

Hurricane Ian and Nicole Report

Developed by: Northeast Florida Regional Council

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Introduction

Hurricanes Ian and Nicole struck Florida in the fall of 2022, devastating the communities in their path. Hurricane Ian hit southwest Florida on September 28, 2022, as a Category 4 hurricane with peak wind speeds at 160 mph. As the storm traveled northeast across the State, Hurricane Ian hit northeast Florida at a tropical storm wind level, affecting local communities. Six weeks later, Hurricane Nicole approached northeast Florida as a Category 1 hurricane. This storm compounded the damage from Hurricane Ian and further impacted the Region. The culmination of the two storms resulted in severe physical damage and economic impact on northeast Florida.

After the hurricanes hit the Region, the Northeast Florida Regional Council (NEFRC) sought to understand how these hurricanes affected northeast Florida and how to better prepare for the next hurricane. This inquiry began an exercise in uncovering the answers to two questions: 1) what information do governments need to collect about hurricane impacts? 2) Are there any gaps in understanding the impacts of Hurricanes Ian and Nicole on northeast Florida?

To understand the regional effects of the hurricanes, this report first describes the regional profile of northeast Florida to provide context to the regional economy, people, and vulnerabilities. Next, this report discusses the direct impacts of the storms. Finally, this report describes the lessons learned and best practices to prepare for and recover from hurricanes more effectively in the future.

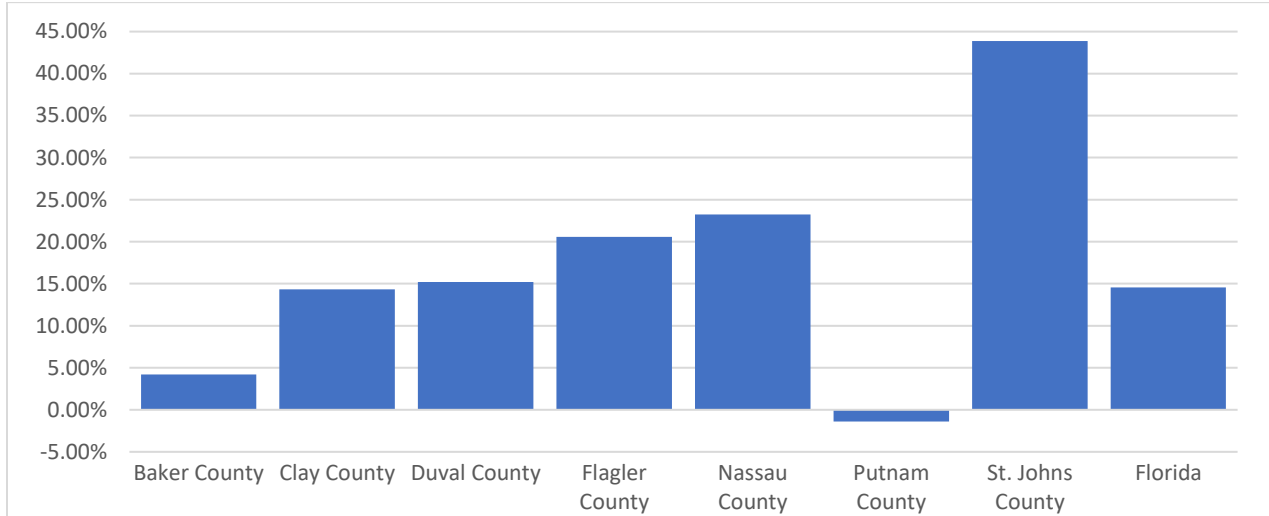
Section 1: Regional Profile

The northeast Florida Region is comprised of seven counties (Baker, Clay, Duval, Flagler, Nassau, Putnam, and St. Johns) and 25 municipalities. With an estimated population of over 1.8 million people in 2022, the Region encompasses an array of communities ranging from rural farming communities to bustling logistics centers (U.S. Census Bureau, 2021). Major water bodies, such as the Atlantic Ocean and St. Johns River, surround the Region, serving as a conduit for tourism and transportation industries. Although each area of the Region is unique, counties and municipalities rely on each other for jobs, housing, and recreation. Due to the interconnectedness of the Region, all communities experience the economic impacts from extreme weather events, such as hurricanes, regardless of where the event occurs. To better understand how a disaster can impact a region or county, it is imperative to understand the people, economy, and vulnerabilities.

People

Figure 1

Population Growth Percentage, 2010-2020



Note. Adapted from *Demographics and Housing Data*, U.S. Census Bureau, 2021.

Although Florida is increasingly experiencing hurricanes and tropical storms, northeast Florida saw a cumulative population growth of 18.4% from 2010-2020. During this time, the Region’s population grew from 1.5 million to over 1.7 million. Figure 1 shows that St. Johns County saw the biggest boom in population, with a growth rate of 44%. St. Johns County is one of the fastest-growing counties in the United States and has a large residential community that commutes to Jacksonville for work. Flagler and Nassau Counties saw rapid population growth as well. These Counties saw a growth rate of 21% and 23%, respectively. Clay and Duval Counties saw moderate growth of 14% and 15%. Baker and Putnam Counties had minimal to no growth during this time, however, projections predict that both Counties will experience population growth in the coming years.

Table 1

County Population and BEBR Medium Population Projections, 2010-2040

County Population and BEBR Medium Population Projections							
	Baker	Clay	Duval	Flagler	Nassau	Putnam	St. Johns
2010	27,115	190,865	864,263	95,696	73,314	74,364	190,039
2020	28,259	218,245	995,567	115,378	90,352	73,321	273,425
2030	30,900	249,800	1,142,200	148,000	111,800	75,300	371,700
2040	33,000	270,300	1,226,200	168,600	126,200	76,300	437,800

Note. Adapted from *Projections of Florida Population by County, 2025-2050, with Estimates for 2023*, by S. Rayer and C. Comfort, 2024.

