

# *Introduction*

## **Purpose & Vision Statement**

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**To guide, develop, and cultivate environmentally, socially, and economically resilient strategies and equitable solutions to climate change for the whole community.**

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## **What is the Climate Action Plan?**

### **Climate Change**

According to the Intergovernmental Panel on Climate Change (IPCC), climate change is a shift in our climate that persists for an extended period of time. It is well-established that current changes in our climate are caused by an excess of **greenhouse gases** in our atmosphere. Greenhouse gases, such as carbon dioxide and methane, are natural and even essential to maintain the perfect climate for life on Earth (the “**Goldilocks zone**”). They do this by trapping heat within our atmosphere, a process known as the **greenhouse effect**. Most radiation from the sun is absorbed by the Earth’s surface, but some of it “bounces” off of Earth and goes back into space as **infrared radiation**. However, greenhouse gases in the atmosphere can cause this infrared radiation to be re-radiated back to Earth, where it is then absorbed. This creates a “greenhouse” in our atmosphere as more infrared radiation, or heat, is absorbed. Without the greenhouse effect, global average temperatures on Earth could be as low as -18°C (-0.4°F), vastly colder than the 14°C (57°F) average today.<sup>[1]</sup>

**Anthropogenic** activities such as energy generation with fossil fuels emit more greenhouse gases than natural, causing more radiation/heat to be trapped within our atmosphere (hence global warming). Since the Industrial Revolution, greenhouse gas emissions have risen exponentially, and average global surface temperatures have increased at unprecedented rates. The IPCC’s Sixth Assessment Report (AR6) found that emissions from anthropogenic sources have caused 1.1°C (~2°F) of warming since 1850-1900.<sup>[2]</sup> The IPCC, along with the United Nations, have established a goal of keeping global average temperatures no higher than 1.5°C above pre-industrial levels. With our current trajectory, it is expected that we will reach averages of 1.5°C above pre-industrial levels in the next twenty years.

In sum, the more greenhouse gases in the atmosphere, the more heat is trapped within it, which has several negative impacts on the balance that allowed life on Earth to develop. Climate change is more than just global warming, however. The increase of heat within our atmosphere causes **positive feedback loops** that amplify other negative effects, further exacerbating climate change. One example of this is the thawing of permafrost. Permafrost, which can be found in the Arctic tundra, releases methane (CH<sub>4</sub>) as it thaws. A warming climate results in increased thawing and

increased methane release. Because methane is an extremely potent greenhouse gas, thawing permafrost will only trap more heat within our atmosphere and make climate change worse. Positive feedback loops such as thawing permafrost are leading to “tipping points” where we will not be able to go back to how our atmosphere was before. The goal of keeping global average temperatures below 1.5°C above pre-industrial levels is an attempt to avoid these tipping points and worse climate change impacts.

Climate change also has very real consequences on human civilization by exacerbating drought and flooding events, crop failures, the strength of tropical cyclones, sea level rise, etc. Climate change is thus shifting the natural world in many ways, and Alachua County is not immune to these changes. The purpose of this **Climate Action Plan (CAP)** is to prepare us for the future as well as mitigate our contribution to climate change.

### Climate Action Plans (CAPs)

CAPs address climate change impacts by identifying appropriate adaptation and mitigation strategies which are then implemented through various government, business and community entities. As per the “**Florida Adaptation Planning Guidebook**,” the process of developing a CAP can be divided into four sections:<sup>[3]</sup>



**Figure 0.1: Florida Adaptation Planning Guidebook steps to make an Adaptation Plan**

## *1) Context*

Alachua County is home to beautiful wetlands and springs, hosting essential Floridian ecosystems and wildlife. Our rich history spans back to the Timucua and Alachua Seminole Tribes who lived on these lands prior to Spanish colonization. Their influence still exists today. In fact, the name “Alachua” is derived from the Timucuan word for sinkhole.<sup>[4]</sup> Alachua County acknowledges that we reside on the traditional lands of the Timucua and Alachua Seminole Tribes, and express gratitude for their contributions to the County we are today. We want to highlight the ongoing struggles of the Indigenous community and the importance of centering their voices and perspectives on issues relating to climate change and the environment.

