

WILL HURRICANE IAN TRIGGER CLIMATE REFUGEE MIGRATION FROM FLORIDA?



James H. Johnson, Jr.
Allan M. Parnell
Jeanne Milliken Bonds

Frank Hawkins Kenan Institute of Private Enterprise
Kenan-Flagler Business School
University of North Carolina at Chapel Hill



TABLE OF CONTENTS

Will Hurricane Ian Trigger Climate Refugee Migration from Florida?	1
Abstract	1
Introduction	1
Research Objective	2
Affected Counties	2
Migration as a Driver of Growth	6
Discussion and Recommendations	11
References Cited	14

Will Hurricane Ian Trigger Climate Refugee Migration from Florida?

Abstract

Hurricane Ian destroyed property and disrupted livelihoods in some of Florida's largest and most rapidly growing coastal and inland counties. For the thirteen counties declared eligible for federal disaster assistance in the immediate aftermath of this extreme weather event, we document the role net migration played in recent population growth—a crucial issue in climate change policy deliberations—and outline creative strategies and investments Florida officials will have to leverage to both rebuild and create resilient communities with reputational equity that remain attractive to newcomers as well as long term residents moving forward.

Introduction

Thirteen of Florida's counties were declared eligible for federal disaster relief following Hurricane Ian's disastrous trek through the state (The White House, 2022). The human toll and economic impact are still unfolding. According to the latest estimates, Ian left in its path more than 100 deaths and property damage and loss currently estimated at \$100 billion (Gerretsen, 2022; Bizouati-Kennedy, 2022; Barker, 2022; Deliso and Kekatos, 2022). Making matters worse, an untold number of households and businesses in some affected Florida communities reportedly did not have insurance coverage

for flood-related damages and losses, making rebuilding extremely difficult, if not impossible, for some victims—federal disaster assistance notwithstanding (Ivanova, 2022; Santana & Philis, 2022).

Extreme weather events like Hurricane Ian are increasing in both periodicity and intensity. Scientific evidence points to climate change as the major culprit (IPCC, 2022; Vince, 2022; Wallace-Wells, 2022; Watson, 2022; Wheeling, 2021). Here in the U.S., one writer asserts, "...people have largely gravitated toward environmental danger, building along coastlines from New Jersey to Florida and settling across the cloudless deserts of the Southwest" (Lustgarten, 2020; also see Korducki, 2022). Recognizing attraction to vulnerable areas, multiple studies offer critical insights into the likely impact extreme weather events—and climate change generally—will have on future migration behavior of affected populations and resulting settlement patterns--domestically and globally (The White House, 2021; Voegele, 2021; Podesta, 2019; Peterson, 2022; Lustgarten, 2020a; Kahanna & Hassol, 2021; Henao, 2022; Hauer, 2017; Bermeo & Speck, 2022; Backman, 2022; Post, et al, 2009).

For jurisdictions that are highly vulnerable to extreme weather events—not only hurricanes but also tornadoes, tropical cyclones, floods, heat waves, wildfires, droughts, and blizzards—the financial, economic, environmental,

and geo-political ramifications are far ranging and in many ways difficult to comprehend or imagine (Lefebvre, 2021; Lustgarten, 2020b; Peterson, 2022; Quin, Fisher-Vanden & Klabier, 2018; Vince, 2022; Voegele, 2021; Wallace-Wells, 2022). As one study put it, “[a] great upheaval is coming,” noting further that “[t]hat the climate crisis has already uprooted millions in the US—in 2018, 1.2 million were displaced by extreme conditions, fires, storms, and flooding; by 2020, the annual toll had risen to 1.7 million people.” The study concludes, “The US now averages a \$1bn disaster every 18 days” (Vince, 2022).

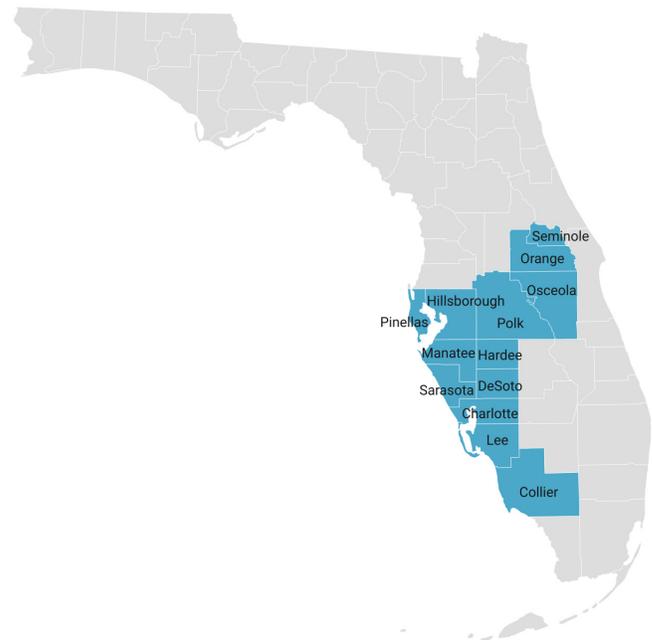
Research Objective

In this paper, we undertake an analysis of recent population trends in the thirteen Florida counties declared eligible for federal disaster assistance following Hurricane Ian. Our objective is to demonstrate specifically how migration influenced both the scope and scale of the disaster. Our analysis is based on data compiled in the U.S. Census Bureau’s American Community Survey, 2020 Census, and cumulative population estimates for the period April 1, 2020 – July 1, 2021—a period of heightened migration in the U.S. due to the COVID-19 pandemic and disastrous wildfires in the western U.S. (Johnson, 2021; Wallace-Wells, 2022). Our findings underscore the urgent need for Florida officials to simultaneously (1) develop expertise in climate finance—strategic know-how to leverage weather-related pre-disaster planning and post-disaster lending, investments, and services; and (2) intentionally and purposefully address climate change by modifying land-use and community economic development policies and practices with an eye toward minimizing the impact of future calamities.

