EAST CENTRAL FLORIDA REGIONAL RESILIENCE COLLABORATIVE (R2C)
HOUSING ASSETS AND RESILIENT POLICIES (HARP)

Coastal Flood Hazards and Affordable Housing:
Developing Housing Data to Support Planning and Action

June 9, 2022

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"Climate change disproportionately affects low-income communities...

...Affordable housing and community development sectors need to approach disaster resilience and climate change adaptation through a cross-sector lens...

...anticipating how a changing climate, extreme events, ecological degradation and their cascading effects will shape housing needs."

Enterprise Community Partners

Introduction

Safe and affordable housing is critical to a community's ability to provide its families with improved health outcomes, along with economic and social mobility.[1] However, coastal flooding, becoming increasingly common with ongoing climate change, is a key risk to the safety of homes and the stability of their resident families. Along the eastern coast of the peninsular state, the East Central Florida (ECF) region is no stranger to flooding due to hurricanes, tropical storms, and other severe weather events. In 2004, the region suffered several particularly impactful events- Hurricane Frances, Hurricane Jeanne, and Tropical Storm Bonnie/Hurricane Charlie. FEMA Open Data estimates the total damage amount (to homeowners) tallied $220.8 million, $180.3 million, and $134.5 million from these storms, respectively. (See Figure 1.) These events caused widespread damage throughout the region, particularly in the coastal counties of Brevard and Volusia. More recently in 2017, Hurricane Irma caused another $73.6 million in estimated damages (to homeowners).[2]

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1 Habitat for Humanity. (2022). Why is affordable housing important? Retrieved from:
https://www.habitat.org/stories/reinforcing-importance-of-our-work
2 Open FEMA. (2021). "Housing Assistance Data Renters - V2." Accessed via UF Shimberg Center for Housing Studies, "Disaster Response" Data http://flhousingdata.shimberg.ufl.edu/disaster-response
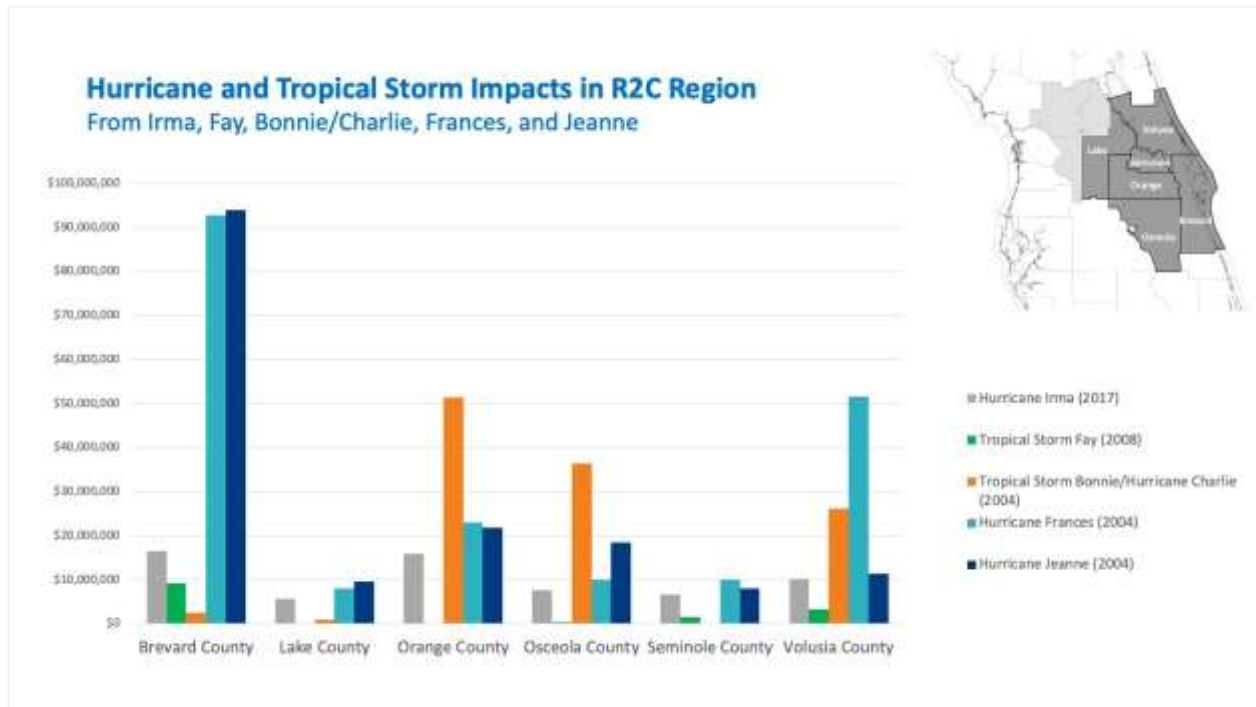
Figure 1. *Total damage amounts to owners (not including renters) from select hurricanes and tropical storms including Hurricane Irma, Tropical Storm Fay, Tropical Storm Bonnie/Hurricane Charlie, Hurricane Frances, and Hurricane Jeanne. Source: Open FEMA, Housing Assistance Data Renters - V2, (05-15-2021).*

These flood risks to housing are disproportionately experienced by socio-economically vulnerable populations, such as those with low incomes or insecure housing. According to the Fourth National Climate Assessment (NCA4), "People who are already vulnerable, including lower-income and other marginalized communities, have lower capacity to prepare for and cope with extreme weather and climate-related events and are expected to experience greater impacts," (U.S. Global Change Research Program (USGCRP), 2018).[3]

According to a 2020 analysis by Climate Central, sea level rise is a significant threat to the nation's affordable housing stock.[4,5] The study found that the amount of affordable housing units at risk from coastal flooding across the U.S. is anticipated to triple over the next three decades. By 2050, nearly every coastal state – Florida included – is expected to have at least some significant percentage of its affordable housing exposed to at least one coastal flood risk event per year. **In fact, Florida's affordable housing stock is the 5th most vulnerable in the**

3 U.S. Global Change Research Program (USGCRP). (2018). *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi:10.7930/NCA4.2018 https://nca2018.globalchange.gov

4 Climate Central. (2020). Report: Coastal flood risk to affordable housing projected to triple by 2050. Climate Central. Retrieved from: https://www.climatecentral.org/news/report-coastal-flood-risk-to-affordable-housing-projected-to-triple-by-2050

5 Buchanan, M. et al. (2020). "Sea level rise and coastal flooding threaten affordable housing." Environ. Res. Lett. 15 124020. Retrieved from: https://iopscience.iop.org/article/10.1088/1748-9326/abb266

nation in terms of units at risk of future coastal flooding.[6] In the state, it is not a matter of "if" a disaster will impact affordable housing, it is a matter of "where will it occur?"

Florida's affordable housing stock is at the frontline of a climate change crisis, and this will also compound the state's soaring housing costs. (See Figure 2.) Climate change disproportionately affects low-income communities, as lower-cost housing options tend to be more vulnerable to flooding due to their age and structure types. Additionally, the lack of insurance and emergency savings, not to mention the increasing cost of housing prices, maintenance, and repair, makes these households even more vulnerable as well. Further, low-income households – particularly renters – have more difficulty obtaining adequate post-disaster housing assistance. Therefore, housing practitioners and planners must approach pre-disaster preparedness and post-disaster recovery planning in an interdisciplinary way,[7] and housing plans and programs need to include the impacts of climate change. Planning and action are the necessary next steps to combat the rising flood threats posed to the state's affordable housing inventory.
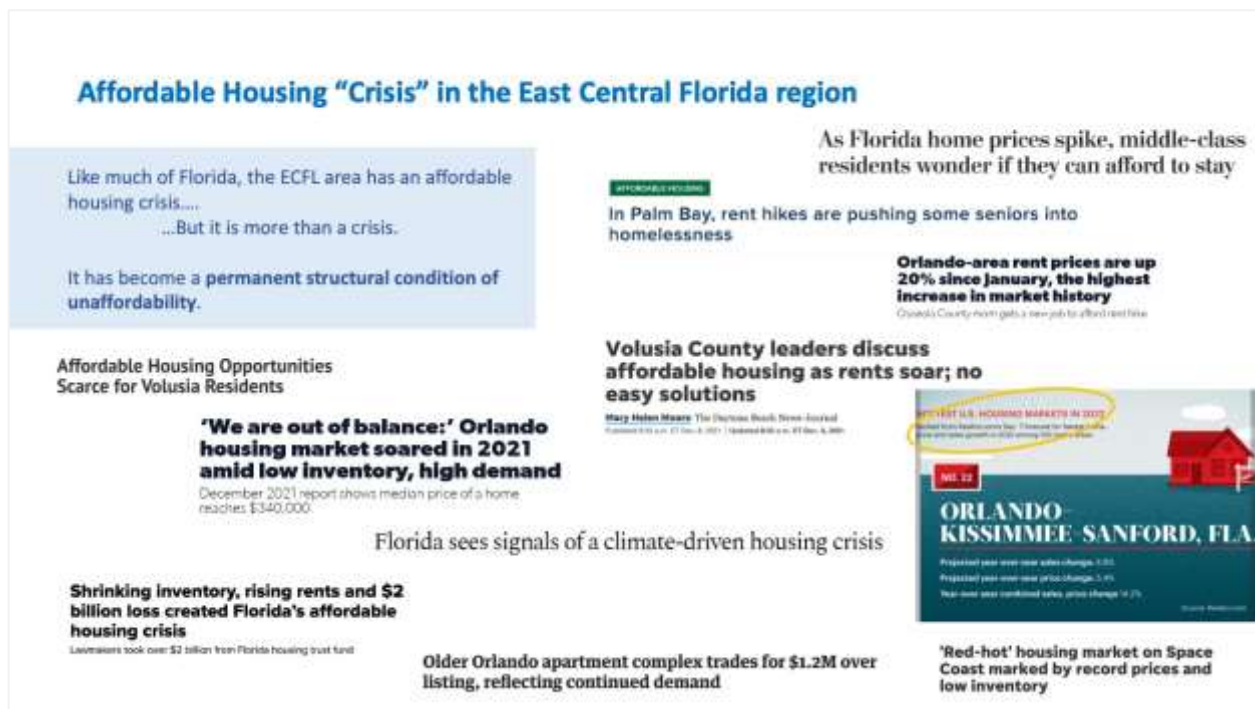
Figure 2. Recent news clippings describing housing challenges facing communities across Florida and in the East Central Florida region.

In response to these and more recent storm events, there has been a range of innovative resilience planning efforts occurring in East Central Florida spearheaded by the Regional Planning Council (ECFRPC). In 2018, with a grant from the Florida Department of Environmental

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6 Climate Central. (2020). Affordable Housing State Factsheets: Florida. Retrieved from:
https://www.climatecentral.org/uploads/media/AH_State_Factsheet_FL.pdf
7 Enterprise Community Partners. (2022). Invest in Our Planet. Invest in Our Communities. Report. Retrieved from:
www.enterprisecommunity.org/blog/invest-our-planet-invest-our-communities

Protection (FDEP), the *East Central Florida Regional Resiliency Action Plan* (ECF RRAP) was developed for Volusia and Brevard Counties with "the goal to increase the ability of local and regional stakeholders to implement resiliency and climate adaptation strategies across disciplines," (2018).[8] The report sets goals, objectives, and activity items to assist the coastal

Figure 3 Resilience framework from the R2C Strategic Resilience Action Plan. "Resilience to any disaster rests on the premise that all aspects of a community- its places, people, and prosperity- are strong."

region in becoming more resilient to chronic stressors and acute shocks. Two sea level rise estimates are included for Volusia and Brevard Counties, which range from 5.15 feet by 2100 (2013 USACE High) to 8.48 feet by 2100 (2017 NOAA High). In addition, the report recommends considering sea level rise impacts at 2040 (20-year planning horizon), 2070 (50-year planning horizon), and 2100 (80-year planning horizon), depending on the nature of the project or planning effort being undertaken. Both Brevard and Volusia County have adopted the ECF RRAP. The above guidance serves as the foundation for the UF Shimberg Center's subsequent housing and flood hazard analysis for the region.

Another action item identified in the RRAP was to expand the "coastal" resilience work to the inland counties. The following year in 2019, the East Central Florida Regional Resilience Collaborative (ECFR2C) was formally established to promote the region's "ability to bounce forward (not back) in the face of short-term shocks like hurricanes or infrastructure failures and long-term stressors like affordable housing, aging infrastructure, and climate change."[9] The R2C mission is to, "Empower the communities in East Central Florida to advance resilience strategies that strengthen and protect the built infrastructure and natural environment, enhance health and equity, and ensure a thriving economy." The R2C operates under 3-pillars in the resilience framework oriented around 1) People (Health + Equity), 2) Places (Built Infrastructure + Natural Environment), and 3) Prosperity (Economic Resilience). The R2C works within each pillar to reduce risk, vulnerability and the carbon footprint and increase efforts toward sustainability. See Figure 3 for more detail about the R2C resilience framework.

8. East Central Florida Regional Planning Council. (2018). East Central Florida Regional Resiliency Action Plan. Retrieved from: http://ftp.ecfrpc.org/Projects/East%20Central%20Florida%20Regional%20Resiliency%20Action%20Plan.pdf
9 East Florida Regional Resilience Collaborative (n.d.). About Us. Retrieved from: https://www.ecfrpc.org/resiliencecollaborative

Housing Assets and Resilience Policies (HARP) Initiative

In 2021, the ECFRPC secured Resilient Florida funding allocated to resilience entities from the FDEP to conduct a deeper dive into the affordable housing stock in the region, and determine how this may be impacted by current and future flood risk through the "Housing Assets and Resilience Policies" (HARP) project. As part of the HARP initiative, the Shimberg Center for Housing Studies at the University of Florida conducted several affordable housing analyses for the R2C Resilience Collaborative including a 1) inventory assessment, 2) needs assessment, and 3) coastal flood hazard exposure assessment.

To better inform climate resilient housing programs and planning, the goals of the affordable housing supply and coastal flood hazards assessment are three-fold:

- Assess the *six-county R2C region's* ongoing housing needs including metrics such as change in home prices over time, rates of housing cost-burden for renters and owners, as well as comparing median wages to needed "housing wages."
- Develop an inventory of affordable housing across the *six-county R2C region*, looking at three specific types of affordable housing: publicly subsidized housing (AHI); affordable market-rate rental housing (NOAH); and mobile homes.
- Determine housing stock vulnerable to coastal flood hazards in the *two coastal counties* and explore how to integrate coastal and inland flood hazards.

Executing on these goals has led to the localization of the Shimberg Center's coastal Flood Hazard Exposure Index (FHEI), as well as the creation of housing and flood hazard datasets for both publicly assisted and unassisted/affordable housing stock. This methodology was first developed through a J.P. Morgan Chase grant in 2018, when the Shimberg Center began to assess the impacts of coastal flood hazards on affordable housing across the state. The resulting FHEI was further developed and refined through a subsequent Chase grant with the Tampa Bay Regional Planning Council (TBRPC) and the "Resilience and Energy Analysis of Communities and Housing" (REACH) project.

These datasets can assist local governments in the East Central Florida region when conducting vulnerability assessments per the FDEP's statewide VA standards, which include affordable public housing.[10] Additionally, the FHEI dataset can be utilized to assess the geographic exposure to flood hazards for other features (such as critical assets, schools, other infrastructure, roadways, etc.) in other types of analyses.

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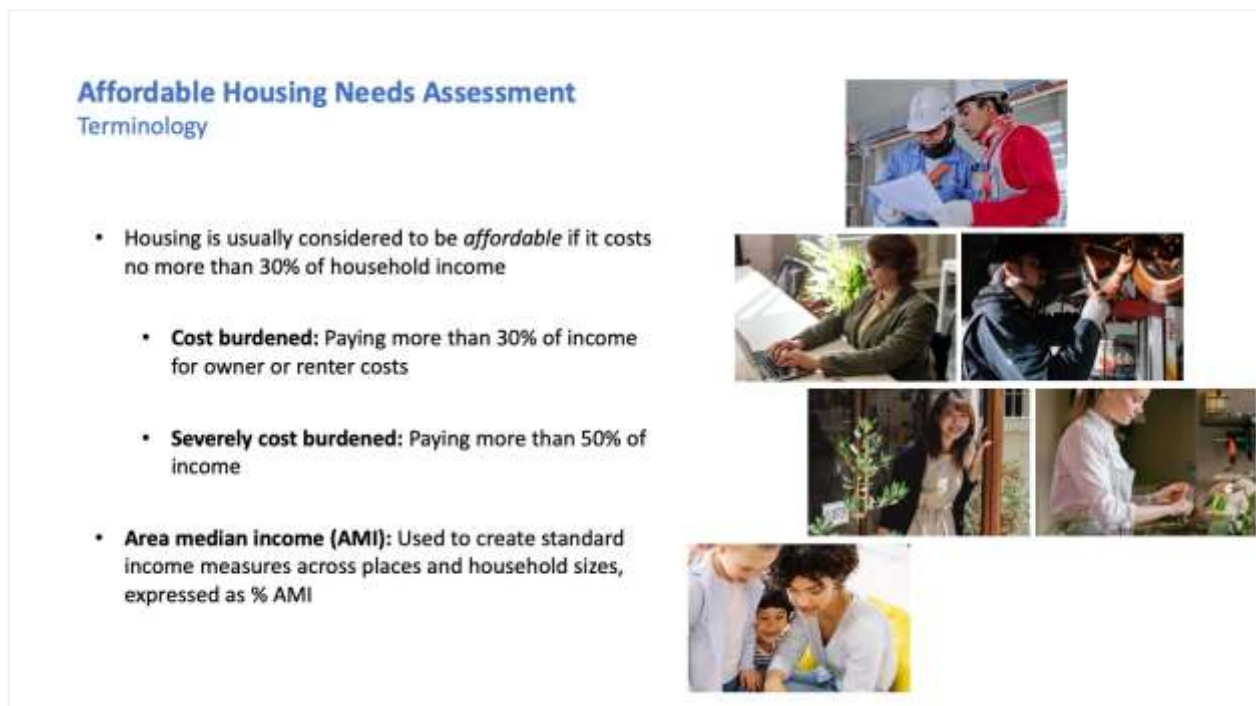
10 28 Fla. Stat. § 390.083 (2)(a)(2) (2021). Retrieved from: https://www.flsenate.gov/laws/statutes/2021/380.093

Terms and Definitions

How does this analysis define affordable housing?

Housing is generally considered to be **affordable** if it costs no more than 30% of a household's total income. (See Figure 4 for an overview of common terms and definitions.) Households spending more than this amount are referred to as "**cost burdened**." Households spending more than 50% of income are referred to as "**severely cost burdened**." For renters, housing costs include rent paid to landlords plus any tenant-paid utility costs. For owners, housing costs include mortgages, insurance, taxes, utilities, and condominium and mobile home fees.

Household income is often expressed as a percentage of **area median income (AMI)** for the purposes of targeting housing assistance and setting eligibility for affordable housing programs. The federal Department of Housing and Urban Development (HUD) publishes dollar amounts annually corresponding to the percentages of AMI, which are adjusted by metropolitan area or county and household size. Many housing subsidy programs target households at 50, 60, or 80% of AMI.

Affordable Housing Needs Assessment
Terminology

- Housing is usually considered to be *affordable* if it costs no more than 30% of household income

  - **Cost burdened:** Paying more than 30% of income for owner or renter costs

  - **Severely cost burdened:** Paying more than 50% of income

- **Area median income (AMI):** Used to create standard income measures across places and household sizes, expressed as % AMI

Figure 4. Common terms and definitions denoting affordable housing.

Affordable Housing Needs Assessment

The affordable housing needs assessment aims to show the current trends in housing prices, amount of housing cost-burdened homeowners and renters, as well as determine the scope of

need for more low-cost housing in the region. This information can then be used to characterize the critical role affordable housing plays in the region's overall housing market, as well as inform more resilient housing development and policy recommendations.