The 2020 decennial census estimated that 278,468 people live in the County, a majority of them concentrated in the Gainesville area.<sup>[5]</sup> Surrounding our urban and suburban hubs are vast expanses of farms and ranches, many of which have been working our lands for several generations. The combination of urban, suburban and rural areas throughout Alachua County means that we must contextualize climate impacts and how to best prepare for them. This highlights the fact that climate impacts (and how we address them) are not uniform. They largely depend on geography, population, infrastructure, and access to resources. For instance, what works to address flooding in an urban area may not work in a rural area. This also means that Alachua County’s responses to climate change will differ from other counties around Florida.

In sum, there is no cure-all to address climate change and solutions vary depending on location and the resources available. This is where public outreach and community participation become vital. Prior to the development of the CAP, a survey was conducted to assess the weather-related risk perceptions and their impacts on the community’s quality of life. The survey, along with the county’s Climate Vulnerability Assessment, allow us to identify and further contextualize the most appropriate climate mitigation and adaptation strategies to be incorporated into the CAP. For example, respondents were asked to select up to three threats of weather changes they are concerned will impact them the most. Of the 456 valid responses, a majority of respondents were concerned by extreme heat (57.68%), rainfall flooding/extreme precipitation (55.70%), and water pollution (46.71%). This data helps us pinpoint what is important to our community and which climate impacts to prioritize.

Community engagement did not stop there. County staff worked to ensure that a variety of interest groups from different backgrounds, as well as the general public, were able to participate in the development of the CAP and provide feedback. County staff hired local organizations to curate surveys based on the content of the Vulnerability Assessment (see next section) and distribute them to the public. Organizations were chosen based on their representation of communities that are often left out of climate conversations. Organizations that worked with the County include:

- Bailey Learning and Arts Collective
- Rural Women’s Health Project
- Flourish Farms
- Grace to Overcome

- St. Peter and St. Paul

Additionally, County staff collaborated with local organizations to host climate-related events.

By taking several public outreach approaches, County staff are better able to better contextualize our community and identify which issues need to be prioritized as climate impacts worsen. Our outreach goal is to engage 20% of the County's population in the CAP's development and review phases. This includes the many organizations we have partnered with and the Alachua County Climate Summit.

## *2) Vulnerability Assessment*

A **Climate Vulnerability Assessment** of Alachua County was conducted to evaluate how climate change will impact us and how well-prepared our communities are for it. By quantifying future impacts, we are able to develop a CAP that can accurately and precisely address Alachua County's local climate issues. The results allow us to assess where we are right now and how we can improve moving forward. For more information on the results of the Assessment, please see the Vulnerability Assessment Summary. Results will be incorporated into the different sections of the CAP.

The Assessment evaluated three main components: 1) exposure, 2) sensitivity, and 3) adaptive capacity where physical and socioeconomics dimensions were considered. **Exposure** is defined as the presence of people, assets, and ecosystems where they can be adversely affected by climate hazards (U.S. Climate Resilience Toolkit, 2023). **Sensitivity** is the degree to which an exposed asset is affected. **Adaptive capacity** is the ability that asset has to cope or withstand potential impact from the threat with minimal disruption or loss. These three components developed an intersectional, community-focused evaluation of climate impacts in Alachua County and are the foundation of the CAP. For more information on the Vulnerability Assessment, see Appendix A.

## *3) Adaptation and Mitigation Strategies*

Based on the results of the Vulnerability Assessment and public input, the CAP contains 9 chapters that precisely identify and incorporate Alachua County-specific climate adaptation and mitigation strategies. The chapters of the CAP are:

1. Agriculture and Food Security
2. Energy Efficiency
3. Flooding
4. **Green Businesses**
5. Land Use and Transportation
6. Natural Resources
7. Public Health
8. Waste
9. Water

The sections following the Introduction will cover each of these areas in detail with results from the Vulnerability Assessment. They will provide policy recommendations, suggested action items, and strategies to improve current or past efforts relating to that area.