Affected Counties

Six of the hardest hit Florida counties were amenity rich but fragile coastal ecosystems, highly vulnerable to both strong winds and storm surge. The other seven hard-hit counties were in the interior of the state (Figure 1). The counties are at risk of major flooding and wind damage. Despite these environmental risks and vulnerabilities, the thirteen highly impacted counties are home to a significant share of Florida’s population and were some of the state’s most rapidly growing communities-- often marketed in flashy promotional materials as “nirvana” destinations and “paradise” living environments.¹

Figure 1: Florida Counties Declared Eligible for Disaster Assistance



In July 2021, according to post-2020 Census population estimates, the thirteen counties declared eligible for disaster assistance in the aftermath of Hurricane Ian were home to 7.8 million people, more than one-third of Florida’s total population (21,781,128). Looking through the lens of population size, five of these most adversely

¹ See, for example, <https://www.livinginfloridaparadise.com/>

impacted counties ranked in the top ten, eight in the top fifteen, and ten in the top twenty largest counties in the state of Florida. Among the state's 67 counties, the remaining three highly impacted counties ranked 28th (Charlotte), 49th (DeSoto), and 53rd (Hardee) in population size (Table 1).

Table 1: Absolute Population & Percent of State Total Population, Federal Disaster Assistance Eligible Florida Counties, July 1, 2021

State/County	Total Population July 1, 2021	Percent of Total Population	Cumulative Percent	Population Size Rank
Florida	21,184,128	100.0	N/A	N/A
Hillsborough	1,478,194	6.8	6.8	4
Orange	1,422,746	6.5	13.3	5
Pinellas	956,615	4.4	17.7	7
Lee	787,976	3.6	21.3	8
Polk	753,520	3.4	24.7	9
Seminole	470,093	2.1	26.8	13
Sarasota	447,057	2.0	28.8	14
Manatee	412,703	1.9	30.7	15
Osceola	403,282	1.8	32.5	16
Collier	385,980	1.7	34.2	18
Charlotte	194,843	0.9	35.1	28
Desoto	34,408	0.2	35.3	49
Hardee	25,425	0.1	35.4	53
Disaster Assistance Eligible Counties	7,772,842	35.4	N/A	N/A

Source: U.S. Census Bureau, Population Division, 2021.

Not surprising, the hurricane-impacted counties were also among the most rapidly growing counties. Florida experienced a net population gain of 241,942 between April 1, 2020 and July 1, 2021. As Table 2 shows, ten of the thirteen counties declared eligible for federal disaster assistance in the aftermath of Hurricane Ian captured well over half (57.5%) of this net growth.

Three of the adversely impacted counties--Polk, Lee, and Hillsborough--ranked number one, two, and five, respectively, in absolute and relative population growth. Five of the remaining affected counties ranked sixth (Osceola), eighth (Sarasota), ninth (Manatee), twelfth (Collier), and fifteenth (Charlotte) in growth. Two of the adversely impacted counties captured a very small share of the net growth (DeSoto and Hardee) and therefore, like the three impacted counties that lost population during this period (Seminole, Pinellas, and Orange), were not among the state's top 15 population growth magnets (Table 2).

Table 2: Cumulative Population Change, State of Florida & Federal Disaster Assistance Eligible Counties, April 1, 2020-July 1, 2021

State/County	Absolute Population Change April 1, 2020-July 1, 2021	Percent of Total Population	Cumulative Percent	Population Growth Rank
Florida	242,941	100.0	N/A	N/A
Polk	28,474	11.7	11.7	1
Lee	27,154	11.2	22.9	2
Hillsborough	18,432	7.6	30.5	5
Osceola	14,626	5.9	36.4	6
Sarasota	13,051	5.4	41.8	8
Manatee	12,993	5.3	47.1	9
Collier	10,228	4.2	51.3	12
Charlotte	7,996	3.3	54.6	15
DeSoto	432	0.1	54.7	*
Hardee	98	.04	54.75	*
Seminole	-763	N/A	N/A	N/A
Pinellas	-2,492	N/A	N/A	N/A
Orange	-7,162	N/A	N/A	N/A

Source: U.S. Census Bureau, Population Division, 2021.

*Not ranked in top 15 most rapidly growing counties

Figure 2 unpacks the population change data by coastal and inland locations of affected counties. Five of the six impacted coastal counties grew more rapidly than the state, collectively capturing 31.7% of Florida’s net growth between April 1, 2020 and July 1, 2021. And local growth outpaced statewide growth in four of the seven inland counties, accounting for 22 percent of the state’s net growth during this period.

Figure 2: Absolute and Total Population Change, April 1, 2020-July 1, 2021

July 1, 2021 Population	Area	April 1, 2020-July 1, 2021 Percent Change	April 1, 2020-July 1, 2021 Absolute Change
331,893,745	United States	0.1	441,464
21,781,128	Florida	1.1	242,941
Coastal Counties			
194,843	Charlotte	4.3	7,996
787,976	Lee	3.6	27,154
412,703	Manatee	3.2	12,993
447,057	Sarasota	3.0	13,051
385,980	Collier	2.7	18,228
956,615	Pinellas	-0.3	-2,492
Inland Counties			
753,520	Polk	3.9	28,474
403,282	Osceola	3.8	14,626
1,478,194	Hillsborough	1.3	18,452
34,408	DeSoto	1.3	452
25,425	Hardee	0.4	98
470,093	Seminole	-0.1	-763
1,422,746	Orange	-0.5	-7,162

Source: U.S. Census Bureau, Population Division, 2021.

