could be improved and is commercially viable; agriculture dominated areas, although having significant forest acres; and, high intensity forest management land use.

**GEORGIA’S CLIMATE**

Georgia’s climate powers its forest productivity, water availability, energy use, tree health and tree species mix. There is great variability and change in Georgia’s long term climate and short term weather. To better appreciate Georgia’s climate for people, trees and forests, looking at temperature and precipitation patterns can be helpful.

Figure 35 shows places in Georgia with similar temperature patterns assigned to five regions, from Coastal to Northern mountains. Temperature zones run roughly North/South, accounting for the North Georgia mountains. Figure 36 shows places in Georgia which share one of five similar precipitation patterns. Note the large pocket in the middle of the State (zone 4) which can be droughty. Zone 5 circles around the State making precipitation distribution, patterns, and intensities in Columbus similar to Savannah. If these two maps (Figure 35 & 36) are combined, Figure 37 is generated. Places with similar combined temperature and precipitation patterns can be divided into seven zones. These climate zones run roughly North to South, except for the maritime area along the coast.

In the last 18 years, hardiness zones (average minimum Winter temperatures) in Georgia have grown significantly warmer and shifted Northward. Figure 38. Some hardiness zones have shifted 100 miles North in just 11 years. Figure 39 shows the current hardiness zones for Georgia. If this level of change continues over the next 20 years, hardiness zones will have changed to a great degree. This type of change will impact tree growth and forest composition (and associated pests), especially in urban/suburban areas.

**URBANIZING GEORGIA**

Looking at Georgia from above, urban/suburban land use intensity is clear. Figure 40 shows where moderate and heavy intensity urban/suburban land use is taking place. Note changing land use is not just in already developed areas sprawling out, but can be seen in many Georgia communities’
expanding land development. Figure 41 provides a graph of how urban/suburban land use has spread out in Georgia, increasing the number of acres impacted by 2/3s in the last 26 years. Georgia’s urban, suburban, and urban-rural interface areas occupy 12.3% of the state’s area, and contains 8.4 million people or 80% of the population.

Figure 42 consolidates elected representative locations, population centers and associated infrastructure supporting metro populations within the state. Note how potential political power, population, and infrastructure supporting the population are divided into metro centers and transportation corridors. Continued population growth and economic development will continue to occur along, and fill in around these areas.

**CONCLUSIONS**

Georgia is a great state with many natural resources and a productive diverse population. The future of Georgia, based upon current trends and resource values, suggests even bigger and better changes in quality of life and sustainable land use. The basic conclusions here can be summarized into four points which will occur in Georgia:

1. rapid growth will continue;
2. growth will cause a number of resource allocation and use problems;
3. ecological resources will need stronger and more careful management and conservation; and,
4. there will continue to be expanding tree and forest health issues.

Key to managing these Georgia changes will be a need for an educated appreciation of community viability and surrounding forest ecological health, all within a urban/suburban environment.

**Sources: (all internet sourced)**

Dr. L. Kramer, NRSAL-CAES, UGA. Georgia Land Use Trends. 2017.
Georgia Forestry Commission, Georgia Statewide Assessment of Forest Resources, 2015.
United States Census Bureau, USDC, Georgia - 2017.
Figure 1: Georgia’s population.
Figure 2: County population growth rates.
Figure 3: Population growth rate regions in Georgia.
Figure 4: The 15 smallest population Georgia counties. (all under 6,900 people)
Figure 5: The 15 largest population Georgia counties. (all over 137,000 people)
Figure 6: Georgia population by race / ethnicity.

61.6% WHITE AMERICAN
31.7% BLACK AMERICAN
8.8% LATINO AMERICAN
4.0% ASIAN AMERICAN
0.5% NATIVE AMERICAN
0.1% POLYNESIAN AMERICAN
Figure 7: Georgia’s population of Latino ethnicity.

**PEOPLE IDENTIFYING AS LATINO AMERICANS**

8.8% HISPANIC / LATINO OF ANY RACE

4.0% OTHER RACE

3.8% WHITE AMERICAN

2.1% MULTIRACIAL AMERICAN
Figure 8: Ancestry of Georgia’s non-Native American population.

10.8% COLONIAL AMERICANS (primarily British)

9.5% IRISH

8.9% ENGLISH

8.8% LATINO (Mexico, Puerto Rico, Caribbean, Central & South America)

8.2% GERMAN
Figure 9: Georgia’s population by gender and race / ethnicity.

