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Analysis of Florida's NFIP Repetitive Loss Properties

Using Geospatial Tools and Field Verification Data

FL-1539/1545/1551/1561-DR - Orlando - JFO

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EXECUTIVE SUMMARY

One of the goals of the Flood Insurance Reform Act of 2004 was to streamline the National Flood Insurance Program (NFIP) by reducing the frequency and costs associated with repetitive property losses. In order to address the repetitive flood property loss, Federal Emergency Management Agency (FEMA) Region IV has been conducting a lengthy field verification process and collection of detailed property data. This report analyzes the updated repetitive loss property data for the state of Florida using Geographic Information System (GIS) technology. The spatial analysis displays the distribution of repetitive loss properties in the state, as well as regional patterns and county hotspots. The purpose of this analysis is to identify regions, counties and local areas that are receiving large amounts of insurance claims due to repetitive flood losses. After identifying the priority counties in the state of Florida, kernel density estimation is used to find the “hotspots” within each county. In the future, resources and funding opportunities, such as the Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) projects, can focus on these priority areas that contain the highest concentrations of flood damages based on insurance payouts.

BACKGROUND

During the 20th century, floods were the number-one natural disaster in the United States in terms of the number of lives lost and property damage.¹ In 2003, floods were the second most expensive weather related event, totaling \$2.142 billion in damages.² In terms of response and recovery, flooding resulting from severe storms and other causes was the most frequent presidential disaster declaration type between 1990 and 1999. During that time period, the Federal Emergency Management Agency (FEMA) committed more than \$7.3 billion in disaster relief in response to flooding. The most costly of the flooding disasters were the Midwest Floods in 1993 (\$1.17 billion); the Red River Valley Floods in 1997 (\$730.8 million); and Tropical Storm Alberto in 1994 (\$544.2). Other major flooding events requiring more than \$100 million in FEMA funding were the Northeast Coastal Storms in 1992; the Arizona Floods in 1993; the Houston Floods in 1994; the New Orleans Floods in 1995; the Mid-Atlantic and Pacific Northwest Floods in 1996; the Ohio River Valley Floods in 1997; the Texas Floods in 1998; and the California Floods in 1993, 1995 and 1998.³

The primary mission of FEMA is to lead the American people in preparing for, preventing, responding to and recovering from disasters. In 1968, in response to the

1 This statistic originated from the USGS Fact Sheet 024-00 entitled, “Significant Floods in the United States During the 20th Century - USGS Measures a Century of Floods” written by Charles A. Perry and published in March 2000.

2 The NWS Office of Climate, Water and Weather Services and the National Climatic Data Center compiled information from Storm Data to create an annual Summary of U.S. Natural Hazard Statistics. This report is available online at <http://www.ncdc.noaa.gov/oa/climate/sd/>.

3 FEMA distributes information through their online library, these statistics were found on the FEMA Disaster Costs: 1990-1999 fact sheet, available at http://www.fema.gov/library/df_7.shtm.

increasing amount of flood damage, Congress enacted that National Flood Insurance Act (P.L. 90-448), which created the National Flood Insurance Program (NFIP). The NFIP is one of the mechanisms with which FEMA manages flood disasters. The goal of the NFIP is to minimize flood-related property losses by making flood insurance available to people living in floodplains while encouraging floodplain management efforts to mitigate future flood hazards.

The National Flood Insurance Act was amended by the Flood Insurance Reform Act of 2004 (P.L. 108-264). The Flood Insurance Reform Act focuses specifically on properties that have experienced repetitive flood losses. As stated in the document, approximately 48,000 properties currently insured under the [NFIP] program have experienced, within a 10-year period, 2 or more flood losses where each such loss exceeds the amount \$1,000 and approximately 10,000 of these repetitive-loss properties have experienced either 2 or 3 losses that cumulatively exceed building value or 4 or more losses, each exceeding \$1,000. Repetitive-loss properties constitute a significant drain on the resources of the NFIP, costing about \$200,000,000 annually. Repetitive-loss properties comprise approximately 1 percent of currently insured properties but are expected to account for 25 to 30 percent of claims losses. The vast majority of the repetitive loss properties were built before local community implementation of floodplain management standards under the program and thus are eligible for subsidized flood insurance. Mitigation of repetitive-loss properties through buyouts, elevations, relocations, or flood-proofing will produce savings for policyholders under the program and for Federal taxpayers through reduced flood insurance losses and reduced Federal disaster assistance. A strategy of making mitigation offers aimed at high-priority repetitive-loss properties and shifting more of the burden of recovery costs to property owners who choose to remain vulnerable to repetitive flood damage can encourage property owners to take appropriate actions that reduce loss of life and property damage and benefit the financial soundness of the program.⁴ Reducing the insurance claims and aid being paid for these repetitive loss properties will benefit all owners of flood insurance policies, who will see premiums rise at a slower rate.

JUSTIFICATION AND PURPOSE

Florida leads the nation in both the number of flood insurance policies and the amount of insurance coverage with 1,851,905 policies and \$306,577,962,700 in coverage. The approximately \$307 billion dollar coverage represents 42.5% of the total insurance coverage nationally.⁵ As of November 11, 2004, there are 115,500 repetitive loss properties reported in the United States. The state of Florida ranks 3rd with 11,006 repetitive loss properties or 9.5% of the national total. For claims processed through November 30, 2004, which contains most of the 2004 hurricane season activity, Florida's repetitive loss properties received approximately \$578 million. When comparing this

⁴ All of these statistics were taken directly from the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, this document is accessible by searching for the Bill Number (S2238) for the 108th Congress (2003-2004) from the following website: <http://thomas.loc.gov/home/search.html>.

⁵ FEMA distributes NFIP statistics on the Internet. These statistics originated from the data table, Policy Statistics by State as of 9/30/2004, available at <http://www.fema.gov/nfip/10110409.shtm>.

value to the pre-2004 season total of \$451 million, there is an increase of 28.2% in claim payouts for the state of Florida.

In the aftermath of Hurricane Georges in Mississippi about six years ago, FEMA Region IV began addressing the problem of repetitive loss. The region identified the need for thorough and detailed repetitive loss property data, so the locations and trends in repetitive loss properties could be analyzed and prioritized. A time intensive field verification process was created to organize, verify and update the repetitive loss database. The data sources and field collection methodology will be addressed later in this report.

Once a large percentage of the data had been collected and verified, the project could attempt to answer some of the questions associated with repetitive losses, specifically in the state of Florida. The purpose of this project is to analyze the detailed repetitive loss data with the power of Geographic Information System (GIS) technology. The GIS adds a spatial perspective that will be very valuable in understanding the distribution of repetitive loss properties in the state of Florida. This report will identify statewide trends and regional differences in repetitive loss, as well as identify counties with concentrations of repetitive loss properties and costly claim payouts. This report will also attempt to define a geospatial methodology for counties to identify areas with extreme losses.

The main goal of this repetitive loss analysis is to identify areas that have concentrated repetitive losses to benefit emergency managers and local planning officials. Once areas are designated as locations with costly repetitive losses, local officials can prioritize resources, such as money and educational material, to benefit and minimize losses in high priority areas. Mitigation measures such as relocation, elevation and buyouts can also be targeted to areas receiving multiple claim payouts through state and federal programs, such as the Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA). Reducing repetitive losses helps everyone, as more efficient floodplain management reduces the amount of money spent on repetitive claim payouts.

STUDY AREA

This report examines repetitive losses for the State of Florida. The analysis will present the data at multiple spatial scales, including the entire state, regional delineations, county-level and local hotspots. The state analysis will focus on trends and patterns throughout the state. The regional analysis will use the regional divisions for the State of Florida as outlined by the Florida Floodplain Managers Association. These entities closely resemble the Water Management District boundaries. Water Management boundaries were considered but were not used since some district boundaries do not always coincide with county boundaries. Since counties are a political unit in which political and planning decisions are made, it's appropriate for regions to be defined by inclusive counties. The county-level study focuses on the twenty-one of Florida's sixty-seven counties that had more than 100 repetitive loss properties. There is a brief analysis of these counties to determine local county hotspots, or areas that have high concentrations of repetitive losses based on insurance payouts.

DATA COLLECTION

DATA SOURCES

The definition of repetitive loss properties used in this report is: “properties with two or more NFIP claims of at least \$1,000 in any rolling ten year period.” The definitive source on repetitive loss property data is the NFIP Bureau and Statistical Agent Bureaunet.⁶ The Bureaunet database for repetitive loss properties contains addresses of all properties that meet the repetitive loss criteria. The database is maintained by the Flood Insurance Administration (FIA) and is updated monthly. Data in this report represents claims through November 30, 2004. For Florida, this should include the majority of the claims resulting from the 2004 Hurricane Season.

In 1998, FEMA Region IV developed a tool to collect data in the field on repetitive losses. The data entry template is a Microsoft Access form which records summary property information, such as address, latitude and longitude, field comments, photographs and mitigation measures. The form was designed to mirror the typical AW-501 paper worksheets that Community Rating System (CRS) communities typically submit for the NFIP. The tool is designed so the updated data from the Insurance Services Office (ISO) and the field data are easy to compare. After the field verification data is collected, it is submitted to ISO for review.

Recently FEMA Headquarters has developed a National Flood Mitigation Data Collection Tool with input from an oversight committee with national representation. The national product hereinafter referred to as the National Tool was developed to 1.) Provide standardization and uniformity of data captured by various regions and 2.) Allow for much more detailed data capture, particularly project development oriented site specific data when warranted. The National Tool has both a limited and detailed data capture form. The limited form closely parallels the Region IV tool with a few additions, while the detailed screen tool provides for much more site-specific data capture. Most of the previously captured field data using the Region IV tool has been imported into the National Tool. Due to the benefits of the national standard and the increased functionality of the National Tool, Region IV has now made the conversion to capture all new field data with the National Tool.

FIELD VERIFICATION PROCESS

The field verification process involved multiple steps. A team of disaster assistance employees photographed buildings, recorded GPS coordinates and recorded inspection comments at each repetitive loss property location using the tools previously discussed. Each team used a notebook computer with mapping navigation software, Microsoft Access, a GPS receiver and a digital camera. Over the years the process has been streamlined to use batch methods of processing data for efficiency of time and is essentially paperless. Recently, repetitive loss kits have been purchased for all regions to use. These kits consist of high performance notebook computers, digital cameras, GPS

⁶ Information available at: <http://bsa.nfipstat.com/>.

receivers and scanners. The new GPS receivers are WAAS enabled which provide an improvement in accuracy from +/- 15 meters to +/- 5 meters.

The coverage of the state of Florida was broken down into counties. Within the county assignments the field verification effort would begin in the dense concentrated areas and then work outward towards the more dispersed property locations. The data collection for Florida began in Miami-Dade County in 2001. Miami-Dade County experienced two major “back to back” events: Hurricane Irene in 1999 and the infamous “No-Name” storm of 2000. These events resulted in major flood damages and increased the number of repetitive loss properties in the county from a few hundred to more than 2,600. Two disaster assistance employees were deployed to the county to collect data in conjunction with local officials. A substantial amount of work was completed in three months and a comprehensive database was provided to the county. The county then developed GIS applications that have been used extensively for mitigation planning and project funding. The next data collection assignment was for the Tampa Bay area, specifically Pinellas and Hillsborough Counties, which had the 2nd largest concentration of repetitive loss properties. This target area was begun in the spring of 2002 and commenced that summer. The Tampa Bay area consisted of approximately 1,900 repetitive loss properties. Subsequent work assignments spread outward from Tampa Bay, with Sarasota and Manatee Counties, south of the Tampa Bay area, and Pasco, Citrus, and Hernando Counties, north of the Tampa Bay area. These counties were processed in August 2003. In the fall of 2003, work shifted to the East Coast north of Miami-Dade County; including the following counties: Broward, Palm Beach, Martin and St.Lucie. The inventory of this area was completed in early 2004. The data collection effort then proceeded to the Panhandle counties of Bay, Walton, Okaloosa, Santa Rosa, and Escambia in early 2004. These counties were completed that summer.

As of January 2005, approximately 21,000 properties in Region IV have been inventoried. In Florida, the inventory has been underway for about three years, during this time period; approximately 8,500 of 11,000 properties have been inventoried. This data has been provided to communities, the state and others as work has progressed. In addition, validated and enhanced repetitive loss data has been provided to states and communities and has been used extensively to develop mitigation strategies and project implementation.

DATA PROCESS

The first step in the repetitive loss inventory process is to obtain the most recent NFIP data from Bureaunet. Bureaunet is a raw data source, which has not been quality assured and quality controlled, so one of the primary goals of the field verification is to update the Bureaunet database, by adjusting county/city conflicts, correcting address errors and removing duplicate entries. A county field is added to the data from Bureaunet, this county delineation includes the unincorporated areas of the county and all participating local jurisdictions within the county. This delineation is necessary as there are occasional errors when insurance agents who write the policies assign an address to county when it should be a city and vice versa. Additionally, annexations and changes in boundaries over time exacerbate the problem. Another common error are mistakes in the address

fields. Addresses are parsed into Street Number and Street Name, obvious spelling errors are corrected and the naming convention is standardized and made uniform. For example if there are several properties on South Magnolia Street with variations like S. Magnolia Street, Magnolia St. South etc. they are made into S Magnolia St. The address adjustments are necessary for field navigation, but more importantly, there are errors in Bureauent concerning multiple property listings. Some properties may have had different addresses in Bureauent due to spelling errors or naming conventions. Bureauent lists all properties by the address provided by the insurance companies. So sometimes the same property is listed in the database many times.

Next, the data is located on a digital map using the navigation/mapping software, such as MS Streets and Trips or Delorme Street Atlas. Properties that have low confidence match are further researched for zip code errors. Once the data is updated and structured as efficiently as possible, a kick off meeting was held with the local officials. Generally the meetings were held at the county level, which includes the appointed floodplain manager and GIS staff, since the final product can be incorporated as a layer in their local data. The mission task is described; information collected about local flood problem areas and flood protection projects that are planned, underway or completed. Assistance is requested for further property research, if needed, and staff is invited to participate as availability permits. Contact is made periodically with the locals for updates and assistance with access problems and other unique problems that may be encountered.

When the effort is near completion another meeting is held with the locals to review findings and discuss issues arising from field observation. Particular focus is given to properties observed that appear mitigated. A CD of the final product is left with the locals.

PRODUCT DEVELOPMENT

A decision is as good as the information that goes into it. --John F. Bookout, Jr.

GEOGRAPHIC INFORMATION SYSTEM (GIS)

A geographic information system (GIS) has been formally defined as an arrangement of computer hardware, software, and geographic data that people interact with to integrate, analyze, and visualize the data; identify relationships, patterns, and trends; and find solutions to problems. The GIS is designed to capture, store, update, manipulate, analyze, and display the geographic information.⁷ The driving force behind GIS is that place matters, space matters. GIS enables people to visualize the distribution of people, places and things. These types of analysis and visualization can be very powerful decision making tools.

In terms of repetitive loss, the first step in utilizing a GIS is to display the repetitive loss property locations. All of the properties that were field verified had GPS coordinates,

⁷ <http://gis.esri.com/library/userconf/proc98/PROCEED/TO700/PAP657/P657.HTM>

these latitude and longitude coordinates were plotted on a map. The unverified properties were plotted based on their addresses using a process called geocoding. Once the location coordinates for every property location were obtained, a map “layer” of repetitive loss properties was created. A map layer can be any type of event displayed as a point, line or polygon. For instance, some other map layers are county boundaries (polygon), city locations (point) or river networks (line). Once a repetitive property loss point layer has been created it can be combined with many different layers. In this study, the point locations of the repetitive loss properties were analyzed with political boundaries, the coastline, populated areas and the river network.

Event features, such as repetitive loss property points, can also be displayed differently based on attributes. Map layers and features can be differentiated by changing the color, size and/or symbol. For instance, a college or university layer could be displayed by plotting the location of the school with a square, the squares could be two different colors representing female or co-ed student populations, and the size of the square could change based on the total number of student enrollment. For this analysis, the repetitive property losses were displayed based on location with color representing the dollar amount of insurance claims filed. This can be seen at a county level in all the maps entitled, “County Name: Property Locations with Magnitude of Claims.”

There are a few important things to note when viewing the maps of repetitive loss property locations with magnitude of insurance claims. The color classification is based on dollars received in insurance claims, there are four categories corresponding to the four colors. These categories were created using quantiles at a state level. Using all of the repetitive loss properties for the state the four categories were created so that each class contained an equal number of properties, as seen below in Table 1. Description of Quantile Classification. The first half of the analysis will be based on a visual description of the locations of the repetitive loss properties and the distribution of these payout categories.

Table 1. Description of Quantile Classification

Description	Class based on Insurance Claims	Number of Properties
Low	Less than \$13,800	2,752
Medium	\$13,800 - \$30,800	2,751
Medium-High	\$30,800 – \$59,500	2,751
High	Greater than \$59,500	2,752
Total Repetitive Loss Properties in FL as of 11/30/2004		11,006

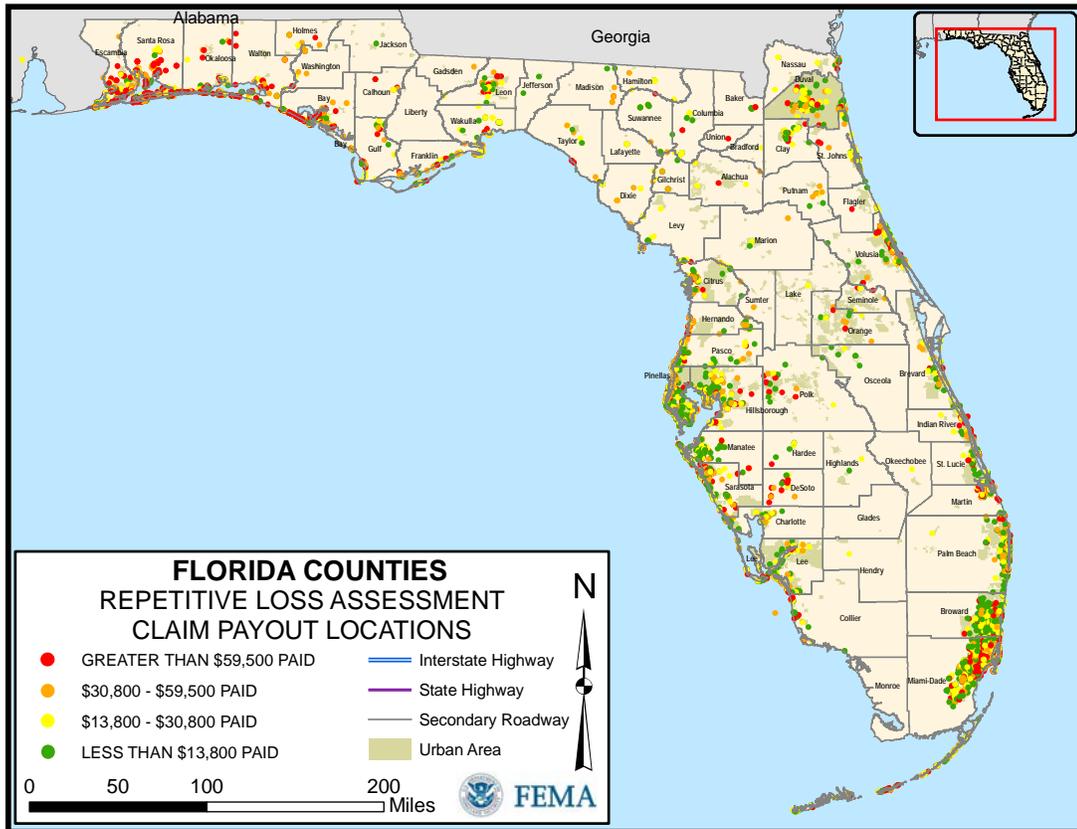
The second step in the GIS analyze in this repetitive loss property analysis, was to utilize the GIS to highlight and prioritize areas receiving a great deal of high claim property losses. The method used for this portion of the study was kernel density estimation. Kernel density estimation was originally used by botanists and ecologists, more recently it has been used for archeology, epidemiology, astronomy and criminology. For example kernel density estimation has been used to define crime hotspots and visualize the diffusion of certain types of disease. Kernel density estimation generates a map of density values based on point data. The estimation is calculated using the density of the points and their associated weights. For the repetitive property loss analysis, the kernel density was used to convert the property points into the density grid. The repetitive loss properties were weighted by the total dollar amount of insurance claims. Therefore the grid was defined by clusters of properties, with an emphasis on clusters of properties with high insurance claims.

RESULTS

STATEWIDE

In Map 1. Statewide Repetitive Loss Properties by Amount of Claim Paid, the repetitive property losses are mapped based on location. Using this overall pattern of repetitive loss properties in the state of Florida general trends can be discussed and analyzed. One of the most dominant patterns is the importance of relative location to coastlines. The majority of the properties are located within close proximity to the coast. There are three dominant coastline areas: the southern panhandle, the west-central coast on the Gulf of Mexico and the southeastern coast along the Atlantic Ocean. There is also a large concentration located in Jacksonville in Duval County located in northeastern Florida. There are many important factors that may be exacerbating the problem of repetitive losses, such as population density and urban areas, development in coastal regions, influence of floodplain delineation, age and type of housing structure and income level of owners. In terms of population density and urban areas, 8,344 out of 11,006 or 75.81% of the repetitive loss properties are located in census designated places.⁸ The other potential factors are not addressed in this project, however, with the repetitive loss data and the available GIS tools they can be investigated in future studies.

Map 1. Statewide Repetitive Loss Properties by Amount of Claim Paid

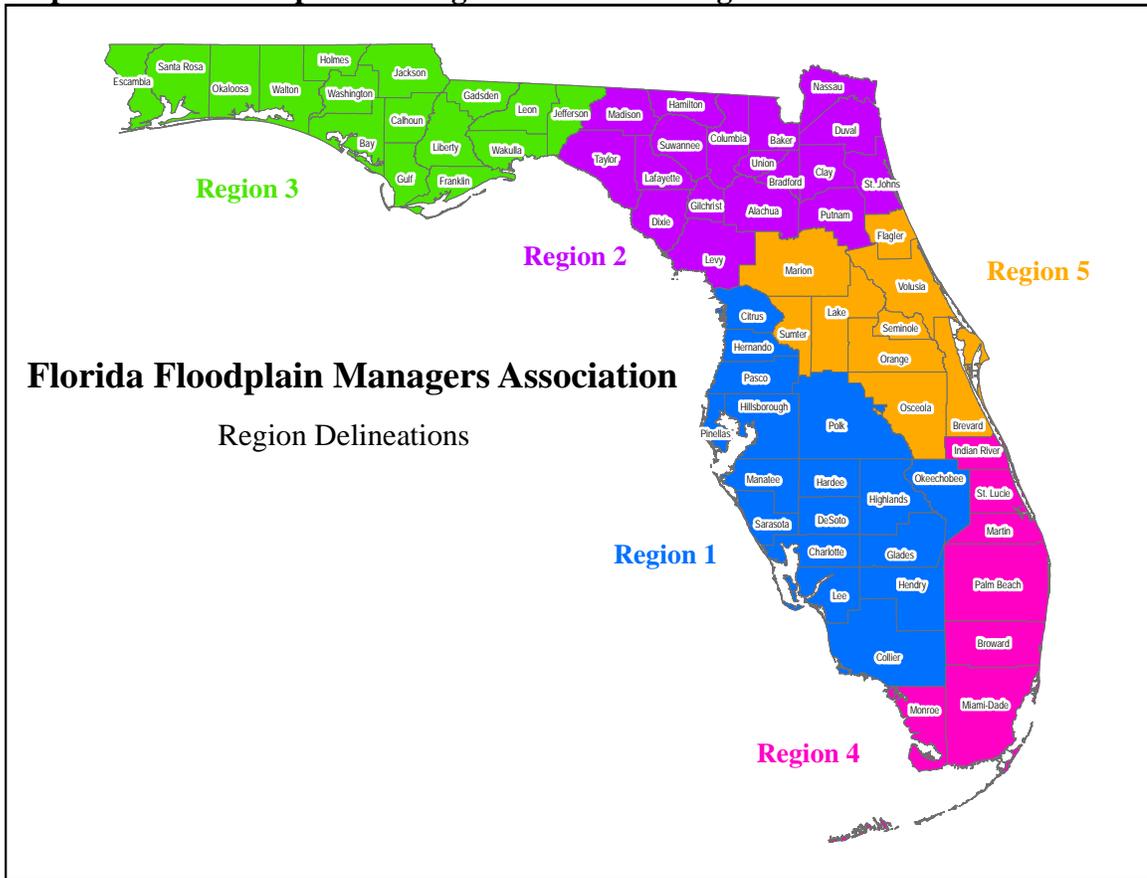


⁸ Definitions for census designated places, consolidated cities and incorporated places can be found at the following website: http://www.census.gov/geo/www/cob/pl_metadata.html.

REGIONAL

The regional analysis uses the regional divisions for the State of Florida as outlined by the Florida Floodplain Managers Association.⁹ As seen in Map 2. Florida Floodplain Managers Association Region Delineations there are five defined regions. The region containing the largest number of counties was Region 2: North-Central (18 counties). Region 1: West-Central and Region 3: Panhandle have fewer counties with 16 and 14 counties, respectively. There are 7 counties in Region 4: South and 9 counties located in Region 5: East-Central. (Table 2. Regional Comparison of Repetitive Loss Properties)

Map 2. Florida Floodplain Managers Association Region Delineations¹⁰



⁹ <http://www.ffma.net>

¹⁰ http://www.ffma.net/board_of_directors.htm

Table 2. Regional Comparison of Repetitive Loss Properties

	Region 1: West-Central	Region 2: North-Central	Region 3: Panhandle	Region 4: South	Region 5: East-Central
Number of Properties	4,478	580	1,948	3,792	208
Amount Paid Out	\$202,005,732.21	\$27,818,315.46	\$172,096,950.93	\$167,190,354.77	\$8,627,396.60
Average Paid Out	\$45,110.70	\$47,962.61	\$88,345.45	\$44,090.28	\$41,477.87
Number of Counties in Region	16	18	14	7	9
Number of Priority Counties	9	1	6	4	1

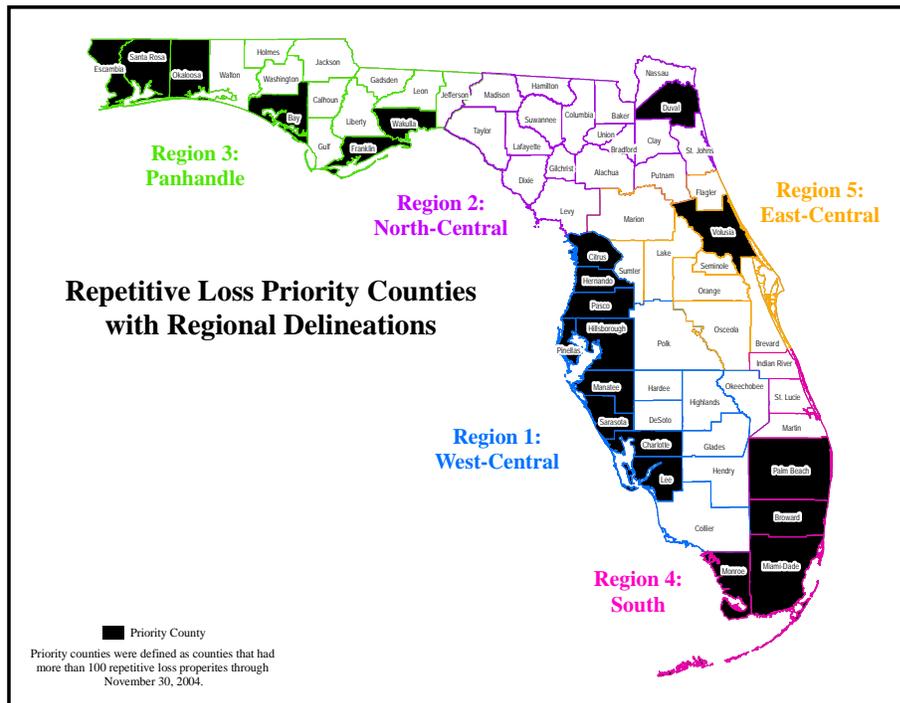
As mentioned in the previous discussion of the pattern of repetitive losses in the state of Florida there are three dominant coastline areas: the southern panhandle, the west-central coast on the Gulf of Mexico and the southeastern coast along the Atlantic Ocean. This trend is replicated when the repetitive loss statistics are broken into regions as in Table 2. Regional Comparison of Repetitive Loss Properties. The West-Central Region (1) has the largest number of repetitive loss properties and amount of monetary insurance payouts with 4,478 properties totaling \$202,005,732.21. The second largest occurrence of repetitive loss by region occurs in Region 4: South with 3,792 properties. However, Region 4 is not the region receiving the second highest amount of insurance payouts. Region 4 has received \$167,190,354.77 in insurance payouts due to repetitive loss, in comparison Region 3 has received \$172,096,950.93 for 1,948 properties. This difference is reflected in the average amount of insurance payment; Regions 1, 2, 4 and 5 range from approximately \$41,000 to \$48,000 per repetitive loss property, while Region 3 has an average of \$88,345.45. Region 2: North-Central and Region 5: East-Central have fewer repetitive loss properties and have received less money in insurance claims, however they will continue to be addressed in this report.