Figure 3: Absolute and Total Population Change, 2010-2020

2020 Population	Area	2010-2020 Percent Change	2010-2020 Absolute Change
331,449,281	United States	7.4	22,703,743
21,538,187	Florida	14.5	2,736,877
Coastal Counties			
399,710	Manatee	23.8	76,877
760,822	Lee	23.0	142,068
375,752	Collier	16.9	54,234
186,847	Charlotte	16.8	26,869
434,006	Sarasota	14.4	54,558
959,107	Pinellas	4.6	42,565
Inland Counties			
388,656	Osceola	44.6	119,971
1,429,908	Orange	24.8	283,952
725,046	Polk	20.4	122,951
1,459,762	Hillsborough	18.7	230,536
470,856	Seminole	11.4	48,138
33,978	DeSoto	-2.5	-866
25,327	Hardee	-8.7	-2,404

Source: U.S. Census Bureau, Quick Facts.

In many respects, this pattern of county-level growth between April 1, 2020 and July 1, 2021--the first fifteen months of the COVID-19 pandemic--was a continuation of the pattern of population growth during the previous decade in Florida. Growing at twice the national rate of growth (14.5% versus 7.4%), Florida’s population increased by 2.7 million between 2010 and 2020. Close to half of this growth (1.2 million) was concentrated in the thirteen counties declared eligible for federal disaster assistance following Hurricane Ian. Five of the six coastal counties and four of the seven inland counties affected by the hurricane grew more rapidly than the state in the prior decade. One county (Pinellas) grew more slowly than the state and two counties (Hardee and DeSoto) experienced population decline in the decade prior to the pandemic and the hurricane (Figure 3).

Table 3: Absolute and Net Migration Per Day, Disaster Assistance Eligible Counties, April 1, 2020-July 1, 2021

State/County	Total Population July 1, 2021	Percent of Total Population	Cumulative Percent	Population Size Rank
Florida	305,218	678	100.0	N/A
Lee	31,411	70	10.3	10.3
Polk	30,129	67	9.9	20.2
Sarasota	19,359	43	6.3	26.5
Manatee	15,506	34	5.1	31.6
Hillsborough	15,407	34	5.0	36.6
Osceola	13,043	29	4.3	40.9
Collier	12,384	27	4.1	45.0
Charlotte	11,260	25	3.7	48.7
Pinellas	6,487	14	2.1	50.8
Desoto	538	1	0.2	51.0
Hardee	-28	<1	-0.1	50.9
Seminole	-977	2	-0.3	50.6
Orange	-13,608	-30	-4.5	46.1
Disaster Assistance Eligible Counties	140,911	313	46.1	N/A

Source: U.S. Census Bureau, Population Division, 2021.

Among the counties experiencing net in-migration, Lee and Polk were the top two migrant destinations, each gaining over 30,000 newcomers, followed by Sarasota, Manatee, and Hillsborough counties where between 15,000 and 19,000 net newcomers settled during this period. Charlotte, Collier, and Osceola received between 11,000 and 13,000 net newcomers while a smaller number arrived in Pinellas (6,487) and DeSoto (528) counties during this 15-month period.

Average net newcomers per day is an even stronger indicator of the role that migration played in shaping the size and composition of the affected counties prior to the hurricane (Table 3, column 3). Between April 1, 2020 and July 1, 2021, Lee and Polk counties averaged, respectively, 70 and 67 net newcomers per day; Sarasota, Manatee, and Hillsborough counties averaged between 34 and 43 migrants per day; between 14 and 29 net newcomers arrived in Pinellas, Charlotte, Collier, and Osceola each day; and one newcomer arrived in DeSoto County every day during this fifteen month period.

Figure 5 expands the time frame to further demonstrate how net migration shaped these Hurricane Ian impacted counties. For the period 2019-2021, these counties were attractive migration destinations for movers within Florida, movers from other states, and movers from abroad. Orange and Hillsborough stand out as popular destinations for both Florida inter-county movers and movers from other states and abroad. Polk, Seminole, and Pinellas also stand out as major destinations for inter-county movers. And Lee County was popular among movers from other states and abroad.

Figure 5: Total & Absolute Number of In-Migrants Per Day, Hurricane Impacted Communities, 2019-2021

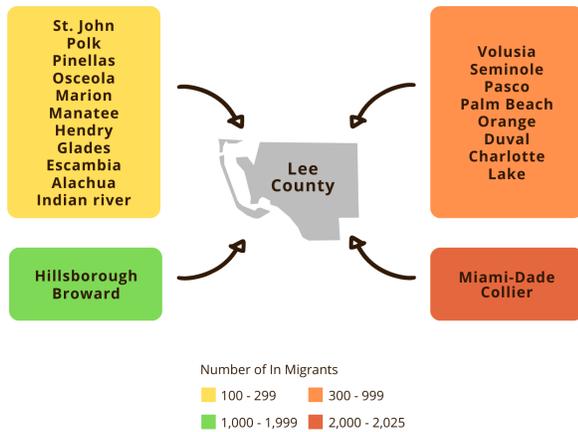
<u>Total In-Migrants</u>	<u>Florida Inter-County Movers/Day</u>	<u>Florida Counties Declared Eligible for Disaster Assistance</u>	<u>Movers from Abroad & Other States/Day</u>	<u>Total In-Migrants</u>	
18,214	17	 Charlotte		28	30,132
28,307	26	 Collier		64	69,071
N/A	N/A	DeSoto		N/A	N/A
N/A	N/A	Hardee		N/A	N/A
121,893	113	 Hillsborough		168	181,268
49,458	46	 Lee		108	116,466
41,103	38	 Manatee		55	54,631
148,277	137	 Orange		154	166,107
52,844	49	 Osceola		40	43,470
69,984	65	 Pinellas		100	107,799
82,735	77	 Polk		69	74,351
36,366	34	 Sarasota		59	63,562
70,513	65	 Seminole		52	56,274