51% FEMALE

59% WHITE AMERICAN
32% BLACK AMERICAN
8% LATINA AMERICAN

49% MALE

60% WHITE AMERICAN
29% BLACK AMERICAN
10% LATINO AMERICAN
Figure 10: Major languages spoken as a percent of the population in Georgia.

90.0%  ENGLISH
7.4%  SPANISH
0.5%  KOREAN
0.4%  FRENCH
0.3%  VIETNAMESE
0.3%  CHINESE
0.3%  GERMAN
0.2%  HINDI
0.6%  OTHER
Figure 11: Largest religions identified in Georgia’s population.

79% CHRISTIAN

18% NONE

1% JEWISH

0.7% MUSLIM

0.3% BUDDHISTS

0.2% HINDU
Figure 12: Income levels of Georgia’s population.

MEDIAN HOUSEHOLD INCOME

= $49,342

PER CAPITA INCOME

= $25,427

18.3% IN POVERTY
8.7% DISABLED
Figure 13: Average state-wide housing values in Georgia.

**HOME VALUE**

= $148,000

**MONTHLY MORTGAGE**

= $1,388

**MONTHLY RENT**

= $874

**PEOPLE PER HOUSEHOLD**

= 2.7
Figure 14: Housing value regions in Georgia.
Figure 15: Largest 15 city populations in Georgia.

<table>
<thead>
<tr>
<th>City</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLANTA</td>
<td>472,522</td>
</tr>
<tr>
<td>COLUMBUS</td>
<td>197,485</td>
</tr>
<tr>
<td>AUGUSTA</td>
<td>197,081</td>
</tr>
<tr>
<td>MACON</td>
<td>152,555</td>
</tr>
<tr>
<td>SAVANNAH</td>
<td>146,763</td>
</tr>
<tr>
<td>ATHENS</td>
<td>123,371</td>
</tr>
<tr>
<td>SANDY SPRINGS</td>
<td>105,703</td>
</tr>
<tr>
<td>ROSWELL</td>
<td>94,598</td>
</tr>
<tr>
<td>JOHNS CREEK</td>
<td>83,873</td>
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<tr>
<td>WARNER ROBINS</td>
<td>74,388</td>
</tr>
<tr>
<td>ALBANY</td>
<td>73,801</td>
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<tr>
<td>ALPHARETTA</td>
<td>65,338</td>
</tr>
<tr>
<td>MARIETTA</td>
<td>60,941</td>
</tr>
<tr>
<td>SMYRNA</td>
<td>56,644</td>
</tr>
<tr>
<td>VALDOSTA</td>
<td>56,474</td>
</tr>
</tbody>
</table>
Figure 16: State metro census areas.
Figure 17: Population of Georgia metro areas (in millions), and number of counties counted within each area.

(* = counties in other states in population count)

<table>
<thead>
<tr>
<th>Metro Area</th>
<th>Population (in millions)</th>
<th>Counties Counted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLANTA</td>
<td>5.60</td>
<td>(29)</td>
</tr>
<tr>
<td>SAVANNAH</td>
<td>0.53</td>
<td>(6)</td>
</tr>
<tr>
<td>MACON</td>
<td>0.42</td>
<td>(8)</td>
</tr>
<tr>
<td>AUGUSTA</td>
<td>0.40</td>
<td>(5*)</td>
</tr>
<tr>
<td>CHATTANOOGA</td>
<td>0.29</td>
<td>(5*)</td>
</tr>
<tr>
<td>COLUMBUS</td>
<td>0.25</td>
<td>(4*)</td>
</tr>
<tr>
<td>ATHENS</td>
<td>0.20</td>
<td>(4)</td>
</tr>
<tr>
<td>GAINESVILLE</td>
<td>0.19</td>
<td>(1)</td>
</tr>
<tr>
<td>ALBANY</td>
<td>0.15</td>
<td>(5)</td>
</tr>
<tr>
<td>VALDOSTA</td>
<td>0.14</td>
<td>(4)</td>
</tr>
<tr>
<td>ROME</td>
<td>0.12</td>
<td>(2)</td>
</tr>
<tr>
<td>BRUNSWICK</td>
<td>0.11</td>
<td>(3)</td>
</tr>
</tbody>
</table>

>8.4 million urban / suburban population
Figure 18: Largest 12 urban / suburban population centers in descending order with percentage of population.

Georgia’s People

20% rural
80% metro

- 67% ATL
- 16% 2-4
- 11% 5-8
- 6% 9-12

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Figure 19: County populations in metro Atlanta area.
Figure 20: Georgia Senate districts from metro areas.