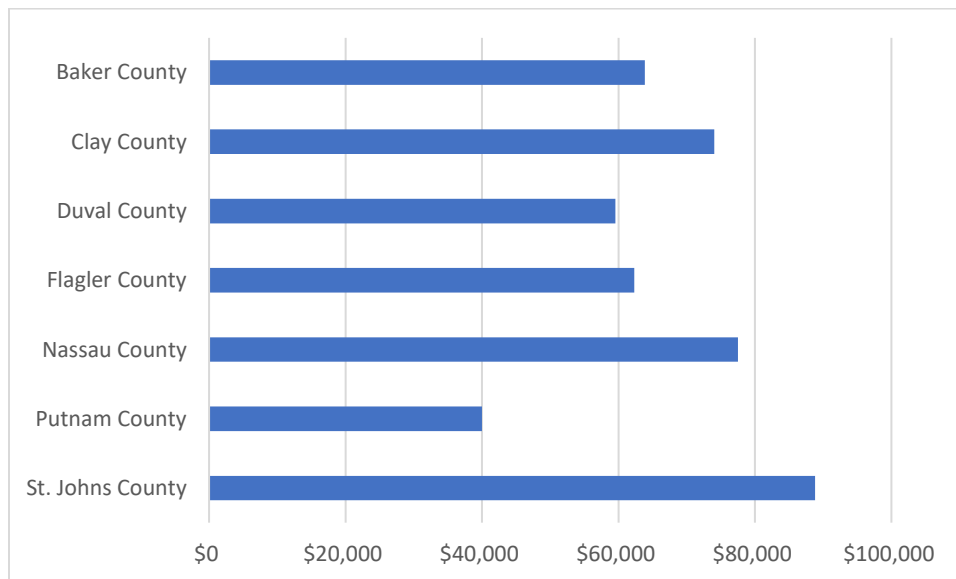
The Bureau of Economic and Business Research (BEBR) from the University of Florida utilizes a rigorous methodology to project the population of each county in Florida in five-year increments from 2025 to 2050. Table 1 shows that every county in northeast Florida is projected to grow in population over the next 20+ years. From 2020 to 2030, the BEBR medium population model projects that Putnam County will reverse the population decline trend and grow from a population of 73,321 to 75,300.

Research shows that hurricanes can further impact the population growth of high-density areas. When costly hurricanes hit growing high-density areas, there is likely to be an influx in population, oftentimes higher than the projected growth. This population growth occurs because there is typically reinvestment in the area and an influx in recovery funding. In turn, there is a rapid increase in spending and job creation that attracts people to the area (Fussell et al., 2016). If northeast Florida experiences costly hurricanes over the next decade, high-density areas may experience more rapid growth than currently projected.

Economy

Figure 2

Median Income (in 2021 dollars), 2017-2021



Note. Adapted from *Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars)*, by U.S. Census Bureau, 2021.

From 2017-2021, the median household income for the State of Florida was \$61,777. Five of the seven counties have a median household income over the State’s median household income, with St. Johns having the highest income at \$88,794. On the other hand, Figure 2 shows that Putnam County has the lowest median household income at \$39,975.

The Region’s 2022 Comprehensive Economic Development Strategy (CEDS) examined the location quotients across northeast Florida, highlighting the military industry and the target industries from JAXUSA: Advanced Manufacturing; Financial Services; Health and Biomedical; Advanced Transportation and Logistics; and Information Technology and Innovation. Location quotients compare the concentration of jobs in each local sector to the concentration of jobs in the entire country. A location quotient greater than 1.0 indicates a higher concentration of jobs in that sector compared to the rest of the country.

Figure 3

Northeast Florida Employment Location Quotients by Industry

Northeast Florida Employment Location Quotients by Industry	
Industries	2021
113-115 - Forestry, fishing, and hunting	0.479
21 - Mining	0.209
22 - Utilities	0.413
23 - Construction	1.188
31-33 - Manufacturing	0.550
42 - Wholesale trade	0.898
44-45 - Retail trade	1.160
48,492-493 - Transportation and warehousing	1.286
51 - Information	0.774
52 - Finance and insurance	1.501
53 - Real estate and rental and leasing	0.990
54 - Professional, scientific, and technical services	0.961
55 - Management of companies and enterprises	0.628
56 - Administrative, support, waste management, and remediation services	1.280
61 - Educational services; private	0.704
62 - Health care and social assistance	1.008
71 - Arts, entertainment, and recreation	1.010
72 - Accommodation and food services	1.132
81 - Other services (except public administration)	1.016
NA - State and Local Government	0.692
State Government	0.711
Local Government	0.685
NA - Federal Civilian	1.284
NA - Federal Military	1.392
111, 112 - Farm	0.223

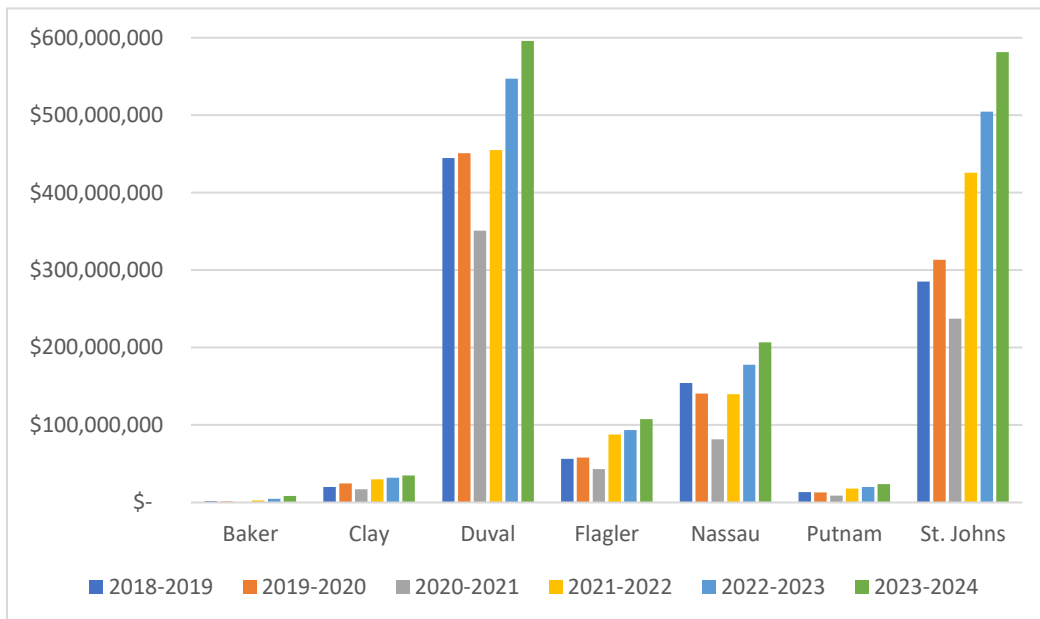
Note. From 2022 – 2027 Northeast Florida Comprehensive Economic Development Strategy, by Northeast Florida Regional Council, 2022, p. 13.