Source: American Community Survey
 N/A = Data not available

To illustrate the demographic reach of the affected counties, we highlight migration flows into Lee County, the hardest hit jurisdiction during the hurricane. As Figures 6 and 7 show, there were major migration flows into Lee County from twenty three counties within the state of Florida and from twenty five communities in other states, including New York, New Jersey, Pennsylvania, and Connecticut in the Northeast; Maryland, Georgia, and Kentucky in the South; Ohio, Indiana, Illinois, Michigan, and Wisconsin in the Midwest; and Arizona and California in the West. The out-of-state flows were part of a longstanding retiree migration to Florida but also included COVID-19 pandemic refugees who fled densely settled

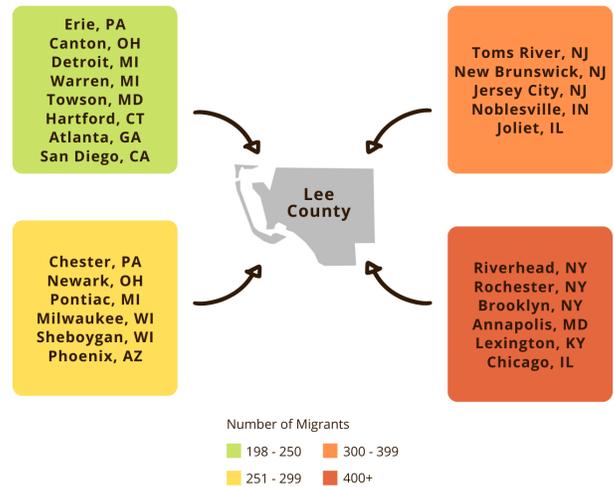
major urban centers where the risk of exposure to the deadly virus was perceived to be much higher, especially in the early phase of the crisis. The within state moves were probably primarily individuals voting with their feet to take advantage of business and employment opportunities in this rapidly growing retirement destination.

Figure 6: In State Origins, Lee County, Florida Migrants, 2019-2021



Source: U.S. Census Bureau, 2015-2019 American Community Survey.

Figure 7: Out of State Origins Lee County, Florida Migrants, 2019-2021



Source: U.S. Census Bureau, 2015-2019 American Community Survey.

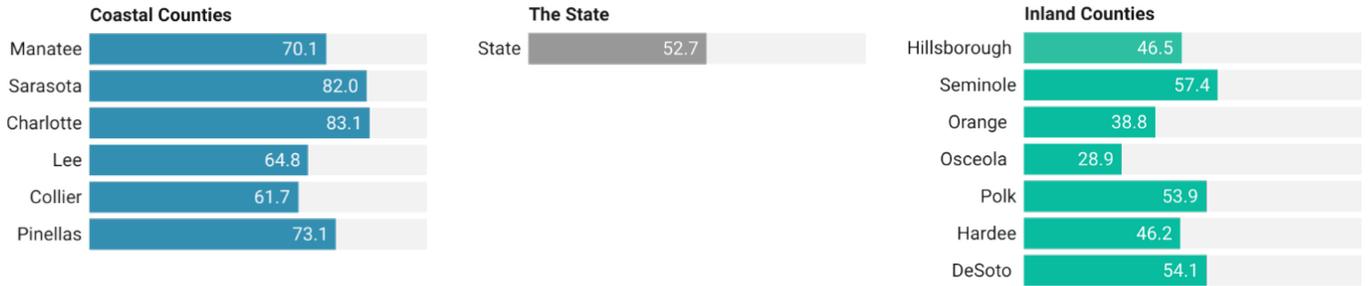
Irrespective of the reasons for migration, the impact of these flows was reflected in the composition of the population of the affected communities when Hurricane Ian made land fall (Figure 8). Compared to statewide distributions, non-Hispanic whites and older adults were over-represented and the younger (under age 18) population was under-represented in the impacted coastal counties. Poverty rates also were much lower in these communities compared to the state. These demographics typify retirement communities.

Generally, the reverse was the case in the impacted inland counties. Whites were under-represented compared to their statewide distribution, which means the population was more diverse in these counties than in the coastal counties. In addition, the 65 plus population was under-represented and the under age 18 population was over-represented in the inland counties. Poverty rates also were higher in the inland counties than they were in the impacted coastal counties.

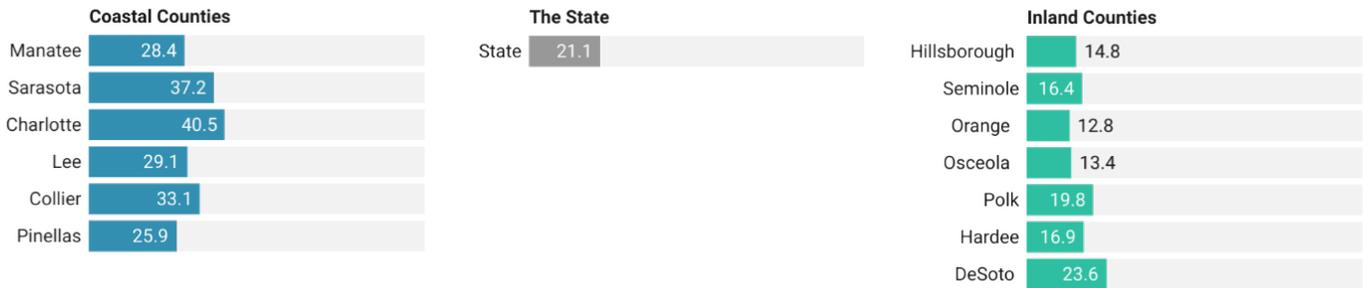
Notably, the inland counties' demographic diversity is partly a function of the significant influx of Puerto Ricans—an estimated 10,000—into central Florida following Hurricane Maria in 2017—a Category 5 Hurricane that destroyed much of Puerto Rico's infrastructure. Due to this influx, Florida reportedly surpassed New York as the

state with the highest concentration of former island residents—a development that changed not only the composition of the population but also the local political landscape, especially of Osceola and Orange counties—evidenced, for example, by the election of the first Puerto Rican born Latina mayor of the Orlando suburb of Kissimmee, Florida in 2020 (Lefebvre, 2021).