Regional Trends in Housing Prices

To start, the Shimberg Center looked at home prices over the last 20 years in the 6-county R2C region. As with other statewide and national trends, home prices in the region are beginning to reach levels last seen in the early housing boom years (2004-2005). Figure 5 illustrates the median price of a single-family home for the Orlando-Kissimmee MSA and the two other counties in the R2C region from 2001 to 2021, corrected for inflation. Prices in the region peaked in 2006, then fell throughout the early 2010s before beginning to rise again. In the first half of 2021, median home sale prices in the region ranged from $265,000 in Volusia County to $325,000 in the Orlando metro counties.
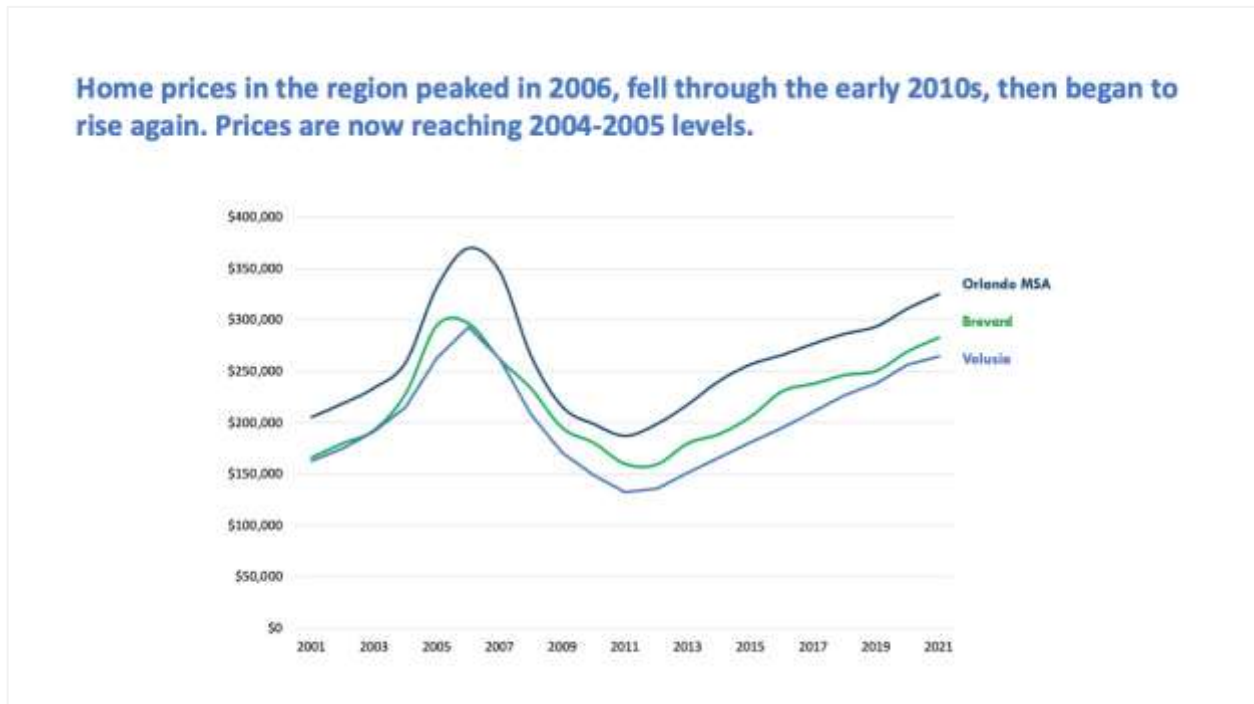
Figure 5. Median single family home sale prices from 2001-2021 by Metropolitan Statistical Area (MSA) and county within the R2C region (2021$). All values in 2021 dollars to correct for inflation. Source: Shimberg Center analysis of Florida Department of Revenue, Sales Data Files.

Household Income Ranges

Figure 6 lists current income limits by percentage of AMI for the R2C counties by household size. It also shows the hourly wages that correspond to the income limits, assuming a single earner working full-time (40 hours per week, 52 weeks per year). For example, in Volusia County, an employee in the 50% AMI bracket would earn between $11 and $16/hour, while an

employee in the 120% AMI income bracket would earn between $26 and $38/hour. As we will explore in the next section, households below 50% AMI make up the largest group of cost-burdened households.
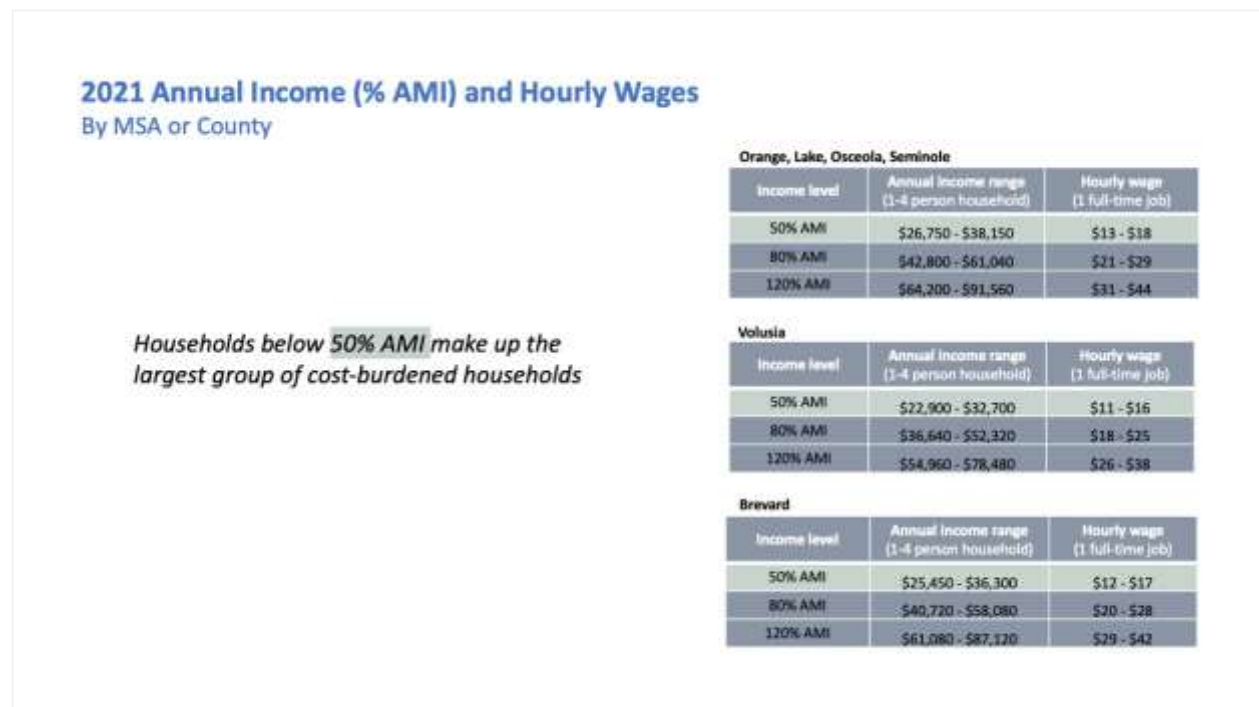
Figure 6. *Comparison of annual income and hourly wages by area median income brackets (50%, 80%, 120%) for the R2C counties. Source: Florida Housing Finance Corporation, 2021 Combined Income and Rent Limits by County.*

Housing Cost-Burden

Looking at cost-burdened households (those paying more than a third of household income towards housing costs) by tenure (homeowner vs. renter) and across income groups (0-50% AMI, 50-80% AMI, and 80+% AMI) was the next step. Out of over 1.4 million households in the 6-county region, 32% (~460,000) are cost burdened.

Findings indicated that renters are consistently more cost burdened across all income groups. For both types of tenure (homeowners and renters), those below 50% AMI have the largest proportion of cost-burdened households (see Figure 7). This means that, of the ~148,000 homeowners comprising this lower-income bracket, approximately 64% are cost-burdened. Of a similar number of renters in this income bracket (~150,000), the percentage of cost-burdened households rises to 84%.

Further, most renters at 50-80% AMI are also cost burdened; this equates to 75% of the region's ~107,000 renters in this income bracket. For comparison, 36% of the region's homeowners (~155,000) in this income bracket are cost burdened. Cost burden is less common among households with incomes above 80% of AMI.

Overall, renters have higher rates of cost-burdening at all income levels- 84%, 75%, and 17% (for 0-50%, 50-80%, and 80+% AMI, respectively). On the other hand, homeowners have cost-burden rates of 64%, 36%, and 10% (respectively).
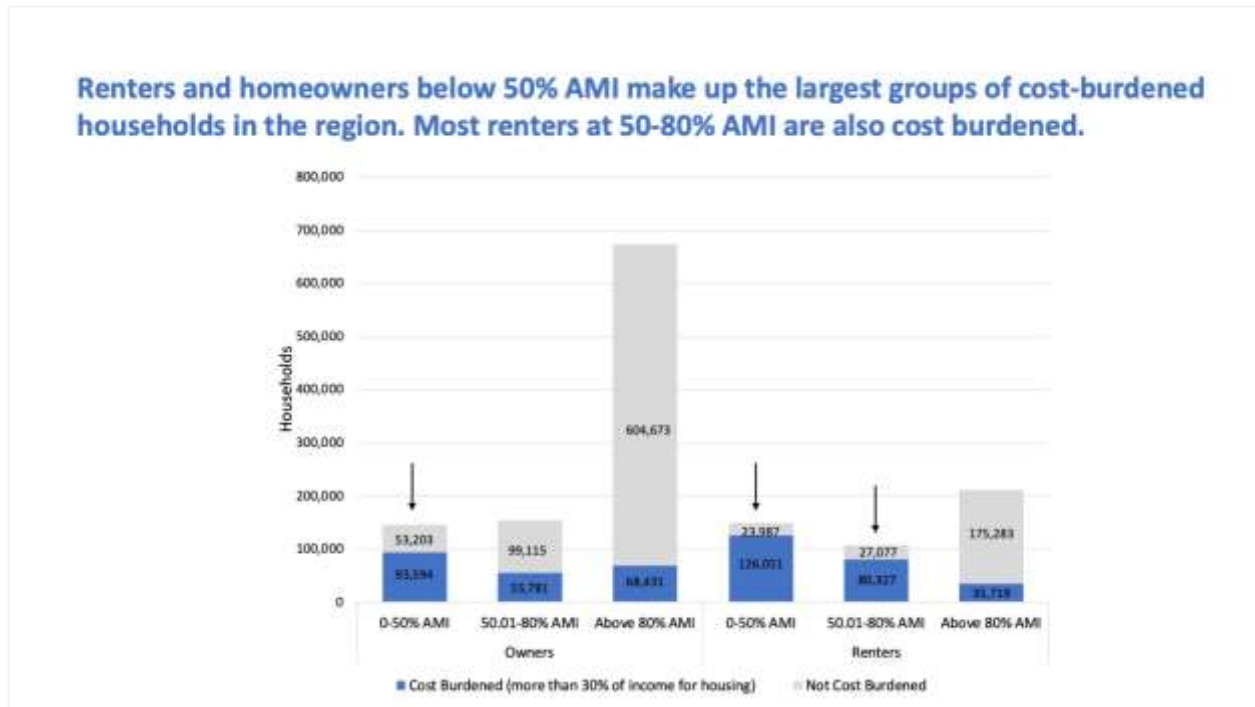
Figure 7. *Cost-burdened households by tenure and across area median income (AMI) brackets (2019) for the R2C region. (Sumter and Flagler Counties are also included due to data limitations; these counties make up just 7% of households.) Source: Shimberg Center analysis of U.S. Census Bureau, 2019 American Community Survey.*

Housing Costs versus Wages

Housing costs outpace wages for many jobs in the region. According to the National Low Income Housing Coalition, the Orlando metro area's "housing wage" was $25.40 per hour in 2021. This is the amount a full-time worker would need to earn to afford two-bedroom apartment at the HUD Fair Market Rent ($1,321 per month). The median wage for jobs in the metro area was $18.23 in 2021, meaning that half of jobs in the region pay well under the housing wage. As Figure 8 shows, discrepancies between the wages needed for housing and actual median wages persist across the region. For further context, the average rent for an "available" 1-bedroom apartment in Orlando is currently $1,818[11], which is even higher than HUD's estimation for the broader metro area.

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11 Apartment List. (2022). Average Rent in Orlando. Retrieved from: https://www.apartmentlist.com/renter-life/average-rent-in-orlando

Housing costs outpace wages for many occupations.
Housing Wage vs. Median Wage

- **Housing wage-** a full-time worker would need to earn this amount to rent a typical 2-bedroom apartment

- Discrepancy between "housing wage" needed and median wage:
    - **Orlando-Kissimmee MSA:** $25.40 housing wage, $18.03 median wage
    - **Brevard:** $21.81 housing wage, $18.38 median wage
    - **Volusia:** $20.19 housing wage, $16.81 median wage

Figure 8. The median wage for all counties does not meet the needed "housing wage" to enable a full-time worker to afford a standard 2-bedroom apartment. Sources: National Low Income Housing Coalition, Out of Reach; Florida Department of Economic Security, 2021 Occupational Employment Statistics and Wages.

Typical Service Wages and Affordable Rents

For workers in many service occupations across the region, an affordable rent level would fall below $1,000 per month. Figure 9 shows affordable monthly housing costs for common service occupations in the Orlando-Kissimmee MSA, assuming that a single full-time worker pays no more than 30% of income for housing. The selected occupations provide nearly 310,000 jobs for the region and are some of the more common ones in the area.

How much can workers afford to pay for housing, each month?
Wage Comparison by Occupation

Housing costs outpace wages for many occupations.

$500-649
- Childcare Workers
- Dishwashers
- Cashiers & Retail Salespersons
- Maids & Janitors
- Home Health & Personal Care Aides
- Food Preparation Workers
- Laundry & Dry-Cleaning Workers
- Preschool Teachers
- Security Guards

$650-799
- Nursing Assistants
- Hairdressers & Hairstylists
- Landscaping & Groundskeeping Workers
- Restaurant Cooks
- Receptionists
- Bus Drivers
- Medical Assistants
- Customer Service Reps
- Veterinary Techs
- Construction Laborers
- Office Clerks

$800-1,000
- Pharmacy Technicians
- EMTs & Paramedics
- Tellers
- Painters
- Secretaries & Administrative Assistants
- Light Truck Drivers
- Auto Mechanics
- Child, Family, & School Social Workers
- Dental Assistants
- Plumbers, Pipefitters, & Steamfitters

Figure 9. Affordable housing costs for various types of service work employees, which range from $500-$1,000/month. Based on median wage for jobs in the Orlando-Kissimmee Metropolitan Statistical Area. Assumes full-time worker, 30% of income spent on housing costs. Source: Florida Department of Economic Security, 2020 Occupational Employment Statistics and Wages.

Trends in Affordable Rental Property Supplies

The number of rental housing units in the region has grown substantially over the past almost 20 years. Over the last two decades, this boom in growth has increased the rental stock by 52%, however growth has occurred unevenly across higher cost versus more affordable dwellings. Figure 10 shows the 2000-2019 change in rental units above and below $1,000 per month for four counties: Brevard, Orange, Osceola, and Seminole. While these counties in the region added nearly 106,000 net rental units between 2000 and 2019, they actually lost units renting for less than $1,000 due to a combination of rent increases and higher-end construction. In total, these counties added 126,083 units above $1,000 but lost 20,343 units renting for $1,000 or less (in 2019 dollars).[12]

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12 Volusia and Lake Counties could not be included due to limitations in the American Community Survey PUMS data. However, the increase in higher cost units and decline in lower cost units is a statewide trend that likely applies to these counties as well.

Counties in the region added nearly 125,000 rental units between 2000 and 2019 but lost units renting for $1,000 or less.

- **The region added 124,665 rental units** between 2000 and 2019, which is about 52.4% growth over the last almost 20 years.
- However, the **vast majority were higher priced** units that rent $1,000 or more
  - $1,000+ units grew by almost 139,000
  - Units at or below $1,000 slightly fell by more than 14,000
- Data for partial region: Volusia and Lake Counties not included due to PUMS data limitations
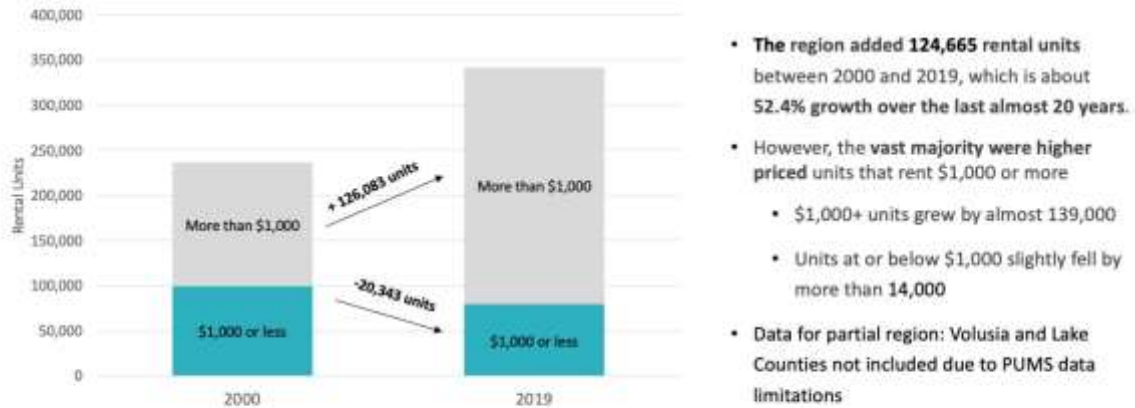
Figure 10. Units by gross rent above/below $1,000 (2019 $) for Brevard, Orange, Osceola, and Seminole Counties for 2000 and 2019. Source: Shimberg Center tabulation of U.S. Census Bureau, 2000 Census and 2019 American Community Survey.

Key Takeaways from the Affordable Housing Needs Assessment

The affordable housing needs assessment reveals that the R2C region is following similar trends across the state and nation that are exacerbating affordable housing challenges.

- Home prices are rising across the region and approaching levels seen during the 2004-2005 "housing boom."
- The majority of low-income households (0%-50% AMI), 64% of owners and 84% of renters, are paying more than they should for housing.
- Renters face particularly acute challenges with 84% of renters at or below half of the area median income paying too much, as well as 75% of renters at 50-80% AMI.
- Wages across many service industries are not keeping up with the increased costs of (rental) housing; none of the counties' median wage met a true "housing wage."
- While rental housing has increased over the past two decades in the region, the stock of affordable units ($1,000 or less) has decreased.

Therefore, all R2C counties need to prioritize planning, policy, and investment in their affordable housing stock.

- There is a critical need to protect, preserve, and keep in good maintenance existing affordable housing supplies.

- There is also a need to expand the stock of rental housing, especially for 0%-80% AMI households, which equates to more units renting between $500-1,000.
- Housing affordability should be supported by local county and municipal actions, including locally tailored approaches, such as:
    - The Central Florida Regional Affordable Housing Initiative, a collaboration between Orange, Seminole and Osceola Counties and the City of Orlando to develop a broader affordable housing strategy.[13]
    - Orange County's Housing for All Action Plan (2019), which "remov[es] regulatory barriers, creat[es] new financial resources, target[es] areas of access and opportunity, as well as engag[es] the community and industry."[14]
    - Orange County's new Affordable Housing Trust Fund (2020), which incentivize[s] the construction and preservation of affordable and attainable housing, encourage[s] Missing Middle housing types, and meet other[s] housing needs identified by the 10-Year Action Plan."[15]

Affordable Housing Supply Assessment

The affordable housing supply assessment was comprised of a geospatial inventory of affordable housing stock within the six-county members of the R2C collaborative (Volusia, Brevard, Orange, Osceola, Lake, and Seminole County). Affordable housing stock includes: **1) publicly subsidized housing (AHI)**, **2) affordable, market-rate "naturally occurring affordable housing"** (NOAH), and 3**) mobile homes**. The differences between and data sources for these housing categories are described below (also see Table 2 below).