#### *4) Implementation Strategies*

“Implementation strategies are the specific steps a community takes to incorporate the adaptation [and mitigation] strategies into existing planning, budgeting, and staffing mechanisms.”<sup>[6]</sup> Recommendations from this CAP will be used to update the Alachua County Comprehensive Plan and associated codes starting in 2026, be integrated into our capital improvement plans, and our emergency management strategies. This way, the CAP will directly influence County policies to bring about strong adaptation and mitigation efforts. To be resilient and vibrant community in the future, we must develop localized adaptation strategies for areas of greatest climate-related vulnerability in collaboration with all of our local municipalities, appropriate agencies, and local organizations to foster multi-jurisdictional solutions and maximize co-benefits.

## **Baseline & Targets for the Climate Action Plan**

### **County Comprehensive Plan 2019-2040**

The Alachua County 2019-2040 Comprehensive Plan lays out the framework for maintaining a sustainable community with a heavy emphasis on natural resource conservation and efficient energy consumption. The Plan’s principles guide this CAP, particularly Principle 1 of the Future Land Use Element: to promote sustainable land development that provides for a balance of economic opportunity, equity, environmental justice, and protection of the natural environment.

In accordance with the Comprehensive Plan, Alachua County aims to “Reduce countywide greenhouse gas emissions by 80% from 2009 baseline emissions by 2050, with an intermediate goal of a 40% reduction by 2020 and a short-term goal of 5% annual reduction” (Energy Element, Objective 1.1). This goal not only holds the County accountable to attain **net-zero** emissions, but it gives us realistic targets that are measurable. The CAP is centered around this goal as well as the rest of the Comprehensive Plan. For more information on the Comprehensive Plan, please visit the Alachua County website.

### **Greenhouse Gas Inventories**

Alachua County published a Greenhouse Gas Inventories Report to determine how much we emit and which sectors emit the most. The last Greenhouse Gas Inventory was published in 2022 (using 2019 data). This study, produced by Local Governments for Sustainability (ICLEI), an international non-governmental organization, found that Alachua County emitted 4,253,781 metric

tons of carbon dioxide equivalent (MT CO<sub>2</sub>e) in 2019. Transportation made up the most of these emissions (39%), followed process and fugitive emissions (21%) and commercial energy (20%). The remaining came from a combination of solid waste, residential energy, industrial energy, and water and wastewater. This is a notable decrease from the previous Inventory in 2009. Between 2009 and 2019, we reduced greenhouse gas emissions from residential electricity by 21% and commercial electricity by 22% (MT CO<sub>2</sub>e).