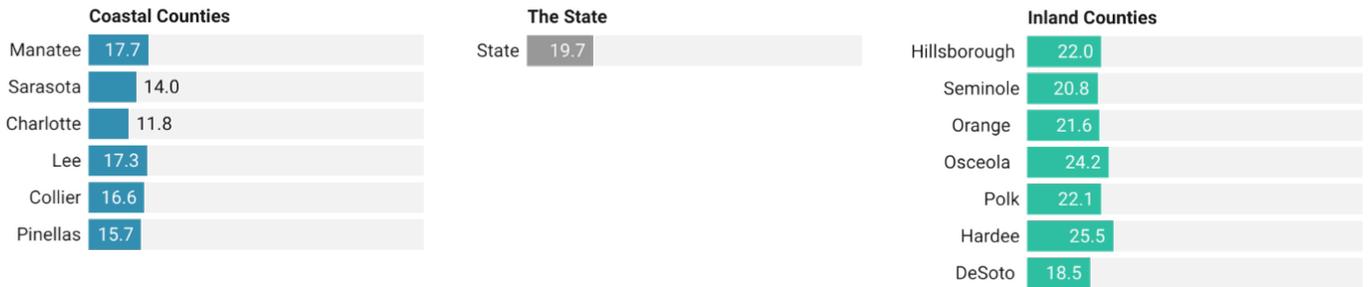
Figure 8: Selected Demographic Characteristics, Disaster Assistance Eligible Counties, July 1, 2021 Percent White Population



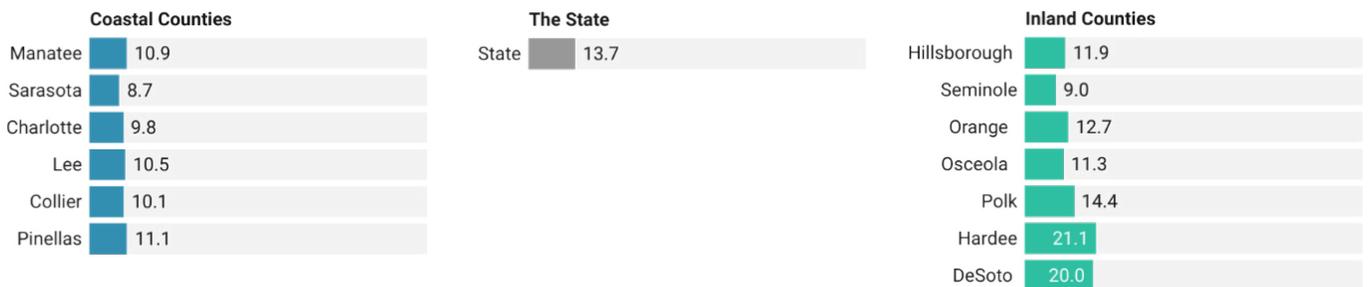
Percent Population 65 and over



Percent Population Under Age 18



Percent Population in Poverty



Source: U.S. Census Bureau, Population Division, 2022.

An effective disaster recovery plan must account for these differing demographic characteristics and the underlying disparities that exist across the six coastal and seven inland counties (Hauer, 2017). Demographic differences and disparities, we should note, that are rooted—at least partly—in a prior extreme weather event.

Discussion and Recommendations

A significant share of the residents of the thirteen counties declared eligible for federal disaster assistance after Hurricane Ian are transplants to Florida. They include some recent movers who fled major urban centers in the Northeast, Midwest, and the West hoping to avoid or minimize the likelihood of exposure to the deadly COVID-19 virus (Johnson, 2021). Some were also fleeing wildfires in the West (Backman, 2022). Returning to the question posed at the outset: Will these individuals, other transplants to Florida, and long-term residents now become climate refugees, forced to move in response to Hurricane Ian and in fear of future climate change-induced environmental disasters which are occurring with increasing frequency?

Only time will tell if the current crisis will motivate significant outmigration from impacted Florida communities (see, for example, BARC Staff, 2021). Asserting that prior disasters have not discouraged migrants from moving to Florida and settling in vulnerable communities, Lustgarten (2020b) notes that,

Since Hurricane Andrew devastated Florida in 1992—and even as [the] state has become a global example of the threat of sea-level rise—more than 5 million people have move to Florida’s shorelines, driving a historic boom in building and real estate.

However, in this specific instance, it is not unreasonable to think that some potential migrants may rethink moving to Florida and some local residents whose socio-economic wellbeing was disrupted by Hurricane Ian—most notably those without any or adequate insurance to rebuild (Ivanova, 2022)—may indeed seek climate refuge in more “livable geographies” as adverse or extreme weather

events repeatedly devastate vulnerable communities (Marandi and Main, 2021; Keenan, et al, 2018; Kotsonis & Stohr, 2022). These storms create major risks to the health and wellbeing of the residents as well as the financial viability of the impacted communities which suffer loss of infrastructure and tax base (Khanna, 2021; Hurdle, 2022; Lustgarten, 2020a; Korducki, 2022). And Florida currently is in a property insurance crisis (Ivanova, 2022; Santana and Phillis, 2022). Homeowners are paying the highest premiums in the country, property premiums are rising at a faster rate than in the rest of the country, and property insurance is increasingly unavailable (Gerretsen, 2022b).