Most of the targeted industries identified by JAXUSA show a high concentration of jobs in northeast Florida, including the numerous military bases, as well as health care and logistics-based industries. Figure 3 also identifies retail trade, arts & recreation, and accommodation/food services as having location quotients over 1.0. These industries are often categorized as part of the tourism-based industry, showing the presence of tourism in northeast Florida.

Tourism is a large economic driver in northeast Florida due to the Region’s position along the Atlantic Ocean and the St. Johns River. These natural features provide numerous recreation and tourism opportunities. One way to measure the amount of tourism in a region is through taxable sales. Taxable sales are all the sales from transient rental facilities like hotels, motels, and condominiums. Taxable sales from places like hotels and motels can help the Region understand how large the tourism industry is. The State of Florida taxes transient rental facilities at a 6% rate. All counties in northeast Florida impose additional taxes in addition to the mandatory 6%.

Figure 4

Estimates of Taxable Sales Reported by Transient Rental Facilities, 2018-2024



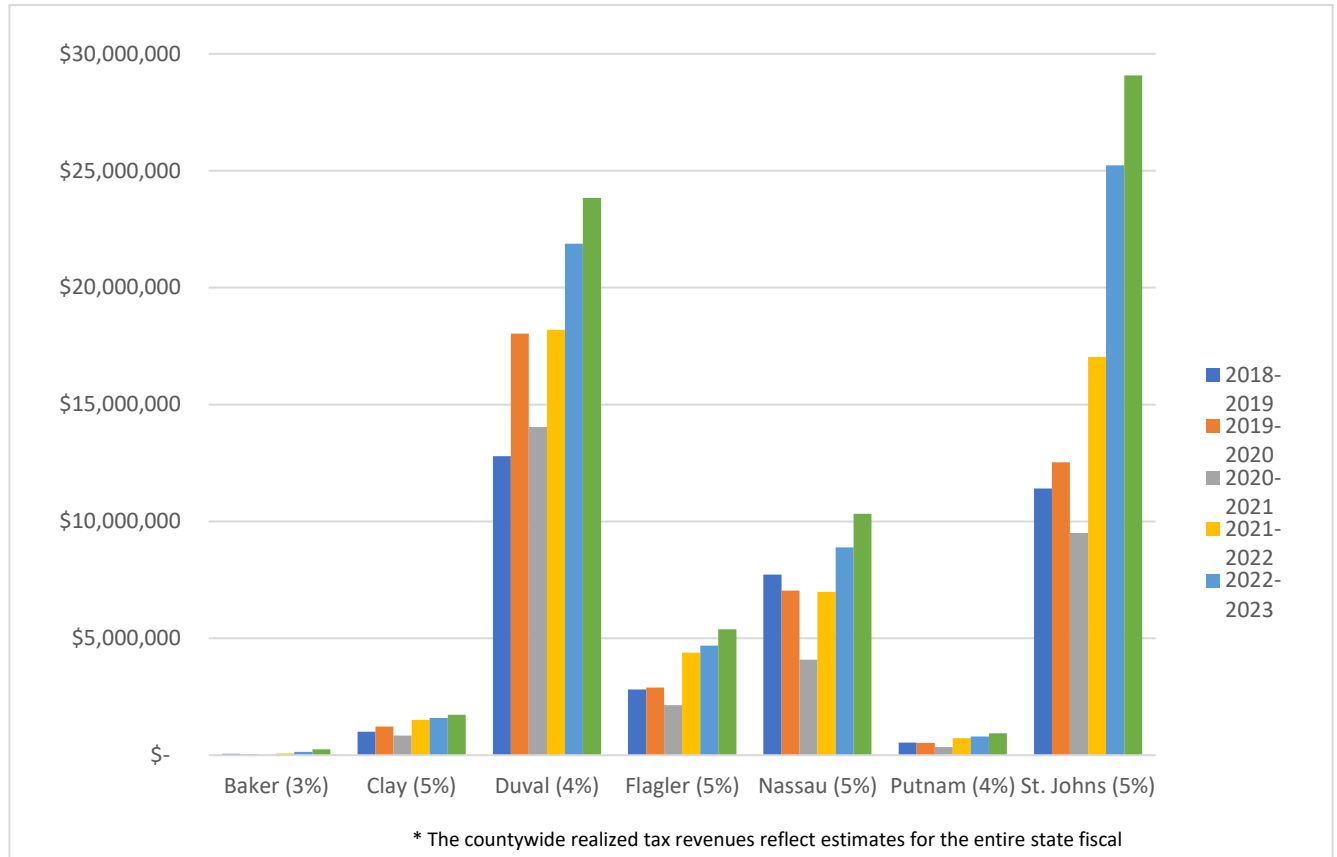
Note. Adapted from *Realized and Unrealized Revenues by County: LFY 2010-2024*, by Department of Economic and Demographic Research, 2023.

Figure 4 depicts the total amount of taxable sales from transient rental facilities from 2018-2024. From 2018-2024, the Florida Department of Revenue expects that taxable transient rental sales will grow by 60% in northeast Florida. In 2018-2019, the total taxable sales were \$976,144,191, while in 2023-2024, the Department of Revenue estimates that the total taxable sales in northeast Florida will increase to \$1,558,114,793 (Department of Economic and Demographic Research, 2023). This number of taxable sales shows that the tourism industry in Northeast Florida is a multi-billion-dollar industry and growing.

In addition to the 6% transient rental tax by the State, each county in northeast Florida applies an additional tax on short-term accommodations. Clay, Flagler, Nassau, and St. Johns Counties impose an additional 5% tax on transient rental facilities while Duval and Putnam County have an additional 4% tax. Baker County has the lowest additional tax percentage at 3%.