These five regions will be used to define the organizational structure of the remaining portions of this report. Within each region, further detail, discussion and in-depth analysis will be included for priority counties. Priority counties were defined as counties with more than 100 repetitive loss properties as seen in Table 3. Repetitive Loss Priority Counties. These 21 counties contain 9,906 properties or 91 % of the state total. The priority counties are predominantly located in Region 1: West-Central, Region 3: Panhandle and Region 4: South. The remaining regions, two and five, contain only one priority county each.

Table 3. Repetitive Loss Priority Counties

County Name	Number of Repetitive Loss Properties
DADE COUNTY	2,693
PINELLAS COUNTY	1,503
ESCAMBIA COUNTY	696
PASCO COUNTY	642
LEE COUNTY	493
BROWARD COUNTY	464
HILLSBOROUGH COUNTY	396
MANATEE COUNTY	387
CITRUS COUNTY	351
SARASOTA COUNTY	346
SANTA ROSA COUNTY	287
OKALOOSA COUNTY	270
MONROE COUNTY	224
BAY COUNTY	211
PALM BEACH COUNTY	210
DUVAL COUNTY	180
CHARLOTTE COUNTY	133
HERNANDO COUNTY	129
FRANKLIN COUNTY	129
VOLUSIA COUNTY	125
WAKULLA COUNTY	108

Map 3. Repetitive Loss Priority Counties with Regional Delineations



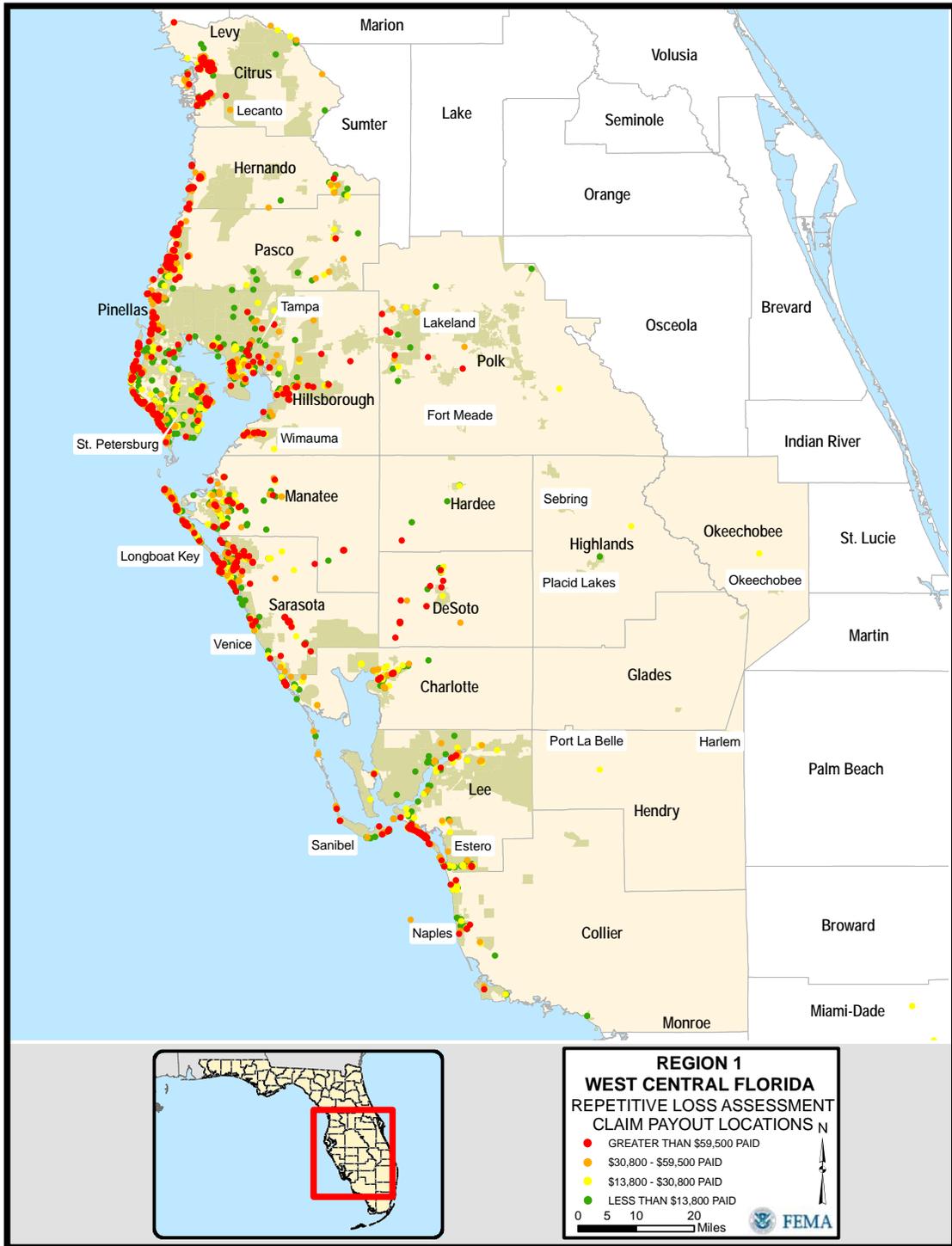
Region 1: West-Central

There are 4,478 repetitive loss properties located in the West-Central Region, which are displayed in Map 4. Region 1: Location of Property Losses by Claim Magnitude. FEMA Region IV has inventoried 3,751 or 83.77% of these properties with the data collection tool. There are nine priority counties within Region 1: West-Central: Pinellas County, Pasco County, Lee County, Hillsborough County, Manatee County, Citrus County, Sarasota County, Charlotte County and Hernando County (Map 3. Repetitive Loss Priority Counties with Regional Delineations).

Flood Zone Delineation	Number of Properties
A	200
AE and A1-A30	3439
AH	4
AHB	3
VE	453
EMG	15
BC and X	321
D	24
Unknown	19

Number of Insurance Claims	2	3	4	5	6	7	8	9	10	12
Number of Properties	2,676	1,136	407	145	61	25	15	10	2	1

Map 4. Region 1: Location of Property Losses by Claim Magnitude



Pinellas County

Pinellas County has the second largest occurrence of repetitive loss properties in Florida counties with 1,503 repetitive loss properties. These properties account for 13.66% of all repetitive loss properties in the state of Florida. According to the map, Map 5. Pinellas County: Property Locations with Magnitude of Claims, the properties are mainly located along the barrier islands from St. Petersburg Beach to north of Belleair Shores at Clearwater Beach. There are also significant clusters of properties located in the north-western Tarpon Springs and the southeastern portion of the county. Pinellas County received \$67,976,750.33, which comprises 21.95% of the total amount of repetitive loss payouts for the state of Florida. The kernel density estimation based on dollar losses, Map 6. Pinellas County: Density of Property Losses, shows that the repetitive loss properties are distributed through the majority of the county in large coastal areas. However the density analysis highlights two main hotspots based on amount of insurance claims: Clearwater Beach and Shore Acres neighborhood. These hotspots are clusters of repetitive properties that are receiving large insurance payments and would be ideal places to target future mitigation programs.

ShoreAcresNeighborhood

PinellasCountyRepetitiveLossPriorityArea

In Pinellas County, one of the two designated repetitive loss hotspots was the Shore Acres neighborhood. Shore Acres is located in Northeast St. Petersburg on the Tampa Bay. There were 267 repetitive loss properties located within this 6 square mile area with total claims payouts of \$13.5 million.

The area was a former marsh land that was first platted in 1923. Dredging operations began shortly thereafter and development occurred during the ensuing boom and bust years. The area was substantially developed by the 1950's. Elevations of the land vary from about 5 to 6 feet above sea level near the waterfront to, in some cases, as little as two-three feet.

Although some elevation activity has occurred by attrition and with mitigation measures, most structures are well below base flood elevation and are vulnerable to flooding.

Since this has been historically one of the areas in Pinellas County repetitively claiming losses it should be targeted for future mitigation measures.



Pasco County

In Pasco County, there are 642 repetitive loss properties, the fourth largest concentration in the state. These account for 5.83% of all repetitive loss properties in the state of Florida. The majority of the repetitive loss properties are located in the western half of Pasco County within 5 miles of the coastline. The analysis of the property distribution in Map 7. Pasco County: Property Locations with Magnitude of Claims, shows two distinct areas with large numbers of repetitive loss properties: Hudson and Port Richey. Pasco County has received \$30,086,271.20 in insurance claims on repetitive loss properties, which comprises 9.72% of the total amount of repetitive loss payouts for the state of Florida. The density estimation based on dollar losses highlights the same two areas; however Hudson is more pronounced and distinct. In conclusion, the Hudson community area is the dominant hotspot for Pasco County and is a clear priority for future mitigation projects.

Hudson community Pasco County Repetitive Loss Priority Area

The hotspot highlighted as a priority area for repetitive loss in Pasco County was Hudson. Hudson is an unincorporated community in northern Pasco County on the Gulf of Mexico. There are over 100 repetitive loss properties and total insurance payouts exceed 5.5 million dollars. The neighborhood is approximately 6.4 square miles with 12,765 residents.

Most of the structures are single family residential that were developed before the development of the Flood Insurance Rate Maps (pre-FIRM). The majority of the structures were built in the late 1960's and early 1970's. The land was developed using traditional dredge and fill construction techniques. Most of the lots have waterfront/canal access.

Although some elevation activity has occurred by attrition and with mitigation measures, most structures are well below base flood elevation and are very

vulnerable to flooding. This neighborhood would be an ideal location to target future mitigation activities.



Lee County

The county with the fifth largest number of repetitive loss properties is Lee County with 493 repetitive loss properties. These properties account for 4.48% of all repetitive loss properties in the state of Florida. In Map 9. Lee County: Property Locations with Magnitude of Claims, some properties are dispersed near the Caloosahatchee River in the Fort Myers area, however the majority of the properties are clustered on two barrier islands, San Carlos Island and Estero Island. There are also properties located on Sanibel Island. Lee County received, \$18,231,466.43, which comprises 5.89% of the total amount of repetitive loss payouts for the state of Florida. The density analysis based on insurance claims, Map 10. Lee County: Density of Property Losses, highlights Fort Myers Beach on Estero Island as the area with the most concentrated repetitive losses.

Elevated Lighthouse Resort Shines ... A Beacon of Success in Ft. Myers Beach, FL

The repetitive loss analysis revealed a hotspot area, Ft. Myers Beach in Lee County, that had numerous repetitive loss properties and received large insurance claims. The results suggested that this area would be an exceptional area to target for future mitigation projects. Further research discovered that there has already been one such success story in this area.

As part of a joint state, federal and local mitigation project, four buildings at the Lighthouse Resort Inn and Suites, which sits 200 feet from the beach at San Carlos Bay, were elevated above the 100-year flood plain. When Hurricane Charley hit Fort Myers Beach in August 2004, these buildings remained dry, undamaged, and full of customers. Other hotels and motels on the island were damaged or flooded and closed.

In the past, the Lighthouse Resort would have been closed, too. In two decades, there have been seven hurricane events causing flood and wind-related damage to the resort, leaving the owner to deal with nearly \$100,000 in repair costs per event. In approximately one year, the owner has saved nearly \$200,000 in repair costs alone – almost 50 percent of the investment.



Hillsborough County

There are 396 repetitive loss properties in Hillsborough County accounting for 3.6% of all repetitive loss properties in the state of Florida. Hillsborough County received, \$19,628,687.06, which comprises 6.34% of the total amount of repetitive loss payouts for the state of Florida. According to Map 11. Hillsborough County: Property Locations with Magnitude of Claims, the repetitive loss properties are located in the western portion of Hillsborough County, including Tampa and the coast of the Hillsborough Bay and Tampa Bay. The properties are concentrated on the Interbay Peninsula, as well as the Gibsonton and Ruskin areas. The map displaying the results of the density analysis, Map 12. Hillsborough County: Density of Property Losses, highlights an area on the northwestern portion of the Interbay Peninsula at the intersection of Henderson Boulevard and West West Shore Boulevard. This hotspot area contains the dense concentration of repetitive loss properties receiving large insurance claims.

Manatee County

There are 387 repetitive loss properties in Manatee County. These account for 3.52% of all repetitive loss properties in the state of Florida. Manatee County received \$14,289,395.92, which comprises 4.61% of the total amount of repetitive loss payouts for the state of Florida. As seen in Map 13. Manatee County: Property Locations with Magnitude of Claims, the repetitive loss properties are located in the western portion of Manatee County, with the most concentration in Bradenton, Anna Marie Island and Longboat Key. When analyzing the distribution of properties by amount of insurance claims the density analysis, Map 14. Manatee County: Density of Property Losses, shows the primary hotspot on the northern end of Longboat Key. There are also three secondary hotspot locations.

Citrus County

In Citrus County, there are 351 repetitive loss properties, which account for 3.19% of all repetitive loss properties in the state of Florida. Citrus County received \$19,526,300.51 in repetitive loss payouts, or 6.31% of the total amount for the state. According to Map 15. Citrus County: Property Locations with Magnitude of Claims, the properties are located in two main areas: east of the city of Crystal River along the Crystal River and Kings Bay and between Homosassa and Homosassa Springs along the Homosassa River. The kernel density estimation highlights the primary hotspot in Crystal River.

Sarasota County

There are 346 repetitive loss properties in Sarasota County, which is 3.14% of all repetitive loss properties in the state of Florida. Sarasota County received \$16,890,631.46 or 5.45% of the total amount of repetitive loss payouts for the state. The majority of the repetitive loss properties are located in the northwestern section of Sarasota County. As seen in Map 17. Sarasota County: Property Locations with Magnitude of Claims, the properties are located in the coastal areas of Longboat Key, Siesta Key and Venice Beach. There are also repetitive loss properties dispersed throughout Sarasota and Fruitville. The kernel density estimation, Map 18. Sarasota County: Density of Property Losses, displays the coastal influences and coverage in Sarasota, it also highlights a hotspot in Sarasota. This hotspot has been identified as the Phillippi Creek Flood area.

Phillippi Creek Watershed

Mitigation Measures in Sarasota County

The density analysis of repetitive loss properties discovered a hotspot of properties and insurance payouts in the Phillippi Creek Watershed. A major flood protection project has recently been completed in Sarasota County within the Phillippi Creek Watershed know as the Bahia Vista / Lockridge Floodplain Reclamation Project. As part of the project, Sarasota County acquired and demolished about 30 flood prone homes along the channel in order to construct an earthen berm and pumping station to protect about 75 remaining flood prone homes. A parallel storage

facility along side the berm complements the flood protection works.

This type of project is an example of how to mitigate properties a county's worst repetitive loss areas.



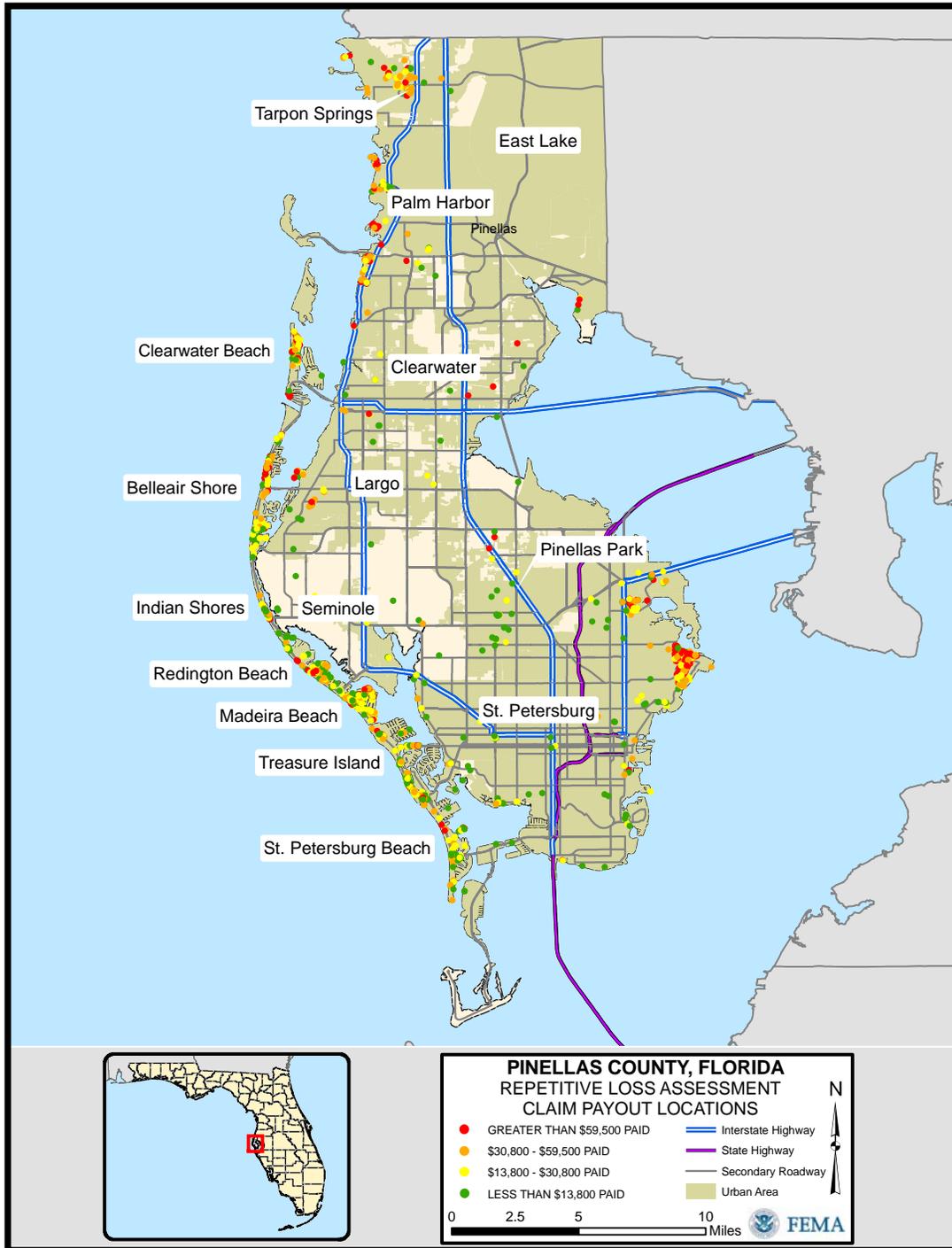
Charlotte County

In Charlotte County, there are 133 repetitive loss properties. These account for 1.21% of all repetitive loss properties in the state of Florida. Charlotte County received \$4,505,920.57, which comprises 1.46% of the total amount of repetitive loss payouts for the state of Florida. There are two main areas of repetitive loss properties in Map 19. Charlotte County: Property Locations with Magnitude of Claims: Manasota Key and Port Charlotte and Punta Gorda along the Charlotte Harbor and the Peace River. When the density estimation evaluates the repetitive loss properties based on insurance payouts the hotspot is found on the southern end of Manasota Key (Map 20. Charlotte County: Density of Property Losses). This barrier island should be targeted with funding opportunities to reduce the number and magnitude of repetitive claims.

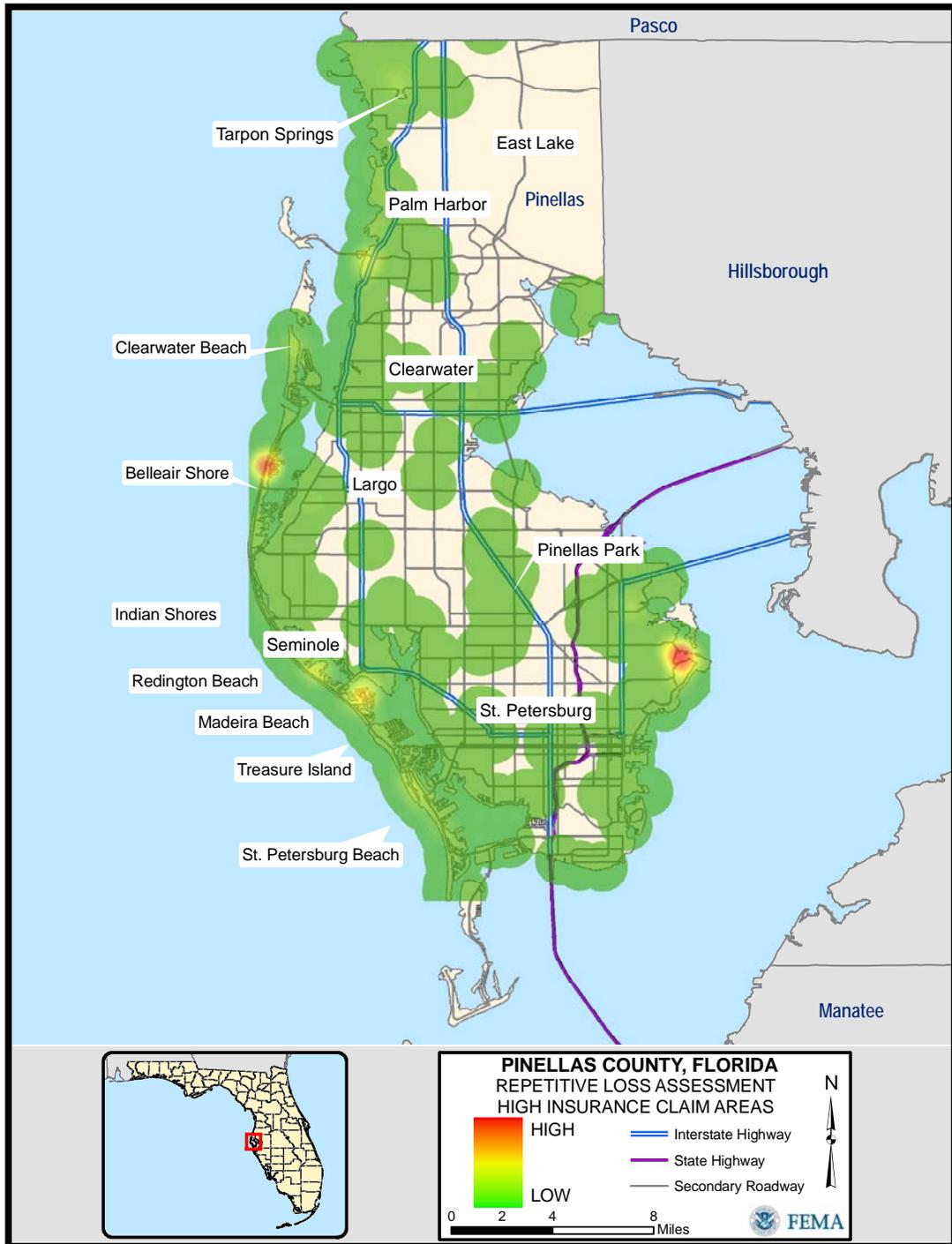
Hernando County

There are 129 Repetitive loss properties in Hernando County. These account for 1.17% of all Repetitive loss properties in the state of Florida. Hernando County received \$6,062,893.04, which comprises 1.96% of the total amount of repetitive loss payouts for the state of Florida. In Map 21. Hernando County: Property Locations with Magnitude of Claims, the repetitive loss properties are located in the southwestern corner of county along the coastline. The main areas of concentration are Pine Island, Weeki Wachee Gardens and Hernando. Using the density analysis based on insuranceclaims, Map 22. Hernando County: Density of Property Losses, there are two main hotspots: Weeki Wachee Gardens and Hernando.