If Florida communities are going to retain existing residents and increase the viability of its vulnerable communities, it will be necessary for local officials to move beyond reliance on federal disaster relief and increasingly unaffordable private insurance in the community rebuilding and restoration process. Instead they must develop expertise in climate finance and disaster recovery, that is, innovative approaches that leverage (1) lending partnerships between traditional banks and Community Development Financial Institutions (CDFIs); (2) Community Reinvestment Act (CRA) weather-related pre-disaster planning and post-disaster lending, investment, and services; and (3) innovative public-private collaborations.

The Community Reinvestment Act (CRA) of 1977 was implemented to encourage banks to financially invest in and meet the credit needs in areas with low-to-moderate income and historically underserved populations. The regulations specify lending, investment, and provision of financial services as the methods banks must use to meet their regulatory requirements for CRA. Typically, such communities are the most vulnerable and least likely

to have the required resources to prepare for, adapt to, and recover from the physical damage/destruction and resulting economic impacts of extreme weather events.

In a 2019 study, the Federal Reserve Bank of San Francisco and Harvard University jointly explored the connection between climate adaptation and resilience. The research focused on the types of community resilience investments that may simultaneously qualify for CRA credits and help banks, community development organizations and local governments collaborate in better preparing communities for the adversities they will face going forward. The research revealed that 57 percent of U.S. counties with federal disaster declarations over the last 20 years contain at least one low- and moderate-income census tract, the measure for CRA, and that, on average, one in every two people impacted by a disaster in these counties has lived in a low- and moderate-income census tract—solid proof that the same communities that have faced long-term disinvestment now face extreme weather events (Keenan and Mattiuzzi, 2019).

The CRA regulations identify geographic areas receiving Major Disaster Declarations administered by the Federal Emergency Management Agency (FEMA) as potential recipients of financial institution lending, investment, and services. Banks may receive CRA credit for investments in stabilization, recovery, and revitalization of such areas—provided the investments are made during a 36-month period after the FEMA disaster designation date. An interagency document called the “Questions and Answers” (Q and As) jointly prepared by the staffs of the Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and Office of the Comptroller of the Currency provides additional guidance to financial institutions and the public regarding community reinvestment activities that “will be presumed to revitalize or stabilize such a geography or area if the activity is consistent with a bona fide government revitalization or stabilization plan or disaster recovery

plan” (Board et al. 2016, p. 48527). Simply put, pre-event investments mitigate risk and generate benefits, and using tools such as CRA can help communities pre-invest for resiliency. Post-disaster recovery can be achieved through revitalization and stabilization activities that match the pre-disaster planning.

If affected Florida communities are going to regain their status as attractive places to live, work, play, and do business, in conjunction with pre-investing for resiliency, local officials also will have to invest resources in developing greater reputational equity, especially given the noted disparities in the incidence of poverty—an indicator of inequities in population health and economic wellbeing—that exist between affected coastal and inland communities (Greenfield, 2022). Places striving to achieve reputational equity “embrace the social determinants of health at the individual or group level and the triple bottom line principles of sustainability at the organizational and community levels to ensure future viability, cohesiveness, resiliency, and prosperity” (Johnson and Bonds, 2021).

Notably, the social determinants of health are “...the conditions in which people are born, grow, live, work, and age” (Robert Wood Johnson Foundation County Health Rankings, 2020), which are rooted most often in local governmental policies, practices, and procedures that create advantage for some and disadvantage for others, leading to disparate community-level outcomes manifested most often along racial lines. And triple bottom line sustainability—a multi-tiered strategy designed to address the social determinants of health—is achieved through conscious and intentional efforts to protect people and the planet while generating profit (Johnson and Bonds, 2021).

At the community level, this translates into local government officials simultaneously striving to achieve:

- 1.** Climate justice by instituting policies that minimize population exposures to environmental risks created by growth and development/redevelopment;
- 2.** Social justice by leveraging climate/environmental injustices to create economic opportunities for historically marginalized populations; and
- 3.** Economic justice by working diligently to generate equitable shareholder and stakeholder value in all economic development and community resiliency initiatives—typically through the creation of inclusive entrepreneurial and small business ecosystems.

Following audits of existing government policies and practices, a number of state and local jurisdictions across the U.S. have developed strategies and roadmaps for environmentally conscious, inclusive, and equitable development and redevelopment that local governmental officials in Florida can use as guides in their efforts to rebuild communities affected by Hurricane Ian (Johnson, McDaniel, & Parnell, 2018; Bonds, Burnett, & Sissman, 2018). And we have produced a checklist of policies, strategies, practices, procedures, and tactics that communities striving to achieve greater reputational equity typically pursue (Johnson and Bonds, 2021).

Moving quickly to develop community resiliency plans rooted in the core principles of equity, inclusion, and sustainability before a disaster is likely to enhance safety and wellbeing, reduce disaster-motivated migration intentions, and restore the image of affected communities as attractive migration destinations moving forward.