Figure 5

Local Optional Tourist Tax Levies on Transient Rental Facilities, Realized and Predicted Taxes 2018-2024



Note. Adapted from *Realized and Unrealized Revenues by County: LFY 2010-2024*, by Department of Economic and Demographic Research, 2023.

Figure 5 depicts the realized and predicted transient rental facilities tax amount from 2018-2024. There is an overall positive trend of transient-rental facility taxes, except during the COVID-19 pandemic, which severely restricted travel in 2020-2021. From 2018-2024, the Florida Department of Economic Research predicted that some counties will double or almost triple tourism tax revenue on these optional taxes.

Vulnerabilities

As northeast Florida expands its population and economy, it is imperative to consider vulnerable people and places that may be more impacted by hurricanes than others. Extreme weather events

can impact the lives of residents, damage property, disrupt businesses, and degrade natural systems. The vulnerabilities for the Region are outlined in this report as social vulnerabilities and extreme weather vulnerabilities.

Social Vulnerabilities

According to the Environmental Protection Agency (EPA), climate change impacts, including those from extreme weather events, will disproportionately affect socially vulnerable “communities that are least able to anticipate, cope with, and recover from adverse impacts” (EPA, 2021, p. 4). The EPA defines socially vulnerable groups as low-income, minority, no high school diploma, and those 65 years or older (2021).

According to the US DOT Equitable Transportation Community Explorer (2023), 33% of all Census Tracts in the Region are considered disadvantaged due to climate & disaster risk burden, environmental burden, health vulnerability, social vulnerability, or transportation insecurity compared to the rest of Florida. This equates to approximately 512,200 people living in disadvantaged Census Tracts in northeast Florida. Most counties in northeast Florida have a high percentile of transportation-insecure Census Tracts due to lack of transportation access and traffic safety.

Table 2

Percent of Persons in Poverty, 2021

Percent of Persons in Poverty, 2021						
Baker County	Clay County	Duval County	Flagler County	Nassau County	Putnam County	St. Johns County
16.1%	8.0%	14.9%	10.3%	9.9%	26.3%	6.3%

Note. Adapted from *Poverty status in the past 12 months*, by U.S. Census Bureau, 2021.

The Census Bureau determines the federal poverty level based on family composition compared to income. In 2021, the federal poverty level for a single-person household under 65 years old was \$14,097, while the poverty level for a two-adult household under 65 years old was \$18,145 (U.S. Census Bureau, 2021f). Table 2 depicts that every county in the Region has an economically vulnerable population. Putnam, Baker, and Duval Counties have the highest percentage of people in poverty in northeast Florida and have higher concentrations of poverty compared to the state level of 12.7% (2021f).

People living near the poverty threshold are more susceptible to the negative impacts of extreme weather events. Lack of insurance for emergencies is a barrier to economic security. Research shows that “many low income people are unable to have their homes insured adequately (underinsured homes) or at all” (Miljkovic, T. & Miljkovic, D., 2014, p. 271). People experiencing financial insecurity are more likely to become homeless due to the impact of a natural disaster (SAMHSA, 2017). People with low incomes may also live in housing not equipped to handle natural disasters like hurricanes; they are more likely to live in flood-prone areas or live in housing with inadequate infrastructure to last through a storm.

Table 3*High School Graduation or Higher Attainment Rate, percent of persons age 25+, 2017-2021*

High School Graduation or Higher Attainment Rate, percent of persons age 25+, 2017-2021						
Baker County	Clay County	Duval County	Flagler County	Nassau County	Putnam County	St. Johns County
85.8%	91.9%	90.5%	92.3%	81.9%	91.5%	94.7%

Note. Adapted from *Educational Attainment*, by U.S. Census Bureau, 2021.

Table 3 shows that Baker and Nassau Counties have the lowest high-school graduation attainment of persons ages 25+ at 85.8% and 81.9%, respectively. The EPA found that in the United States, those with no high school diploma make up 31.3% of the agricultural, forestry, fishing, and hunting industry and 19.0% of the construction industry (EPA, 2021). This population may be vulnerable to extreme weather events because those industries rely heavily on outdoor work. Individuals are likely to lose working hours due to rain, wind, and flooding risks from hurricanes and tropical storms.

Table 4*Persons Over 65 Years Old, percent, 2021*

Persons Over 65 Years Old, percent, 2021						
Baker County	Clay County	Duval County	Flagler County	Nassau County	Putnam County	St. Johns County
14.5%	15.8%	14.2%	30.4%	22.3%	22.9%	20.1%

Note. Adapted from *Age and Sex*, by U.S. Census Bureau, 2021.

Florida is commonly known as a state that people retire in, with 20.4% of Florida’s population being 65 years or older (U.S. Census Bureau, 2021a). Table 4 shows that almost a third of the Flagler County population is 65 years or older, while approximately a quarter of Nassau and Putnam Counties’ population is 65 years or older. Baker, Clay, and Duval Counties have less people 65 years or older than the state average, while St. Johns County sits at just about the state average of population 65 years or older.

Extreme weather events can become a hazard for older adults for numerous reasons. The National Institute on Aging identifies disruption of healthcare, income immobility, and coping with a disaster as threats to older adults (“Protecting older”, 2022). During a disaster, older adults may find that there is a lack of primary care for treatment of chronic diseases as there is no power or lack of transportation to medical offices due to debris. According to the Centers for Disease Control and Prevention (CDC), over 85% of people 65 and older in the United States have one or more chronic diseases (2015).

Some people over 65 are retired and earning income from Social Security or a pension. These monthly incomes are fixed, meaning they cannot be adjusted or modified. If a storm damages a

home or personal property, the retiree may have an undue financial burden while completing repairs.