What is Publicly Subsidized Housing?

Publicly subsidized or "assisted housing" is *multifamily rental housing stock* that receives federal, state, or local funding to provide units to households at lower prices than available at market rates. The Assisted Housing Inventory (AHI) is a database assembled and maintained by the UF Shimberg Center for Housing Studies which catalogues publicly supported rental housing in Florida. Housing subsidies include traditional public housing and properties subsidized by the U.S. Department of Housing and Urban Development (HUD), U.S. Department of Agriculture

13 Orange County, City of Orlando, Seminole County, and Osceola County. (2018). Regional Affordable Housing Initiative: Executive Summary Report. Retrieved from:
https://www.orangecountyfl.net/Portals/0/Library/Board%20of%20County%20Commissioners/docs/Regional%20Affordable%20Housing%20Executive%20Summary%20Report%2005-2018-Final_web-Cert-CERT.pdf
14 Orange County. (2019). Housing for All Action Plan. Retrieved from:
https://www.orangecountyfl.net/NeighborsHousing/HousingForAll.aspx#.YoLUspPMIqs
15 Orange County. (2020). Affordable Housing Trust Fund Plan (FY 2020-2022). Retrieved from:
https://www.orangecountyfl.net/Portals/0/Resource%20Library/neighbors%20-%20housing/AffordableHousingTrustFundPlan-CERT.pdf

Rural Development (RD), HUD multifamily programs, Florida Housing Finance Corporation (Florida Housing), and other local housing finance authorities (LHFAs). In exchange for subsidies, property owners provide affordable (i.e., assisted) units with limits on tenant incomes and rents[16]. Assisted housing tends to include mostly multifamily buildings; however, some single-family homes are included in the stock as well.

While publicly assisted housing is a relatively smaller portion of the overall affordable housing stock, it plays a particularly critical role especially for the most vulnerable households.

HUD properties are more deeply subsidized than Florida Housing properties and serve a lower income community. In addition, while there is an ongoing construction of new Florida Housing units, there are generally no new HUD properties being built in the state. This means, that once HUD properties are lost due to subsidy expiration (or storm damage), they are typically not replaced. For example, Table 1 illustrates the housing program information for publicly subsidized units in the region. Please note, as units are typically subsidized by multiple funding sources, figures include duplicated counts where some Florida Housing properties have HUD assistance, some public housing has Florida Housing funding, etc. (Information is not available for the LHFA-only properties.)

	Florida Housing	HUD Multifamily	Public Housing	RD
Average Gross Rent	$868	$292	$402	NA
Average Household Income	$26,799	$12,537	$17,556	$18,962
Average Household Income (% AMI)	39%	23%	28%	33%
% Elderly Households (62+)	22%	54%	33%	42%

Table 1. Average gross rent, household income, % AMI and % elderly for assisted units by funding source for the R2C region. Source: Shimberg Center Assisted Housing Inventory (AHI).

What is Naturally Occurring Affordable Housing?

Affordable market-rate housing, also called "naturally occurring affordable housing" (NOAH) is *rental housing stock that is affordable but not due to public subsidies*. It may be more affordable due to its age, condition, location, or other features. NOAH includes multi-family, single-family, and condominiums. There are various methods that can be used to determine NOAH properties, and the Shimberg Center assessment conducted an exploratory analysis to determine NOAH on a parcel-by-parcel basis. Factors to identify NOAH include:

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16 Shimberg Center for Housing Studies. (2022). Assisted Housing Inventory User Guide. Florida Housing Data Clearinghouse. Retrieved from: http://flhousingdata.shimberg.ufl.edu/AHI-user-guide

- Residential land use (property appraiser)
- Non-subsidized, market-rate properties (excluded from AHI dataset)
- Single-family, multi-family, and condos (property appraiser)
- Rental properties (no homeowner exemption, property appraiser)
- Affordable rent threshold for the area = approximately 30% of the median renter income (5-year American Community Survey data))
- Also identified based on building, spatial, and socio-economic characteristics (property appraiser and 5-year American Community Survey data)

Mobile Homes as Affordable Housing- Where Are They Located?

Mobile homes are often considered to be in their own affordable housing classification, posing unique opportunities and challenges. Mobile homes provide an important source of affordable accommodations; however, they may be more vulnerable to storm impacts and flooding than single-family or multifamily homes due to their construction. Mobile homes are a relatively understudied housing type due to the lack of accessible and standardized data. However, sources of mobile home information are collected in two ways:

- **Individual mobile home parcels-** Includes parcels where both the land/mobile home are owned by an individual; land use codes from the property appraiser are used to identify these parcels. For mobile home stock estimations, we assume that one parcel includes one residential unit.
- **Mobile home parks-** Includes parcels where the land is owned by an individual or corporate entity and the mobile homes may be owned or rented by different tenants. Land use codes from the property appraiser are used to identify these park parcels, and mobile home lot counts are available from the Florida Department of Business and Professional Regulation (FDBPR), which includes only parks licensed by the FDBPR. For stock estimations, we assume that the lot count equals the number of residential units located in the park.

This study includes both individual mobile home parcels and parks to the extent possible. Additionally, the mobile home parcels include <u>both</u> owner-occupied mobile homes as well as rental mobile homes, unlike AHI and NOAH, which are defined to <u>only</u> include rental properties.

Residential Housing Supply Data Sources

Data Layers + Notes	Source	Housing Type
Statewide Parcel Data (based on FDOR county and municipal property tax data)	UF GeoPlan, Florida Geospatial Data Library, Florida Department of Revenue (FDOR), 2019; UF Shimberg Center Parcel Database	All Residential, AHI, NOAH, Mobile Homes

Assisted Housing Inventory	UF Shimberg Center for Housing Studies, Florida Housing Data Clearinghouse, 2021	AHI
Median Income and Rent Threshold (MSA)	U.S. Census Bureau, American Community Survey (ACS), 2015-2019	NOAH
General Transit Feed Specification (GTFS)	Florida Department of Transportation (FDOT), 2019-2021 (may vary)	NOAH
Mobile Home Parks (licensed by FDBPR)	Florida Department of Business and Professional Regulation (FDBPR), 2021	Mobile Homes

Table 2. Data layers and sources for the residential housing related data used in the R2C region's affordable housing supply assessment.

Regional Affordable Housing Supply Results

In total, there are 1,225,589 residential parcels across the six-county R2C region based on the Florida Department of Revenue (DOR) property appraiser information (2019). Since some contain multifamily developments with more than one dwelling unit, this equates to 1,524,990 total residential units comprised of:

- Single family
- Multi-family- 10 units or more
- Multi-family- fewer than 10 units
- Mobile homes
- Condominiums

However, while also available in the residential parcel data, the following are not included in the 1.5 million residential unit tally:

- Vacant residential
- Other nuanced residential land use types (retirement homes, cooperatives, etc.)
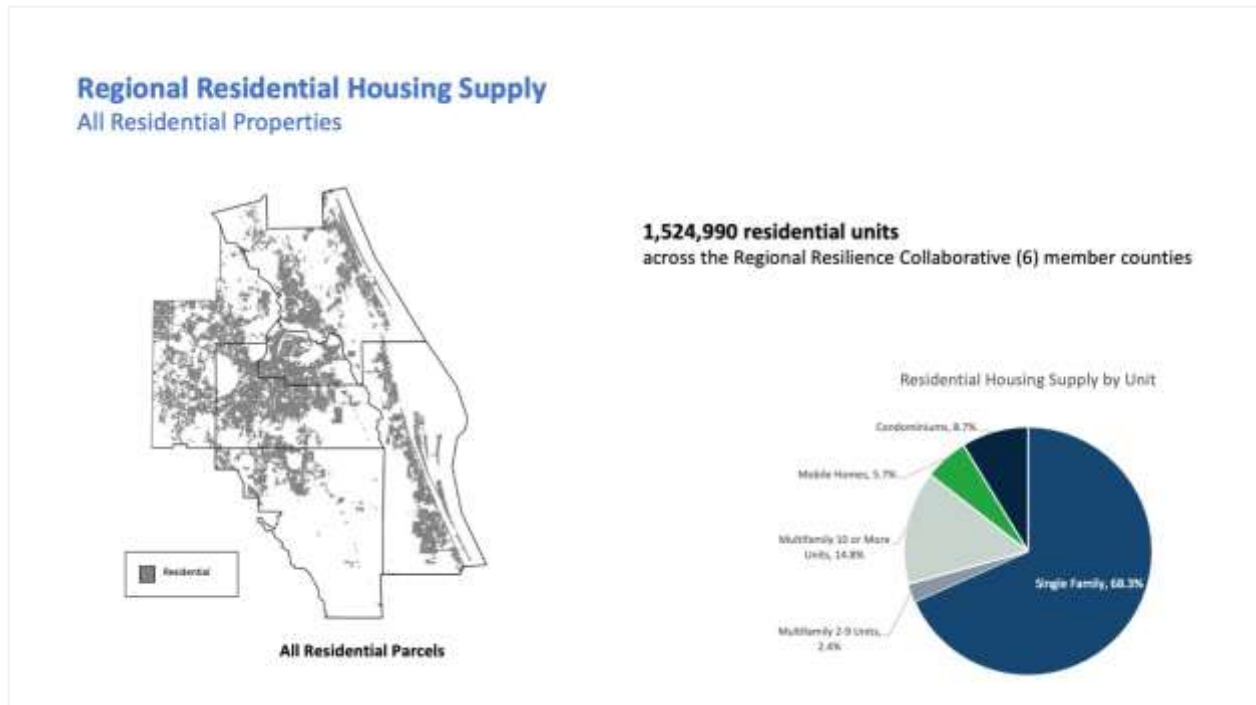
Figure 11. *Residential housing stock. Source: Shimberg Center tabulation of Florida Department of Revenue (FDOR) property appraiser data (2019).*

The study identified **182,700 affordable housing properties out of 1,225,600 residential properties overall, which is about 15% of the residential stock**. Breaking down the affordable housing stock into three primary classifications (AHI, NOAH, and mobile homes)[17], Table 3 shows for the region that:

- **Publicly subsidized properties** (AHI) comprise less than 1% of the affordable housing properties
- **Affordable market-rate properties** (NOAH) comprise the largest portion of the affordable housing properties (74%)
- **Mobile home properties** (including individually owned parcel and park parcels) comprise just over a quarter of the affordable housing properties (26%)

Figure 12 shows the percentages of housing types comprising the affordable housing stock:

- **Seminole County** has proportionately the most NOAH (90%)
- **Lake County** has proportionately the most mobile homes (52%)
- **Orange County** has proportionately the most AHI (0.4%)
- **Volusia County** has a 75% / 25% split between NOAH and mobile homes

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[17] The statistics do not include approximately 3,047 (~2.3%) of NOAH properties that fell outside of the single-family, multifamily, and condominium classifications. These more specific residential properties include retirement homes, cooperatives, etc.

- **Brevard/Osceola Counties** have close to a 70% / 30% split between NOAH and mobile homes

	Brevard (%, Total Properties)	Lake (%, Total Properties)	Orange (%, Total Properties)	Osceola (%, Total Properties)	Seminole (%, Total Properties)	Volusia (%, Total Properties)	Region (%, Total Properties)
Affordable Housing Properties, by County and Region							
AHI	0.1% (59)	0.2% (69)	0.4% (195)	0.3% (47)	2% (40)	0.2% (71)	0.3% (481)
NOAH	72% (29,320)	48% (15,136)	89% (41,373)	69% (12,081)	90% (15,350)	75% (22,009)	74% (135,269)
MH	28% (11,333)	52% (16,282)	10% (4,832)	31% (5,472)	10% (1,742)	25% (7,312)	26% (46,973)
Total	40,712	31,487	46,400	17,600	17,132	29,392	182,723

Table 3. Summary of affordable housing stock including AHI, NOAH, and mobile home properties by total counts of properties and % stock for the six counties and region.

Figure 12. Summary of affordable housing stock including AHI, NOAH, and mobile home properties.

Publicly Subsidized Housing

There are **~57,200 publicly subsidized housing units (AHI)** across the R2C's six member counties as determined from Florida's Assisted Housing Inventory (AHI). These include multifamily properties subsidized by federal, state, or local government.

These units are located on 481 residential parcels across the region, including properties containing smaller (2-9 unit) multifamily properties and larger (10+ unit) properties. (See Figure 13.)
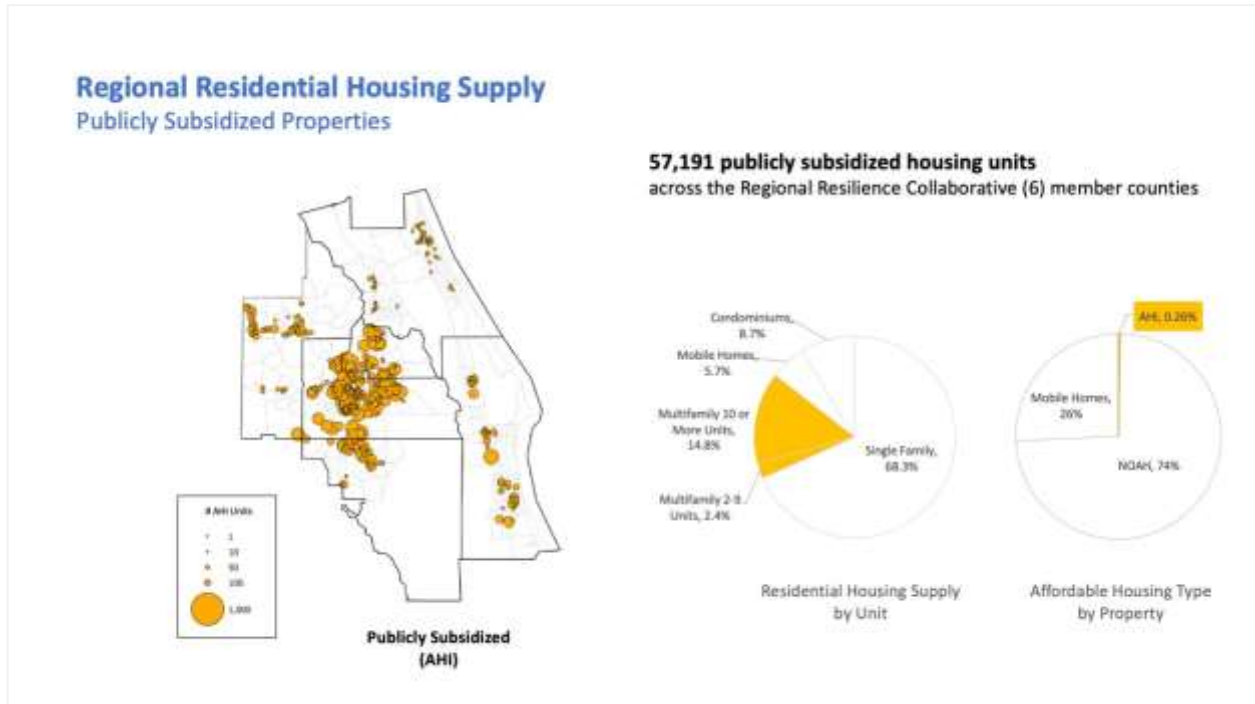
Figure 13. Assisted housing stock. Source: Shimberg Center Assisted Housing Inventory (AHI) and tabulation of Florida Department of Revenue (FDOR) property appraiser data (2019).

Figure 14 illustrates that Orange County has the highest number of AHI by properties (195) and units (~28,200); the county is followed by Volusia (~7,300 units), Osceola (~6,500 units), and Seminole (~6,100 units).

Regional Residential Housing Supply
Publicly Subsidized Properties
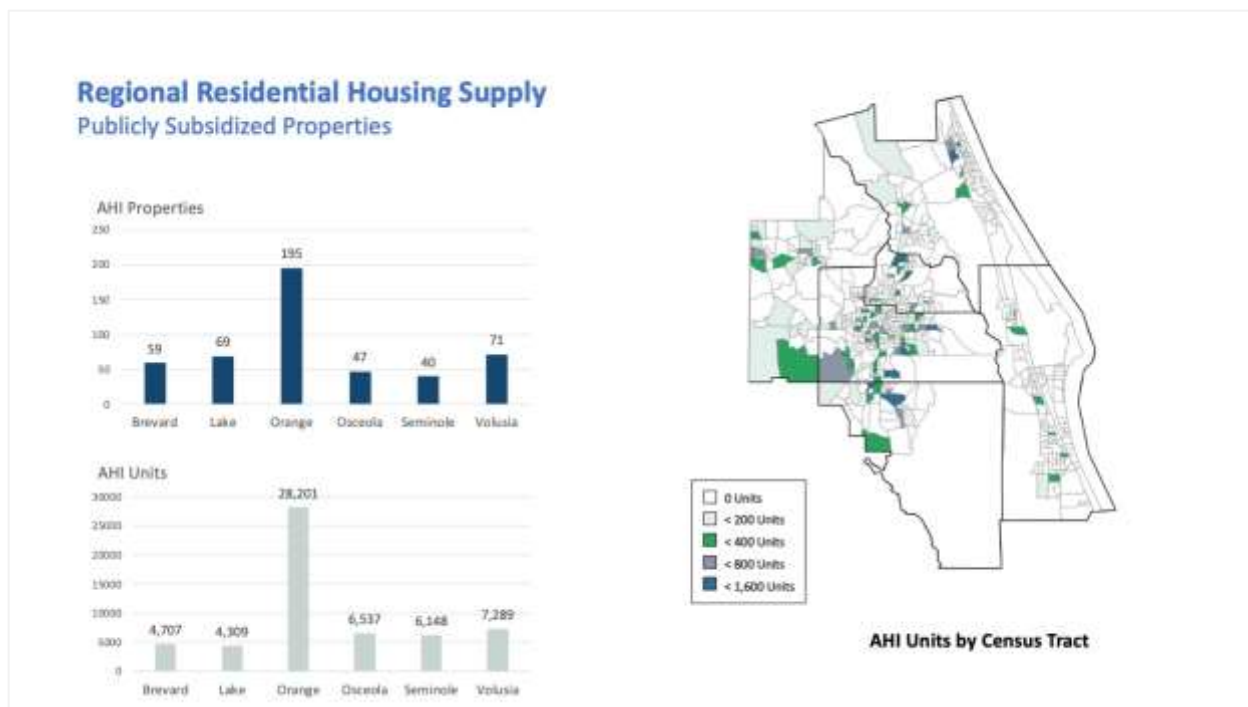
Figure 14. Assisted housing stock by county and Census tract. Source: Shimberg Center Assisted Housing Inventory (AHI) and tabulation of Florida Department of Revenue (FDOR) property appraiser data (2019).

In the context of the affordable stock overall, publicly subsidized *properties* comprise a smaller share in all counties. For example, Orange County, AHI properties are 0.4% of the affordable stock, Osceola (0.3%), Lake/Seminole/Volusia (0.2%) and Brevard (0.1%). As noted above, while comprising a smaller portion of the affordable housing property stock, AHI properties play a particularly critical role especially for the most vulnerable households.

It is important to note that the comparison between AHI and other NOAH/mobile home parcels are not fully comparable in this analysis because they differ in both scale and tenure. AHI are large multifamily properties, typically housing well over 100 families each on average, and are all rental. NOAH properties are mostly 1/100 the size in terms of units, and include an unknown number of non-rental units. Mobile home parcels and lots are also 1/100 the size, and are a mix of owner and rental. (Future work will include a comparison of affordable housing by units.)