References Cited

- Backman, Maurie, 2022, What Are Climate Migrants and Where Are they Moving? U.S. News, August 31, available at <https://realestate.usnews.com/realestate/articles/what-are-climate-migrants-and-where-are-they-moving>.
- BARC Staff, 2021, People Keep Moving to the Worst Places for Climate Risk, Bay Area Regional Collaborative, August 25, available at <https://barc.ca.gov/whats-happening/news/people-keep-moving-worst-places-climate-risk>.
- Barker, Aaron, Most of Hurricane Ian's 100-plus Victims in Florida Died by Drowning, Data Shows, foxweather.com, October 11, available at <https://www.foxweather.com/weather-news/most-hurricane-ian-deaths-in-florida-were-drownings-data-shows>.
- Bermeo, Sarah and Speck, Mary, 2022, How Climate Change Catalyzes More Migration in Central America, usip.org, September 21, available at <https://www.usip.org/publications/2022/09/how-climate-change-catalyzes-more-migration-central-america>.
- Bizouati-Kennedy, Yael, 2022, How Will Hurricane Ian Affect the Economy?, gobankingrates.com, October 3, available at <https://www.gobankingrates.com/money/economy/how-hurricane-ian-affect-economy/>.
- Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, and Office of the Comptroller of the Currency (Board et al.). Interagency Questions and Answers Regarding Community Reinvestment (Q&As). Vol. 81 Federal Register, 48505-48556, 2016. <https://www.federalregister.gov/documents/2016/07/25/2016-16693/community-reinvestment-act-interagency>.
- Bonds, Jeanne Milliken, Burnett, Anne A., & Sissman, Emma, 2018, "Community Finance in East Baltimore: A Study of Phase One Redevelopment and Financing," Community Practice Paper, Federal Reserve Bank of Richmond, September, available https://www.richmondfed.org/publications/community_development/practice_papers/2018/practice_papers_2018_no3.
- Campbell, Sueellen, 2022, Coverage of Migration from Place to Place Within the U.S. Yaleclimateconnections.org, June 1, available at <https://yaleclimateconnections.org/2022/06/coverage-of-migration-from-place-to-place-within-the-u-s/>.
- Deliso, Meredith and Kekatos, 2022, Hurricane Ian Death Toll Now More Than 100 after Storm Slams into Florida, North Carolina, abcnews.go.com, October 12, available at <https://abcnews.go.com/US/multiple-deaths-reported-hurricane-ian-slams-florida/story?id=90693636>.
- Gerretsen, Isabelle, 2022a, Hurricane Ian Could Cost US 67bn in Economic Damages, climatechangenews.com, September 29, available <https://www.climatechangenews.com/2022/09/29/hurricane-ian-cost-us-67bn-economic-damages-climate-change/>.
- Gerretsen, Isabelle, 2022b, Hurricane Ian Could Push Insurers Out of Florida, climatechangenews.com, October 21, available at <https://www.climatechangenews.com/2022/10/21/hurricane-ian-could-push-insurers-out-of-florida/>.
- Greenfield, Nicole, 2022, Climate Migration and Equity, NRDC, May 9, available at <https://www.nrdc.org/stories/climate-migration-equity>.
- Hauer, Mathew E., 2017, Migration Induced by Sea-Level Rise Could Reshape the US Population Landscape," Nature Climate Change, Vol 7, available at <https://www.nature.com/articles/nclimate3271>.
- Henao, Luis Andres, 2022, Climate Migration: Alaska Village Resists Despite Threats, ABC News, October 28, available at <https://abcnews.go.com/Lifestyle/wireStory/climate-migration-alaska-village-resists-threats-92280379>.
- Hurdle, John, 2022, As Climate Fears Mount, Some in U.S. are Deciding to Relocate, YaleEnvironment360, March 24, available at <https://e360.yale.edu/features/as-climate-fears-mount-some-in-u.s.-are-deciding-to-relocate>.
- IPCC, 2022, Climate Change 2022: Mitigation of Climate Change, IPCC-57, The Intergovernmental Panel on Climate Change, Working Group III Sixth Assessment Report, available at <https://www.ipcc.ch/report/ar6/wg3/>.
- Ivanova, Irina, 2022, As Floridians Recover from Ian, Most Homeowners in the State Do So Without Flood Insurance," cbsnews.com, October 4, available at <https://www.cbsnews.com/news/hurricane-ian-flood-insurance-fema/>.
- Johnson, James H., Jr., McDaniel, Mark S., & Parnell, Allan, 2018, BUILT2LAST: A Roadmap for Inclusive and Equitable Development in Durham. Prepared for the City of Durham Office of Economic and Workforce Development, available at https://www.durhamnc.gov/DocumentCenter/View/27855/Built2Last_06142019_Final.
- Johnson, James H., Jr., 2021, Coronavirus Pandemic Refugees and the Future of American Cities, Urban Studies and Public Administration, Vol 4, available at <http://www.scholink.org/ojs/index.php/uspa/article/view/3511>.
- Johnson, James, H., Jr., and Bonds, Jeanne Milliken, 2020, Does Your City Have Reputational Equity? A Checklist for Local Governments, Economic Development Journal, Summer, available at <https://www.iedonline.org/pages/edj-summer-2021>.
- Keenan, Jesse, et al, 2018, Climate Gentrification: From Theory to Empiricism in Miami-Dade County, Florida, Environmental Research Letters, Vol 13, available at https://iopscience.iop.org/article/10.1088/1748-9326/aabb32?_ac_lk_id=df90-2a14-b0f6-39ef173886b4d03.
- Keenan, Jesse M, and Mattiuzzi, Elizabeth, 2019. "Climate Adaptation Investment and the Community Reinvestment Act," Federal Reserve Bank of San Francisco Community Development Research Brief 2019-5, Available at <https://doi.org/10.24148/cdrb2019-05>.
- Khanna, Parag and Hassol, Susan Joy, 2021, America's Next Great Migrations Are Driven by Climate Change, Scientific American, October 14, available at <https://www.scientificamerican.com/article/americas-next-great-migrations-are-driven-by-climate-change/>.
- Korducki, Kelli Maria, 2022, Americans Are Moving Into the Paths of Hurricanes, The Atlantic, October 6, available at <https://www.theatlantic.com/newsletters/archive/2022/10/americans-moving-into-paths-of-hurricanes/671677/>.