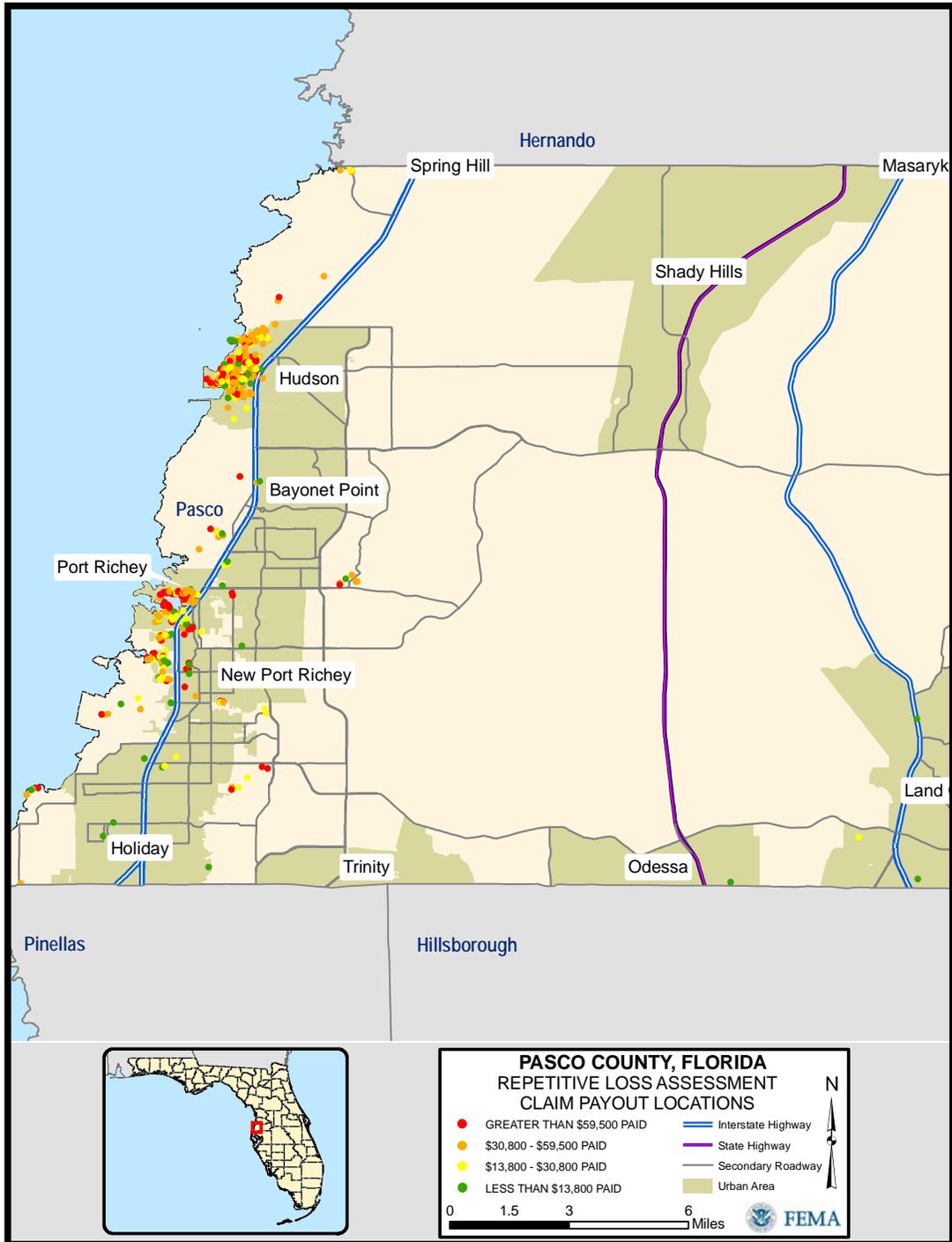
Map 5. Pinellas County: Property Locations with Magnitude of Claims



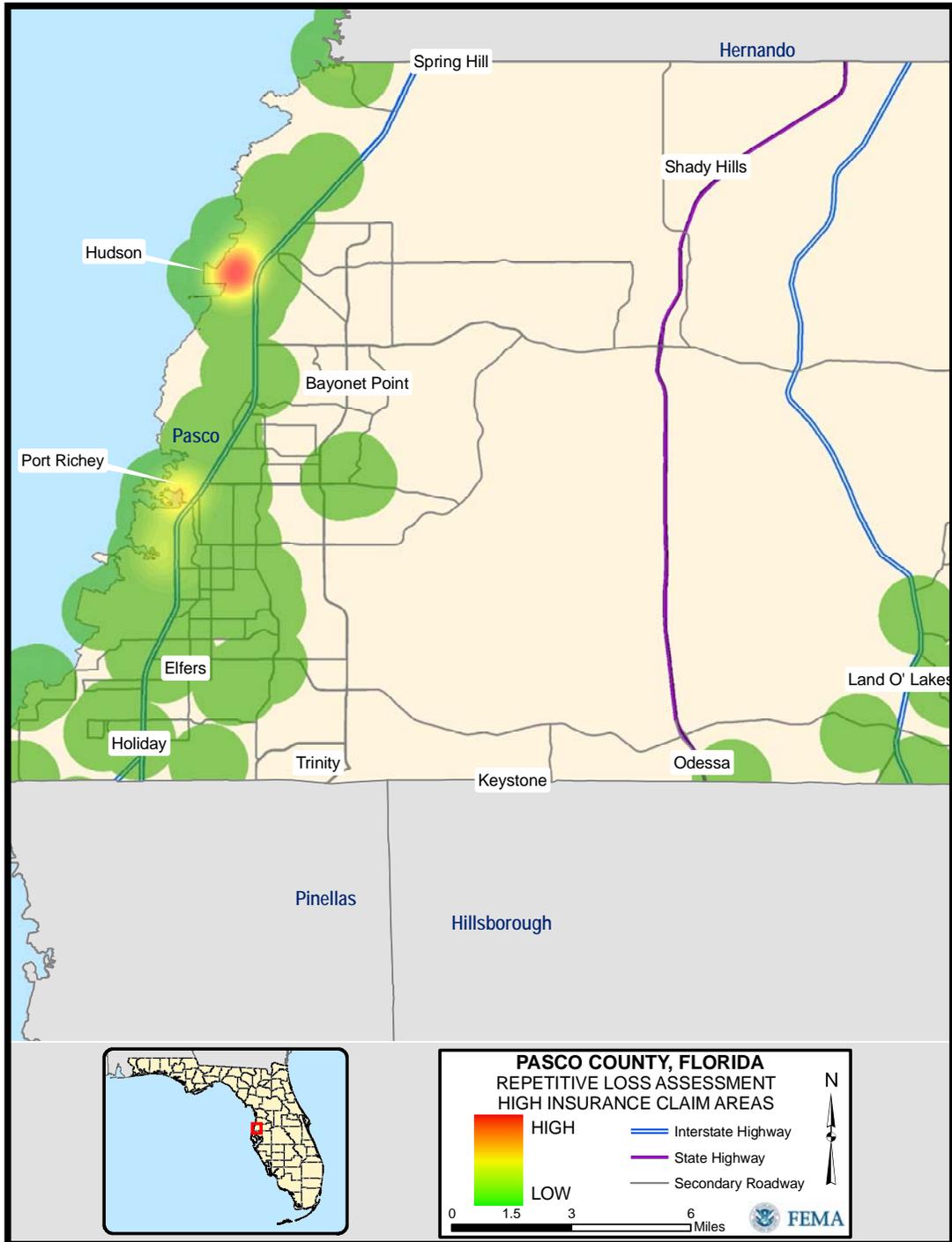
Map 6. Pinellas County: Density of Property Losses



Map 7. Pasco County: Property Locations with Magnitude of Claims



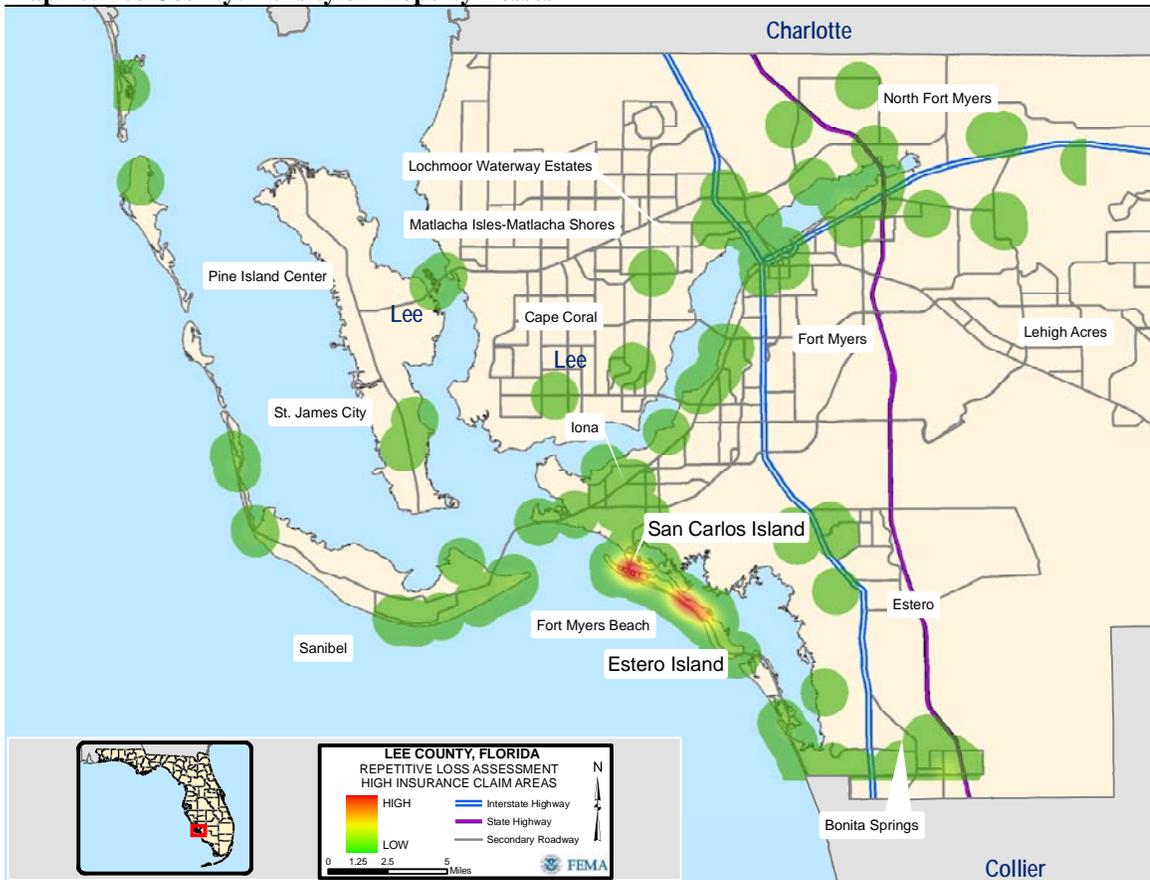
Map 8. Pasco County: Density of Property Losses



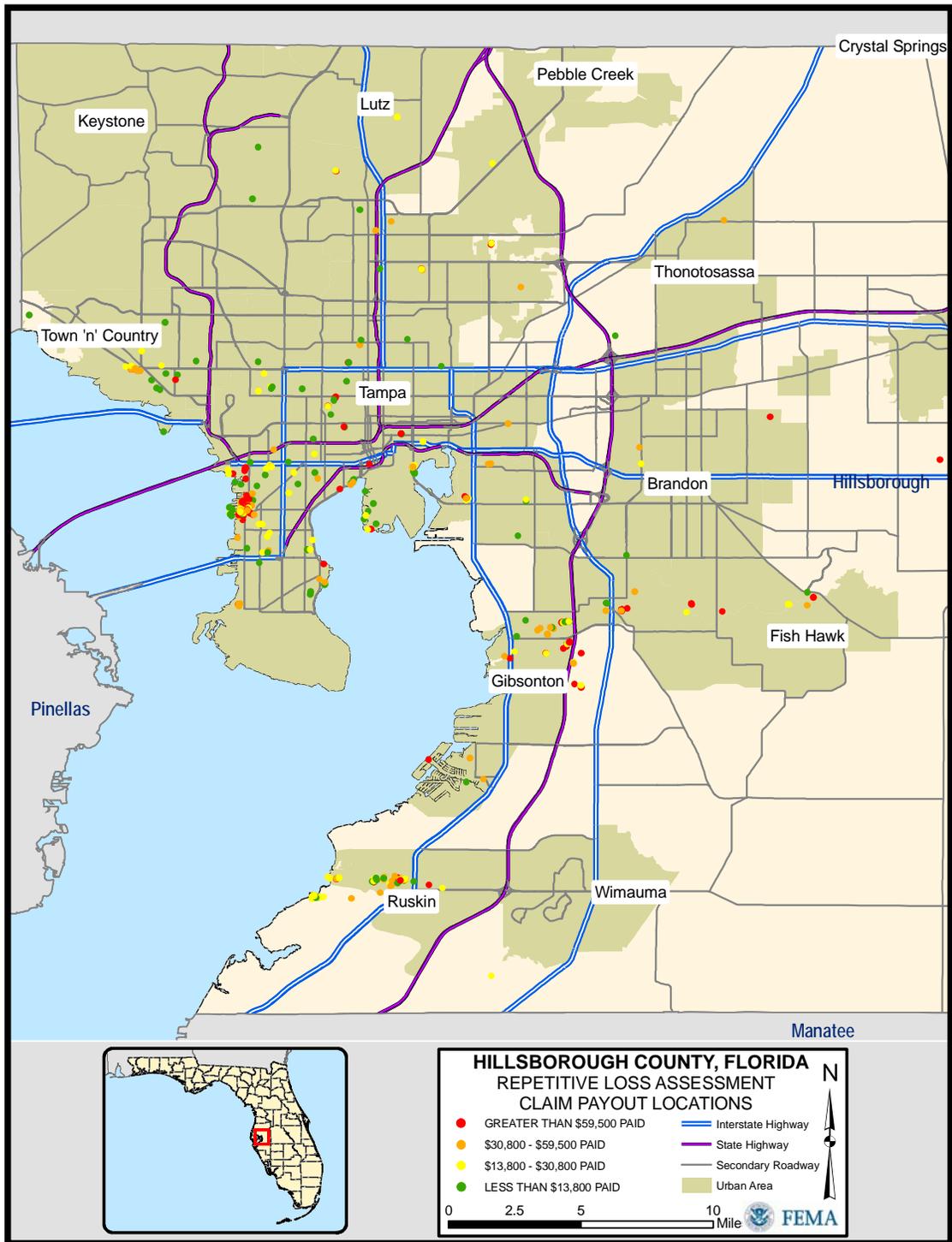
Map 9. Lee County: Property Locations with Magnitude of Claims



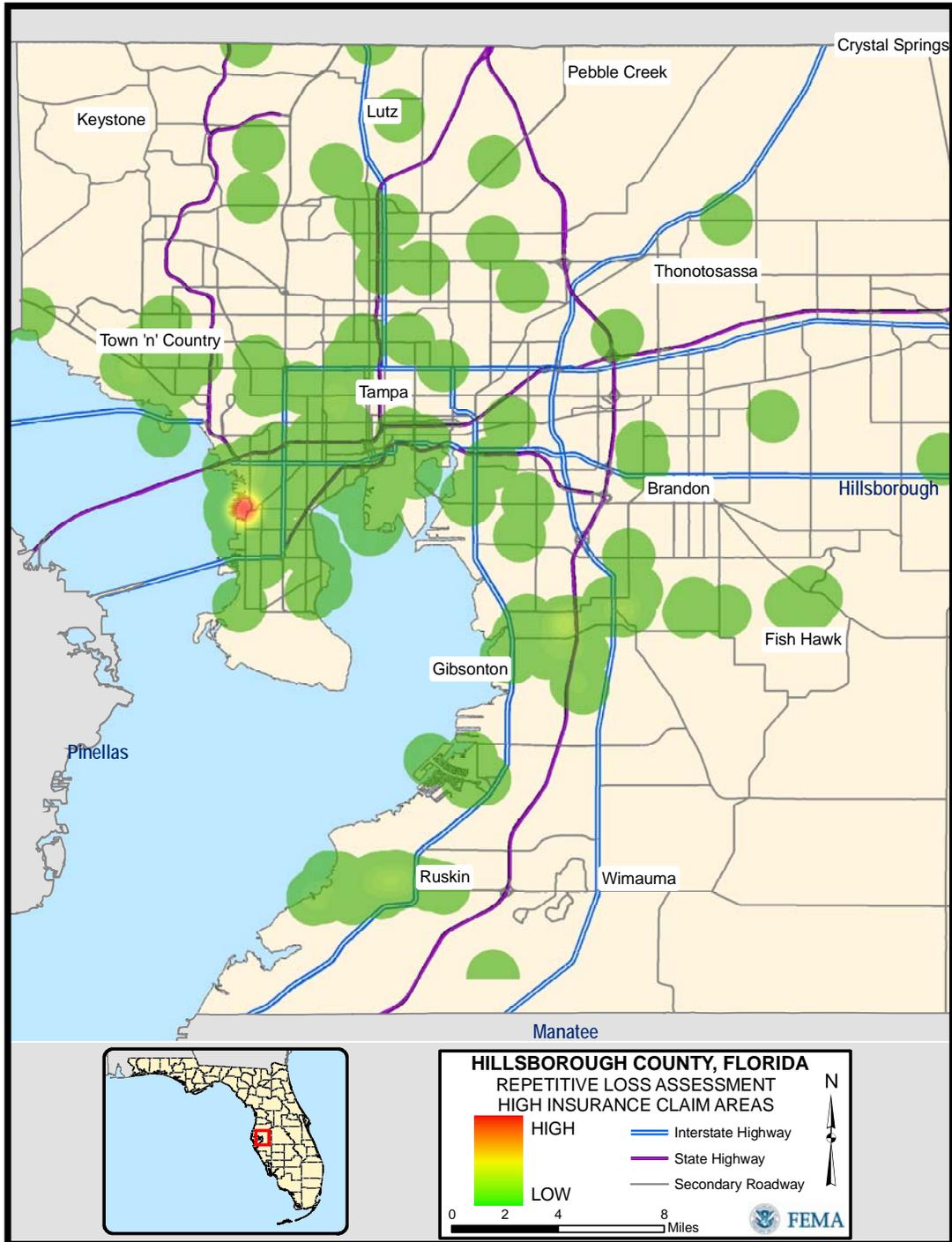
Map 10. Lee County: Density of Property Losses



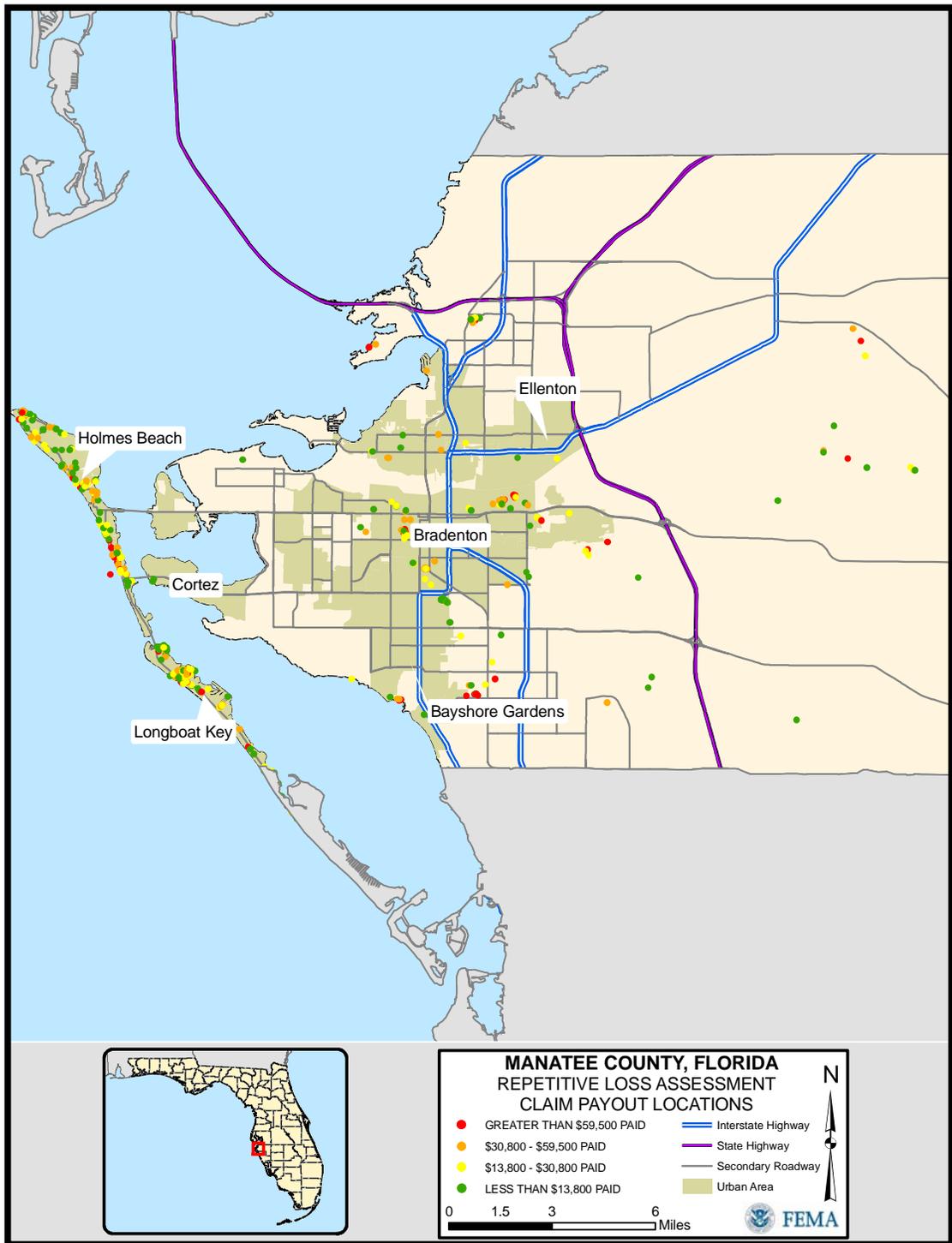
Map 1. Hillsborough County: Property Locations with Magnitude of Claims



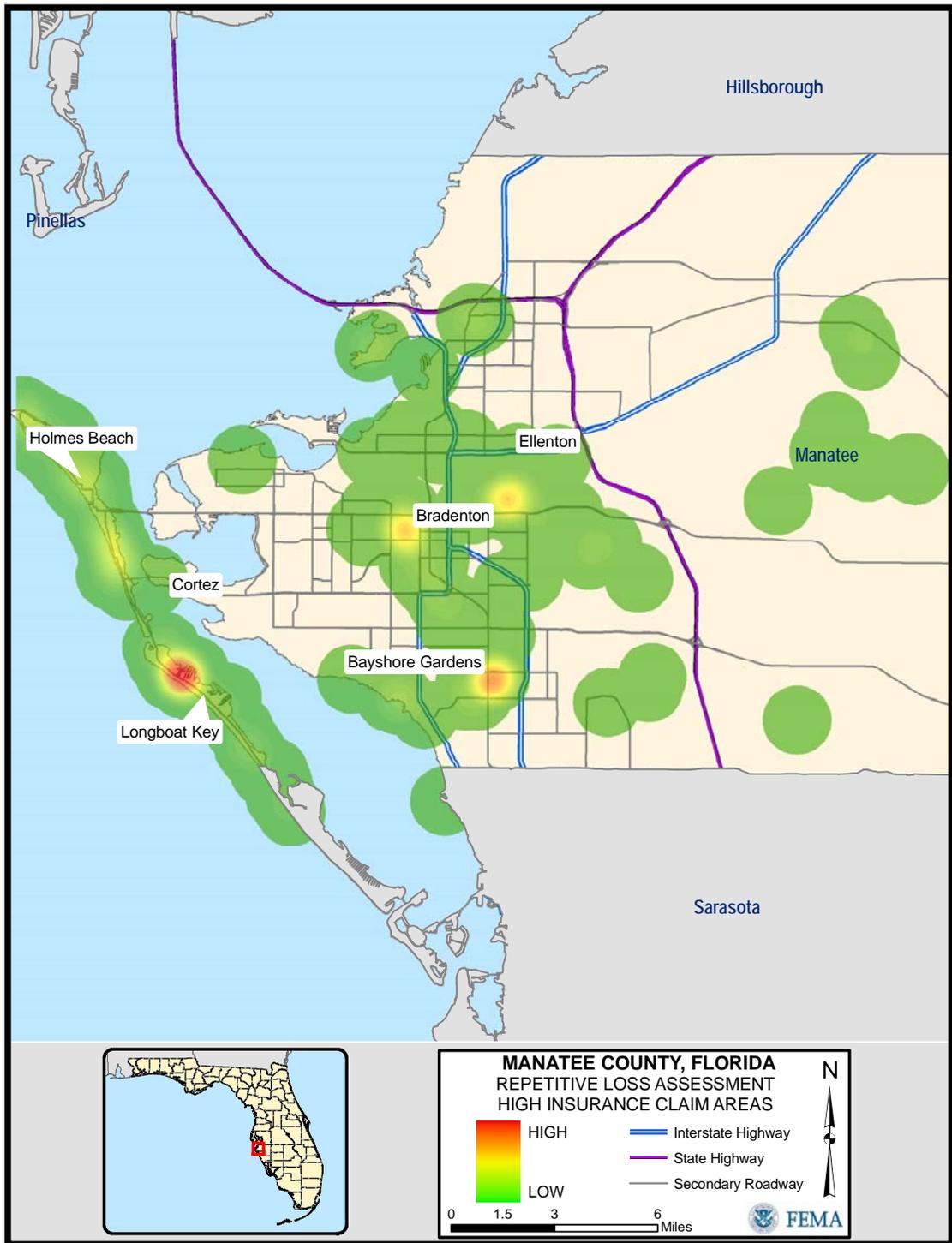
Map 2. Hillsborough County: Density of Property Losses



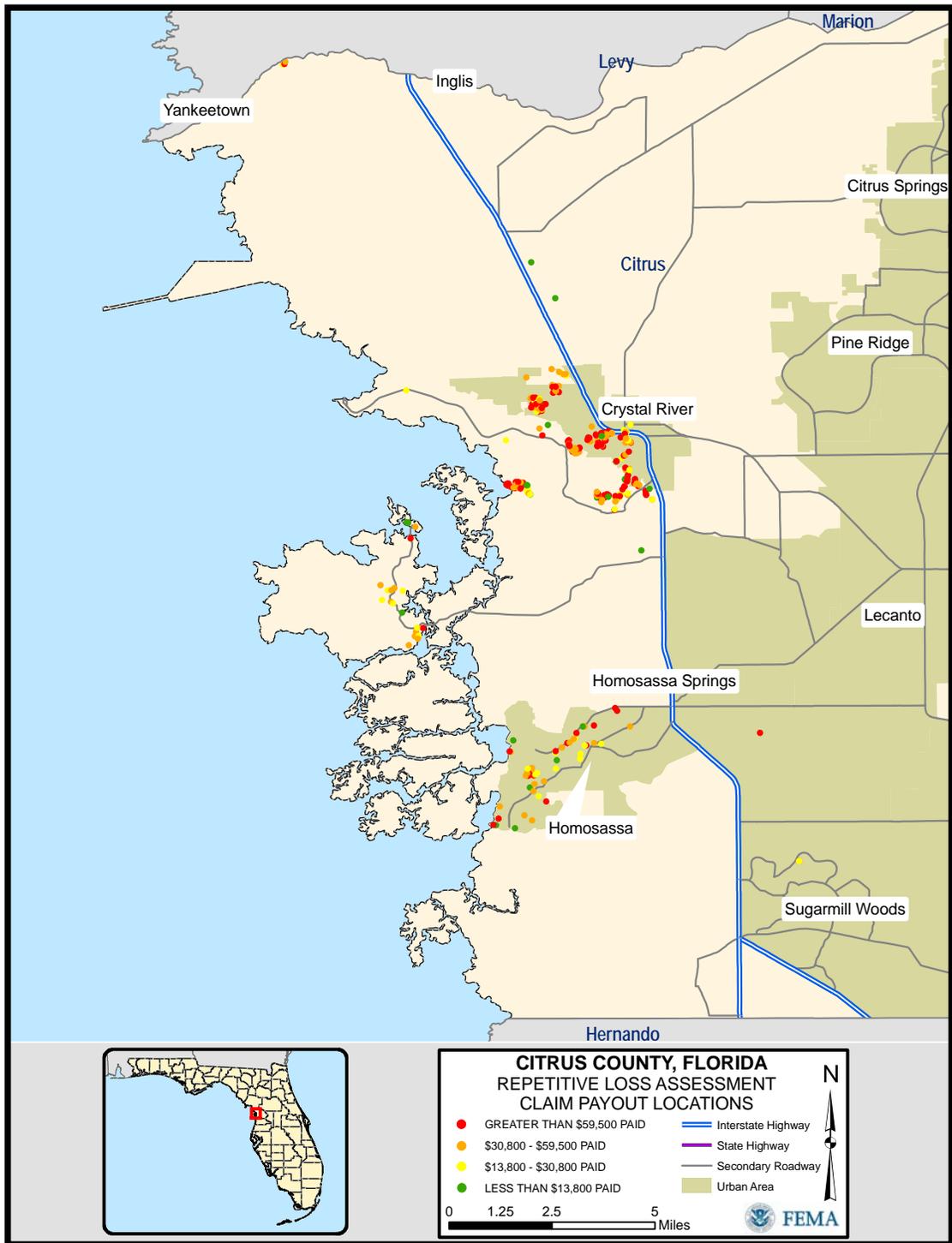
Map 3. Manatee County: Property Locations with Magnitude of Claims