Assisted housing is subsidized most frequently by state and local sources including the Florida Housing Finance Corporation (Florida Housing) and Local Housing Finance Authorities (FHFAs). Assisted housing properties commonly receive public subsidies from multiple funding sources and thus the chart in Figure 15 includes units tallied under multiple programs. For example, Florida Housing funds at least in part 81% of subsidized units; LHFAs fund, in part, 27% of subsidized units.

While federal subsidies through HUD multifamily, HUD Public Housing, and USDA Rural Development have lower counts, they play a critical role in communities, especially for very low

income and elderly households, persons with disabilities, and other more vulnerable populations.

Assisted Housing Units by Funding Source
Including federal, state, local subsidy sources; units typically include more than one source
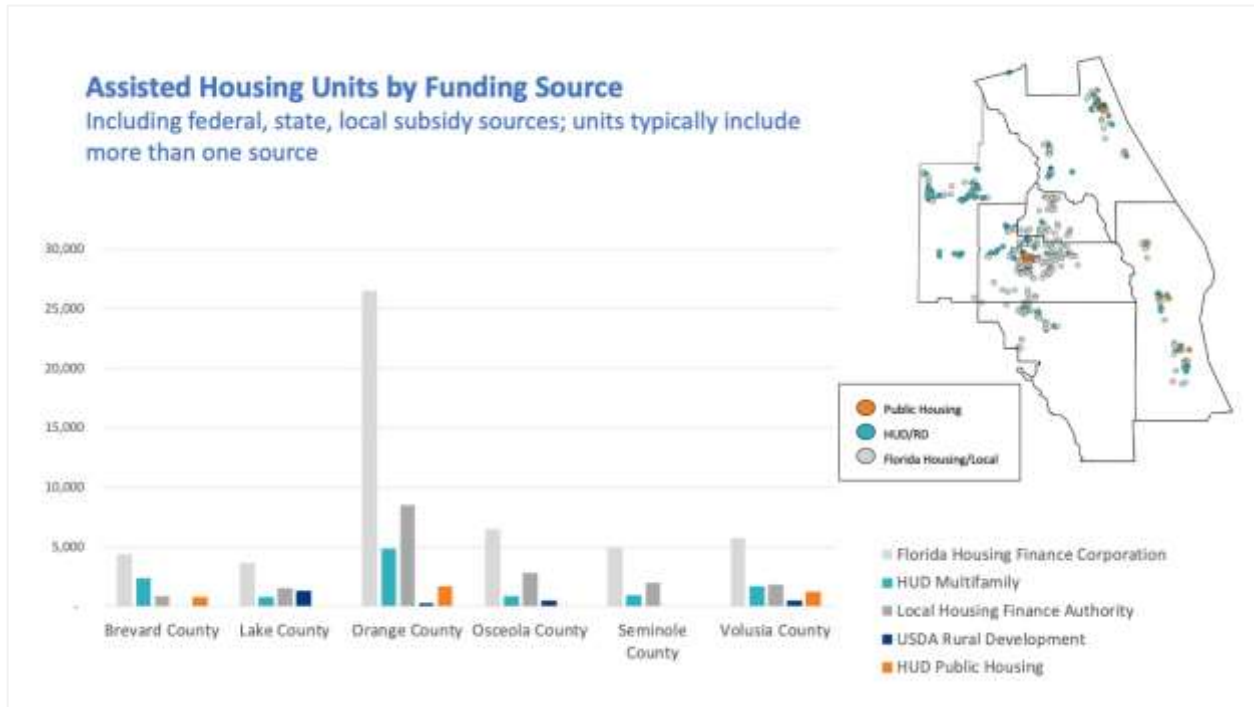
Figure 15. Assisted housing units by funding source. Source: Shimberg Center Assisted Housing Inventory (AHI).

Affordable, Market-Rate Housing

There are **~135,300 "naturally occurring affordable housing" (NOAH) rental properties** across the R2C's six member counties. Across the region, NOAH properties make up the largest share of affordable housing stock for all counties: Seminole (90%), Orange (89%), Volusia (75%), Brevard (72%), Osceola (69%), and Lake (48%). (Recall Figure 12 and Table 2 above.)

Within the NOAH stock, single family homes and condominiums make up the majority of properties at almost 51% and 41%, respectively. Multifamily properties comprise 8% of the NOAH, see Figure 16.[18] As mentioned above, because the analysis considered NOAH at the property level (versus unit), the higher counts of multifamily units within these properties (versus either single-family or condominiums) is not captured. Therefore, the scale of multifamily housing in the affordable housing stock is likely underrepresented.

Further, while these statistics provide a preliminary estimation of affordable market-rate properties, the identification of NOAH condominiums should be regarded with caution. Condominiums are often utilized for seasonal residences, short-term rentals, vacation

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[18] Note that these statistics do not capture approximately 3,047 (~2.3%) of NOAH properties that fell outside of the single-family, multifamily, and condominium classifications. These more specific residential properties include retirement homes, cooperatives, etc.

properties, etc., and likely do not contribute to a source of affordable longer-term, stable rental housing for local households. Due to time constraints of the analysis, teasing out a more accurate identification of NOAH condominiums was not possible, however, this may be explored in future research.
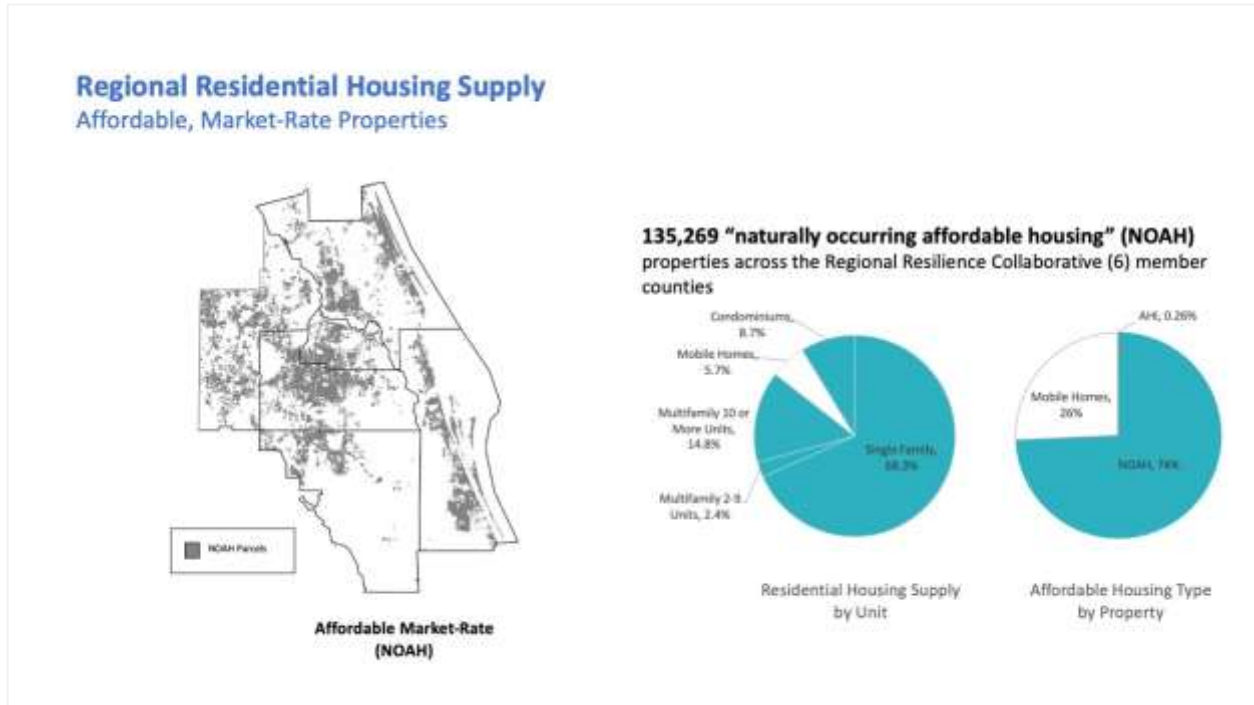
Figure 16. *Affordable, market-rate properties include single-family, multifamily, and condominiums. Source: Shimberg Center summarization of Florida Department of Revenue (FDOR) property appraiser data (2019).*

Affordable market-rate properties are distributed in clusters across the region with higher overall counts in Orange, Brevard, and Volusia County. The proportion of single-family properties, multifamily properties, and condominiums within the NOAH stock varies across the counties as well. (See Figure 17.) For example, higher proportions of single-family properties are located in Lake (79% of NOAH) and Volusia (54%); while higher proportions of condominiums are located in Osceola/Lake (49% of NOAH), Brevard (47%), Orange (43%), and Volusia (38%).

Lastly, in terms of multifamily properties, these comprise 9% of the NOAH in Lake, 8% in Orange/Volusia, 7% Brevard, and 6% in Osceola and Seminole. While these percentages are lower, multifamily properties are important because it is expected that they make up a more significant proportion of NOAH units; however specific unit data was not available at the time of the report's publication.
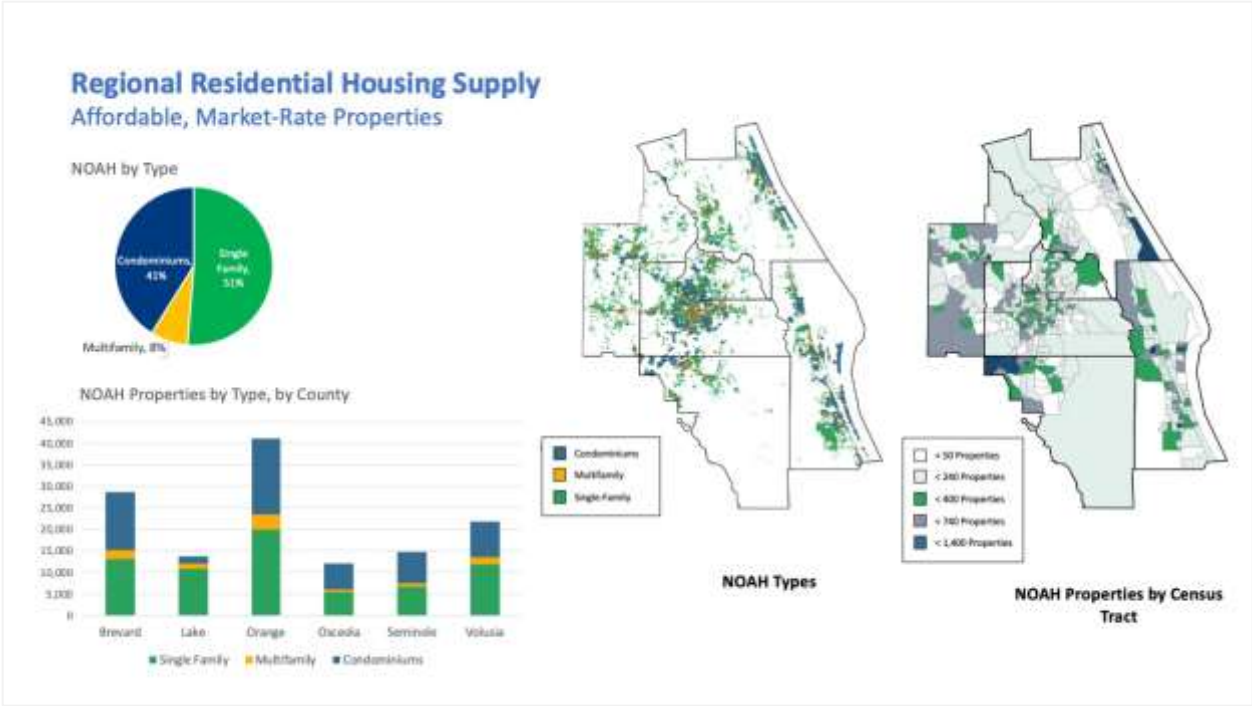
Figure 17. *Affordable, market-rate properties by county and Census tract. Source: Shimberg Center summarization of Florida Department of Revenue (FDOR) property appraiser data (2019).*

Mobile Homes

There are **~115,500 mobile homes (in individual parcels and park lots)** across the R2C's six member counties, see Figure 18. Of these, approximately 68,940 (59%) are lots in mobile home parks, and 46,870 (41%) are mobile homes on individual land parcels. Interestingly, the region has more mobile homes in aggregate in parks than on individually owned parcels of land.
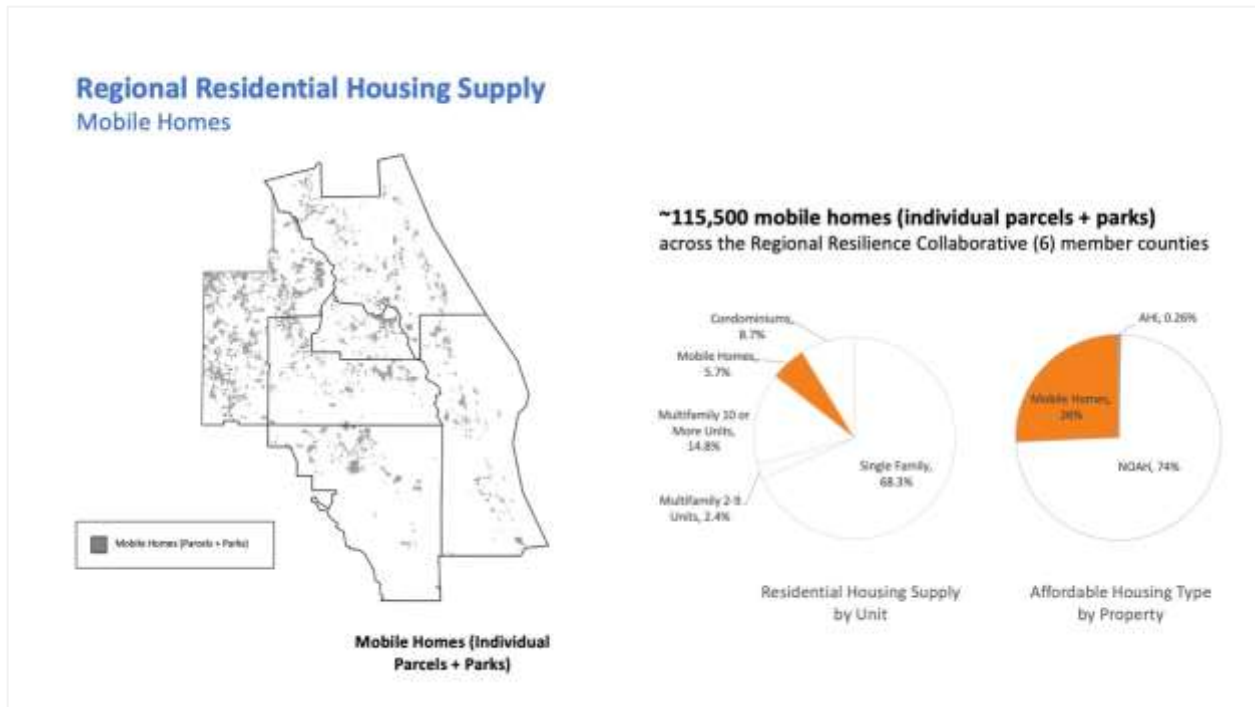
Figure 18. *Mobile home stock including individual parcels and park parcels. Source: Shimberg Center summarization of Florida Department of Revenue (FDOR) property appraiser data (2019) and Florida Department of Business and Professional Regulation (FDBPR).*

Mobile homes are often located in more rural areas, with the highest counts (including both individual parcels and total lots in parks) in Lake (~28,600), Volusia (~25,100), and Brevard Counties (~20,700), see Figure 19. While there are fewer mobile home park parcels than individually owned parcels, there are high numbers of lots within the parks. For example, lots in mobile home parks account for the majority of mobile homes in Orange (74%), Volusia/Seminole (71%), Osceola (55%), and Lake (52%). Due to the aggregation of mobile homes within parks, these areas may be potential "hot spots" for storm damage.
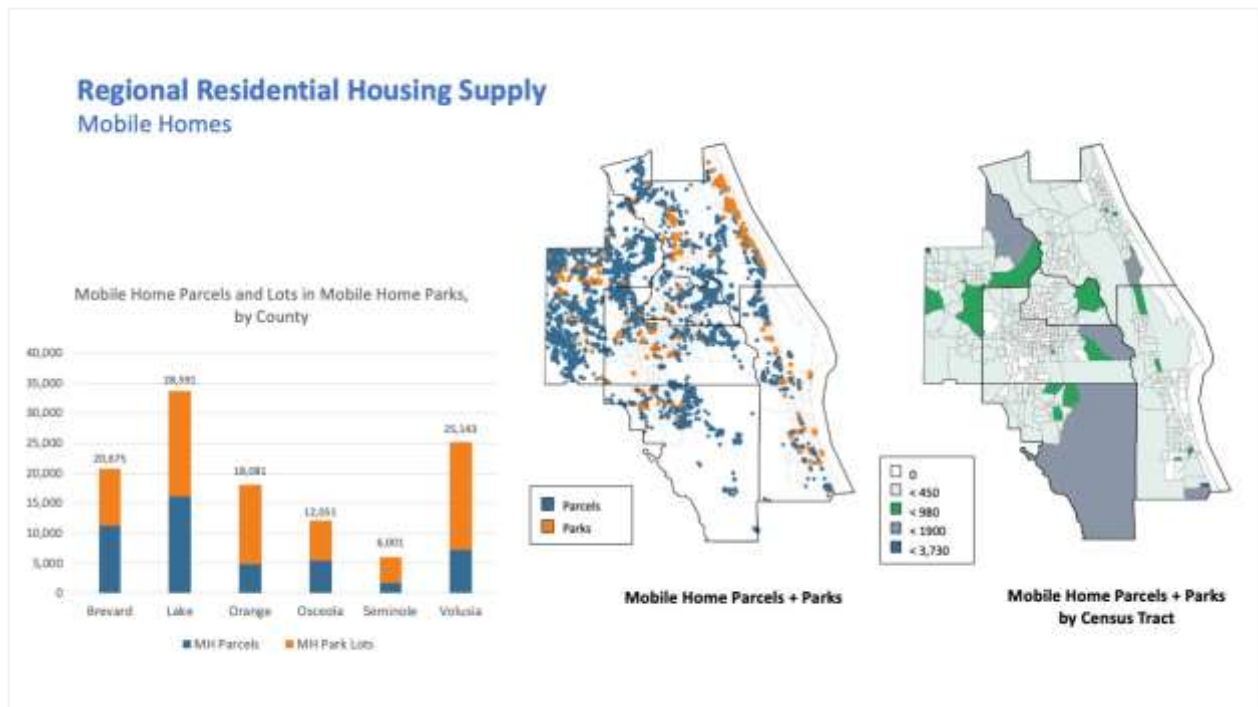
Figure 19. *Mobile home stock including individual parcels and park parcels. Source: Shimberg Center summarization of Florida Department of Revenue (FDOR) property appraiser data (2019) and Florida Department of Business and Professional Regulation (FDBPR).*

Figure 20 shows that most (83%) mobile homes on parcels in the region were built before 1999. These older homes are considered more vulnerable to storm impacts than those built from 2000 on. ***It should be noted that this estimation does not include counts of lots in parks (a significant portion of overall mobile home stock).*** Nonetheless, this information is useful to gain insight into the region's quality and potential resilience of mobile home stock. Lake County has the highest counts of mobile homes (both parcels and parks, see above) and the highest percentage of mobile homes built prior to 1999 (85%). Brevard and Volusia Counties also have a proportionately large number of mobile homes and 83/84% are built prior to 1999. Seminole also has 83%, while Orange has 78%, and Osceola 76%.