Kotsonis, Stefano and Stohr, Kimberly Atkins, 2022, America's Climate Havens of the Future, wbur.org, September 27, available at <https://www.wbur.org/onpoint/2022/09/27/americas-climate-havens-of-the-future>.

Lefebvre, Ben, 2021, How 'Climate Migrants' Are Roiling American Politics, politico.com, November 27, <https://www.politico.com/news/magazine/2021/11/27/how-climate-migrants-are-roiling-american-politics-523295>

Lustgarten, Abraham, 2020a, The Great Climate Migration Has Begun, The New York Times Magazine, July 23, available at <https://www.nytimes.com/interactive/2020/07/23/magazine/climate-migration.html>.

Lustgarten, Abraham, 2020b, Climate Change Will Force a New American Migration, ProPublica.org, September 15, available at <https://www.propublica.org/article/climate-change-will-force-a-new-american-migration>.

Marandi, Anna and Leilanai Main, Kelly, 2022, The Next American Migration: What Cities Should Know about Climate Change and Populations on the Move. National League of Cities, available at <https://www.nlc.org/wp-content/uploads/2022/04/CS-Domestic-Climate-Migration-and-US-Cities-Report.pdf>

Peterson, Isa, 2022, Internal Climate Migration Imposes Varying Challenges Across the U.S., texasimpact.org, April, available at <https://texasimpact.org/2022/04/internal-climate-migration-imposes-varying-challenges-across-the-u-s/>.

Podesta, John, 2019, The Climate Crisis, Migration, and Refugees, Brookings Policy Brief, July 25, available at <https://www.brookings.edu/research/the-climate-crisis-migration-and-refugees/>.

Post, Dudley L., Jr., et al., 2009, The Effect of Climate on Migration: United States, 1995-2000, Social Science Research, Vol 38, September, available at <https://www.sciencedirect.com/science/article/abs/pii/S0049089X08001087>.

Qin Fa, Fisher-Vanden, Karen, and Klaiber, H. Allen, 2018, Climate Change, Migration, and Regional Economic Impacts in the United States, Journal of the Association of Environmental and Resource Economists, Vol 5, available at <https://www.journals.uchicago.edu/doi/abs/10.1086/697168>.

Robert Wood Johnson Foundation, 2020, 2020 County Health Rankings Key Findings Report, available at [CHRR_Key_Findings_2020_0.pdf](https://www.rwjf.org/content/dam/robert_wood_johnson/pdfs/2020/09/2020_County_Health_Rankings_Key_Findings_Report.pdf) (countyhealthrankings.org).

Santana, Rebecca and Phillis, Michael, 2022, Lack of Flood Insurance Leaves Families with Broken Homes Following Hurricane Ian, pbs.org, October 7, available at <https://www.pbs.org/newshour/nation/lack-of-flood-insurance-leaves-families-with-broken-homes-following-hurricane-ian>.

The White House, 2022, President Joseph R. Biden, Jr. Approves Florida Disaster Declaration, September 29, available at <https://www.whitehouse.gov/briefing-room/presidential-actions/2022/09/29/president-joseph-r-biden-jr-approves-florida-disaster-declaration/>.

The White House, 2021, Report on the Impact of Climate Change on Migration, October, available at <https://www.whitehouse.gov/wp-content/uploads/2021/10/Report-on-the-Impact-of-Climate-Change-on-Migration.pdf>.

U.S. Census Bureau, Population Division, 2021, Annual and Cumulative Estimates of the Components of Resident Population Change for the United States, Regions, States, District of Columbia, and Puerto Rico: April 1, 2020 to July 1, 2021, December, available at <https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-total.html>

U.S. Census Bureau, Population Division, 2022, Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin: April 1, 2020 to July 1, 2021, available at <https://www.census.gov/data/tables/time-series/demo/popest/2020s-national-detail.html>.

Vince, Gaia, 2022, The Century of Climate Migration: Why We Need to Plan for the Great Upheaval, The Guardian, August 18, available at <https://www.theguardian.com/news/2022/aug/18/century-climate-crisis-migration-why-we-need-plan-great-upheaval#:~:text=Climate%2Ddriven%20movement%20of%20people,become%20greater%20and%20more%20urgent>.

Voegele, Juergen, 2021, Millions on the Move: What Climate Change Could Mean for Internal Migration, World Bank Blogs, November 1, available at <https://blogs.worldbank.org/voices/millions-move-what-climate-change-could-mean-internal-migration>.

Wallace-Wells, David, 2022, The New World: Envisioning a Future After Climate Change, The New York Times Magazine, October 30, available at <https://www.nytimes.com/interactive/2022/10/26/magazine/visualization-climate-change-future.html>.

Watson, Julie, 2022, Climate Change is Already Fueling Global Migration. The World Isn't Ready to Meet People's Changing Needs, Experts Say, July 28, pbs.org, available at <https://www.pbs.org/newshour/world/climate-change-is-already-fueling-global-migration-the-world-isnt-ready-to-meet-peoples-needs-experts-say>.

Wheeling, Kate, 2021, Climate Change Has Come to the United States, thenation.com, April 18, available at <https://www.thenation.com/article/environment/californias-climate-migrants-fire/>.

The Kenan Institute fosters mutual understanding between members of the private sector, the academic community, and their government, and to encourage cooperative efforts among these groups.

The Kenan Institute serves as a national center for scholarly research, joint exploration of issues, and course development with the principal theme of preservation, encouragement, and understanding of private enterprise.



▶ KenanInstitute.unc.edu