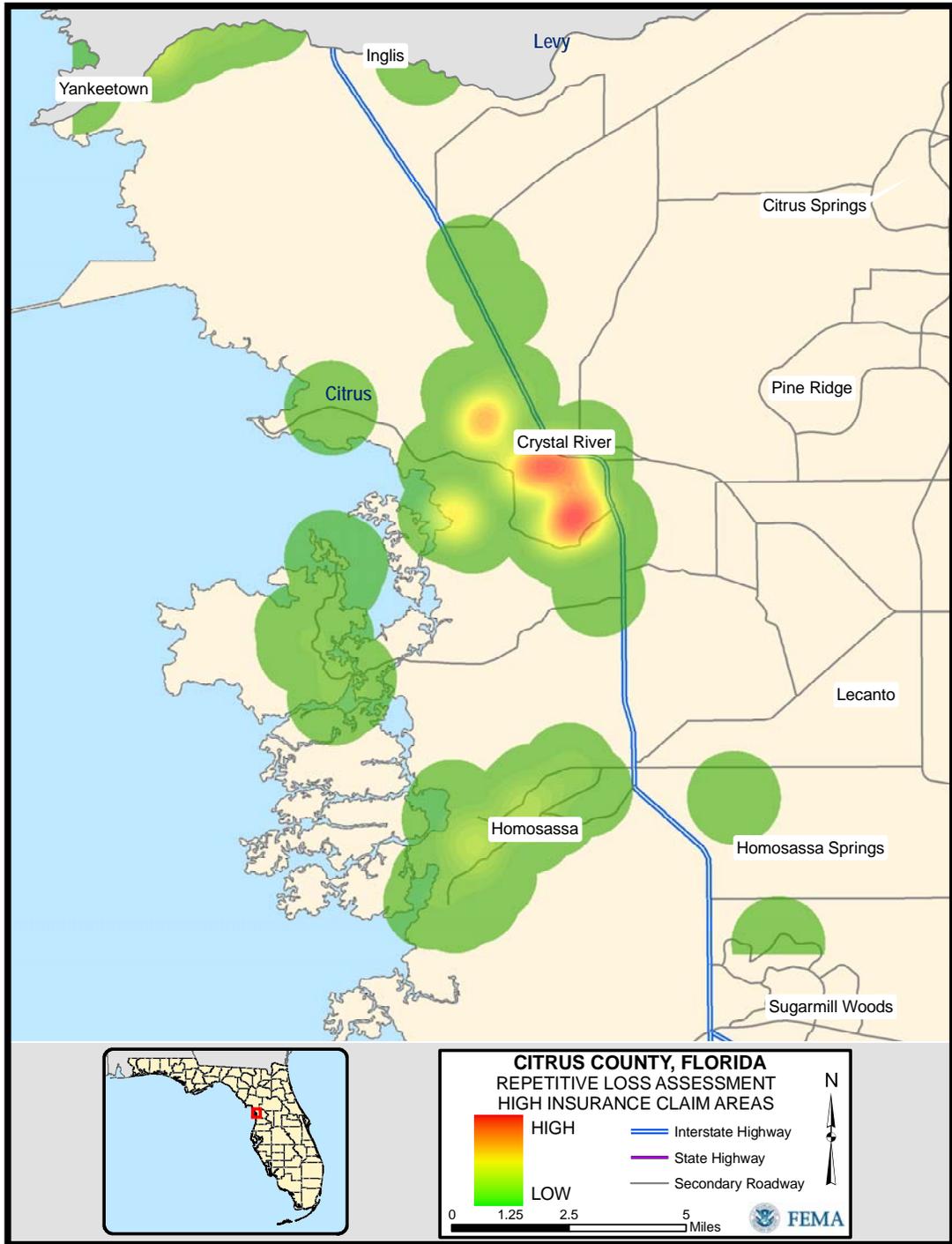
Map 4. Manatee County: Density of Property Losses



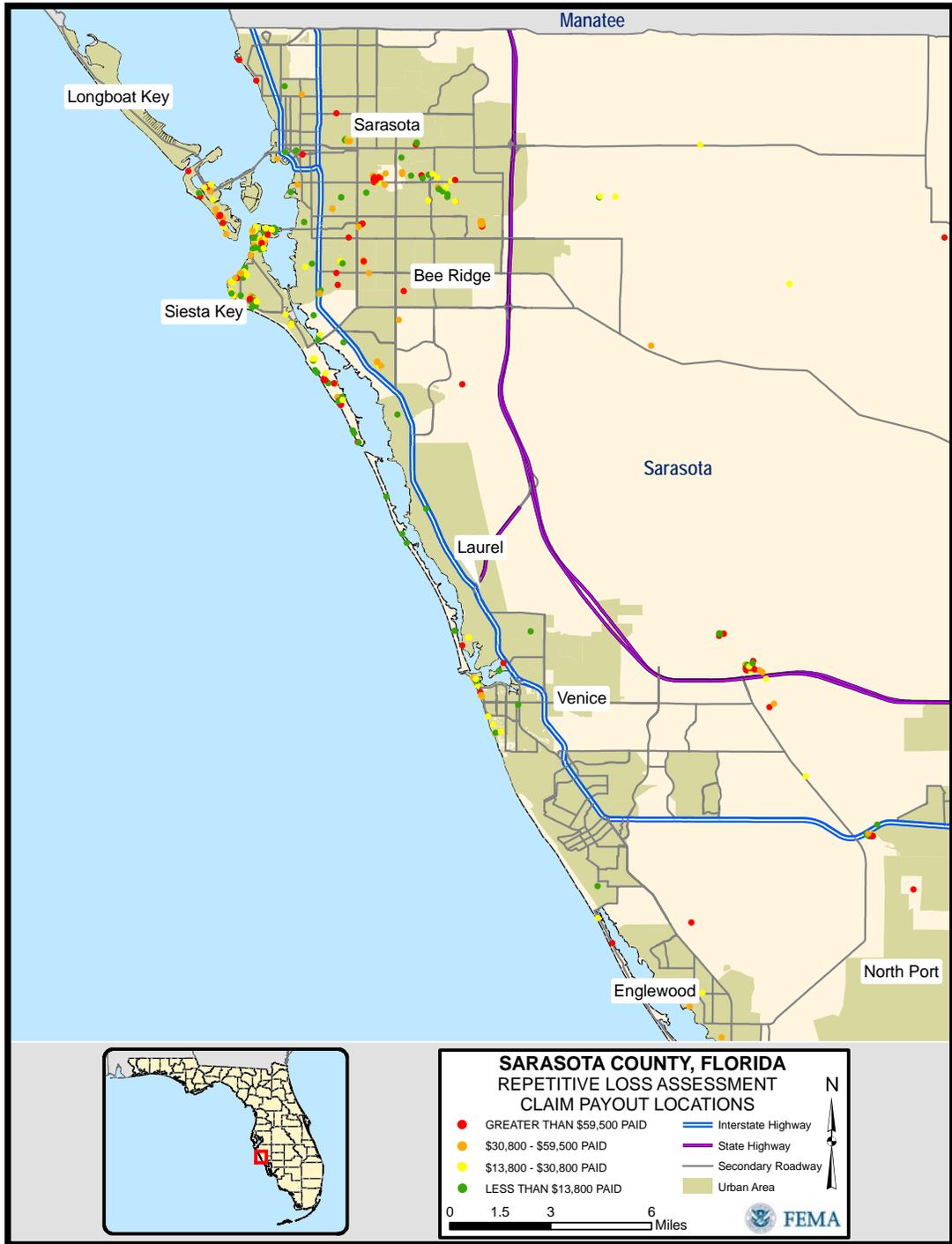
Map 5. Citrus County: Property Locations with Magnitude of Claims



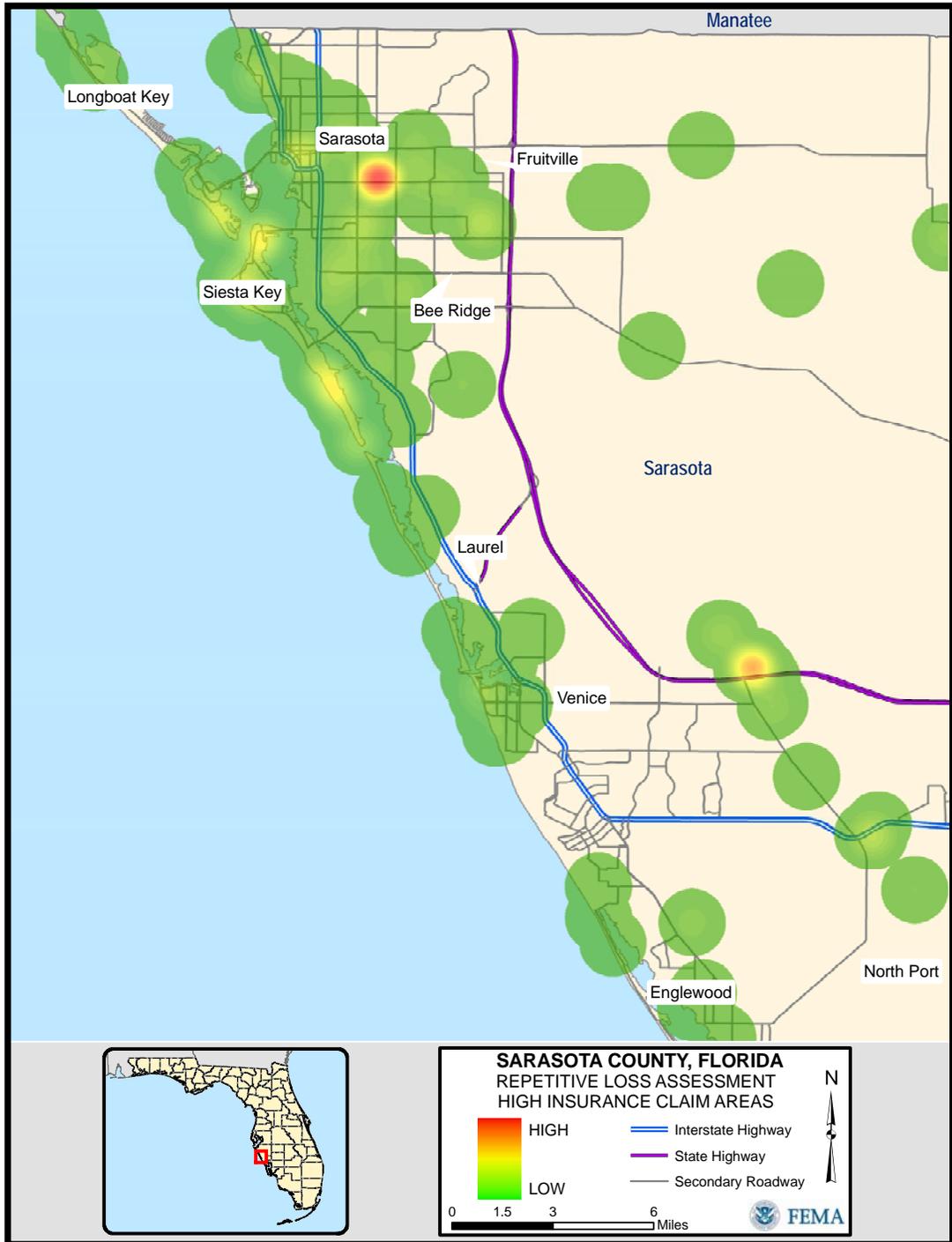
Map 6. Citrus County: Density of Property Losses



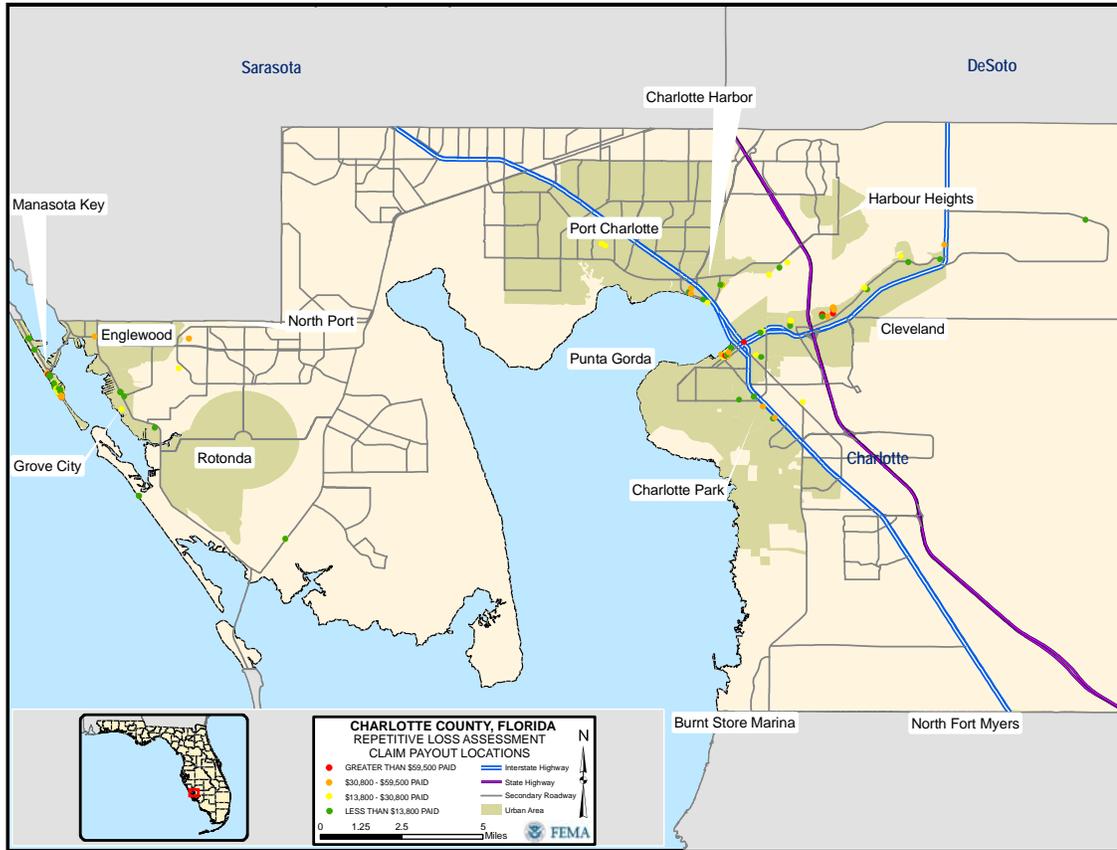
Map 7. Sarasota County: Property Locations with Magnitude of Claims



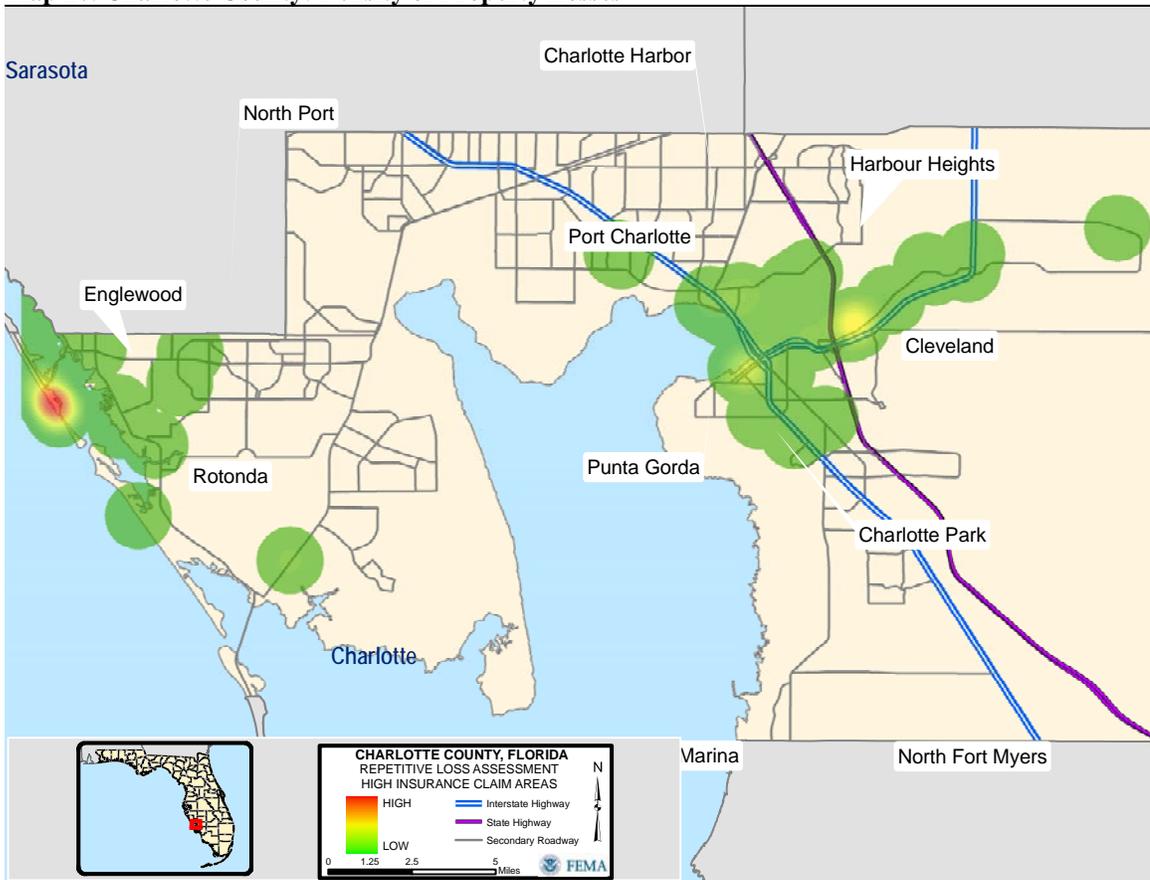
Map 8. Sarasota County: Density of Property Losses



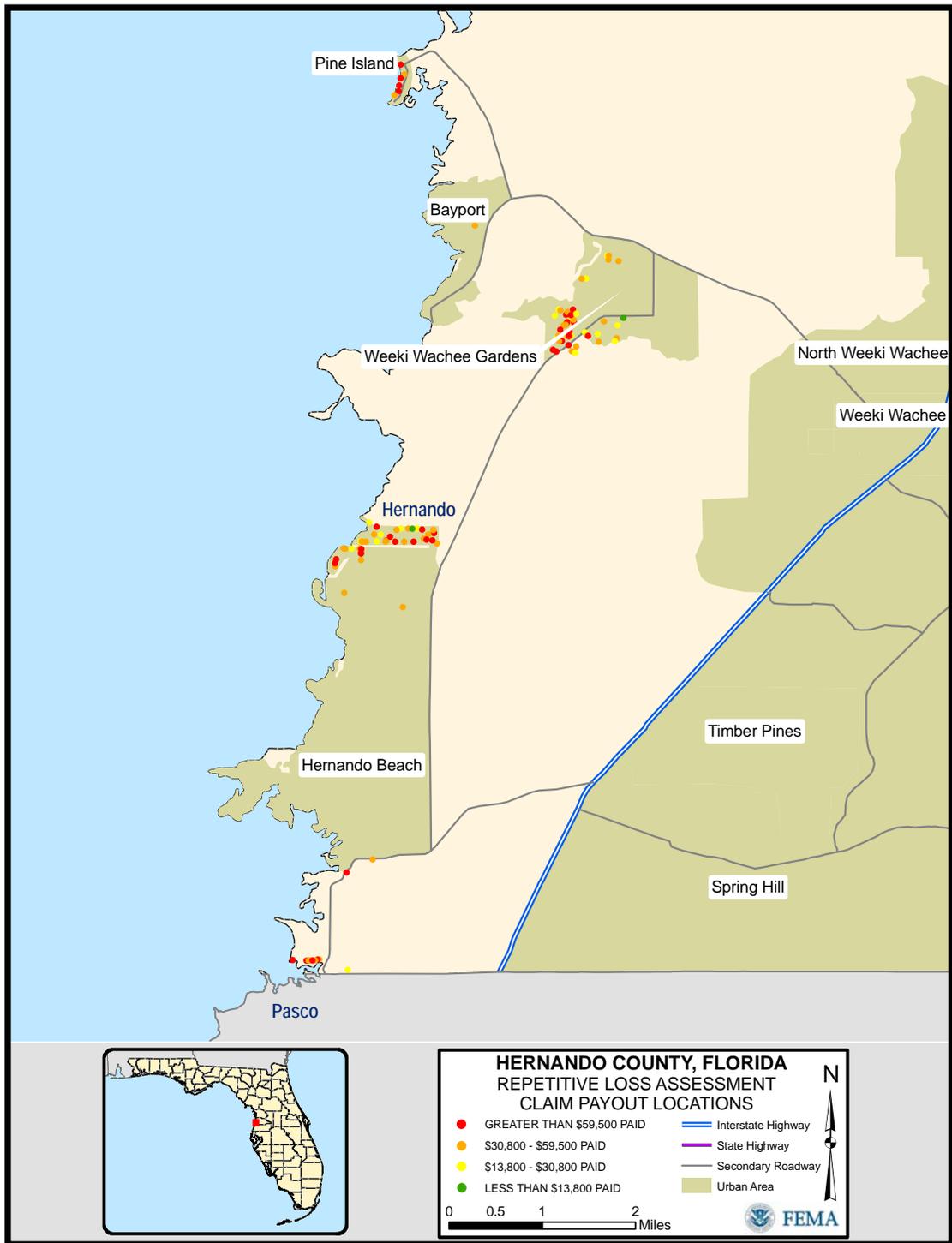
Map 9. Charlotte County: Property Locations with Magnitude of Claims



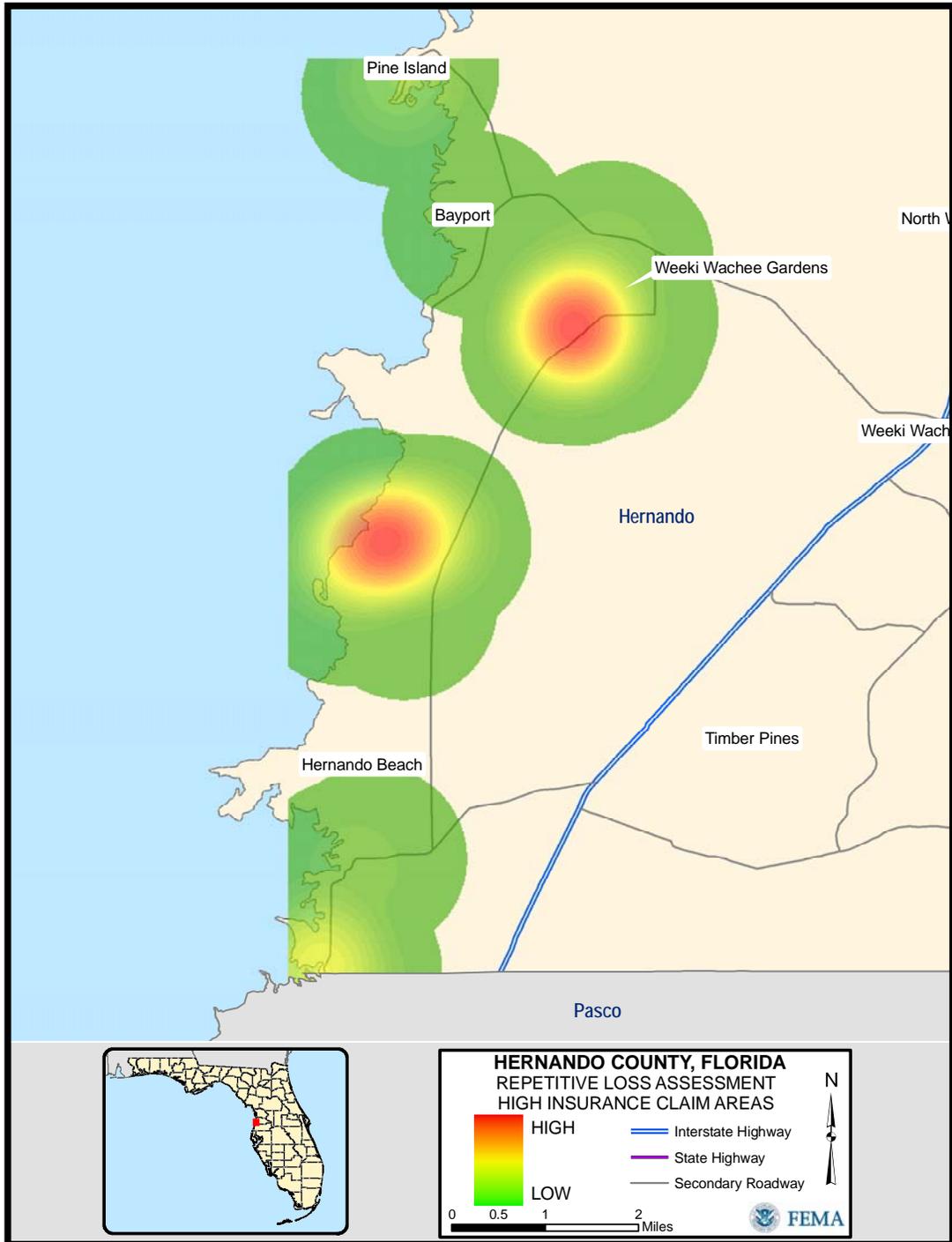
Map 10. Charlotte County: Density of Property Losses



Map 11. Hernando County: Property Locations with Magnitude of Claims



Map 12. Hernando County: Density of Property Losses



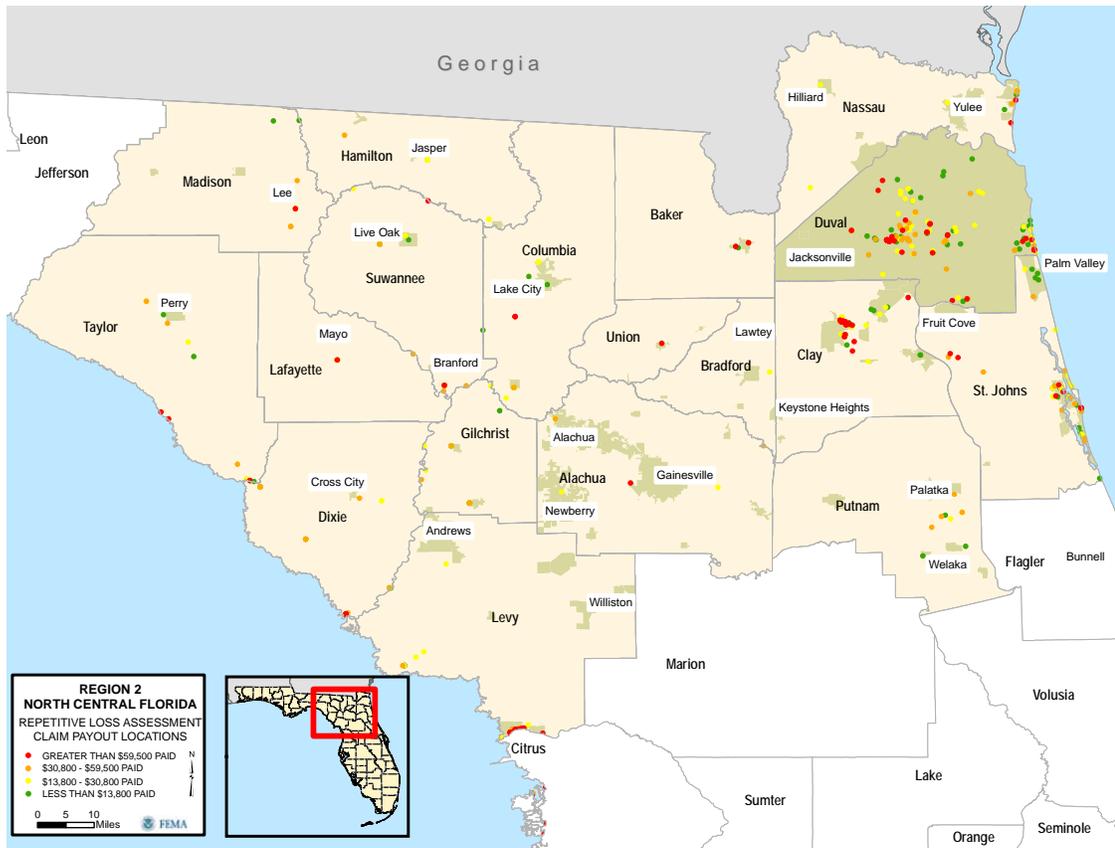
Region 2: North-Central

There are 580 repetitive loss properties located in the North-Central Region, which are displayed in Map 13. Region 2: Location of Property Losses by Claim Magnitude. FEMA Region IV has not inventoried any of these properties with the data collection tool. There is only one priority county within Region 2: North-Central: Duval County. (Map 3. Repetitive Loss Priority Counties with Regional Delineations)

Flood Zone Delineation	Number of Properties
A	49
AE and A1-A30	199
AHB	1
VE and V	102
EMG	35
BC and X	187
Unknown	7

Number of Insurance Claims	2	3	4	5	6	7
Number of Properties	361	127	54	22	10	6

Map 13. Region 2: Location of Property Losses by Claim Magnitude



Duval County

There are 180 repetitive loss properties in Duval County. These account for 1.64% of all repetitive loss properties in the state of Florida. Duval County received \$12,171,195.88, which comprises 3.93% of the total amount of repetitive loss payouts for the state. Duval County is predominantly Jacksonville, as seen in Map 14. Duval County: Property Locations with Magnitude of Claims, with the county covered in urban area. The repetitive loss properties are dispersed throughout the county, however the greatest concentration appears in southwestern Jacksonville. The results of the density analysis, Map 15. Duval County: Density of Property Losses, are similar displaying a primary hotspot located in the Hyde Grove area.