Lastly, counts of mobile homes on individual parcels of land built prior to 1999 may possibly be reasonably extrapolated to mobile homes within parks as well; however, future research is needed to better understand this issue.
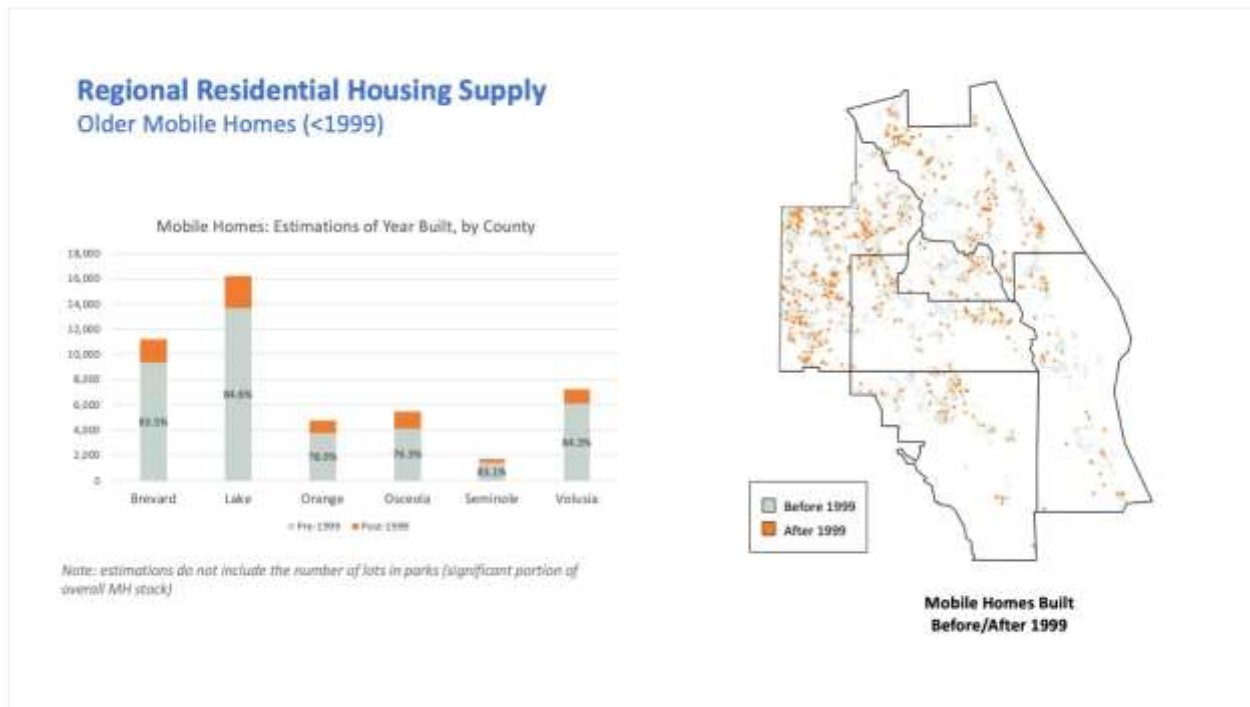
Figure 20. *Mobile home stock including individual parcels built before and after 1999. Source: Shimberg Center summarization of Florida Department of Revenue (FDOR) property appraiser data (2019) and Florida Department of Business and Professional Regulation (FDBPR).*

Mitigation Challenges and Opportunities

The distribution of affordable housing types across the region provides interesting challenges and opportunities in terms of flood risk reduction and other storm mitigation measures. Figure 21 illustrates how publicly subsidized multifamily housing is typically located in similar areas (Census tracts) as other affordable, market rate properties (multifamily, single-family, or condos). For example, clusters of AHI and NOAH could indicate areas for potential prioritization of:

- Tract-scale mitigation opportunities
- Investments in community development/ redevelopment initiatives

In these situations, local officials will need to address the challenges posed by finding cost-effective mitigation options to reduce storm and flood damage to multifamily buildings, which comprise the majority of the AHI units and NOAH units.

On the other hand, mobile homes and parks tend to be clustered in areas with an inverse relationship to publicly subsidized properties. This is likely the result of urban versus rural land development practices. Mobile homes are clustered in tracts that indicate potential for mitigation opportunities in rural areas. In these instances, challenges remain to effectively mitigate high counts of older mobile homes (<1999), which are a less resilient housing type.
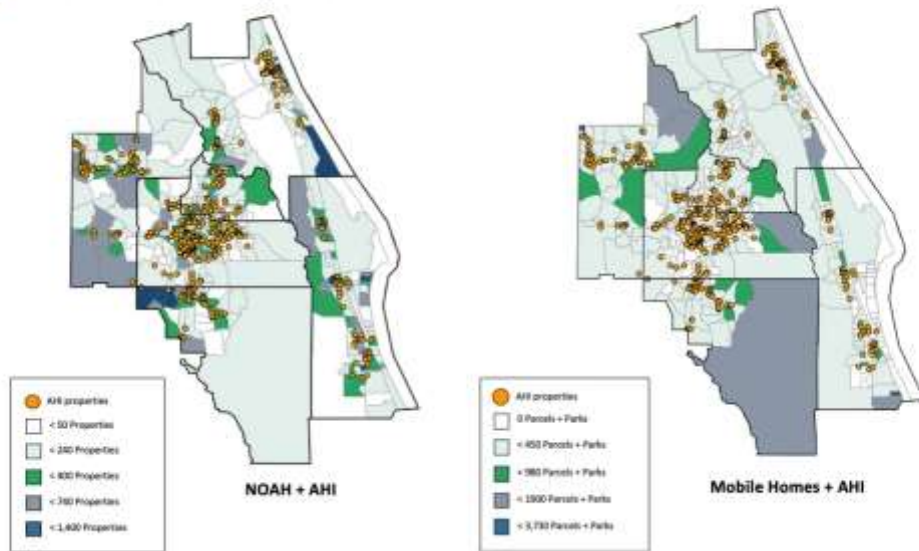
Figure 21. *Distribution of publicly subsidized properties versus affordable, market rate properties and mobile homes (including parcels and parks).*

Summary and Key Takeaways from the Affordable Housing Supply Assessment

In sum, the region has approximately 182,700 affordable housing properties out of 1,225,600 residential properties overall, which is about 15% of the residential property stock. Of the regional affordable property stock, the study shows that affordable, market-rate properties comprise the largest share across the region (75%), mobile homes (25%), and publicly subsidized properties are less than 1% of the property stock.

Overall, Orange (46,400), Brevard (40,700), Lake (31,500), and Volusia (29,400) Counties have higher counts of affordable housing properties in total, likely due to greater density of development/population within these counties. Osceola and Seminole have 17,600 and 17,100 affordable housing properties, respectively. (See Figure 22.)

The housing supply assessment illustrates the diverse range of housing types that comprise the affordable stock in the region. For example:

- **Seminole County** has proportionately the most NOAH properties within its affordable stock (90%)
- **Lake County** has proportionately the most mobile homes within its affordable stock (52%)
- **Orange County** has proportionately the most AHI properties within its affordable stock (0.4%)
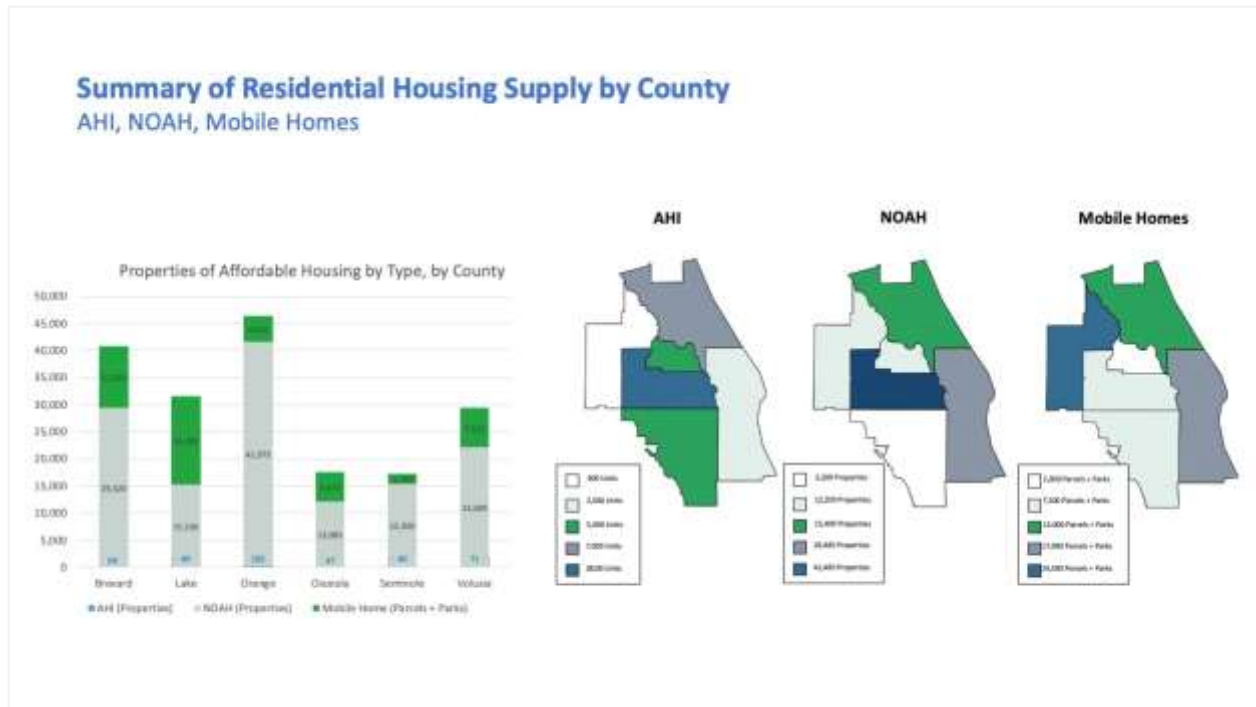
Figure 22. *Summary of affordable housing supply for the 6-county R2C region.*

In addition:

- **Publicly subsidized** properties comprise small shares of the affordable housing stock in all counties. For example, Orange County (0.4%), Osceola (0.3%), Lake/Seminole/Volusia (0.2%) and Brevard (0.1%).
  - While AHI properties comprise a smaller share of the affordable housing stock, these income restricted units are critical.
  - AHI are primarily multifamily properties and, as noted for NOAH, the scale of multifamily housing in the affordable housing stock is underrepresented when number of units (vs. properties) is not taken into consideration.
  - While more deeply subsidized properties (HUD multifamily, HUD Public Housing, and USDA Rural Development) are fewer still, they play an outsized role in communities, particularly for low income and elderly households, persons with disabilities, and other vulnerable populations.
- **NOAH properties** make up the largest share of affordable housing stock across almost all counties, except for Lake where mobile homes are the largest share of property stock. For example, Seminole (90%), Orange County (89%), Volusia (75%), Brevard (72%), Osceola (69%) and Lake (48%).
  - The scale of multifamily housing is likely underrepresented as the units within these properties (versus single-family and condominiums) are not captured.
  - NOAH condominiums may potentially be overestimated due to the inclusion of seasonal residences, short-term rentals, vacation properties, etc.

- **Mobile homes** (individual parcels and parks) play a proportionately more significant role in Lake (which has 29% of the region's mobile homes), followed by Volusia (22%), Brevard (18%), Orange (16%), Osceola (10%) and Seminole (5%) Counties.
  - o The mobile home stock may be overrepresented in this analysis as both owner-occupied mobile homes as well as rental mobile homes are included; unlike AHI and NOAH, which include only rental properties.
  - o Mobile home parks (lots) comprise the largest proportion of the mobile home stock (59%), which also pose risks from storm impacts as well as opportunities to prioritize mitigation actions.
  - o The region contains a majority (83%) of older mobile homes (built prior to 1999), which are considered to be more vulnerable to storm impacts.
  - o Because mobile homes tend to cluster in rural areas, it is important to consider how to make mobile homes more resilient and/or to explore alternative resilient housing solutions in rural communities.

Coastal Flood Hazard Exposure Assessment

The coastal flood hazard assessment is conducted for the region's two coastal counties- Volusia and Brevard Counties through the customization and application of the Flood Hazard Exposure Index (FHEI) to reflect the region's coastal flood hazard data and definitions. This section describes the process followed and results of the analysis.

Flood hazard data sources were obtained from the East Central Florida Regional Planning Council (ECFRPC). The sea level rise (SLR) estimate was based on the *East Central Florida Regional Resiliency Action Plan* (ECFRRAP) (2017), which includes a SLR curve estimation of 8.48 feet by 2100 (NOAA High, 2017). The report also provides suggested timesteps for analysis including 2040, 2070, and 2100. For more information about the ECFRRAP, see: http://ftp.ecfrpc.org/Projects/East%20Central%20Florida%20Regional%20Resiliency%20Action%20Plan.pdf

The flood hazard data was clipped to the East Central Florida regional boundary. Areas impacted by any given potential flood hazard were assigned a score (1), and a composite exposure value was calculated by summing the hazards into a Flood Hazard Exposure Index (FHEI), which ranged from Low (1-2 scores), Medium (3-4 score), and High (5-6 scores). Finally, the resulting scores and classifications were transferred to the housing datasets.

Flood Hazard Data

The flood hazards included in the analysis are below. See Figure 23 as well.

1. FEMA DFIRMS

- o 100-year Floodplain
- o 500-year Floodplain
- o Floodway
2. Storm Surge[19]
    - o High Frequency Storm Surge (Cat 1-3)
    - o Low Frequency Storm Surge (Cat 4-5)
3. King Tide
4. Sea Level Rise (NOAA High, 2017)
    - o 2040 SLR
    - o 2070 SLR
    - o 2100 SLR
5. Storm Surge + SLR (NOAA High, 2017)
    - o 2040 Storm Surge + SLR
    - o 2070 Storm Surge + SLR
    - o 2100 Storm Surge + SLR
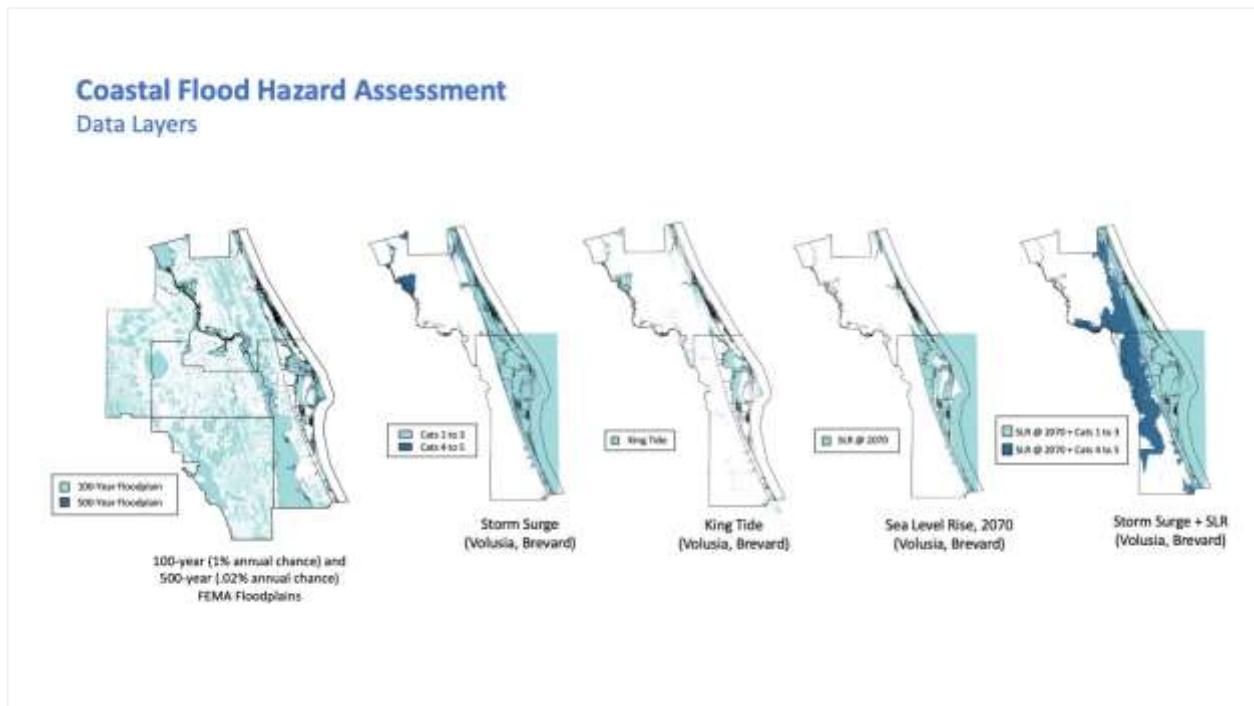
Figure 23. *Flood hazard datasets included in the Flood Hazard Exposure Index (FHEI) for Volusia and Brevard Counties.*

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19 It should be noted that the NOAA storm surge data are categorized into high and low frequency surge (Hurricane Categories 1-3 and 4-5 respectively). This categorization is based on the distribution of hurricane direct hits on the U.S. mainland coast (1851-2019). Hurricane Categories 1-3 accounted for more than 89% of the total, while Categories 4-5 accounted for the remaining 11%. https://www.aoml.noaa.gov/hrd-faq/#landfalls-by-state

Flood Hazard Mesh

For this analysis, a 1-acre hexagonal Flood Hazard Mesh (FHM) was created to provide flexibility in analysis and to enable the assignment of scores and FHEI categories to any feature layer of interest (e.g., critical assets, schools, other infrastructure, roadways, etc.). The cell size of the FHM is determined by examining the frequency distribution of parcel sizes within the R2C region. Since just over 88% of parcels are 1-acre or less in size, a 1-acre cell size was chosen.

A series of flood hazard feature layers were compiled (as described above) and sequentially intersected to the FHM. A *presence/absence model* was adapted for use in calculating a flood hazard exposure score. Thus, when a polygon was intersected by a hazard, it was assigned a value of 1. Polygons not intersected by hazards were assigned a value of 0. This calculation only took into consideration Volusia and Brevard counties.

Flood Hazard Exposure Index

Once all hazards were intersected with the mesh, a cumulative exposure index (FHEI) was calculated for each time period (2020, 2040, 2070, 2100). Final indexes were obtained by summing the exposure (presence/absence) scores of relevant hazards for each time period. At the end of this process, each polygon within the mesh had four final exposure indexes ranging from 0 to 5 (2020) and from 0 to 7 (2040, 2070, and 2100). See Table 4 for the hazards that composed each index:

Time Period	Hazards used to calculate exposure score
2020	1. 100-year Floodplain 2. 500-year Floodplain 3. King Tide 4. High Frequency Storm Surge (Cat 1-3) 5. Low Frequency Storm Surge (Cat 4-5)
2040	1. 100-year Floodplain 2. 500-year Floodplain 3. King Tide 4. 2040 SLR 5. High Frequency Storm Surge (Cat 1-3) + 2040 SLR 6. Low Frequency Storm Surge (Cat 4-5) + 2040 SLR
2070	1. 100-year Floodplain 2. 500-year Floodplain 3. King Tide 4. 2070 SLR 5. High Frequency Storm Surge (Cat 1-3) + 2070 SLR 6. Low Frequency Storm Surge (Cat 4-5) + 2070 SLR

2100	1. 100-year Floodplain
	2. 500-year Floodplain
	3. King Tide
	4. 2100 SLR
	5. High Frequency Storm Surge (Cat 1-3) + 2100 SLR
	6. Low Frequency Storm Surge (Cat 4-5) + 2100 SLR

Table 4. *Flood hazard layers comprising the Flood Hazard Exposure Index at 2020, 2040, 2070, and 2100.*

Lastly, a categorical score was created by classifying the FHEI into an equal interval distribution, represented as:

- **Low Exposure:** Index = 1 – 2
- **Medium Exposure:** Index = 3 – 4
- **High Exposure:** Index = 5 – 6

Once the FHEI was completed, the housing data were gathered, standardized, converted into points, and clipped to the R2C regional boundary. Housing data included Publicly Assisted Housing (AHI), Naturally Occurring Affordable Housing (NOAH), and Mobile Home layers. The FHM was spatially joined to each housing layer; this transferred the scores of all individual hazards, the final exposure indexes for each time period, as well as the categorical classifications (low, medium, high exposure) to the housing layers.