Table 5

Households Receiving Food Stamps/SNAP Assistance, 2021

Households Receiving Food Stamps/SNAP Assistance, 2021								
	Baker County	Clay County	Duval County	Flagler County	Nassau County	Putnam County	St. Johns County	Total
Total Households	8,532	77,434	387,008	45,491	34,691	29,174	95,640	677,970
Households Receiving Food Stamps/SNAP Assistance	1,401	7,184	58,918	3,677	3,334	6,280	4,793	85,587
Percent of Total Households Receiving Assistance	16.42%	9.28%	15.22%	8.08%	9.61%	21.53%	5.01%	12.62%

Note. Adapted from *Food Stamps/Supplemental Nutrition Assistance Program (SNAP)*, by U.S. Census Bureau, 2021.

Table 5 indicates that Baker, Duval, and Putnam Counties have the highest percentages of households receiving food stamps/SNAP assistance in 2021, which can indicate food insecurity within these counties. Generally, the qualifications for assistance are that a household’s gross monthly income must be at or below 130% of the federal poverty level “as well as a net monthly income at or below 100% of the federal poverty level” (DeSilver, 2023). Those receiving food assistance may not have access to food during a weather event, which puts this population at risk.

Extreme Weather Vulnerabilities

Hurricanes pose weather threats such as storm surge, inland flooding, and high winds (“Hurricane Preparedness”, n.d.). As the northeast Florida Region recognizes these vulnerabilities, local governments, business owners, and residents can take mitigation measures to better prepare for the impacts of hurricanes.

Northeast Florida is uniquely positioned geographically between the Atlantic Ocean, the St. Johns River, Intracoastal Waterway, and the St. Marys River. Storm surges, flooding, and tides impact all of these water bodies. Storm surge caused by hurricanes “pose the greatest threat to life and property along the coast” (“Hurricane Preparedness”, n.d.). Storm surges occur when winds push water from rivers and oceans onshore during hurricanes and can have damaging effects on coastal habitats and beaches. Storm surge can also devastate infrastructure such as roads and bridges.

Heavy rainfall produces inland flooding. Hurricanes often produce inches of rain, which can cause destructive flooding. According to the National Hurricane Center, tropical cyclones produce heavy rainfall due to the size and speed of a storm, as well as the geography of the area; slower and larger storms produce heavier rainfall (“Hurricane Preparedness”, n.d.).

High winds can be damaging to both people and property. Hurricanes are classified by their wind speed, ranging from category 1 – 5, which often indicates how damaging a storm will be to a community. High winds can move debris and other objects at a fast rate, breaking windows, uprooting vegetation, and damaging structures. Severe winds may also cause damage to roofs, walls, windows, and doors (FEMA, 2017).

Section 2: Hurricane Impact

This section describes the impact of Hurricane Ian and Hurricane Nicole on northeast Florida, including impacts on businesses, coastal areas, households, and the built environment.

Hurricane Ian Overview

Hurricane Ian made landfall in southwest Florida on September 28th as a Category 4. On September 29th, Hurricane Ian traveled northeast throughout Florida, weakening from a Category 4 to a tropical storm as it made landfall across the State. By September 30th, Hurricane Ian hit South Carolina and North Carolina as a Category 1 storm. In northeast Florida, Flagler, Putnam, and St. Johns Counties were impacted the most. FloridaCommerce and the U.S. Department of Housing and Urban Development designated these counties as some of the “most impacted and distressed” counties in Florida. Clay, Duval, and Nassau Counties also saw minor damage due to flooding.

In northeast Florida, Ian mainly caused flooding and coastal erosion due to storm surges and rainfall. Along the St. Johns River, USGS (United States Geological Survey) sensors measured inundation levels of two to four feet above ground level (Bucci, et al., 2023). Flagler and St. Johns Counties experienced flooding from rainfall in inland communities and flooding in coastal communities from storm surges. Rainfall totals in central and eastern Florida were 10 to 20 inches, affecting Putnam, Clay, and Duval Counties.

Hurricane Nicole Overview

Hurricane Nicole struck northeast Florida just six weeks after Hurricane Ian on November 10, 2022. Hurricane Nicole hit Florida late into hurricane season as a Category 1 hurricane and became the third November storm in recorded United States history to make landfall. The center of the storm hit east-central Florida near Vero Beach; however, counties in northeast Florida were also affected by the wind and rainfall caused by the storm (Powell, 2022). Heavy wind and rainfall affected mainly St. Johns, Putnam, and Flagler Counties; however, one resident from Duval County passed away due to a house fire resulting from heavy winds (Beven & Alaka, 2023). During Hurricane Nicole, east coast beaches were more vulnerable to storm surge damage.

Impact on Businesses

During Hurricanes Ian and Nicole, coastal areas in Flagler and St. Johns Counties experienced the most economic impact. The small, locally owned businesses in coastal areas rely on a consistent customer base of tourists and local community members to support their businesses. These small businesses suffered due to road collapses, flooding, and wind damage; however, most were able to recover from the storms. Other areas of northeast Florida were also impacted by these storms, as tourism levels dropped, and some supply chains were disrupted.

Hurricane Ian Business Impacts

During major storm events, FloridaCommerce activates a self-reported Business Damage Assessment Survey, where business owners can report the direct and indirect physical and economic damage caused by the storm. Results from the Business Damage Assessment Survey showed that 81 total businesses in northeast Florida reported physical or economic damage caused by Hurricane Ian, compared to the 103,831 total businesses throughout the Region (“Level up”, 2022). In the State and federally designated most impacted and distressed (MID) counties, there were 34 businesses that reported damage from Flagler County, 21 from St. Johns County, and three from Putnam County. Across the entire region, business owners reported 59 temporary layoffs and 11 total permanent layoffs due to Hurricane Ian. The Florida Department of Environmental Protection (FDEP) reports that in Flagler County, ten major structures sustained damage during the storm. FDEP defines major structures as commercial or recreation buildings utilized for businesses or recreation (“Hurricane Ian”, 2022).

Flagler County experienced damage to two community hubs: the Bull Creek Fish Camp, a locally beloved restaurant, and the Flagler Beach Pier, the heart of the small town of Flagler Beach. The Bull Creek Fish Camp shut down permanently due to flooding damage. Exterior high-water marks of three feet indicate storm surge from the St. Johns River. As for the Flagler Beach Pier, Hurricane Ian ripped 165 feet off the end of the pier. The pier was determined unsafe to use because the pilings were substantially damaged. Flagler County is in the process of securing funding to rebuild the Fish Camp’s building while the pier is anticipated to reopen in 2026.