Hyde Grove Park

Duval County Repetitive Property Loss Priority Area

The most intense “hot spot” in Duval County is located in the Hyde Grove Park area, a residential neighborhood in southwest Jacksonville. Flooding from Wills Branch has plagued the neighborhood for years.

A Corps of Engineers Flood Control Project was completed in 2000 and brought an end to periodic flooding of the area. The level of protection is designed for the five year rainfall event. Approximately 50 repetitive loss properties with \$6.9 million in insurance payouts have benefited.

A review of Bureaunet data indicated that no claims have been filed since completion of the project yet the properties. Once field information such as this is verified Bureaunet can be updated. Further analysis can monitor repetitive loss properties that have been mitigated.

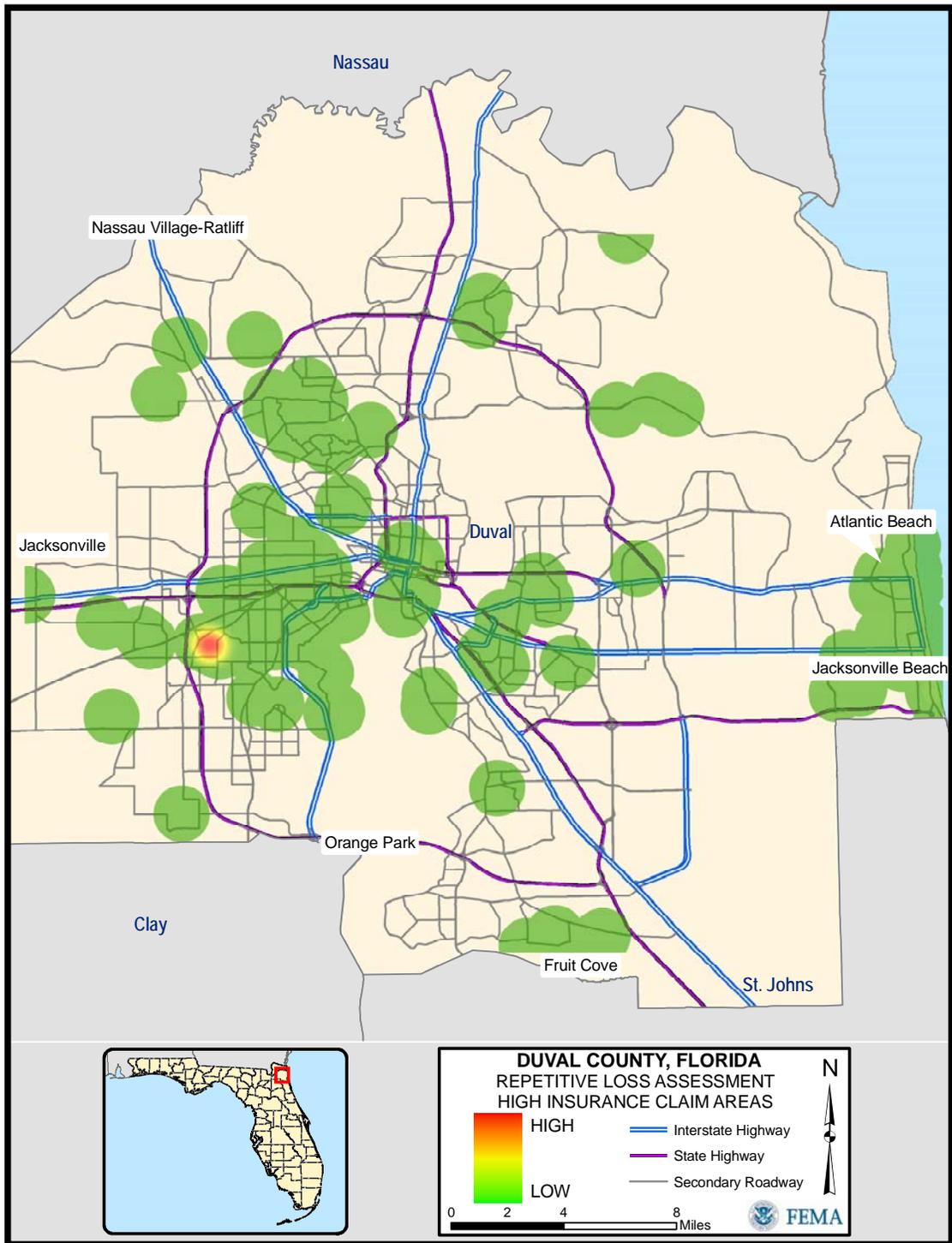
This represents a valuable use of the hotspot density maps. A major repetitive loss area that has been mitigated may have been overlooked through conventional processes.



Map 14. Duval County: Property Locations with Magnitude of Claims



Map 15. Duval County: Density of Property Losses



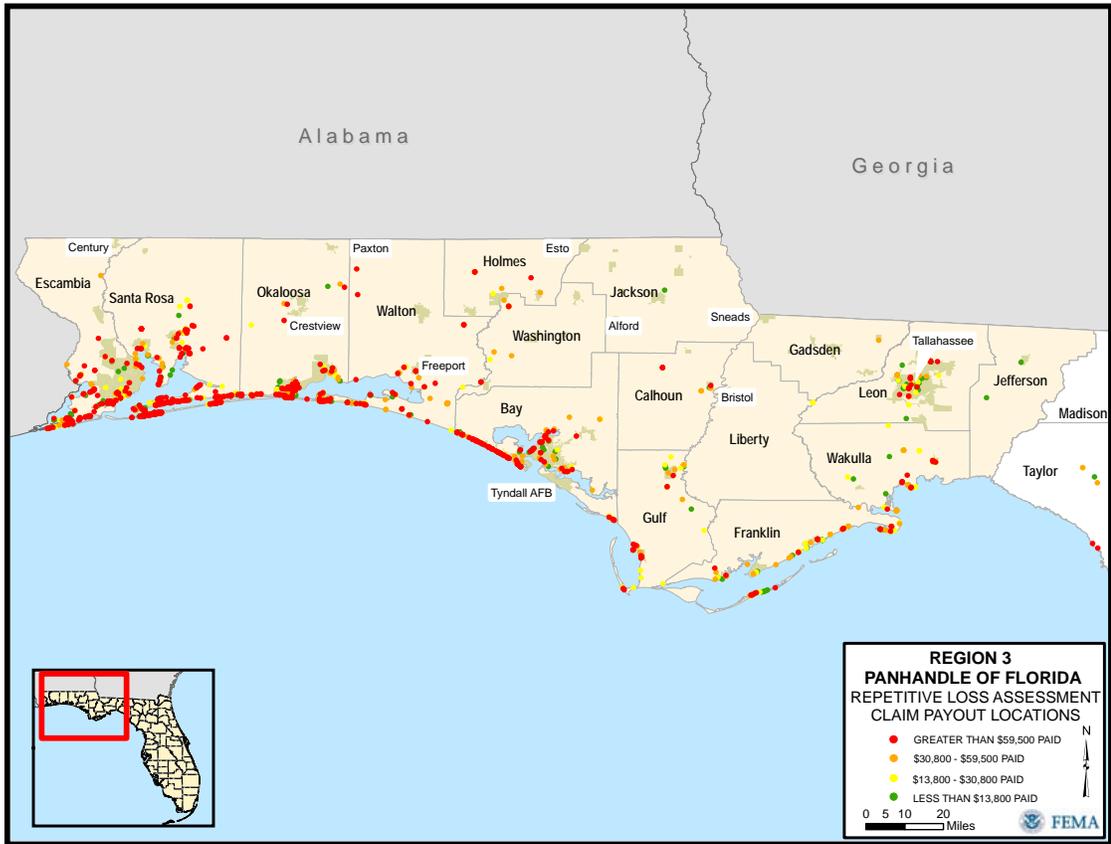
Region 3: Panhandle

There are 1,948 repetitive loss properties located in the Panhandle Region, which are displayed in Map 16. Region 3: Location of Property Losses by Claim Magnitude. FEMA Region IV has inventoried 926 or 47.54% of these properties with the data collection tool. There are six priority counties within Region 3: Panhandle: Escambia County, Santa Rosa County, Okaloosa County, Bay County, Franklin County and Wakulla County. (Map 3. Repetitive Loss Priority Counties with Regional Delineations)

Flood Zone Delineation	Number of Properties
A	162
AE and A0-A17	1071
AO	14
AOB	37
VE and V	199
B,C and X	456
EMG	4
D	2
Unknown	3

Number of Insurance Claims	2	3	4	5	6	7	8	10
Number of Properties	1,461	337	103	35	5	3	3	1

Map 16. Region 3: Location of Property Losses by Claim Magnitude



Escambia County

Escambia County has the 3rd most repetitive loss properties (696), which is 6.32% of all repetitive loss properties in the state of Florida. This county is also third in the largest amounts of insurance claims by receiving \$61,384,444.47 or 19.82% of the total amount of repetitive loss payouts for the state. The majority of the repetitive loss properties are located on the extreme southern portion of Escambia. As seen in Map 17. Escambia County: Property Locations with Magnitude of Claims, the repetitive loss properties are located along the bodies of water: Pensacola Bay, Perido Bay and the Gulf of Mexico. The highest concentrations appear to be along the barrier island, Perido Key, at Pensacola Beach on Santa Rosa Island and Warrington. When using the kernel density estimation based on magnitude of insurance claims in Map 18. Escambia County: Density of Property Losses, the analysis highlights Pensacola Beach as the primary hotspot in Escambia County.

Santa Rosa County

Santa Rosa County contains 287 repetitive loss properties, these properties account for 2.61% of all repetitive loss properties in the state of Florida. Santa Rosa County received the fourth largest amount of money in the state with \$32,964,873.49. This sum represents 10.65% of the total amount of repetitive loss payouts for the state of Florida. The majority of the repetitive loss properties are located in southeastern Santa Rosa surrounding the Pensacola Bay (Map 19. Santa Rosa County: Property Locations with Magnitude of Claims). There are properties are dispersed with the exception of the southern coastline of the peninsula bordering Santa Rosa Island. This area has a cluster of repetitive loss properties along the coastline. This trend is enforced with the density analysis map, Map 20. Santa Rosa County: Density of Property Losses. When evaluating the map it is evident that there are not only a lot of properties located along this section of beach, but it also receives the most money in insurance claims. This hotspot area between Oriole Beach and Woodlawn Beach should be targeted for mitigation measures to reduce repetitive flood property losses.

Okaloosa County

There are 270 repetitive loss properties in Okaloosa County. These properties account for 2.45% of all repetitive loss properties in the state of Florida. Okaloosa County received \$25,671,948.42, which comprises 8.29% of the total amount of repetitive loss payouts for the state. The majority of the repetitive loss properties are located in the southern portion of the county, predominantly located along the Choctawhatchee Bay (Map 21. Okaloosa County: Property Locations with Magnitude of Claims). There are clusters of repetitive loss properties in Fort Walton Beach, Destin and on Santa Rosa Island. When evaluating the density estimation based on magnitude of insurance claims in Map 22. Okaloosa County: Density of Property Losses, there is an area in southeast Destin that has concentrated repetitive loss properties receiving large insurance claims.

Bay County

The 211 repetitive loss properties in Bay County have received \$29,293,882.73 in insurance claims. These properties account for 1.92% of all repetitive loss properties in the state and 9.46% of the total amount of repetitive loss payouts for the state. As seen in Map 23. Bay County: Property Locations with Magnitude of Claims the properties are located in the southeastern Bay County along the Gulf of Mexico and the bays. The repetitive loss properties are dispersed in Panama City and lined up down Panama Beach. According to the density estimation map, Map 24. Bay County: Density of Property Losses, there was a hotspot located on the extreme northwest end of Panama Beach. Further investigation into this hotspot highlighted a property that had experienced flood losses twice.

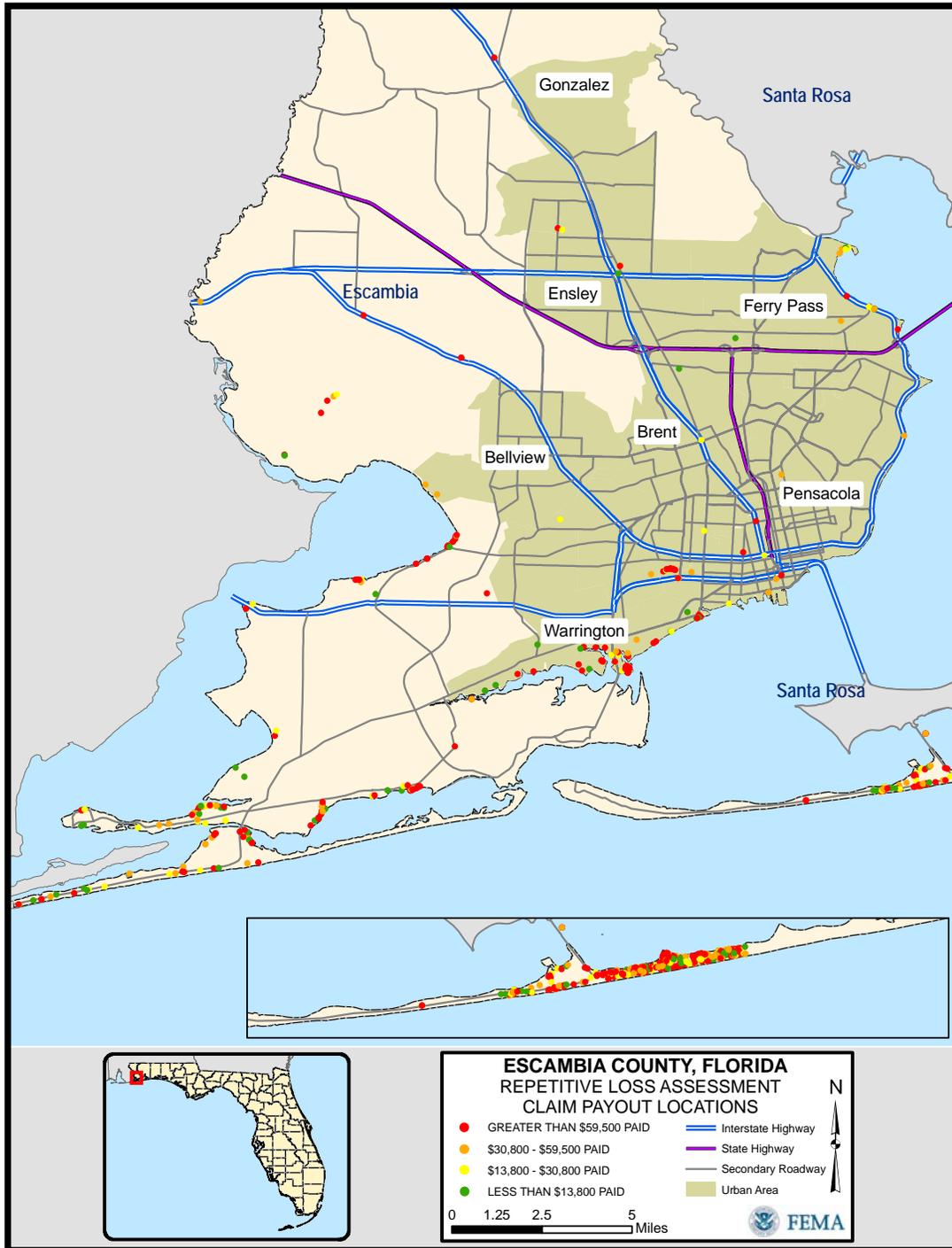
Franklin County

There are 129 repetitive loss properties in Franklin County, which account for 1.17% of all repetitive loss properties in the state of Florida. Franklin County received \$4,513,987.47 or 1.46% of the total amount of repetitive loss payouts for the state. The repetitive loss properties in southwest Franklin County along the coast on the Gulf of Mexico and on St. George Island (Map 25. Franklin County: Property Locations with Magnitude of Claims). The density estimation based on the amount received from insurance claims highlighted a hotspot in Carrabelle. Based on the map alone, it appears that there is only one repetitive loss property located in that area, however the underlying database suggests that there are 15 properties located in that area. This distortion is due to the fact that the points are all located in the same position. This is an issue that would be corrected through the field verification process.

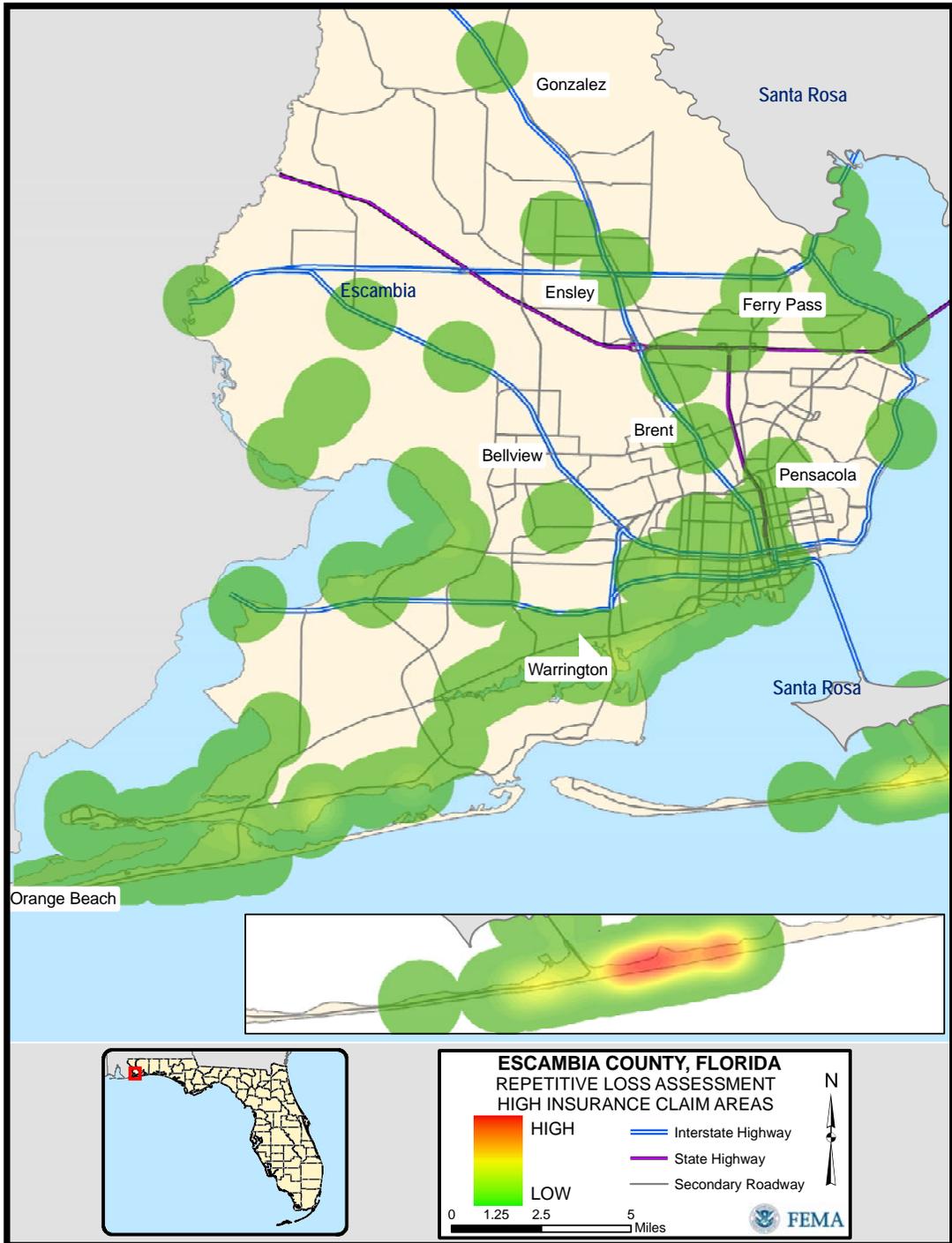
Wakulla County

In Wakulla County there are 108 repetitive loss properties that account for 0.98% of all repetitive loss properties in the state. The properties received \$3,096,549.14, which comprises 1% of the total amount of repetitive loss payouts for the state of Florida. When viewing Map 27. Wakulla County: Property Locations with Magnitude of Claims, the concentration of repetitive loss properties appears to be located in St. Marks. However, the density estimation in Map 28. Wakulla County: Density of Property Losses defines two hotspot areas based on insurance claims: St. Marks and Shell Point. The repetitive loss properties in St. Marks are primarily non-single family residential, consisting of mostly marinas and campgrounds. While the Shell Point density hotspot was residential properties which have experienced flood losses 2 to 5 times in the past.

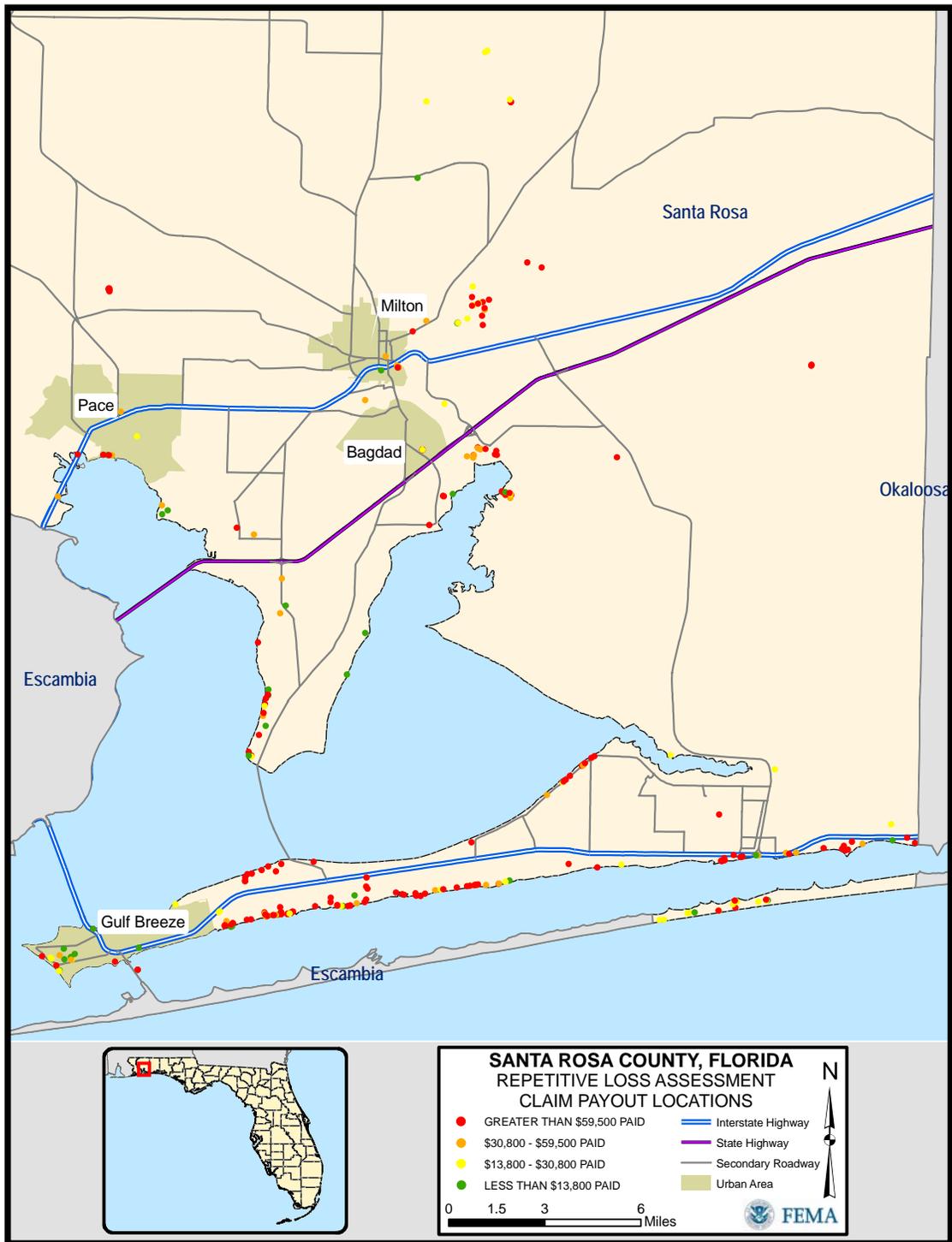
Map 17. Escambia County: Property Locations with Magnitude of Claims