Inland Flood Hazard Exposure

Lastly, there was also an interest from the ECFRPC to integrate future inland flood hazards with coastal flood hazards in the region by incorporating standardized rainfall and duration of events for the region (an outcome from an ongoing statewide CDBG-MIT effort in conjunction with the SFWMD); but these data sets were not yet available within the timeframe of the study. However, to start the exploration of the potential exposure of affordable housing stock to inland flood hazards, the FEMA Digital Flood Insurance Rate Map (DFIRM) data were employed. Properties were assessed in the 100-year Floodplain, 500-year Floodplain, and Regulatory Floodway (see Figure 24). This assessment incorporated all 6 counties within the R2C Collaborative.
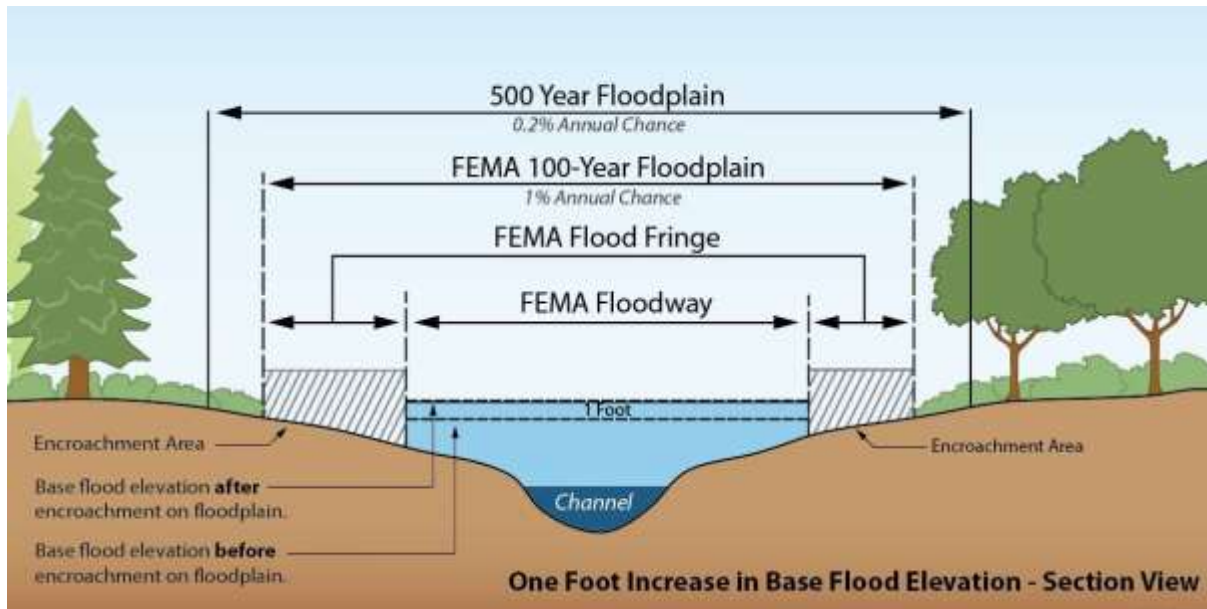
Figure 24. Diagram of the FEMA Floodway. Source: Pierce County, Washington.[20]

A **floodway** is the area surrounding the channel of a river or stream, which serves to contain waterflow as it moves downstream. The FEMA regulatory floodway is "the channel of a river or other watercourse and the adjacent land area that is reserved from encroachment in order to discharge the base flood without cumulatively increasing the water-surface elevation by more than a designated height …which is one foot for most communities,"[21] (FEMA, 2019, p2). Additionally, floodways "tend to include the most hazardous areas of the floodplain with the greatest depths and velocities of floodwaters and amount of debris," (FEMA, 2019, p.6).

Development in the floodway is restricted as it has the potential to impede waterflow, increase the height of floodwaters, and create more flood damages to upstream communities. Since the mid-1970s and creation of FEMA FIRMS, communities that participate in the National Flood Insurance Program (NFIP) have been required to prohibit any development causing a rise in the Base Flood Elevation (BFE). However, the floodway may contain structures built prior to the mid-1970s, which face heightened risk of flooding if not resiliently built to withstand these conditions.

The **100-year floodplain**, or the 1-percent annual chance flood, is defined as "the area that will be inundated by the flood event having a 1% chance of being equaled or exceeded in any given year," (FEMA, 2020). This is also referred to as the Special Flood Hazard Area (SFHA), in which any development must be made reasonably safe and minimize flood damage. In terms of residential properties, the lowest floor must be at or above the BFE (in Zone A), or the bottom

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20 Pierce County, Washington. (n.d.). FEMA Floodway. Retrieved from: https://www.piercecountywa.gov/7215/FEMA-Floodway
21 Federal Emergency Management Agency. (2019). "Guidance for Flood Risk Analysis and Mapping: Floodway Analysis and Mapping." Guidance Document 79. Retrieved from: https://www.fema.gov/sites/default/files/2020-02/FloodwayAnalysis_and_Mapping_Nov_2019.pdf

of the lowest horizontal structural member of the lowest floor must be at or above the BFE (in Zone V)[22]. Similar as above, the 100-year floodplain may contain older structures that, if not resiliently built, are at higher risk to flood hazards.

The **500-year floodplain**, or the 0.2-percent-annual-chance flood, is an area of a minimal flood hazard, and that will be inundated by the flood event having a 0.2% chance of being equaled or exceeded in any given year. Some consider the 500-year floodplain to be a rough estimate of the "future" 100-year floodplain.[23]

Coastal Flood Hazard Assessment Results

Flood Hazard Exposure Index

Figure 25 illustrates the change in the FHEI over time, from 2020 to 2100.
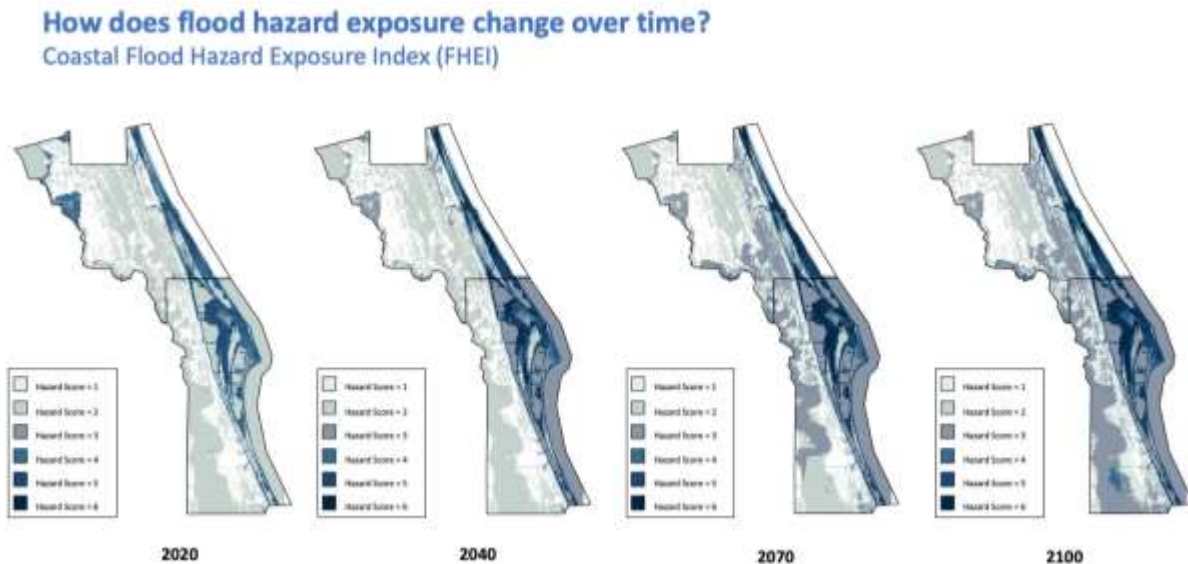
Figure 25. Coastal Flood Hazard Exposure Index (FHEI) over time.

The Flood Hazard Exposure Index shows that currently (2020), about 73% of the land area (acres) of Volusia and Brevard Counties are affected by at least one of the five hazards that make up FHEI (see above). By 2040, the FHEI estimates that about 73.3% of the land area in these counties would be affected by at least one of the six hazards that make up that year's FHEI. This percentage increases to about 79% in 2070, and 83.0% in 2100. (See Table 5 below).

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22 International Code Council and FEMA. (2019). "Reducing Flood Losses Through the International Codes® Coordinating Building Codes and Floodplain Management Regulations 5th Edition." September 2019. Retrieved from: https://www.iccsafe.org/wp-content/uploads/bsj/FEMA_Reducing_Flood_Losses_RFL_5th-Ed_508.pdf
23 Masterson, J. et al. (2017). Plan Integration for Resilience Scorecard Guidebook. Retrieved from: https://ifsc.tamu.edu/getattachment/News/July-2017/Plan-Integration-for-Resilience-Scorecard-Guideboo/Scorecard-(1).pdf.aspx

Year	Area Affected by 1+ Hazards (Acres)	Percentage of Total Area (Volusia and Brevard)
2020	1,392,520	72.8%
2040	1,401,890	73.3%
2070	1,510,690	79.0%
2100	1,587,740	83.0%

Table 5. *Area (in acres) and percent of total county area affected by one or more coastal flood hazards for Volusia and Brevard Counties.*

Results also show that about 6.2% of the two counties' land area is at High exposure in 2020. As indicated above, this study considers exposure to 5-6 hazards as High. In 2040, the area of these counties at High exposure rises to about 11%; in 2070, to about 12%; and in 2100 to 13.5%, see Table 6 below. *It is worth noting that the area with a High FHEI more than doubles from 2020 to 2100.*

Year	Area of High Exposure (Acres)	Percentage of Total Area (Volusia and Brevard)
2020	117,870	6.2%
2040	210,270	11.0%
2070	233,760	12.2%
2100	258,810	13.5%

Table 6. *Area (in acres) and percent of total county area affected by one or more coastal flood hazards for Volusia and Brevard Counties.*

Affordable Housing + Flood Hazard Exposure

Publicly Subsidized Housing (AHI)

The study results show that about 41.5% of AHI properties in Volusia and Brevard counties are exposed to at least one hazard in 2020. By 2040, that percentage increases to 44.6%, in 2070 it increases to 60.8%, and in 2100 it increases to 75.4%. See Table 7 below.

AHI Flood Hazard Exposure Over Time				
	2020	**2040**	**2070**	**2100**
Percentage of AHI exposed to 1+ hazards	41.5%	44.6%	60.8%	75.4%

Table 7. *AHI by percentage of stock exposed to one or more flood hazards.*

Table 8 and Figure 26 also show how the number of AHI parcels exposed to flood hazards increases substantially over time. In 2020, 25.4% of the AHI properties had a Low FHEI (1-2 hazards), while only 3.1% had a High FHEI (5-6 hazards).

By 2100, these counts all increase where now a majority (or 53.1%) of the AHI properties had a Low FHEI, and 14.6% of the properties have a High FHEI. Figure 27 also illustrates this same pattern where AHI properties exposed to multiple coastal flood hazards increases over time.

Figure 28 illustrates the exposure of AHI properties to specific coastal flood hazards.
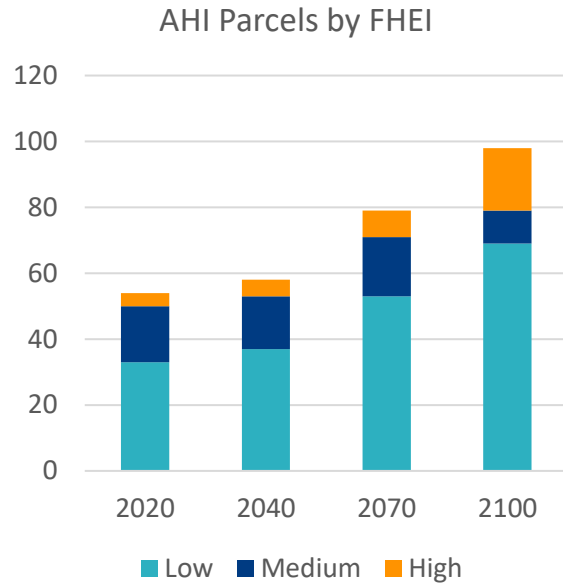
Figure 26 *AHI properties by flood hazard exposure (Low, Medium, and High FHEI) over time.*

Levels of AHI Exposure								
	2020		**2040**		**2070**		**2100**	
None	*76*	*58.5%*	*72*	*55.4%*	*51*	*39.2%*	*32*	*24.6%*
Low (1 - 2 hazards)	33	25.4%	37	28.5%	53	40.8%	69	53.1%
Medium (3 - 4 hazards)	17	13.1%	16	12.3%	18	13.8%	10	7.7%
High (5 - 6 hazards)	4	3.1%	5	3.8%	8	6.2%	19	14.6%
Total AHI exposed to 1+ hazards	**54**	**41.5%**	**58**	**44.6%**	**79**	**60.8%**	**98**	**75.4%**

Table 8. AHI by counts and percentage of stock with a Low, Medium, or High FHEI score.

Figure 27. *Spatial distribution of flood hazard exposure (Low, Medium, and High FHEI) for AHI properties over time.*
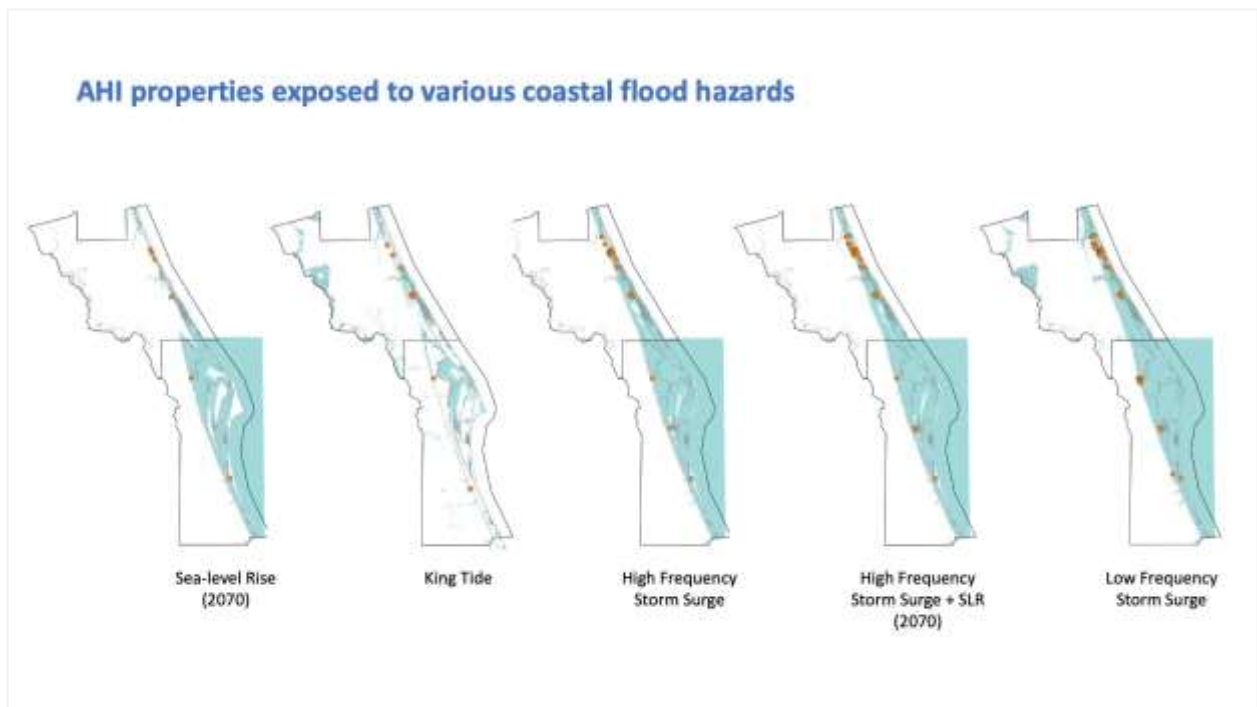
Figure 28. *AHI properties exposed to various flood hazards.*

Affordable, Market-Rate Housing (NOAH)

Results show results show that about 56.4% of NOAH properties in Volusia and Brevard counties are exposed to at least one hazard in 2020. By 2040, that percentage increases to 57.8%, in 2070 it increases to 67.4%, and in 2100 it increases to 75.2%. See Table 9 below.

NOAH Flood Hazard Exposure Over Time				
	2020	**2040**	**2070**	**2100**
Percentage of NOAH exposed to 1+ hazards	56.4%	57.8%	67.4%	75.2%

Table 9. *NOAH by percentage of stock exposed to one or more flood hazards.*

In this case too, Table 10 and Figure 29 shows how the number of NOAH parcels exposed to flood hazards increases over time. In 2020, 32% of the NOAH properties had a Low FHEI, while 4.3% had a High FHEI.

However, by 2100, 40.8% of the NOAH properties had a Low FHEI 13.7% of the NOAH properties had a High FHEI. Figure 30 also illustrates this same pattern where NOAH properties exposed to multiple coastal flood hazards increases over time.
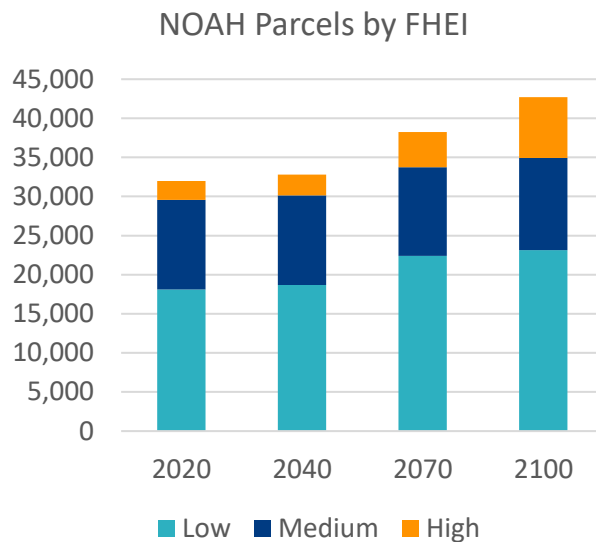
Figure 29. *NOAH properties by flood hazard exposure (Low, Medium, and High FHEI) over time.*

Table 10. *NOAH by counts and percentage of*

Levels of NOAH Exposure								
	2020		**2040**		**2070**		**2100**	
None	*24,752*	*43.6%*	*23,946*	*42.2%*	*18,511*	*32.6%*	*14,050*	*24.8%*
Low (1 - 2 hazards)	18,130	32.0%	18,678	32.9%	22,415	39.5%	23,132	40.8%
Medium (3 - 4 hazards)	11,420	20.1%	11,471	20.2%	11,348	20%	11,796	20.8%
High (5 - 6 hazards)	2,440	4.3%	2,647	4.7%	4,468	7.9%	7,764	13.7%
Total NOAH exposed to 1+ hazards	**31,990**	**56.4%**	**32,796**	**57.8%**	**38,231**	**67.4%**	**42,692**	**75.2%**

stock with a Low, Medium, or High FHEI score.