Table 6

Hurricane Ian Small Business Administration Physical Damage Loan Information

Hurricane Ian Physical Damage Loan Information			
	Applications Received	Applications Approved	Dollars Approved
Flagler County	41	3	\$132,300
Putnam County	31	1	\$76,400
St. Johns County	52	4	\$200,000

Notes. Adapted from *Hurricane Ian Small Business Administration Physical Damage Loan Information*, by J. Saunders, personal communication, November 9, 2023.

Table 7

Hurricane Ian Small Business Administration Economic Injury Disaster Loan (EIDL) Information

Hurricane Ian Economic Injury Disaster Loan (EIDL) Information			
	Applications Received	Applications Approved	Dollars Approved
Flagler County	18	2	\$187,600
Putnam County	13	1	\$14,000
St. Johns County	26	3	\$221,800

Notes. Adapted from *Hurricane Ian Small Business Administration Economic Injury Disaster Loan (EIDL) Information*, by J. Saunders, personal communication, November 9, 2023.

The Small Business Administration (SBA) is a critical resource for individuals and businesses following a natural disaster. There are two categories of SBA loans: physical damage loans and Economic Injury Disaster Loans. Business owners in a federally declared disaster area are eligible to apply for SBA loans. For physical damage loans, businesses can apply for up to \$2 million in support to repair or replace “real property, machinery, equipment, fixtures, inventory, and leasehold improvement” (“Physical damage”, 2023b). Table 6 shows that in Flagler County, 41 businesses applied for a physical damage loan, while the SBA only approved three applications. In St. Johns County, 52 business owners applied for loans, while the SBA approved four applications. In Putnam County, the SBA received 31 business loan applications, while the SBA approved one application.

Economic Injury Disaster Loans (EIDL) “provide funding to help small businesses recover from the economic impacts” of disasters (“Economic injury”, 2023a). Small businesses, agricultural cooperatives, and most private nonprofit organizations that “have suffered substantial economic injury” within a declaration area may apply for this assistance (2023a). Table 7 states that in Flagler County 18 EIDL applications were received, while the SBA approved two applications. In St. Johns County, there were 26 EIDL applications received, while the SBA approved three applications. In Putnam County, there were 13 EIDL applications received, while the SBA approved one application.

As illustrated in the charts above, the SBA receives significantly more applications than it approves. Discussions with the SBA revealed there are numerous reasons why a loan may be denied or stalled. The SBA may deny a loan application if the application does not meet the loan requirements. SBA loans require certain credit scores, debt-to-income ratios, and collateral, depending on the type of loan. If a business does not meet these requirements, SBA will refer the business to FEMA for additional assistance.

Hurricane Nicole Business Impacts

According to NOAA’s National Weather Service, Hurricane Nicole caused over \$1 billion in damage across the State (2023). The south-central portion of the east coast sustained the most economic damage from Hurricane Nicole while northeast Florida saw little direct economic damage to businesses. Regarding SBA loans, three businesses in Flagler County and five in St. Johns County applied for the business damage loan as shows in Table 8; however, the SBA did not approve any applications. Table 9 shows that one business in Flagler and Putnam County applied for the economic injury loan while neither of these applications were approved.

Table 8

Hurricane Nicole Small Business Administration Physical Damage Loan Information

Hurricane Nicole Physical Damage Loan Information			
	Applications Received	Applications Approved	Dollars Approved
Flagler County	3	0	\$0
Putnam County	0	0	\$0
St. Johns County	5	0	\$0

Notes. Adapted from *Hurricane Nicole Small Business Administration Physical Damage Loan Information*, by J. Saunders, personal communication, September 22, 2023 & November 9, 2023.

Table 9

Hurricane Nicole Small Business Administration Economic Injury Disaster Loan (EIDL) Information

Hurricane Nicole Economic Injury Disaster Loan (EIDL) Information			
	Applications Received	Applications Approved	Dollars Approved
Flagler County	1	0	\$0
Putnam County	1	0	\$0
St. Johns County	0	0	\$0

Notes. Adapted from *Hurricane Nicole Small Business Administration Economic Injury Disaster Loan (EIDL) Information*, by J. Saunders, personal communication, September 22, 2023 & November 9, 2023.

Road Impacts

Damage to roads can slow down recovery efforts. Small businesses along damaged roads may not be able to reopen after a storm, and families may not be able to return home after an evacuation. Repairing roads is often a priority for disaster recovery teams, as roads are critical for everyday life to resume.

Hurricane Ian Road and Infrastructure Impacts

First Coast News reported that in St. Johns County, part of County Road 13 collapsed and was repaired immediately following the storm. The *Hurricane Ian & Hurricane Nicole Post-Storm Beach Conditions and Coastal Impact Report* from FDEP did not report any major damage to roads in northeast Florida.

Hurricane Nicole Road and Infrastructure Impacts

Along the A1A Scenic Highway in St. Johns and Flagler Counties, the road was severely damaged and impassable in some areas. The road damage economically impacted small businesses along the A1A Scenic Highway due to the lack of physical access to these businesses. In Flagler County, Hurricane Nicole damaged 395 feet of roads (“Hurricane Ian”, 2022). In St. Johns County, two portions of the A1A Scenic Highway collapsed or flooded in Vilano Beach (2022). The two segments damaged were approximately 454 feet and 370 feet long (2022).

Impact on the Coast

Coastal areas of northeast Florida are a driver for tourism. Beach access attracts tourists to local restaurants, shops, and activities. The coast also serves as a barrier to storms; both dunes and manmade coastal armoring protect northeast Florida from storm damage. When hurricanes impact the Region, it is imperative to quickly replace lost sand, vegetation, and armoring.

Hurricane Ian and Nicole Coastal Impacts

Coastal dunes act as a storm barrier from storm surges and strong waves. When dunes erode due to human impact or weather events, the built environment can become more susceptible to coastal flooding or structural damage (“Protecting dunes:”, 2016). Coastal dunes also provide habitats to native vegetation and wildlife. The two most impacted coastal counties in northeast Florida, St. Johns and Flagler, were reviewed by FDEP for dune erosion conditions following Hurricanes Ian and Nicole.