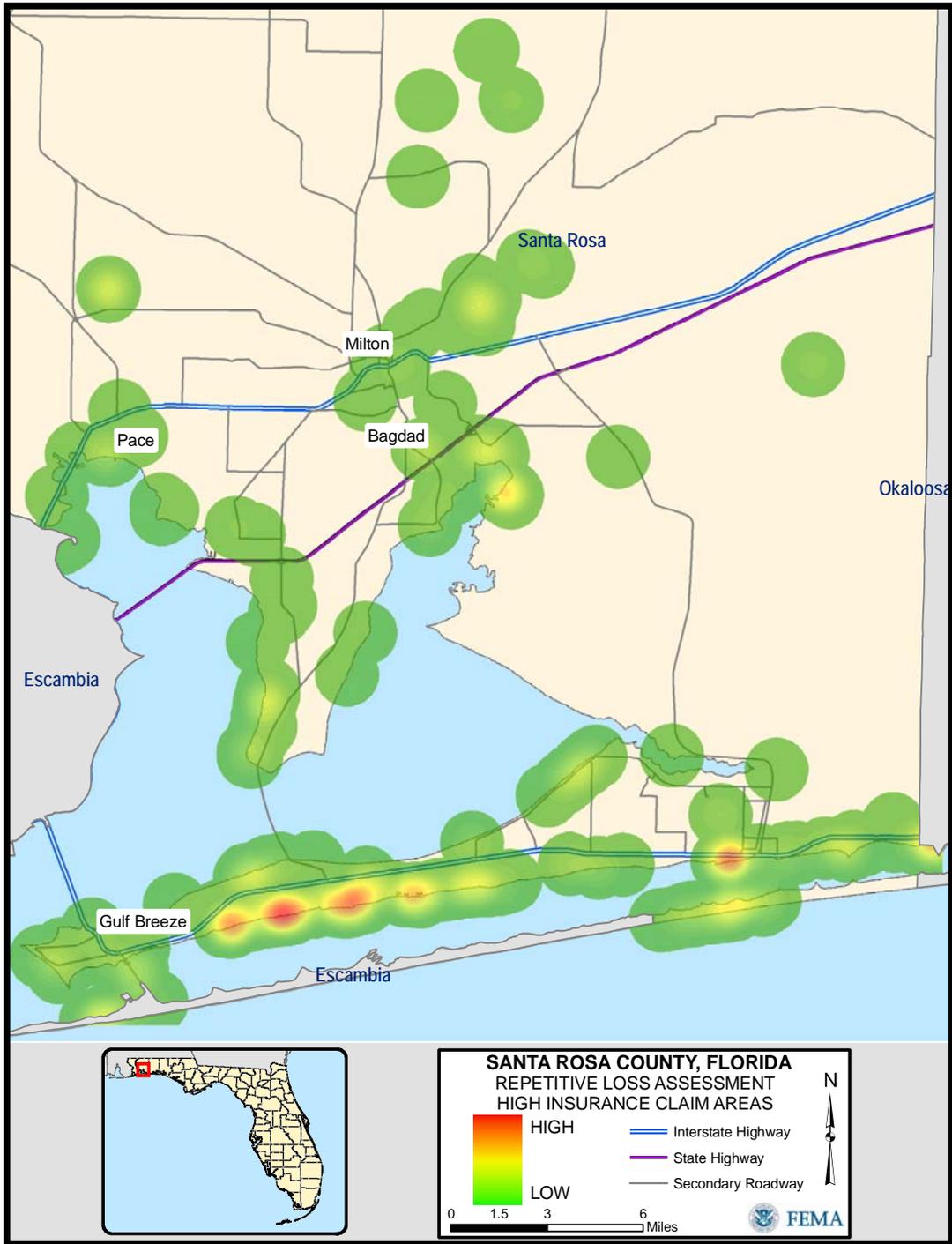
Map 18. Escambia County: Density of Property Losses



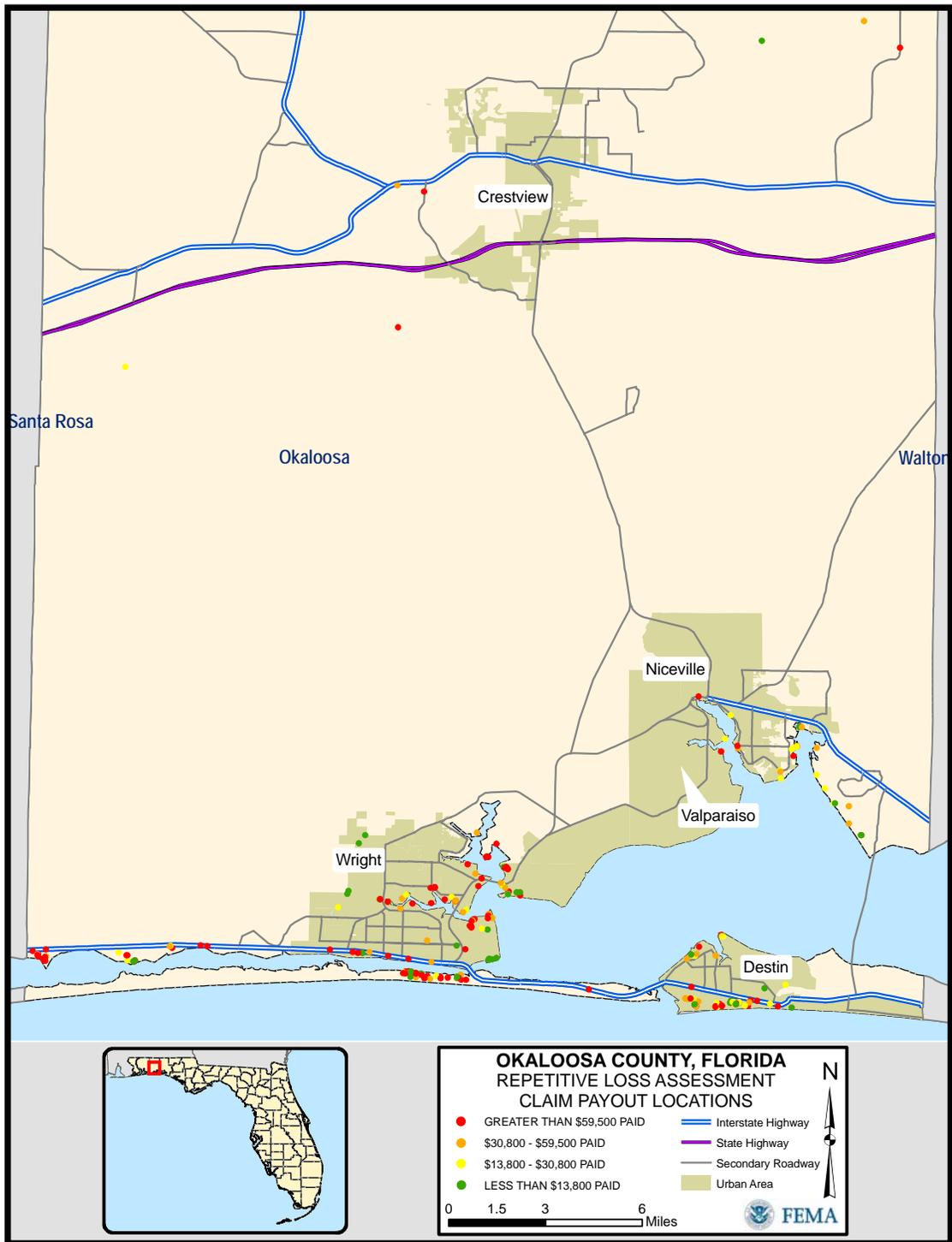
Map 19. Santa Rosa County: Property Locations with Magnitude of Claims



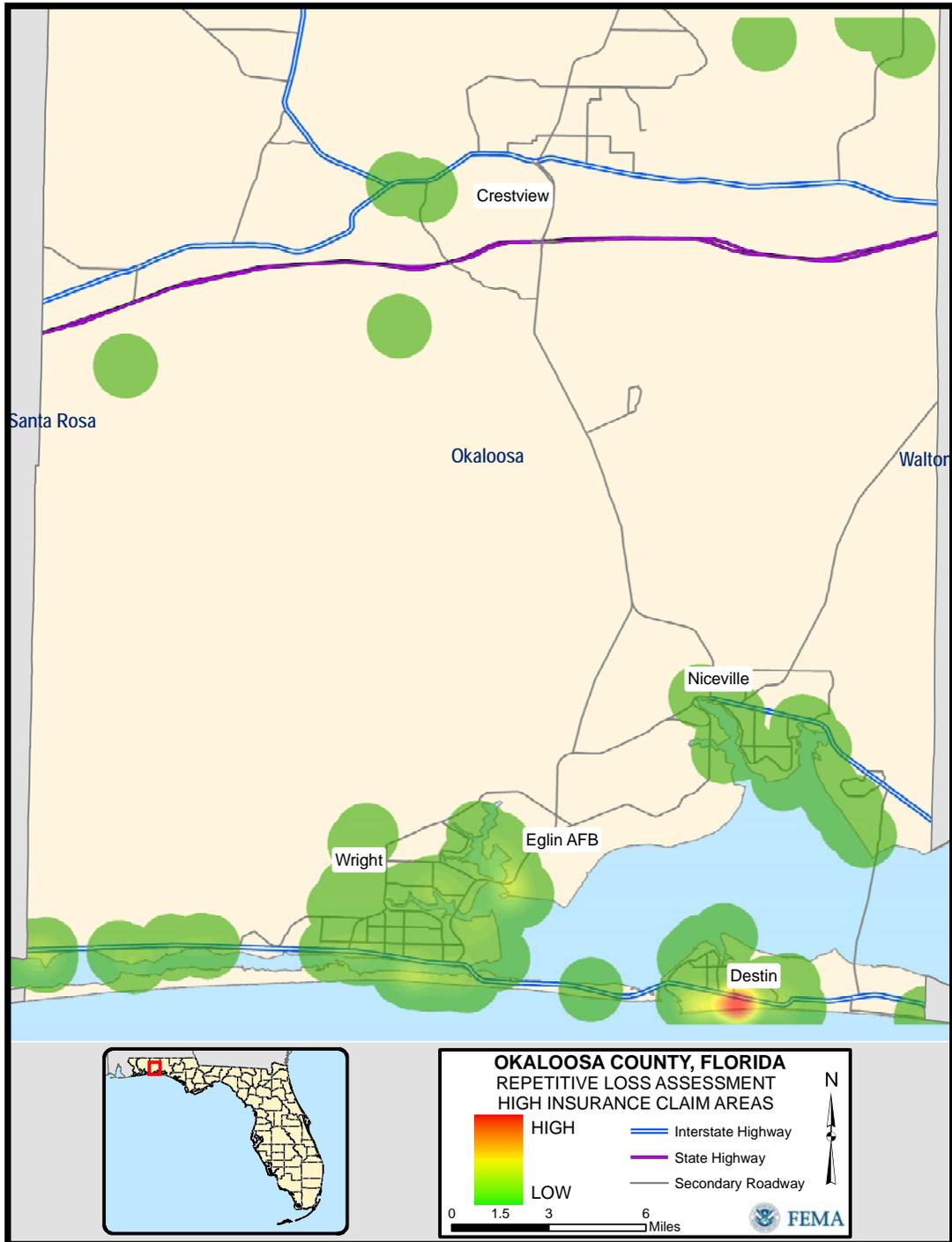
Map 20. Santa Rosa County: Density of Property Losses



Map 21. Okaloosa County: Property Locations with Magnitude of Claims



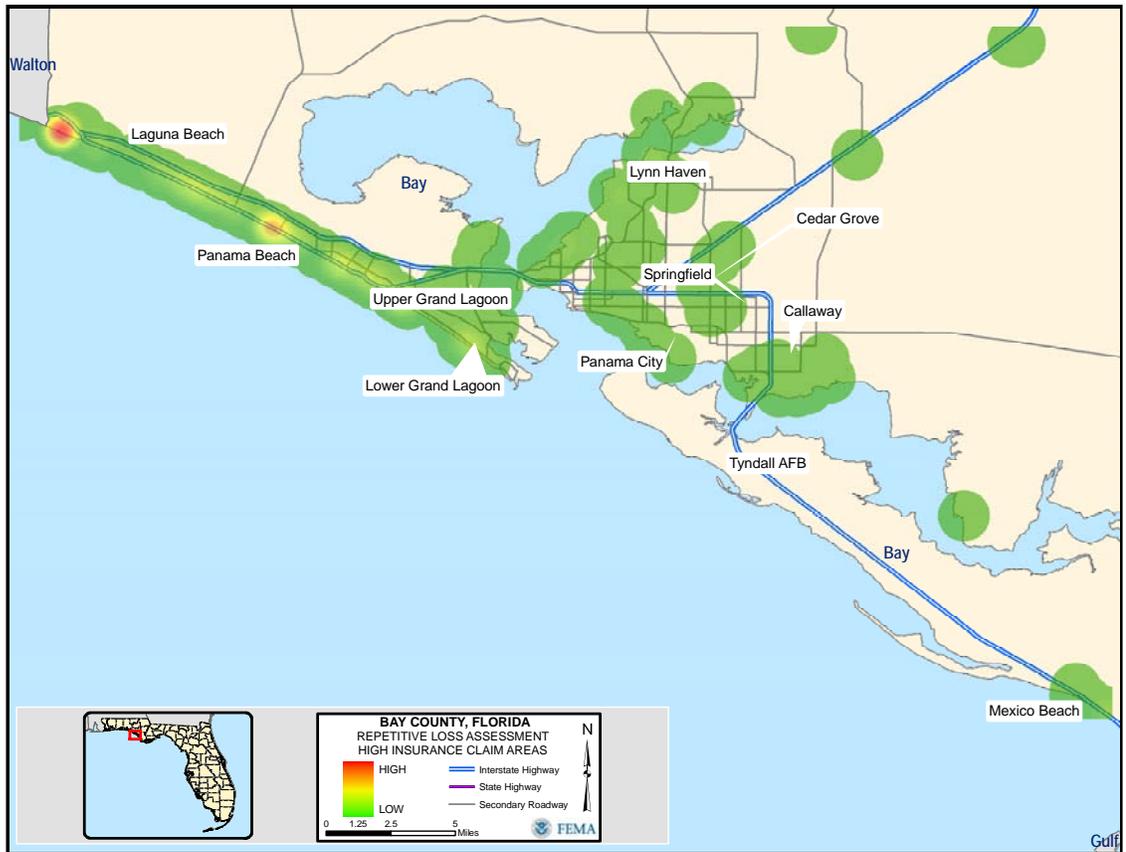
Map 22. Okaloosa County: Density of Property Losses



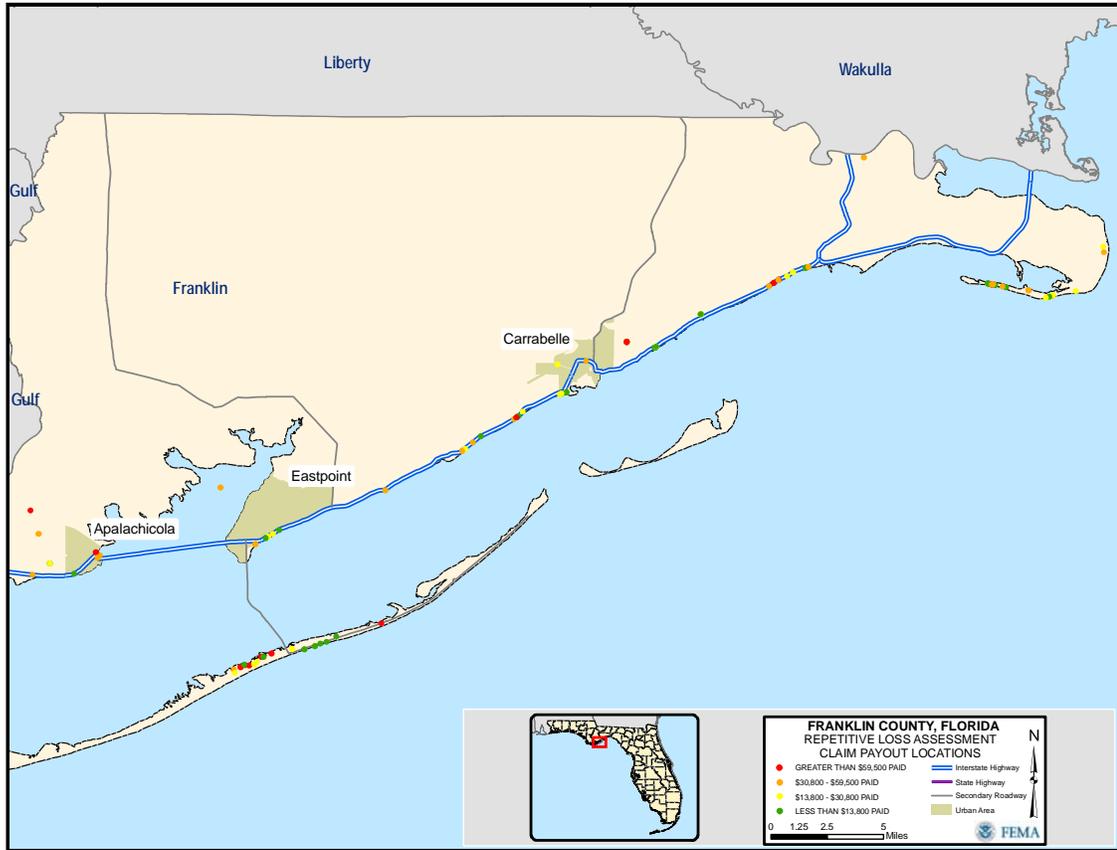
Map 23. Bay County: Property Locations with Magnitude of Claims



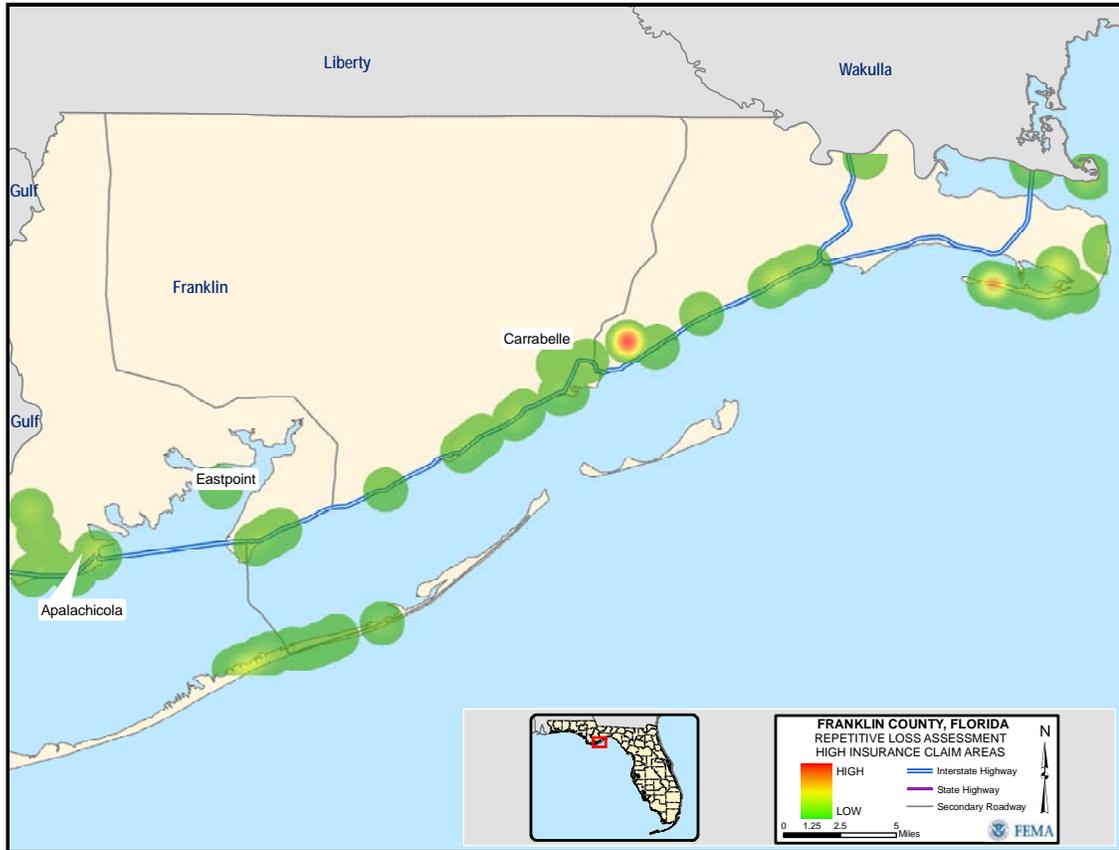
Map 24. Bay County: Density of Property Losses



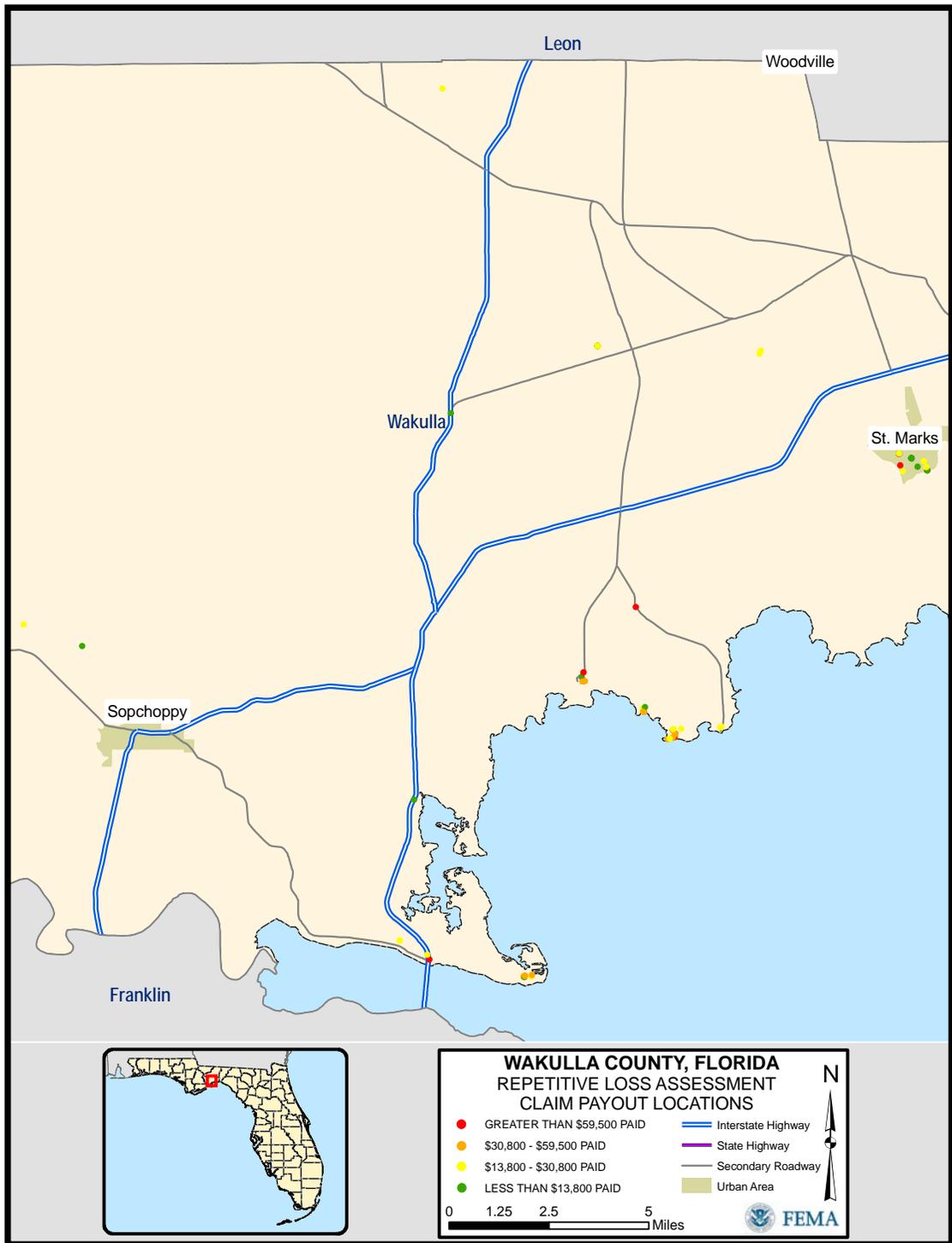
Map 25. Franklin County: Property Locations with Magnitude of Claims



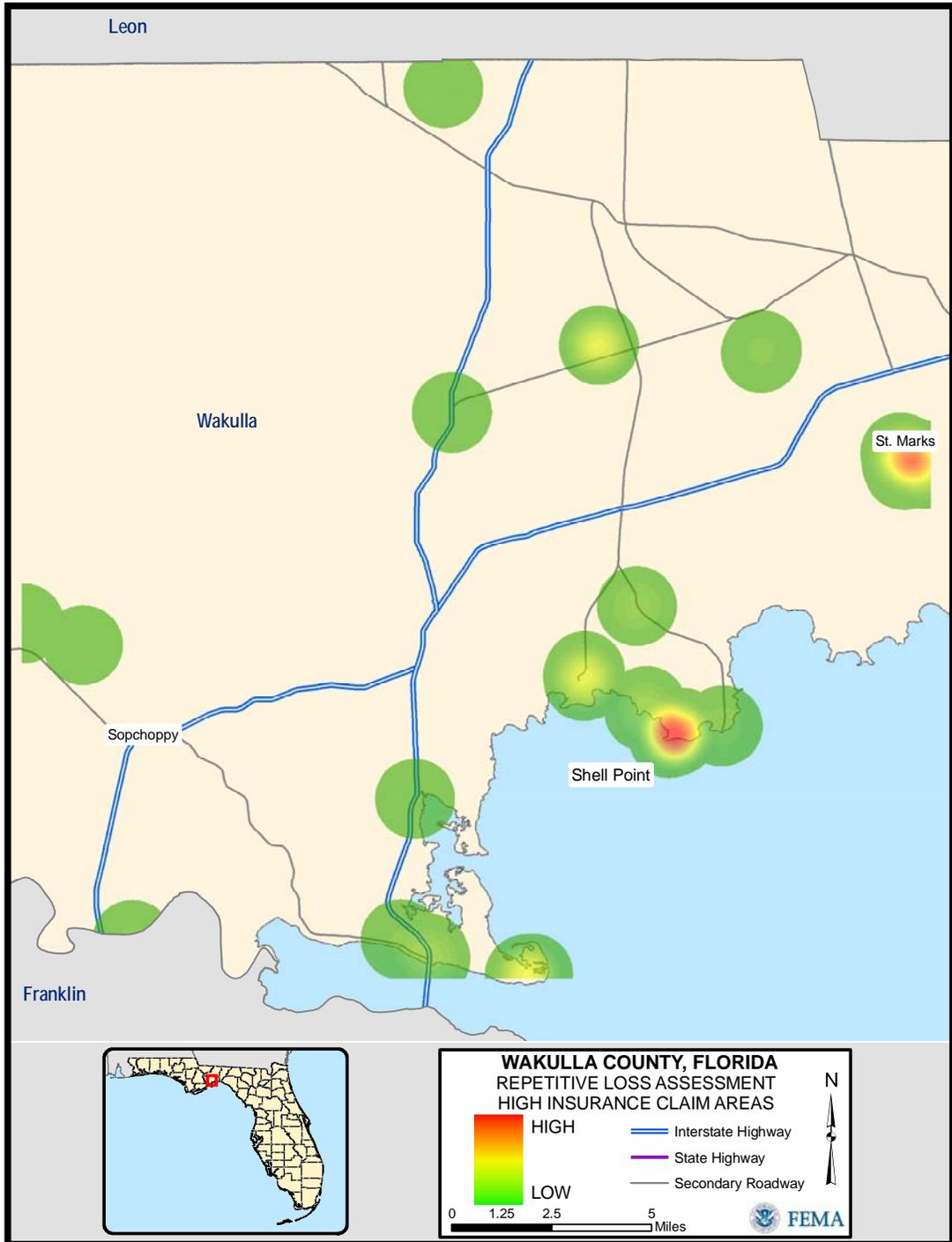
Map 26. Franklin County: Density of Property Losses