How does flood hazard exposure of NOAH change over time?
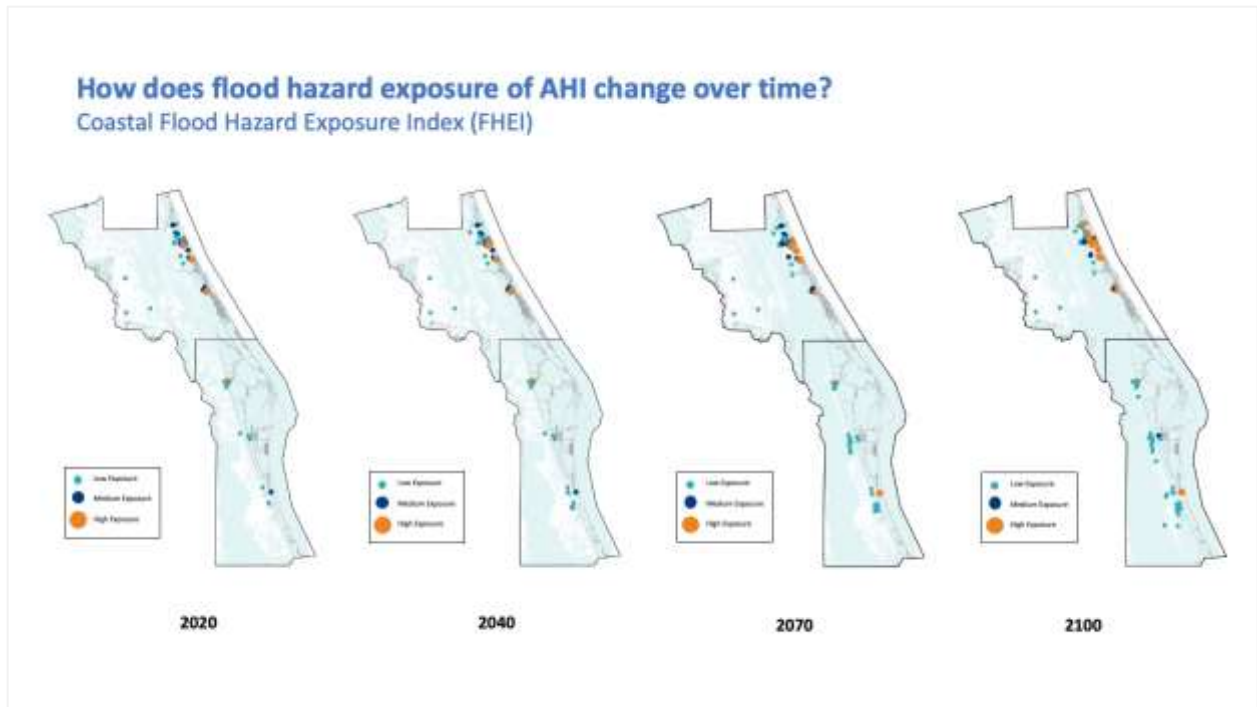Coastal Flood Hazard Exposure Index (FHEI)
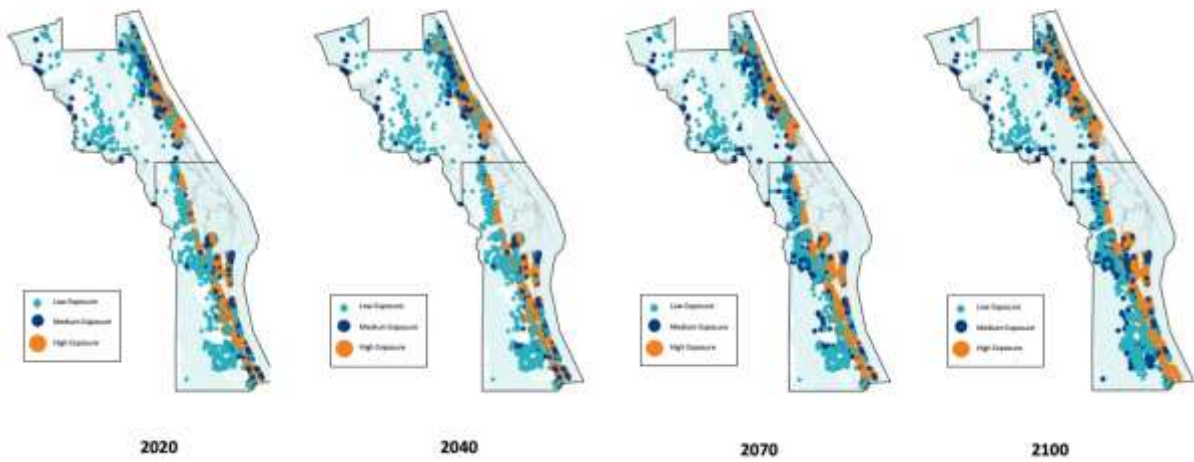
Figure 30*. Spatial distribution of flood hazard exposure (Low, Medium, and High FHEI) for NOAH properties over time.*
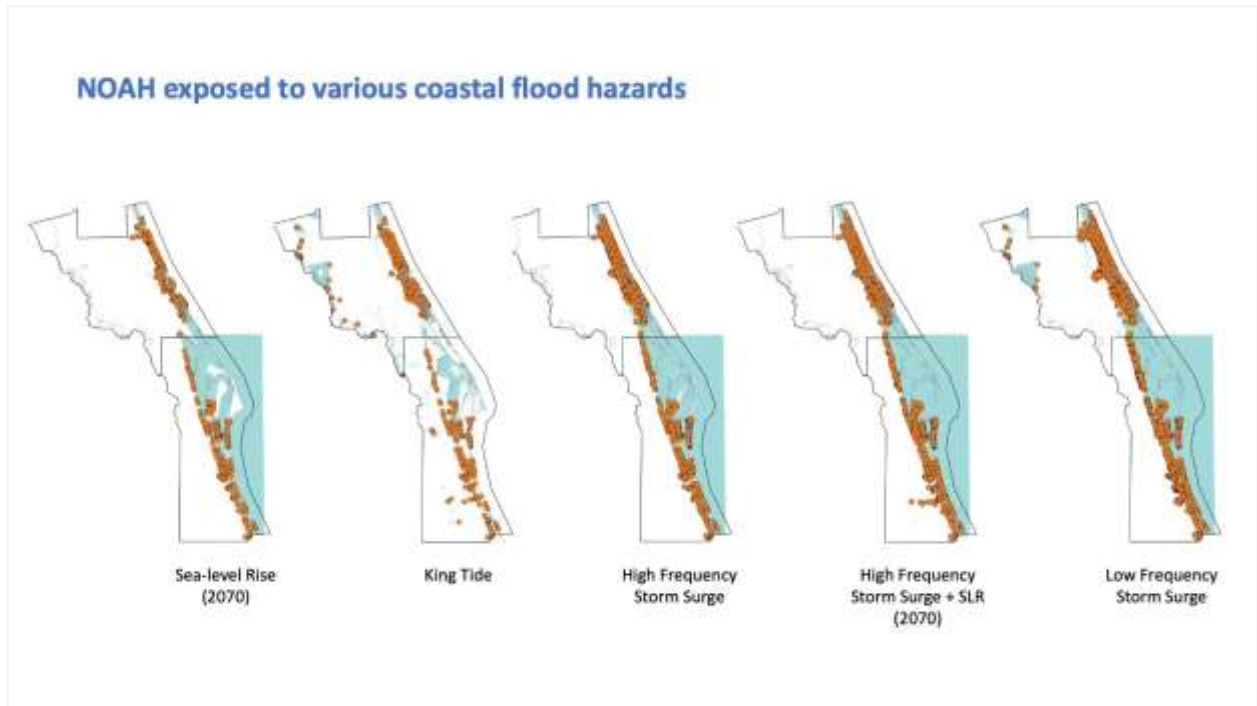
Figure 31*. NOAH properties exposed to various flood hazards.*

Mobile Homes

Finally, results show that about 44.4% of mobile home properties (including both individually owned parcels, as well as mobile home parks) in Volusia and Brevard counties are exposed to at least one hazard in 2020. By 2040, that percentage increases to 45.8%, in 2070 it increases to 70.5%, and in 2100 it increases to 83.3%. See Table 11 below.

Mobile Home Flood Hazard Exposure Over Time				
	2020	**2040**	**2070**	**2100**
Percentage of MH exposed to 1+ hazards	44.4%	45.8%	70.5%	83.3%

Table 11. *Mobile homes by percentage of stock exposed to one or more flood hazards.*

Once again, the number of mobile home parcels exposed to flood hazards follows a similar pattern as above and increases over time (see Table 11 and Figure 32). In 2020, 31.4% of the mobile home properties had a Low FHEI in 2020, while 4.5% had a High FHEI. By 2100, a majority (55.3%) of the mobile home properties had Low FHEI and 7.8% of mobile home properties had a High FHEI.

Mobile Home Parks + Parcels by FHEI
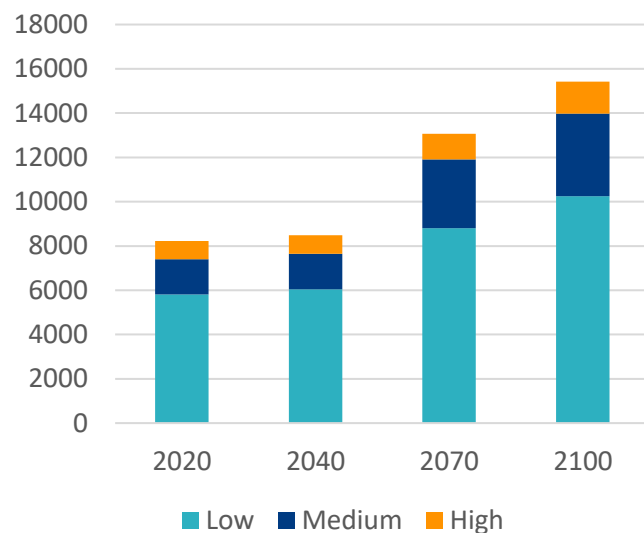
Figure 32. *Mobile homes (individual and park parcels) by flood hazard exposure (Low, Medium, and High FHEI) over time.*

Levels of Mobile Home Exposure								
	2020		**2040**		**2070**		**2100**	
None	*10,308*	*55.6%*	*10,042*	*54.2%*	*5,461*	*29.5%*	*3,104*	*16.8%*
Low (1 - 2 hazards)	5,815	31.4%	6,041	32.6%	8,799	47.5%	10,249	55.3%
Medium (3 - 4 hazards)	1,580	8.5%	1,607	8.7%	3,107	16.8%	3,734	20.2%
High (5 - 6 hazards)	825	4.5%	838	4.5%	1,161	6.3%	1,441	7.8%
Total MH exposed to 1+ hazards	**8,220**	**44.4%**	**8,486**	**45.8%**	**13,067**	**70.5%**	**15,424**	**83.3%**

Table 12. *Mobile home by counts and percentage of stock with a Low, Medium, or High FHEI score.*

Figure 33 also shows how the mobile home properties exposed to multiple coastal flood hazards increases over time. Figure 34 illustrates the exposure of mobile home properties to specific coastal flood hazards.
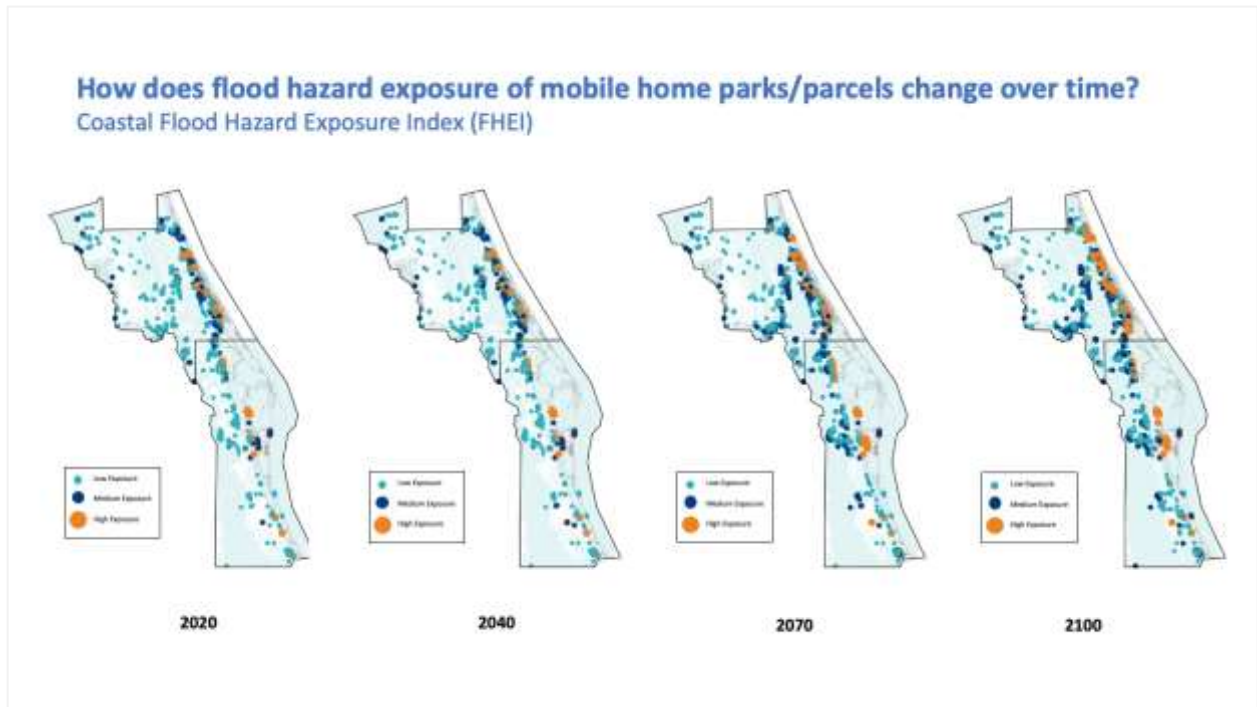
Figure 33. Spatial distribution of flood hazard exposure (Low, Medium, and High FHEI) for mobile homes (individual and park parcels) over time.
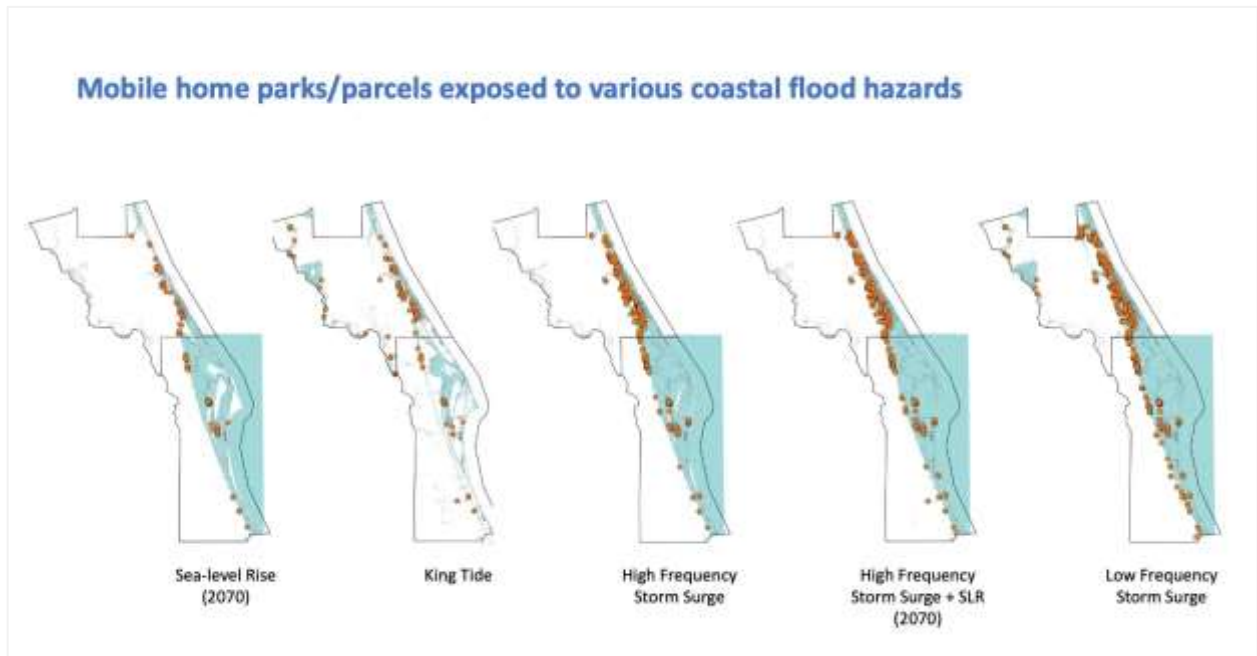
Figure 34. Mobile homes (individual and park parcels) exposed to various flood hazards.

In sum, for all affordable housing properties (AHI, NOAH, and mobile homes) the percentage of properties exposed to one or more hazards increases substantially over time from 2020 to 2040, 2070, and 2100.

- In 2020, 41.5%% of **AHI properties** in Volusia and Brevard counties are exposed to at least one hazard; by 2040, that percentage increases to 44.6%; in 2070 it increases to 60.8%, and in 2100 it increases to 75.4%.
- In 2020, 56.4% of **NOAH properties** in Volusia and Brevard counties are exposed to at least one hazard; by 2040, that percentage increases to 57.8%; in 2070 it increases to 67.4%, and in 2100 it increases to 75.2%.
- In 2020, 44.4% of **mobile home properties** in Volusia and Brevard counties are exposed to at least one hazard; by 2040, that percentage increases to 45.8%; in 2070 it increases to 70.5%, and in 2100 it increases to 83.3%.

Affordable Housing + Inland Flood Hazard Exposure

Looking beyond coastal flooding, the inland flood hazard exposure assessment aimed to quantify potential flood hazard exposure from rivers, waterbodies, poor drainage areas, and other sources for all 6 counties within the R2C region. The index utilized FEMA Digital Flood Insurance Rate Map (DFIRM) data including the 100-year Floodplain, 500-year Floodplain, and Floodway hazards. (See Figure 35.)

Figure 35. Inland flood hazard exposure for AHI, NOAH, and mobile home properties.

Of all of the housing types, mobile homes and NOAH have proportionately the most exposure to inland flood hazards with 27.5% and nearly 23.4% of the stock in a floodplain or floodway, respectively. Approximately 18.3% of the AHI is also exposed to inland flood hazards. Overall, about a quarter of the affordable housing properties are potentially exposed to inland flood hazards. (See Table 13.)

Additionally, due to the higher likelihood of flooding in the Floodway, it is worth noting that there are an estimated 687 properties located here; NOAH comprises the almost three-fourths of these in the floodway, while mobile homes make up the almost all of the remainder (just over a quarter).
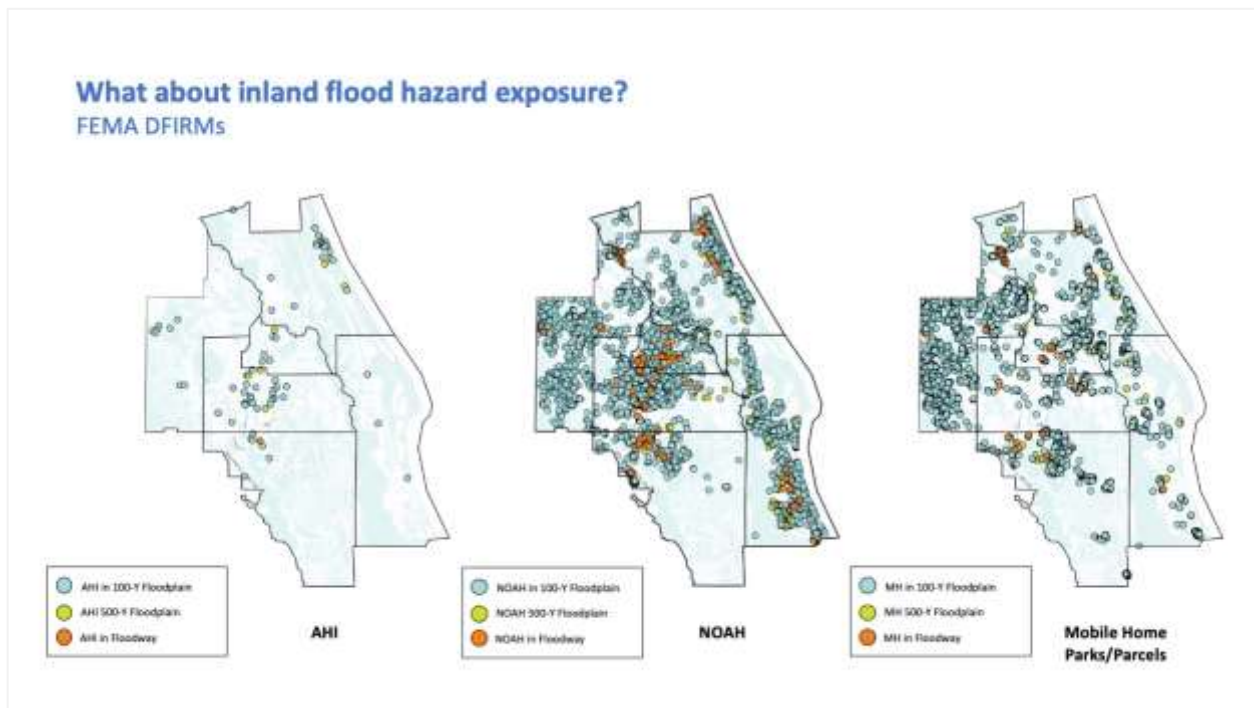
Housing Type	Properties Exposed to Inland Flooding	Percentage of Total Properties Exposed to Inland Flooding	Properties in Floodway
AHI	88	18.3%	1 in Floodway
NOAH	31,664	23.4%	494 in Floodway
Mobile Homes	12,908	27.5%	192 in Floodway
Total	44,660	24.4%	687 in Floodway

Table 13. *Housing types by counts and percentage of total properties exposed to inland flood hazards for the six-county R2C region.*

Inland flooding also affects the counties across the R2C region differently. Table 14 and Figure 36 show that Volusia County has the highest percentage of AHI properties exposed to one or more inland flood hazards (39.4%); the county is followed by Seminole, Orange, and Osceola which all have approximately ~17% of AHI properties exposed. In terms of NOAH, Volusia County again has the highest counts of properties exposed (37.9%), followed by Brevard (30.5%) and Osceola (22.8%). Lastly, Seminole leads the counts of mobile homes exposed (35.8%), followed by Volusia (32.3%) and Osceola (31.4%).