Dune erosion is rated on a scale of I – IV, with stage I being minor beach erosion and IV being major dune erosion. After Hurricanes Ian and Nicole, seven out of 22 areas along the St. Johns County coastline were at coastal erosion stage IV: major dune erosion (“Hurricane Ian”, 2022). Only three of the twenty-two areas were rated as stage I: minor dune erosion (2022). In Flagler County, eight of 26 areas of the beach were rated as major dune erosion, nine of 26 as condition III: moderate dune erosion and beach profile lowering, and eight of 26 as condition II: minor dune and beach erosion (2022). The Guana Tolomato Matanzas National Estuarine Research Reserve, which is a major environmental asset that passes through St. Johns and Flagler Counties sustained only minor dune erosion conditions at condition levels I-II (2022).

Hurricane Ian Coastal Impacts

During Hurricane Ian, both Flagler and St. Johns Counties experienced coastal armoring damage. According to the FDEP, coastal armoring is “a manmade structure designed to either prevent erosion of the upland property or protect eligible structures from the effects of coastal wave and current action” (“Coastal Armoring”, 2016, p. 1). Some examples of coastal armoring include seawalls, retaining walls, and revetments. Flagler County endured a total of 1,200 feet of major armoring damage and 9,350 feet of minor damage. St. Johns County endured 845 feet of minor damage (“Hurricane Ian”, 2022). Major damage to coastal armoring may include effects such as a significant loss of backfill sand or the displacement of armoring stone (2022). Minor damage includes some displacement of armoring stone or displacement of a few geotextile bags.

Hurricane Nicole Coastal Impacts

Similar to Hurricane Ian, Hurricane Nicole caused major and minor damage to the coastal armoring of Flagler and St. Johns Counties. In Flagler County, there were 7,790 feet of major damage and 2,036 feet of minor damage. Flagler County has 18 total miles of coastline” (“Flagler County”, 2023). During Hurricane Nicole, almost 10% of the beach received major or minor damage (“Hurricane Ian”, 2022). In St. Johns County, there were 2,008 feet of major damage and 1,243 feet of minor damage (2022).

Impact on Housing

Homes are meant to serve as a safe space for families to thrive. In the event of a hurricane, homes are susceptible to severe damage from flooding and wind. As flood insurance rates soar, many people lack the capital to pay for this insurance or to pay for repairs following a storm. This can create lasting unmet housing needs for residents impacted by hurricanes.

Hurricane Ian Housing Impacts

Hurricane Ian damaged numerous single-family and multi-family homes in Flagler, Putnam, and St. Johns Counties. Both FDEP and the Florida Department of Emergency Management (FDEM) reported on home damage as well as homeowners applying for home-repair loans.

FDEP reported the number of homes that sustained major structural damage. Hurricane Ian caused major home damage in Flagler and St. Johns Counties. In Welaka, a town in Putnam County, over 70 homes were left underwater following Hurricane Ian (Monroe et al., 2022). In Flagler County, there were 61 single-family and five multi-family homes damaged (“Hurricane Ian”, 2022). In St. Johns County, there were 16 single-family homes and three multi-family dwellings damaged. Along A1A, local officials deemed one home in Vilano Beach unsafe to occupy as erosion from the storm damaged the pylons. In comparison, one of the most impacted counties in the state, Lee County in southwest Florida, reported 2,791 single-family homes and 502 multi-family dwellings damaged (“Hurricane Ian”, 2022).

Table 10

Hurricane Ian Small Business Administration Home Loan Information

Hurricane Ian Home Loan Information			
	Applications Received	Applications Approved	Dollars Approved
Flagler County	133	39	\$1,766,100
Putnam County	73	28	\$1,493,400
St. Johns County	155	62	\$4,210,400

Notes. Adapted from *Hurricane Ian Small Business Administration Home Loan Information*, by J. Saunders, personal communication, November 9, 2023.

The Small Business Administration allows homeowners and renters to apply for physical disaster loans to repair and replace property damaged due to declared extreme weather events (“Physical damage”, 2023b). Table 10 shows that of the homeowners and renters who applied for this loan, the Small Business Administration approved approximately 36% of applications, awarding over 7 million dollars to assist residents in northeast Florida.

Hurricane Nicole Housing Impacts

Similarly, during Hurricane Nicole, St. Johns and Flagler Counties were the only counties in the Region where the FDEP reported housing damage. Compared to Hurricane Ian, the Region incurred less physical damage from Hurricane Nicole. In St. Johns County, the effects of Hurricane Nicole damaged ten single-family homes and two multi-family dwellings. In Flagler County, Hurricane Nicole caused major structural damage to seven single-family homes and one multi-family dwelling.

Table 11

Hurricane Nicole Small Business Administration Home Loan Information

Hurricane Nicole Small Business Administration Home Loan Information			
	Applications Received	Applications Approved	Dollars Approved
Flagler County	33	14	\$832,300
Putnam County	5	0	\$0
St. Johns County	21	7	\$325,600

Notes. Adapted from *Hurricane Ian Small Business Administration Home Loan Information*, by J. Saunders, personal communication, September 22, 2023 & November 9, 2023.

Table 11 shows that the Small Business Administration approved 21 home loan applications to residents in Flagler and St. Johns Counties. The low quantity of loan applications and assistance received indicates a lesser impact on the community than Hurricane Ian.

Section 3: Best Practices and Lessons Learned

At the end of 2022, northeast Florida experienced an anomaly event: two hurricanes in six weeks. As the Region went through this hardship, many people agreed that northeast Florida fared well compared to other parts of the state and proved its resilience to hurricanes. Following the storms and subsequent damage assessments, the Economic Development Administration (EDA) and NEFRC hosted two meetings to discuss the impacts of the hurricanes and long-term recovery priorities. The result of this meeting included identifying regional priorities for regional long-term recovery. Some topics included expanding and increasing the resiliency of the tourism industry, improving business education on hurricanes, and creating affordable, disaster resilient housing.

As northeast Florida continues its long-term recovery from Hurricanes Ian and Nicole, leaders, business owners, and residents should continue to prepare for future disasters and plan to recover from them quickly. Below are the best practices and lessons learned from Hurricanes Ian and Nicole.