46% ATLANTA
5% SAVANNAH
4% AUGUSTA
4% COLUMBUS
4% MACON
2% ATHENS, DALTON, GAINESVILLE, VALDOSTA

~70% = URBAN / SUBURBAN GEORGIA SENATE SEATS
46% ATLANTA
3% SAVANNAH
3% AUGUSTA
3% MACON
2% ALBANY, ATHENS, COLUMBUS, DALTON, GAINESVILLE, VALDOSTA

68% = URBAN / SUBURBAN GEORGIA HOUSE SEATS
Figure 22: United States House of Representatives seats from urban / suburban districts.

<table>
<thead>
<tr>
<th>Seats</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 / 14 Seats</td>
<td>64%</td>
</tr>
<tr>
<td>Urban / Suburban</td>
<td></td>
</tr>
</tbody>
</table>

9 / 14 Seats (64%) Urban / Suburban or Interface
Figure 23: Metro area elected decision makers.
Figure 24: Physiographic regions of Georgia.

KEY
1. ridge & valley
2. mountain
3. Piedmont
4. sand hills
5. loam hills
6. upper Coastal Plains
7. flatwoods
8. forest swamp
Figure 25: Major watersheds of Georgia.

1) Tennessee  6) Ocmulgee  10) Altamaha
2) Coosa       7) Oconee     11) Satilla
3) Tallapoosa  8) Savannah   12) Suwannee
4) Chattahoochee  9) Ogeechee 13) St. Mary
5) Flint
Figure 26: Dominant land use and cover in Georgia.
Figure 27: Tree canopy cover levels across Georgia.

H = HEAVY
M = MEDIUM
L = LIGHT
VL = VERY LIGHT
Figure 28: Major forest types in Georgia.

KEY:
1. oak - hickory
2. oak - pine
3. loblolly - shortleaf
4. longleaf - slash
5. oak - gum - cypress
Figure 29: Native forests of Georgia.

- **Birch / Beech / Maple / Hemlock**
- **Chesnut / Chesnut Oak / Yellow Poplar**
- **Oak / Pine**
- **Longleaf / Loblolly / Slash**
- **Cypress / Tupelo / Gum**
  - also along Coastal Plain river bottoms
- **Marsh Grass**

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Figure 30: Potential natural forest without human development or disturbance.

KEY:
1. Appalachian oaks
2. Piedmont mixed (oak, hickory, pine)
3. Southern mixed (beech, sweetgum, magnolia, pine, oak)
4. Southern floodplain (oak, gum, cypress)
Figure 31: Changes in land use and cover types.
Figure 32: Potential commercial forest land in Georgia by percent of total land use or cover.
Figure 33: Forest land ownership in Georgia

56% PRIVATE INDUSTRIAL
25% CORPORATE
10% FOREST IND.
9% PUBLIC
Figure 34: Forest management intensity zones in Georgia.
Figure 35: Similar temperature zones in Georgia.
(30 years data -- cluster analysis)
Figure 36: Similar precipitation zones in Georgia.
(30 years data -- cluster analysis)
Figure 37: Combined temperature and precipitation zones in Georgia. (30 years data -- cluster analysis)
Figure 38: Tree hardiness zone changes in Georgia from 2001-2012.

<table>
<thead>
<tr>
<th>Hardiness Zone</th>
<th>Average Annual Minimum Temperature °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>6b</td>
<td>-5</td>
</tr>
<tr>
<td>7a</td>
<td>0</td>
</tr>
<tr>
<td>7b</td>
<td>5</td>
</tr>
<tr>
<td>8a</td>
<td>10</td>
</tr>
<tr>
<td>8b</td>
<td>15</td>
</tr>
<tr>
<td>9a</td>
<td>20</td>
</tr>
</tbody>
</table>

2012 map lines

2001 map lines
Figure 39: Tree hardiness zones of Georgia 2012.

<table>
<thead>
<tr>
<th>Hardiness Zones</th>
<th>average annual zone number minimum temperature °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>6b</td>
<td>0</td>
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<tr>
<td>7a</td>
<td>5</td>
</tr>
<tr>
<td>7b</td>
<td>10</td>
</tr>
<tr>
<td>8a</td>
<td>15</td>
</tr>
<tr>
<td>9a</td>
<td>20</td>
</tr>
</tbody>
</table>

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Figure 40: Areas of concentrated urban / suburban land surfaces in Georgia.
Figure 41: Changes in urban / suburban land surface area in Georgia over last 26 years.
Figure 42: Centers and corridors of development within the State. (concentrated voters and elected representatives)