Map 27. Wakulla County: Property Locations with Magnitude of Claims



Map 28. Wakulla County: Density of Property Losses



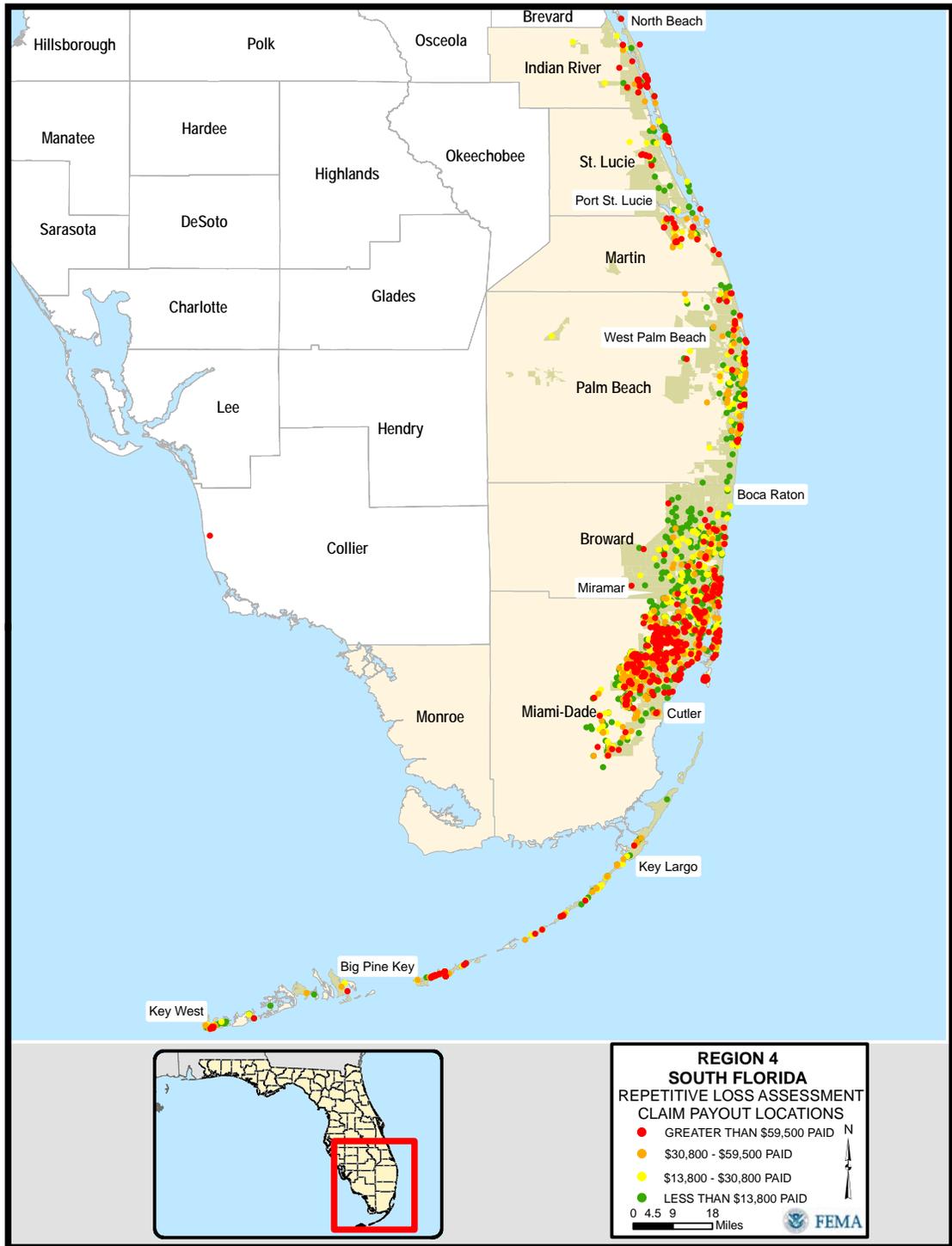
Region 4: South

There are 3,792 repetitive loss properties located in the South Region, which are displayed in Map 29. Region 4: Property Location with Claim Magnitude. FEMA Region IV has inventoried 3,274 or 86.34% of these properties with the data collection tool. There are four priority counties within Region 4: South: Escambia County, Dade County, Broward County, Monroe County and Palm Beach County. (Map 3. Repetitive Loss Priority Counties with Regional Delineations)

Flood Zone Delineation	Number of Properties
A	225
AE and A1-A17	1959
AH	77
AHB	1003
AO	1
AOB	1
B,C and X	454
VE and V	58
D	7
EMG	2
Unknown	5

Number of Insurance Claims	2	3	4	5	6	7	8	9	10	12	14	17
Number of Properties	3,216	376	103	56	13	9	9	5	2	1	1	1

Map 29. Region 4: Property Location with Claim Magnitude



Miami-Dade County

Miami-Dade County had the largest number of repetitive loss properties and has received the most insurance payouts in the state of Florida with 2,693 properties claiming \$121,483,687.60. These account for 24.47% of all repetitive loss properties in the state and 39.23% of the total amount of repetitive loss payouts. The majority of these properties are located in the northeastern portion of Miami-Dade County, as seen in Map 40. Miami-Dade County: Property Locations with Magnitude of Claims. Due to the fact that Miami-Dade has so many repetitive losses and insurance claims distributed throughout that area, mitigation programs should be targeted at the large area, however the kernel density estimation highlighted particular local sections receiving more dollar losses. In Map 41. Miami-Dade County: Density of Property Losses the most dominant hotspot has been identified as the Tile District, where most of the repetitive property dollar losses were occurring to businesses.

Tile District, Miami-Dade County

Repetitive Property Loss Priority Area

In terms of high dollar claims areas, the densest area in Miami-Dade County revealed in the analysis is in a commercial area known as the “Tile District.” The name reflects the nature of the large number of businesses there, specializing in marble, ceramic, tile, granite, commercial grade stone, etc. A large portion of the claims are not damage to building structures, but rather the contents of the building. The area is not impacted by flooded waterways, but water percolation from the aquifer that is generally shallow.

This area has largely gone unrecognized as a flood prone area possibly for the following reasons:

- Less Personal Hardship
- Fewer Costs to Local Resources
- Code Violations
- Lack of Media Interest
- Political Interest

However, in terms of monetary drain to the National Flood Insurance Program (NFIP) the approximately \$10,000,000 in claims in a five square mile area is a major burden.

According to local officials the area was not originally developed up to county standards, thus the roads were not accepted as public. At some point in time however they became public. Also it has been reported that county actions were taken to require owners to store inventory on pallets at a higher level than is customary. This has not been confirmed.

A task order is currently underway for a “Losses Avoided Study” to quantify the impacts of the flood protection works in more detail than is possible here. particular focus will be given to this area. The lowering of the water table via the forward pumps may have a positive impact in reducing flooding of this area but this has not been determined at this time.



Miami-Dade County : Mitigation Measures

Hurricane Irene in 1999 and the No-Name storm of 2000 inflicted millions of dollars in flood damage to Miami-Dade County. These events nearly quadrupled the number of repetitive loss properties in the county. This resulted in a partnership between the County, State and Federal Government to pursue an aggressive flood mitigation program.

Many of Miami-Dade County's repetitive loss properties are not coastal, they are located inland in primarily the central and southwestern portions of the populated area of the county. The hydrography plays an important role in flooding events, with flat topography, a high water table and surface/aquifer interaction. Flooding is typically shallow but can be very widespread.

Due to the number of repetitive loss properties, tremendous strides have been taken recently to provide flood protection with the construction of massive forward pumping stations. These stations would lower the water table and provide increased storage capacity in the advent of an approaching storm. The pumps are capable of moving about 10 billion gallons of water per day. Detention basins to capture incoming flows from the Everglades and provide off line storage, which is then released slowly afterwards, complement the pumping stations. Another very positive benefit of this type of mitigation is the reduced duration of flooding. Properties that previously were flooded for days will now be flooded for only hours. This should tend to reduce the amount of damage for any given event.

The flood protection works to provide approximately a 25 year design level of protection. Achieving a 100 year level was simply not attainable due to engineering and financial constraints.



On-Line Forward Pumping Station on the C-4 Tamiami Canal



Detention Basin West of Miami near the Everglades

This project will impact thousands of properties that will include hundreds of repetitive loss properties, therefore mitigating for future events. The massive improvements to increase capacity in the primary system coupled with local improvements to convey the water from the problem areas to the main system will reduce repetitive loss properties vulnerability to flooding.

The repetitive loss data has been used to prioritize approximately \$2,000,000 per year of local drainage improvements. Areas with chronic repetitive loss problems should be a higher priority for funding. The mitigation effectiveness will ultimately be determined over time based on dollar amount of claims filed within an area for an event similar to comparable historic floods that produced the existing claims.

Broward County

There are 464 repetitive loss properties in Broward County. These properties account for 4.22% of all repetitive loss properties in the state of Florida. Broward County received \$17,678,587.28, which comprises 5.71% of the total amount of repetitive loss payouts for the state. All of the repetitive losses are located on the eastern side of Broward County, due to the fact that the western side is part of the Everglades Wildlife Management Area. It is hard to discern a trend in the dispersion of properties in Map 42. Broward County: Property Locations with Magnitude of Claims. However in Map 43. Broward County: Density of Property Losses, the density analysis determined an area of concentrated insurance claims near Hollywood. The repetitive property loss database lists the properties in this area as primarily non-residential.

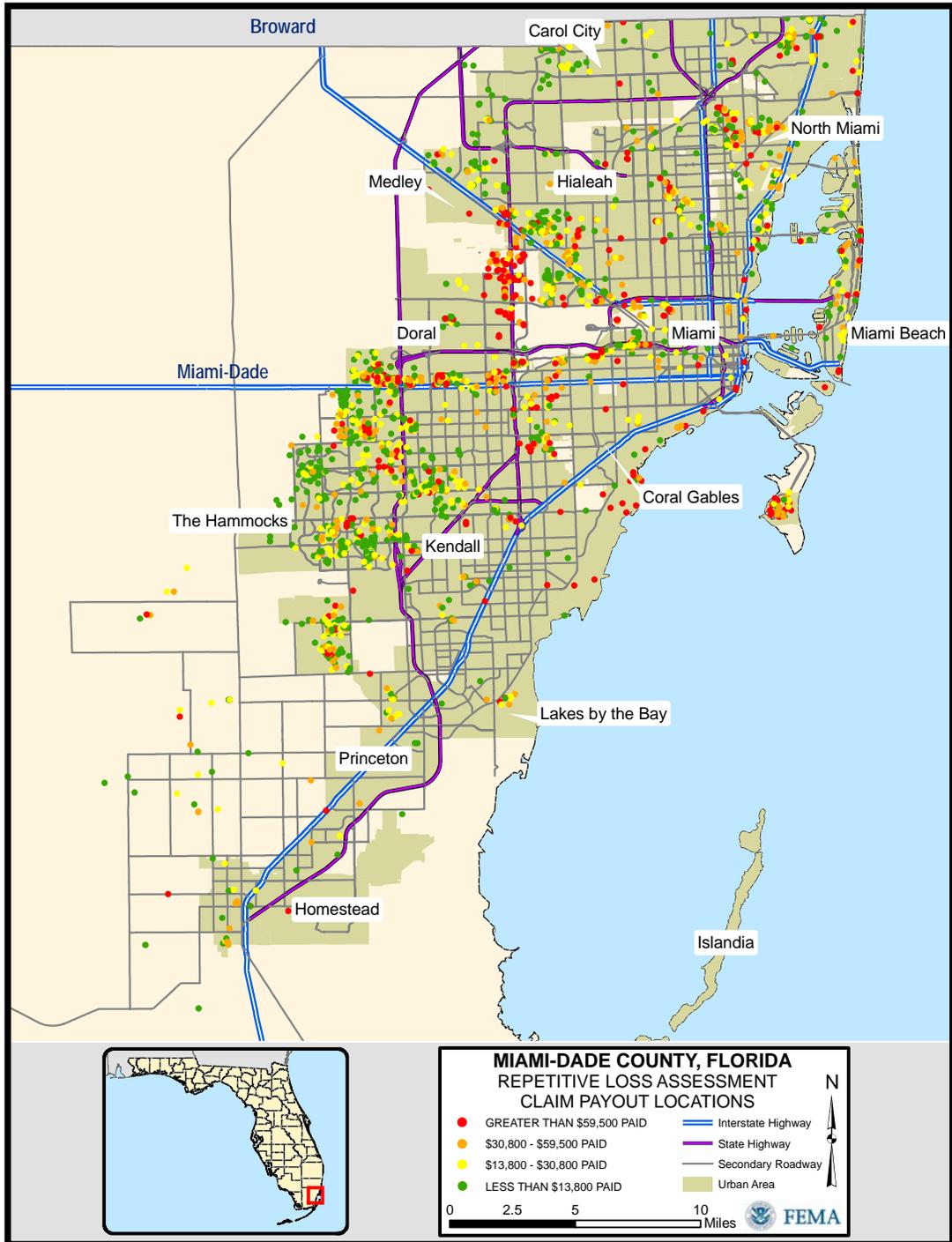
Monroe County

In Monroe County there are 224 repetitive loss properties, which account for 2.04% of all repetitive loss properties in the state of Florida. Monroe County received \$8,401,300.14 or 2.71% of the total amount of repetitive loss payouts for the state. The repetitive loss properties are located along the Florida Keys as seen in Map 44. Monroe County: Property Locations with Magnitude of Claims. The purpose of the density estimation on amount of insurance claims was to highlight areas. Using the resulting map from the density estimation, Map 45. Monroe County Density of Property Losses, highlighted areas with higher insurance claims than the other properties. One of the high concentrations was located on Key Colony Beach and was mainly due to repetitive damage to condominiums and apartments. There was a smaller less intense area in Marathon that was comprised primarily of residential insurance claims. Finally the other main hotspot was located in Key West, due to numerous properties of all types.

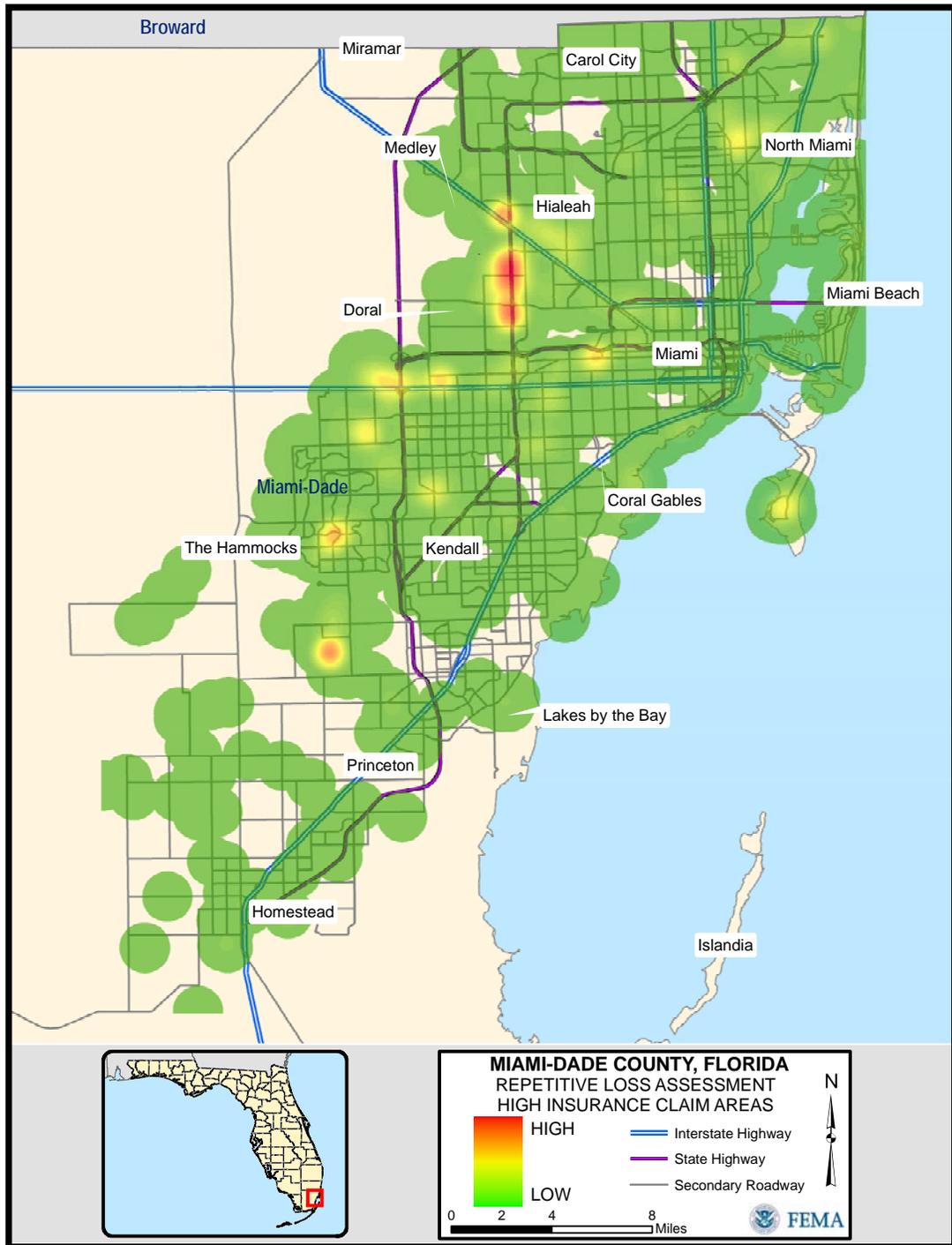
Palm Beach County

There are 210 repetitive loss properties in Palm Beach County. These properties account for 1.91% of all repetitive loss properties in the state of Florida. Palm Beach County received \$7,948,702.92 which compromises 2.57% of the total amount of repetitive loss payouts for the state. The repetitive property losses are concentrating along the eastern side of the county bordered by the Atlantic Ocean (Map 46. Palm Beach County: Property Locations with Magnitude of Claims). In Map 47. Palm Beach County: Density of Property Losses, there is a clear hotspot of residential homes in Palm Beach located on a barrier island.

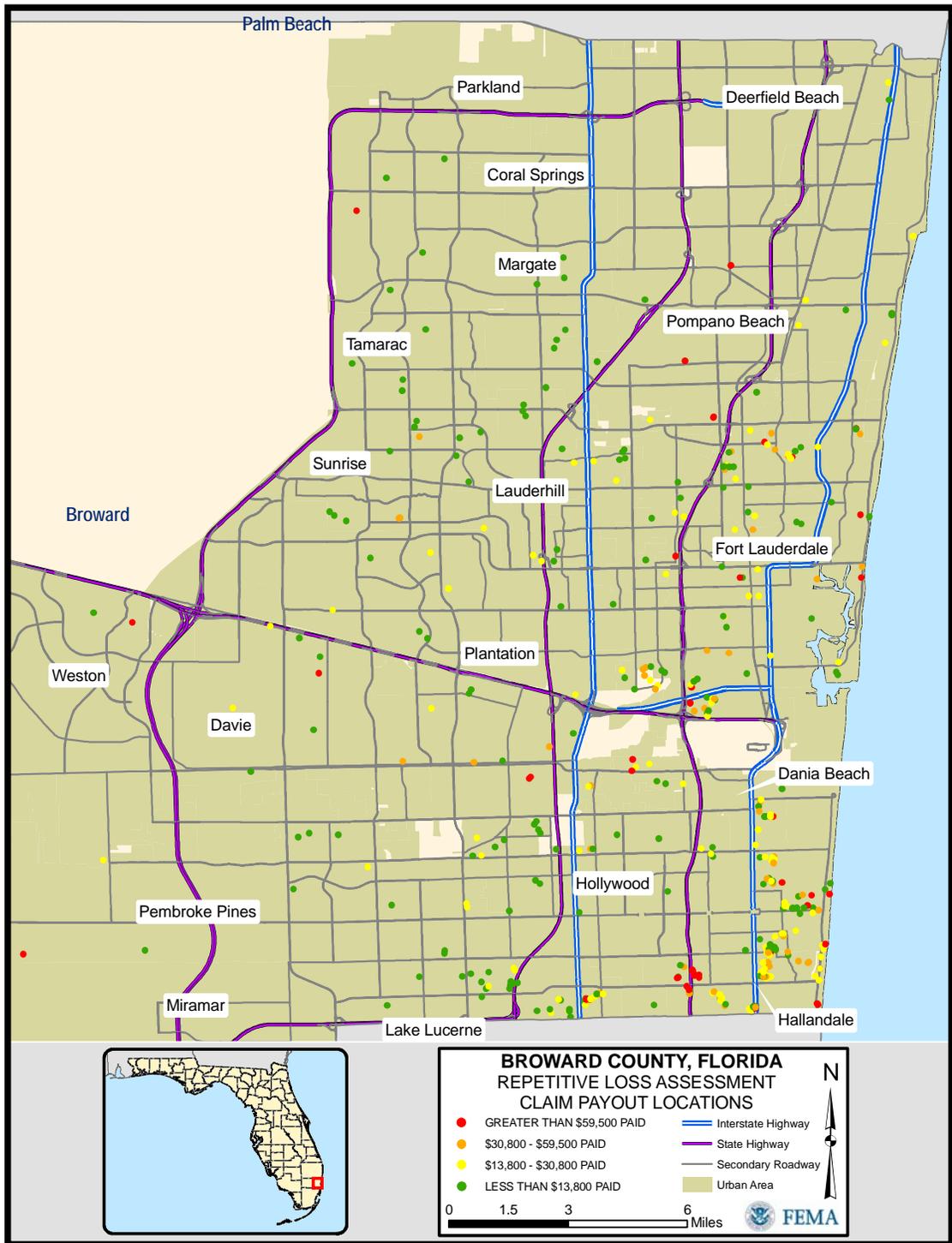
Map 40. Miami-Dade County: Property Locations with Magnitude of Claims



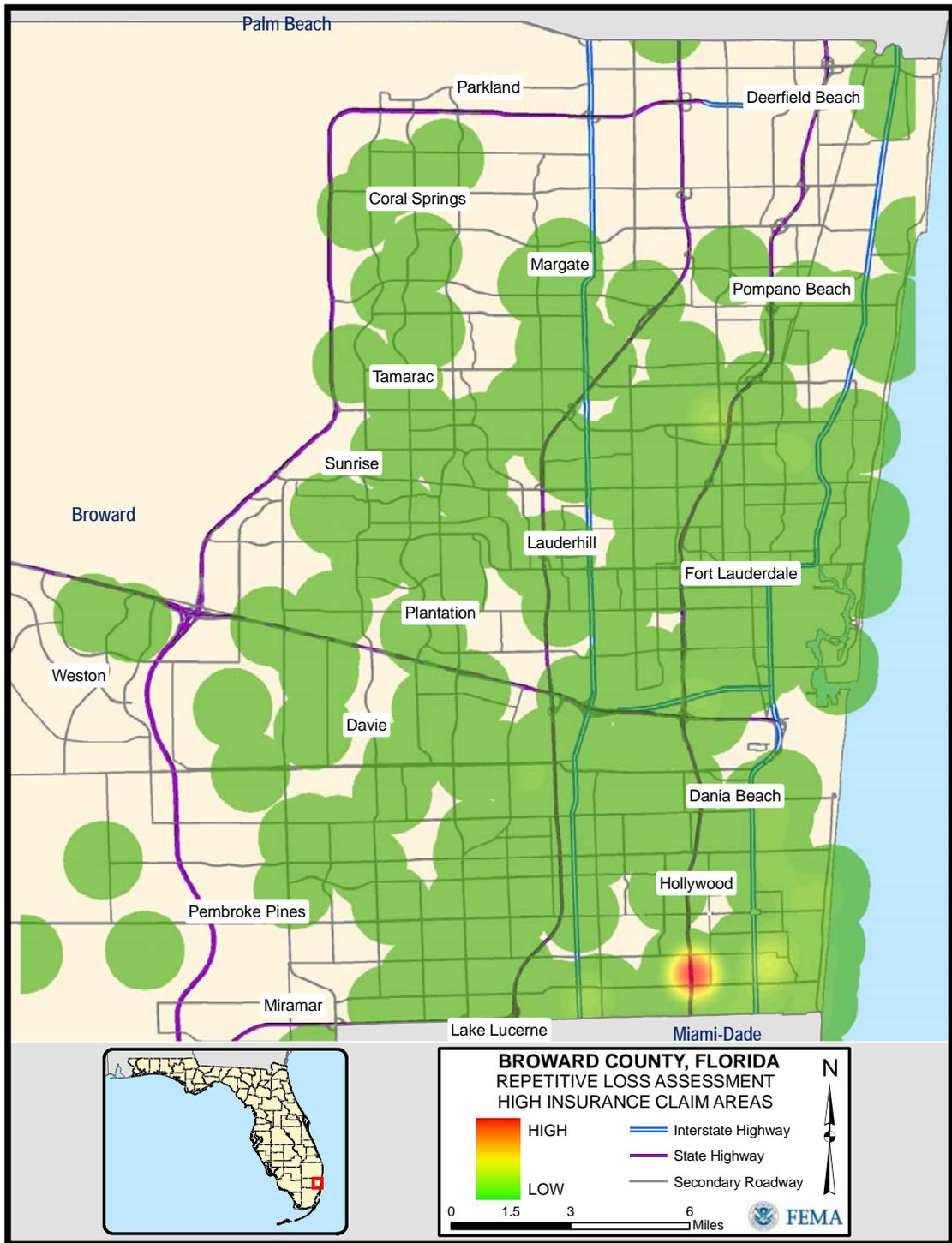
Map 41. Miami-Dade County: Density of Property Losses



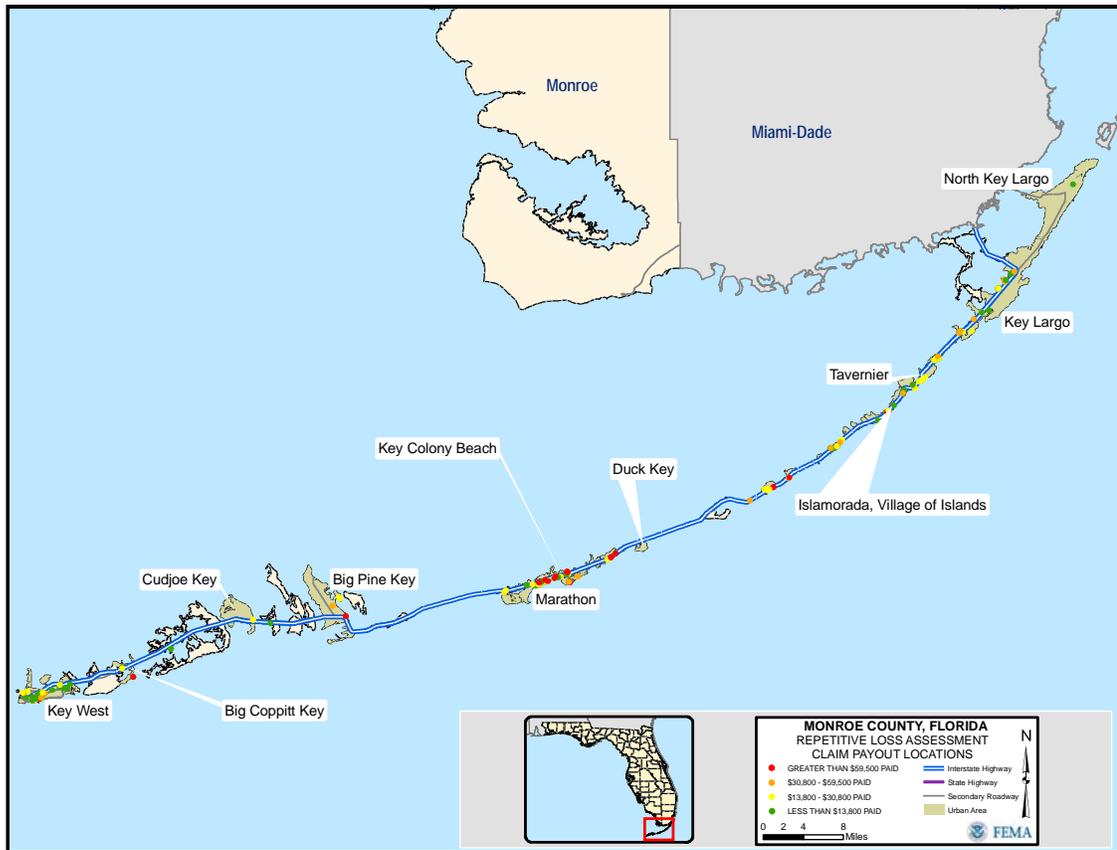
Map 42. Broward County: Property Locations with Magnitude of Claims