Integrating Climate Resiliency Efforts with Hurricane Preparedness

Through funding and guidance from the Florida Department of Environmental Protection, counties and municipalities are conducting Vulnerability Assessments to measure the exposure and sensitivity of flooding and sea level rise on important infrastructure and assets. All the counties and most of the municipalities in northeast Florida are currently conducting Vulnerability Assessments, and some have already completed this assessment. In the coming years, FDEP will fund Adaptation Plans that will guide action towards protecting critical infrastructure and assets in vulnerable areas.

As the results from Vulnerability Assessments and Adaptation Plans are released, counties and municipalities should work across program areas to integrate the information from these assessments into work plans. Local governments should prioritize vulnerable infrastructure and critical facilities for upgrades that make these assets more resilient in the face of flooding and other storm-related impacts. With careful planning, local governments can implement resiliency projects that protect critical assets in the face of disaster by utilizing disaster recovery funds available after storms, such as the EDA Disaster Supplemental Grant, FEMA Hazard Mitigation Grant Program, and FEMA Building Resilient Infrastructure and Communities Program.

Sharing and Collecting Data by Building Strong Relationships

Information is critical to understanding the risks a county or municipality may face in a disaster; likewise, information is crucial to begin to recover from a disaster. Before a hurricane, it is critical to build and maintain relationships with emergency management and economic development professionals at various regional, state, and federal agencies to keep channels of dialogue open before and after a hurricane. After a disaster, leveraging these relationships to compile disaster assessments from local, state, and federal agencies may help leaders understand the full scope of how a hurricane has impacted the built and natural environment. Furthermore,

creating relationships with residents, business owners, and community organizations can help communities “ground truth” information from government sources.

FEMA created an information-sharing guide for public-private partnerships on disaster preparedness and recovery. One best practice from this guide is from the Nebraska Preparedness Partnership (NPP). The NPP is a 501(c)(3) dedicated to facilitating public-private partnerships, namely between business owners and local governments. This effort ensures disaster preparedness and planning for businesses while fostering coordinated efforts in disaster recovery between governments and businesses. FEMA’s Information Sharing Guide can be found here: https://www.fema.gov/sites/default/files/documents/fema_information-sharing_guide.pdf.

Model Potential Storm Impacts

The full economic impact of hurricanes is not easily measured. Although some governments collect information on physical property damage estimates, it can be more difficult to capture impacts on the supply chain, how physical damage to beaches may impact the tourism industry, or if a hurricane may create an influx of recovery jobs after a storm. Economic modeling software such as REMI PI+ can help governments generate realistic scenarios that forecast the economic impacts of various scenarios.

The National Institute for Transportation and Communities funded research in the Wasatch Front, Utah to understand the relationship between transportation systems and the regional supply chain after a disaster; in Utah, earthquakes are one of the biggest concerns. In the first phase of the project, the project team utilized three popular economic models, Hazus, the Wasatch Front Travel Demand Model, and REMI PI+, to determine the economic impact of a M7.0 earthquake. This study found that the Wasatch Front Region of Utah could experience a \$6 billion economic loss due to road disruption (Chandrasekhar, 2022). The industries expected to experience the most economic loss from this scenario are retail; professional, scientific, and technical services; manufacturing; and finance and insurance. By modeling this scenario, the Wasatch Front can better prepare mitigation efforts by strengthening transportation systems and preparing businesses in the most impacted industries.

Educate Business Owners, Employees, and Residents on Hurricane Preparedness and Recovery

Hurricanes can be life-threatening, cause devastating damage to property, and disrupt everyday life; however, new and current residents may not be aware of the risks or recover from hurricane impacts. Data from hurricanes Ian and Nicole show low loan acceptance rates. Education surrounding loan eligibility and required documentation is necessary to bolster loan approval rates for residents in need of support.

The St. Johns County Chamber of Commerce hosts a page on its website that compiles local, state, and federal information on hurricane preparedness. This website emphasizes the importance of having a plan for businesses and families. This website categorizes information by contact information, preparing before the storm, and hurricane preparedness. The “contact information” section details all the contact information for emergency services, shelters, and

disaster assistance hotlines. The “preparing before the storm” section helps connect residents to Chamber of Commerce members in industries such as insurance, pharmacies, and healthcare. The “hurricane preparedness” section links to the County’s emergency management website, which details information about hurricane tracking, preparedness checklists, and local emergency information (“Are you prepared?”, n.d.). Local governments and outreach partners across northeast Florida should strive to have this information readily available for their residents.

Moving forward, local governments across northeast Florida should also better educate residents on hurricane recovery, with a focus on disaster loan options, eligibility, and documentation. Local governments and their partners should provide support and education surrounding how to successfully recover after a hurricane by providing disaster recovery workshops, advertising Small Business Administration loan information, and coordinating with partners, such as chambers of commerce, to conduct outreach after a storm.

Conclusion

Shortly following the storms in 2022, communities quickly secured funding and other aid to repair roads, replenish beaches, and repair the Flagler Beach Pier; however, individuals experienced unmet needs in housing and business repairs. As Hurricanes Ian and Nicole slowly fade from recent memory, recovery efforts are still ongoing throughout the State.

At the end of 2023, FloridaCommerce introduced the Community Development Block Grant for Disaster Recovery (CDBG-DR) to meet the unmet needs in long-term recovery from Hurricane Ian. The program allocated \$910,624,000 to long-term recovery efforts primarily focused on housing and infrastructure (“FloridaCommerce Announces”, 2024). The State of Florida and the U.S. Department of Housing and Urban Development (HUD) have identified Flagler, Putnam, and St. Johns Counties as part of the most impacted and distressed communities and allowing these Counties access to CDBG-DR funds (2024).

These ongoing recovery efforts prove that even a relatively small impact from a hurricane can pose long-term repercussions to a community. Moving forward, northeast Florida must prioritize hurricane resiliency to better equip vulnerable communities and places for future storms. Although the Region cannot stop hurricanes from happening, communities can help mitigate their impacts by being prepared, informed, and equipped with the tools to mitigate hurricane impacts before they happen.

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