Percentage of Properties Exposed to Inland Flood Hazards, by County and Region							
	Volusia	Lake	Seminole	Orange	Osceola	Brevard	Region
AHI	39.4%	11.6%	17.5%	17.4%	17.0%	5.1%	18.3%
NOAH	37.9%	18.7%	17.9%	14.6%	22.8%	30.5%	23.4%
MH	32.3%	28.3%	35.8%	24.3%	31.4%	21.4%	27.5%
Total	36.5%	23.6%	19.7%	15.6%	25.5%	28.0%	24.4%

Table 14. *Percentage of county's properties (by type) exposed to inland flood hazards.*
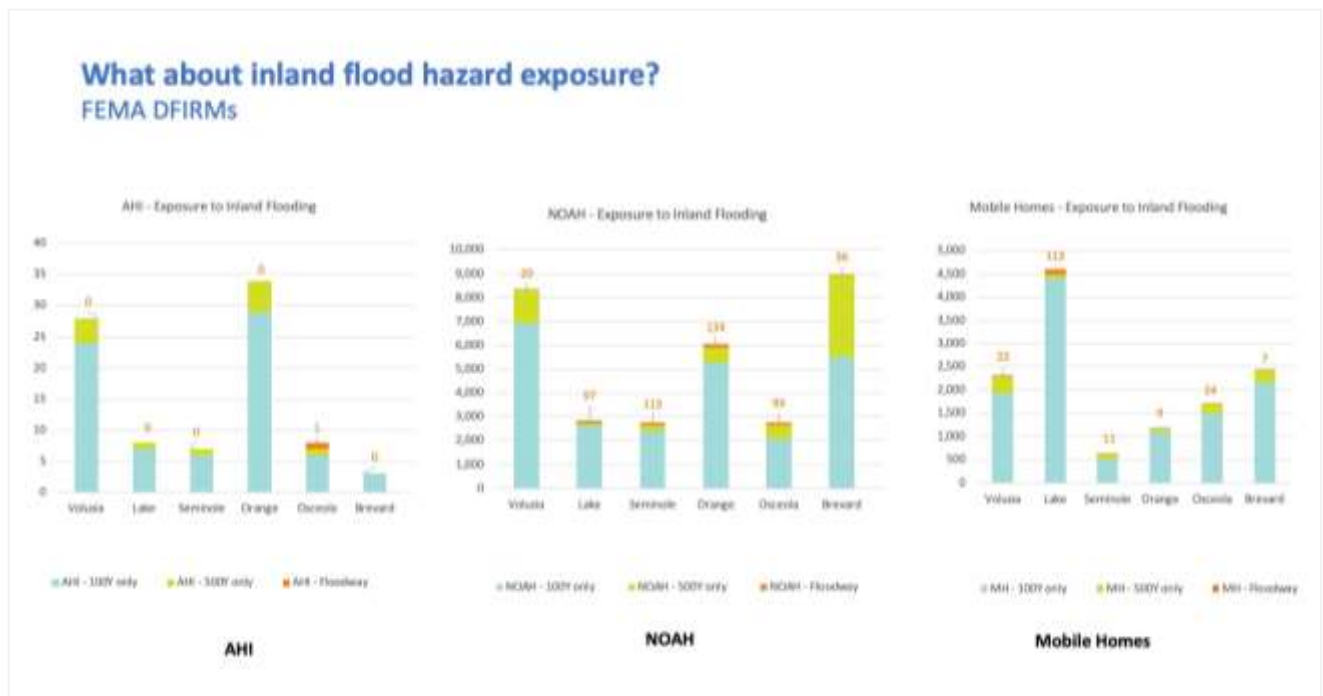
Figure 36. *Counts properties (by type) exposed to inland flood hazards for each county.*

Publicly Subsidized Housing (AHI)

Results show that about just under ~90 AHI properties (18.3% of all AHI properties) are exposed to at least one inland flooding hazard. Of all 6 counties, Volusia (39.4%), Seminole (17.5%), and Orange (17.4%) have the highest rates of exposed AHI properties (see Table 15 below).

	Volusia	Lake	Seminole	Orange	Osceola	Brevard
Percentage of AHI exposed to inland flooding	39.4%	11.6%	17.5%	17.4%	17%	5.1%
AHI properties in Floodway	0	0	0	0	1	0

Table 15. *AHI by percentage of properties exposed to inland flood hazards and counts of properties in the Floodway for the six R2C counties.*

Affordable, Market-Rate Housing (NOAH)

On the other hand, results show that about ~31,700 NOAH properties (23.4% of all NOAH properties) are exposed to at least one inland flooding hazard. Of all 6 counties, Volusia (37.9%), Brevard (30.5%), and Osceola (22.8%) are the ones with the highest rates of exposed NOAH properties (see Table 16 below). Orange and Seminole have the highest counts of NOAH properties in the Floodway (134 and 113, respectively).

50

	Volusia	Lake	Seminole	Orange	Osceola	Brevard
Percentage of NOAH exposed to inland flooding	37.9%	18.7%	17.9%	14.6%	22.8%	30.5%
NOAH in Floodway	20	97	113	134	93	36

Table 16. *NOAH by percentage of properties exposed to inland flood hazards and counts of properties in the Floodway for the six R2C counties.*

Mobile Homes

Finally, our results show that about ~12,900 mobile home parcels and parks (27.5% of all mobile home properties) are exposed to at least one inland flooding hazard. Of all 6 counties, Seminole (35.8%), Volusia (32.3%), and Osceola (31.4%) are the ones with the highest rates of exposed mobile home properties (see Table 17 below). Lake County has the highest counts of mobile home properties in the Floodway (113).

	Volusia	Lake	Seminole	Orange	Osceola	Brevard
Percentage of mobile homes exposed to inland flooding	32.3%	28.3%	35.8%	24.3%	31.4%	21.4%
Mobile homes in Floodway	23	113	11	9	24	7

Table 17. *Mobile home properties (including individual parcels and parks) by percentage of properties exposed to inland flood hazards and counts of properties in the Floodway for the six R2C counties.*

Summary and Key Takeaways from the Flood Hazard Exposure Assessment

The flood hazard assessments show that the region faces substantial and growing risk from these hazards over time. (See Figure 37.)

- Currently (in 2020), the majority of NOAH properties (56.4%) are already potentially exposed to one or more flood hazards.
  - Substantial portions of mobile homes (44.4%) and AHI (41.5%) are exposed to one or more coastal flood hazards.
- The number of properties exposed to one or more flood hazards grows over time from 2020 to 2100 for all housing types (AHI, NOAH, and MH). For example:
  - **AHI properties** increase from 41.5% to 75.4%.
  - **NOAH properties** increase from 56.4% to 75.2%.
  - **Mobile home properties** increase from 44.4% to 83.3%.

In terms of the FHEI:

- **For AHI,** most of the exposed properties (61.1%) had a Low FHEI (1-2 hazards) in 2020, while only 7.4% had a High FHEI (5-6 hazards). By 2100, the AHI properties with a Low FHEI increases to 70.4%, and properties with a High FHEI increases to 19.4%.
- **For NOAH,** most of the exposed properties (56.7%) had a Low FHEI in 2020, while only 7.63% had a High FHEI. By 2100, the NOAH properties with a Low FHEI slightly decrease, and properties with a High FHEI increase to 18.2%.
- **For mobile homes,** most of the exposed properties (70.7%) had a Low FHEI in 2020, while only 10% had a High FHEI. By 2100, the mobile home properties with both a Low and High FHEI decrease. However, properties with a Medium FHEI (3-4 hazards) increase from 19% in 2020 to 24% in 2100.
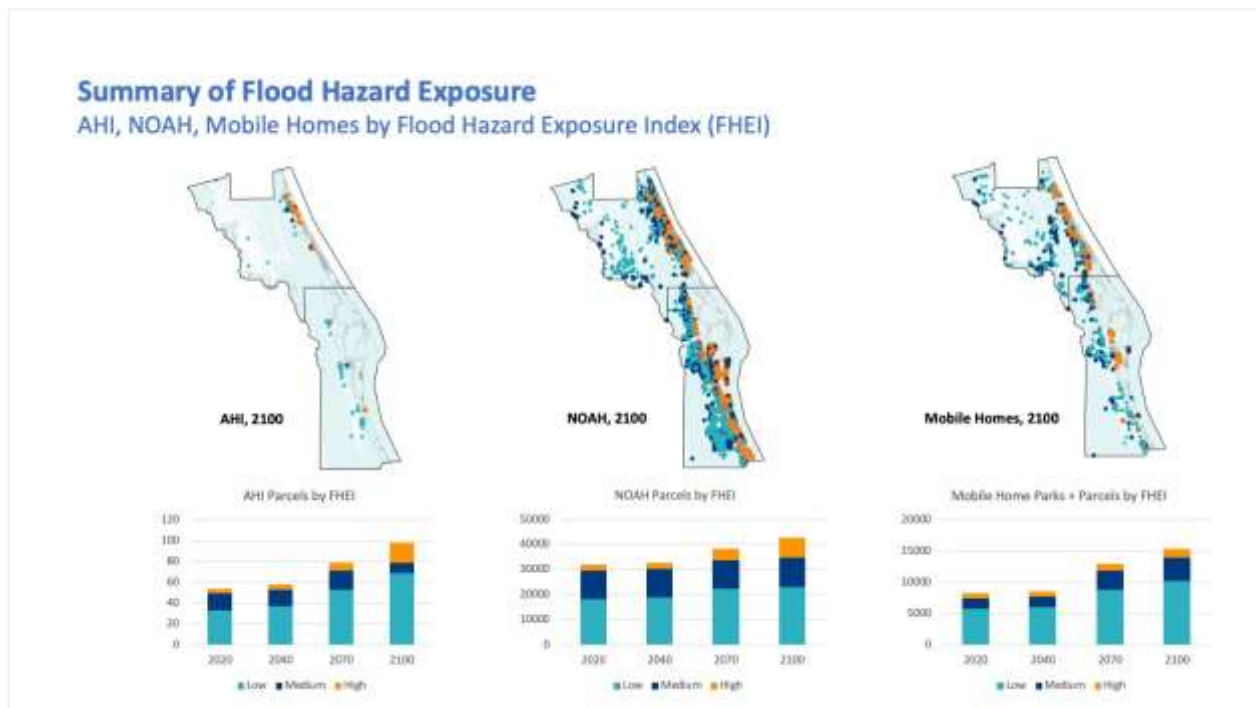
Figure 37. Flood hazard exposure (Low, Medium, and High FHEI) for AHI, NOAH, and mobile homes over time.

In terms of inland flooding:

- Overall, about a quarter of the affordable housing properties are potentially exposed to inland flood hazards.
- Across the region, mobile homes include the largest proportion of properties exposed to inland flood hazards (nearly 27.5%), which is then followed by NOAH (23.4%).
- AHI has approximately 18.3% of properties exposed to inland flood hazards.
    - While AHI has proportionately fewer properties exposed to inland flood hazards, the limited supply of this stock, combined with the limited resources of the lower-income families living in these properties, means that the impact of these potential hazards may be especially pronounced in these areas.

- Inland flood hazards affect the six counties in slightly different ways, where:
  - **Volusia County** has the largest proportion of exposed AHI properties (39.4%), as well as has the largest proportion of exposed NOAH properties (37.9%).
    - After Volusia, **Osceola, Orange, and Seminole Counties** also have higher proportions (~17%) of AHI exposed to inland flooding.
  - **Orange and Seminole Counties** have the highest counts of NOAH properties in the Floodway (134 and 113, respectively).
  - **Seminole County** also has the largest proportion of exposed mobile home properties (35.8%), followed closely by **Volusia** (32.3%) and **Osceola Counties** (31.4%).
  - **Lake County** has the highest counts of mobile home properties in the Floodway (113).

Conclusions and Recommendations

The study provides an understanding of the R2C region's affordable housing needs, as well as existing affordable housing properties. Of the region's 1,225,600 residential properties overall, there are approximately 182,700 affordable housing properties, or about 15% of the residential stock. This would seem to be a generally slim proportion of housing stock, and indicates that there is a need to increase the affordable housing supply (through a variety of means as noted previously).

Of the affordable properties, the study shows that NOAH comprises the largest share across the region (75%), then mobile homes (25%), and publicly subsidized properties are less than 1% of the property stock. While AHI properties comprise a smaller share of affordable housing properties, these income restricted units are critical. Further, while more deeply subsidized properties (HUD multifamily, HUD Public Housing, and USDA Rural Development) are fewer still, they play an outsized role in communities, particularly for low income and elderly households, persons with disabilities, and other vulnerable populations.

The distribution of affordable housing across the region provides challenges and opportunities in terms of flood risk reduction. Publicly subsidized multifamily housing is typically located in similar areas as other affordable, market rate properties, which could indicate areas for potential prioritization of tract-scale mitigation opportunities or other investments in community development/redevelopment initiatives. On the other hand, mobile homes are clustered in tracts that indicate potential for mitigation opportunities in rural areas. In these instances, challenges remain to effectively mitigate the region's high counts of older mobile homes (<1999), which are a less resilient housing type.

In terms of coastal flood hazard exposure, substantial amounts of properties are already exposed to at least one flood hazard (ranging from 41% of AHI to 67% of mobile homes). And

coastal flood exposure will only increase in the future to where the large majority of affordable properties will be exposed to coastal flood hazards. This ranges from 75% of the AHI and NOAH property stock to 83% of mobile home parcels and parks by 2100.

Furthermore, inland flood hazards also pose challenges to the region in the current day. About a quarter of all affordable housing properties are potentially exposed to inland flood hazards. Particularly concerning are the properties located within the Floodway. Overall, the region has about several hundred properties located in this area; Orange and Seminole Counties have the highest amounts of NOAH properties in the Floodway, and Lake County has the highest amount of mobile home properties. These higher-risk areas should be explored in more detail, and potentially be prioritized for flood risk mitigation measures.

The above illustrates the potential flood hazard exposure to affordable housing stock. Therefore, it is critical that housing planners, program managers, and others take proactive steps to reduce this risk.

Recommendations

First, housing planners and program managers should become involved their community's hazard assessment and mitigation planning (Local Mitigation Strategy). While residential properties are often a part of the LMS plan, this information can be augmented with additional data about affordable housing stock in order to better understand the risks to the most vulnerable homes and households.

While this study provides preliminary information that can be used to determine and prioritize mitigation activities, the datasets underlying this analysis contain additional details that can be further mined to determine potential vulnerabilities and mitigation actions. The integration of hazard, housing, and tenant information can illustrate potential challenges and opportunities to reduce the impacts of current and future floods or storm/disaster events, as well as applied to other multi-hazard frameworks. It is hoped that this information can enable local communities in the ECF region to better compete for pre-disaster or post-disaster mitigation funding such as through FEMA BRIC, Florida Resilient Coastlines Program, or other grant programs.

The information underlying this report should be considered useful at a regional, county or municipal *planning scale*. It can assist in identifying sub-geographies (Census tracts) to explore with more detailed flood studies. For example, one could explore tracts with:

- High counts of co-located AHI and NOAH
- "High" flood hazard exposure index
- High counts of properties in the floodway

These Census tracts can be overlaid with watershed boundaries (or other) for more holistic mitigation approaches. Then, when looking at potential prioritization of mitigation of measures,

there are benefits, challenges and opportunities that come with the three affordable housing types.

Publicly Assisted Housing

For example, publicly assisted properties could be prioritized by:

- High flood hazard exposure index, or in floodway
- HUD funded
- Older building
- High number of units
- Target populations- elderly, disability, family, etc.

As described throughout the report, publicly assisted housing plays a critical role in communities. Public assistance comes with income qualifications to rent these properties, so tenants are genuinely low income and investment in AHI supports these households. With housing that is publicly funded, there is also a public interest in mitigation. It is in the interest of federal, state, and local governments to find ways to creatively leverage public investment sources (FEMA, HUD, Florida Housing, FDEP, FDEO, LHFAs) to align various federal, state, and local funds promoting flood hazard mitigation.

Affordable, Market-Rate Housing

For example, NOAH could be prioritized by:

- High flood hazard exposure index, or in floodway
- Older buildings
- Multifamily
- High number of units
- Multiple properties with same owner/investor

NOAH properties are the largest portion of the affordable housing stock, and it is often located in similar areas at AHI properties. Therefore, focusing mitigation investment in these areas may have a larger impact. However, in these situations, local officials will need to address the challenges posed by finding cost-effective mitigation options to reduce storm and flood damage to multifamily buildings, which comprise the majority of the AHI units and NOAH units. Further, mitigation efforts could also prioritize reaching out to smaller-scale, local landlords and property investors. These "mom-and-pop" local businesses often do not have the financial resources or capacity to undertake flood hazard assessments of their properties or navigate governmental grant programs to access funding resources that may be available for mitigation. Such property owners could be connected to financing sources (like SBA loans or other). In addition, local and state governments need to consider developing sources of annually re-occurring mitigation funding.

Mobile Homes

For example, mobile home parcels or parks could be prioritized by:

- High flood hazard exposure index, or in floodway
- Individual parcels built before 1999
- Larger mobile home parks, such as those with 100 or more lots

Much of the region's mobile home stock (83%) is older (built prior to 1999) and considered to be more vulnerable to storm impacts. Making such properties more resilient is challenging, and local communities may want to consider creative approaches for mitigating these structures or potentially up-zoning large parks to create more resilient housing developments.

New Development

While this report has focused on better understanding existing affordable housing stock, there is a need to also consider where and how to build more resilient new development. The needs assessment demonstrates that there is a huge need for affordable housing, but where should it go and how can it be made to withstand flood risks today as well as those over the course of the development's lifetime (50-70 years)? Furthermore, flood resilience is just one aspect of smart housing development. Planners and program managers will be challenged to determine how to promote quality housing in balance with access to transit hubs, quality jobs, schools, and other community amenities alongside consideration of current and future flood hazards.