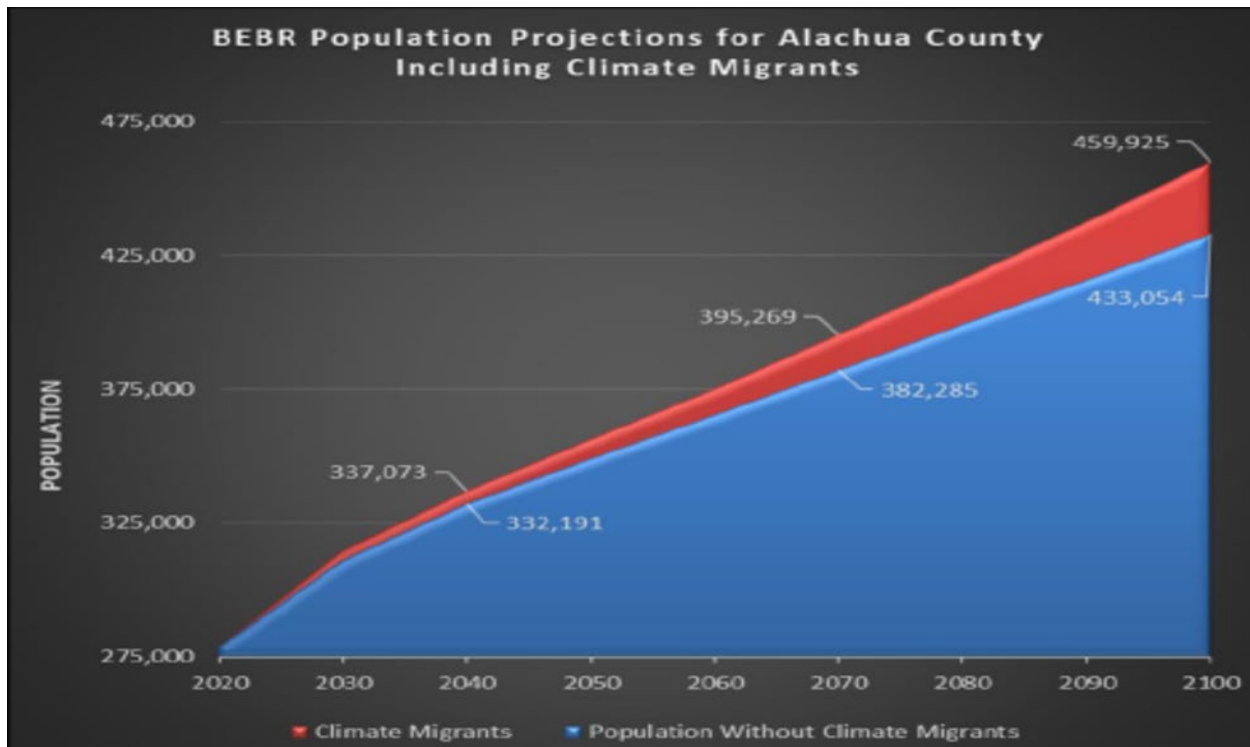
This data establishes a benchmark for future comparisons so we can quantify progress. The next Greenhouse Gas Inventory will be released in 2025 (using 2024 data). A decrease in emissions compared to 2019 levels is expected, partly due to the Covid-19 Pandemic as well as efforts made by Alachua County and its cities and municipalities. The goal of the County is to release Inventories every five years.

We acknowledge that the Comprehensive Plan's goal of a 40% reduction by 2020 was not met. We are continuing to work toward net zero and the 80% reduction by 2050. The County is scheduled to complete the next GHG Report in 2025 to have a 5-year update from the prior study based on 2019 data to continue to monitor our progress.

### **Climate Migration**

Climate migration is expected to increase in Florida as sea level rise pushes populations inland. Climate migration occurs when the impacts of climate change result in displacement or individuals moving to less impacted areas.<sup>[7]</sup> A study by the Bureau of Economic and Business Research and the University of Florida projects a net migration of 23,000 people by 2100, as shown in Figure 0.2.<sup>[8]</sup> This is on top of an already growing population. The projections also show an estimated 2,000 additional housing units by 2040 and 11,000 by 2100, placing stress on our natural resources.





**Figure 0.2: Bureau of Economic and Business Research Population Projections for Alachua County including Climate Migrants**

These projections showcase an urgent need to prepare Alachua County for an influx of new residents while also pushing for climate and environmental proactiveness. Alachua County’s most income- and resource-constrained residents and those who are black, indigenous, and people of color (BIPOC) are most vulnerable and least resilient to climate change’s impacts. The CAP is thus designed to keep these social realities in mind and balance responsiveness to vulnerability with proactive strategies that build resilience.

### Integrated and Strategic Resilience

The path towards a sustainable, green future is not complete without comprehensively integrating policies and practices that are strategic, technically feasible, economically viable, and tailored to address specific community needs and opportunities. Given the range of economic, environmental, and social assets *and* vulnerabilities in our community, the ultimate goal of the CAP is to improve quality of life for all residents by providing a suite of paths to sustainability and resilience. Each chapter of the draft CAP addresses specific topical areas through a “triple bottom line” lens: one that considers economic, environmental, and social costs and benefits to ultimately minimize vulnerability and maximize resiliency to climate change impacts across all segments of Alachua County.

### References

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