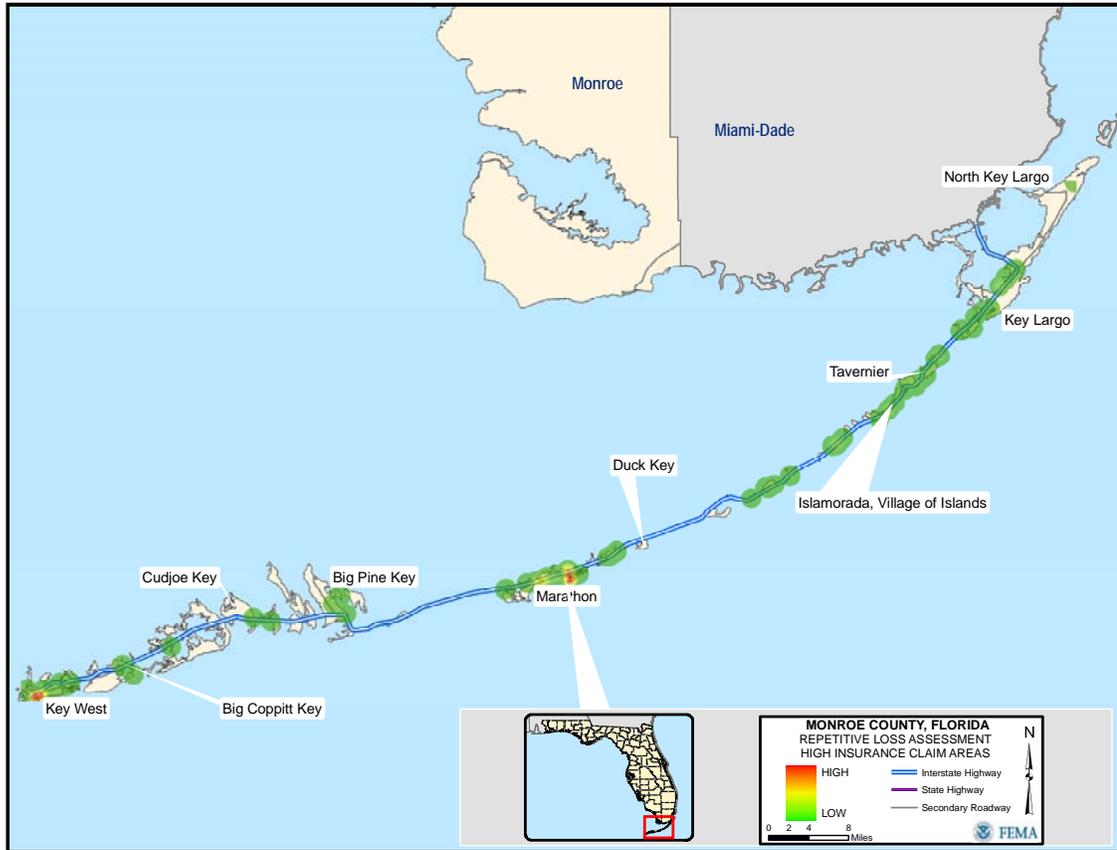
Map 43. Broward County: Density of Property Losses



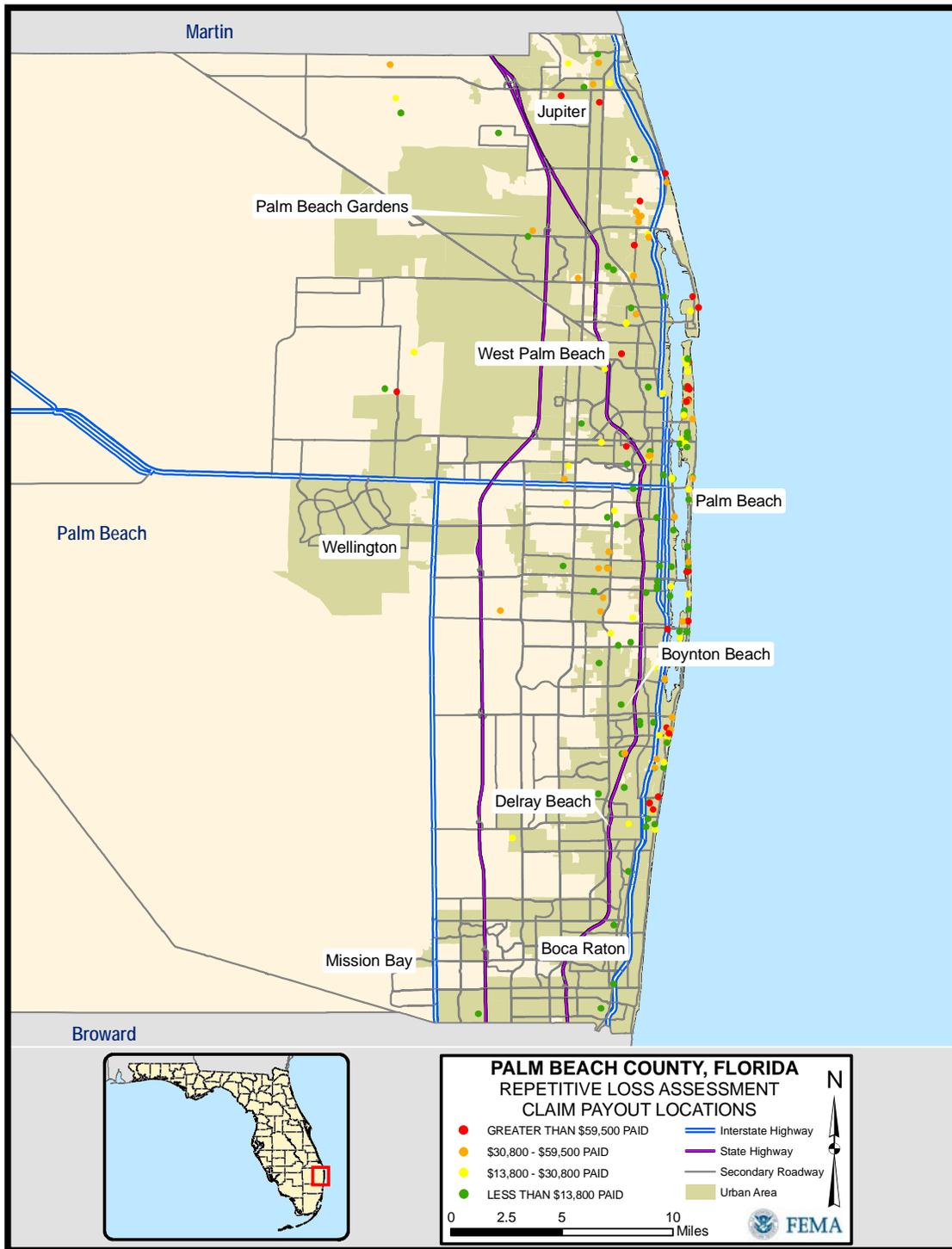
Map 44. Monroe County: Property Locations with Magnitude of Claims



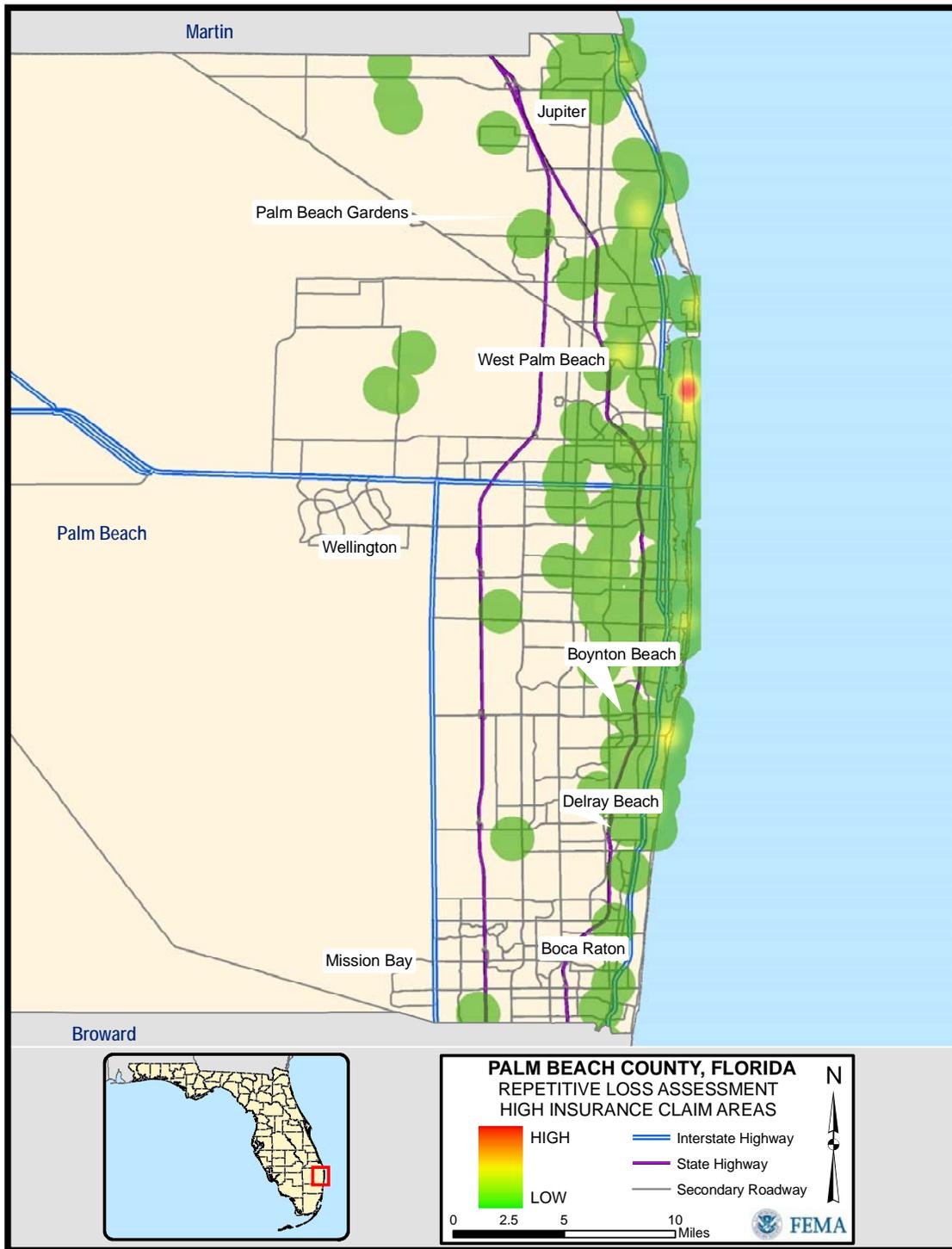
Map 45. Monroe County: Density of Property Losses



Map 46. Palm Beach County: Property Locations with Magnitude of Claims



Map 47. Palm Beach County: Density of Property Losses



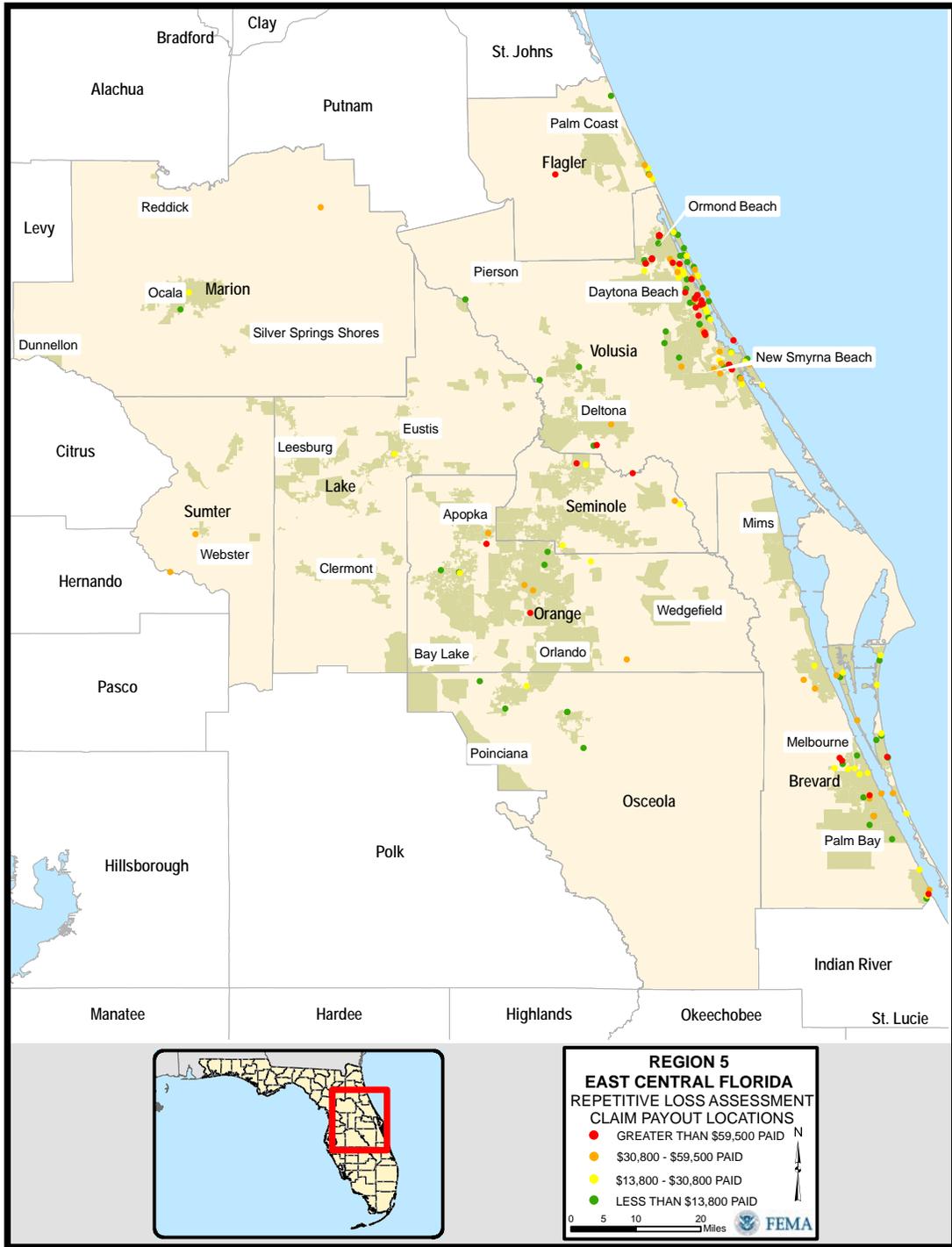
Region 5: East-Central

There are 208 repetitive loss properties located in the East-Central Region, which are displayed in Map 19. Region 5: Location of Property Losses by Claim Magnitude. FEMA Region IV has not inventoried any of these properties with the data collection tool. There is only one priority county within Region 5: East-Central: Volusia County. (Map 3. Repetitive Loss Priority Counties with Regional Delineations)

Flood Zone Delineation	Number of Properties
A	14
AE and A1-7	92
AHB	1
VE	1
B,C and X	99
EMG	1

Number of Insurance Claims	2	3	4	5	6	8
Number of Properties	168	29	7	2	1	1

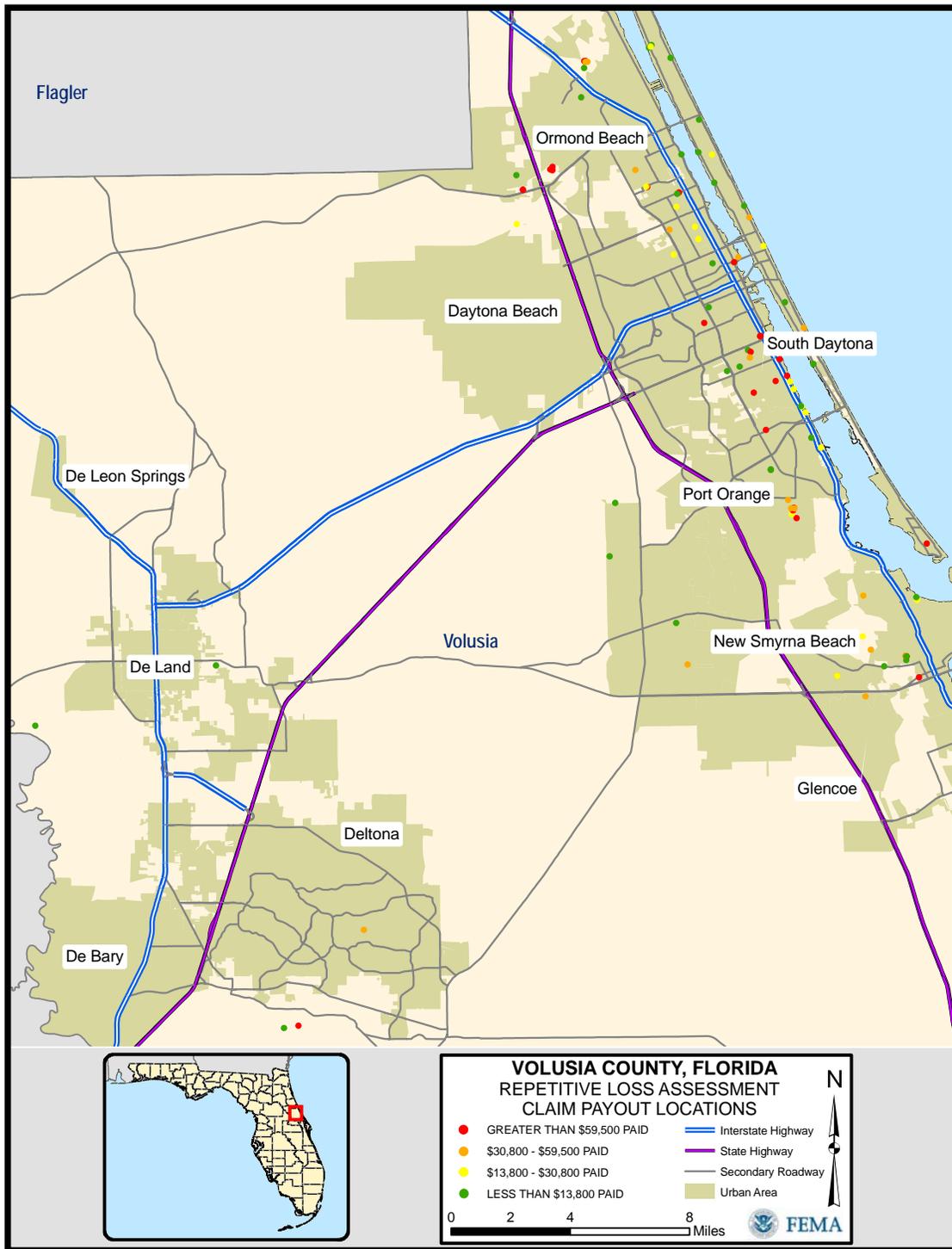
Map 48. Region 5: Location of Property Losses by Claim Magnitude



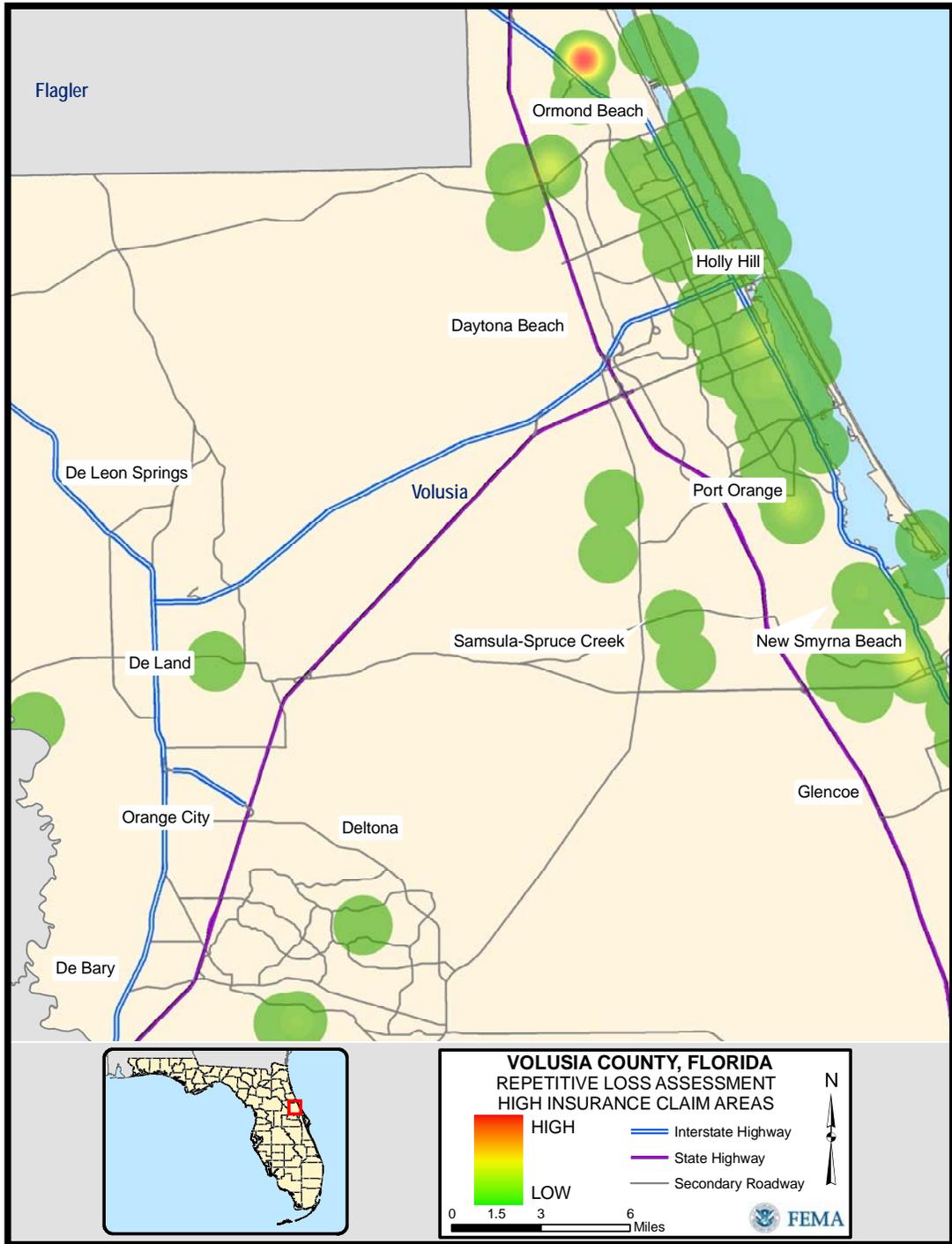
Volusia County

Volusia County contains 125 repetitive loss properties that account for 1.14% of all repetitive loss properties in the state of Florida. Volusia County received \$5,769,574.51, which comprises 186.32% of the total amount of repetitive loss payouts for the state. The repetitive loss properties are mainly located along the northeastern coast (Map 20. Volusia County: Property Locations with Magnitude of Claims). Analyzing the map resulting from the density analysis based on insurance claims, Map 21. Volusia County: Density of Property Losses, there is a clear area of concentration, possibly due to residential properties of Tomoka Estates in Ormond Beach.

Map 49. Volusia County: Property Locations with Magnitude of Claims



Map 50. Volusia County: Density of Property Losses



Summary of Results

This report provides the methodology and results to locate and prioritize areas experiencing repetitive property losses. The combination of the physical locations and the density of insurance payouts make many comparisons possible. For instance, this report can be used to identify target areas of repetitive loss between regions and within regions. The region that has the largest number of repetitive loss properties and has received the most money in insurance claims is Region 1: West-Central. Region 4 (South) and Region 3 (Panhandle) also have significant numbers of repetitive loss properties. The final two regions, Region 2: North-Central and Region 5: East-Central, have minimal repetitive losses in comparison. Therefore, there is clearly a hierarchy by region: Region 1, Region 4, Region 3, Region 2, Region 5.

The results can also be used to define priority counties within regions and target areas within counties. In Region 1, the county with the largest number of repetitive loss properties was Pinellas County with 1,503 repetitive loss properties. The density analysis of Pinellas County located two hotspots, the most dominant are being the Shore Acres Neighborhood. In Region 4, the county with the largest number of repetitive loss properties was Miami-Dade County with 2,693 repetitive loss properties. The density analysis revealed a highly concentrated area of repetitive losses in Miami known as the Tile District. Within the Panhandle (Region 3), Escambia County contained the most repetitive loss properties with 696 properties. Further analysis of Escambia County determined that Pensacola Beach was the dominant location of repetitive loss properties and amount of insurance claims. In Region 2, Duval County contained the largest number of repetitive loss properties (180). The density analysis highlighted a repetitive loss hotspot in Duval County in an area that was determined to be the Hyde Grove Park Area. Finally in Region 5, the largest concentration of repetitive loss properties was in Volusia County, which contained 125 properties. Analyzing the map resulting from the density analysis there is a clear area of concentration, possibly due to Tomoka Estates.

Depending on the needs of the emergency managers, local planning officials and other users, it is now possible to analyze the repetitive loss property data in more detail. Other relationships and prioritizations can be created simply by viewing the table in Appendix I. Repetitive Loss Statistics for All Counties.

Conclusions

The purpose of this project is to analyze the detailed repetitive loss data with the power of Geographic Information System (GIS) technology. The GIS adds a spatial perspective that will be very valuable in understanding the distribution of repetitive loss properties in the state of Florida. This report will identify statewide trends and regional differences in repetitive loss, as well as identify counties with concentrations of repetitive loss properties and costly claim payouts. This report will also attempt to define a geospatial methodology for counties to identify areas with extreme losses.

The main goal of this repetitive loss analysis is to identify areas that have concentrated repetitive losses for emergency managers and local planning officials. Once areas are designated as locations with costly repetitive losses, local officials can prioritize resources, such as money and educational material, to benefit and minimize losses in high priority areas. Mitigation measures such as relocation, elevation and buyouts can also be targeted to areas receiving multiple claim payouts. Reducing repetitive losses helps everyone, as more efficient floodplain management reduces the amount of money spent on repetitive claim payouts.

Future Implications

Now that the repetitive loss properties have been identified, hotspots determined, and general trends are recognized, GIS can continue answering questions in an effort to explore other topics of interest. Concerning specific prospective areas of study, we can begin to examine the following topics:

Coastal importance

What is the percentage of repetitive loss properties are located within buffer of coastline (50 miles)?

Watershed structure

What is the percentage of repetitive loss properties are located within 100 year floodplain (availability of Q3 Data)?

Type of housing

What type of housing is most dominant in repetitive loss structures?

Income

Is there a trend concerning income of residents affected by floodplain loss?

Appendix I. Repetitive Loss Statistics for All Counties

County Name	Number of Properties	Percentage of Total State Properties	Amount Paid Out	Percentage of Total State Payouts
Alachua	3	0.03%	\$241,384.68	0.08%
Baker	5	0.05%	\$208,120.05	0.07%
Bay	211	1.92%	\$29,293,882.73	9.46%
Bradford	2	0.02%	\$51,385.62	0.02%
Brevard	45	0.41%	\$1,556,527.83	0.50%
Broward	464	4.22%	\$17,678,587.28	5.71%
Calhoun	9	0.08%	\$602,846.42	0.19%
Charlotte	133	1.21%	\$4,505,920.57	1.46%
Citrus	351	3.19%	\$19,526,300.51	6.31%
Clay	51	0.46%	\$2,351,193.51	0.76%
Collier	42	0.38%	\$1,951,885.54	0.63%
Columbia	18	0.16%	\$475,889.75	0.15%
Dade	2693	24.47%	\$121,483,687.60	39.23%
Desoto	27	0.25%	\$2,968,797.27	0.96%
Dixie	66	0.60%	\$2,600,657.10	0.84%
Duval	180	1.64%	\$12,171,195.88	3.93%
Escambia	696	6.32%	\$61,384,444.47	19.82%
Flagler	7	0.06%	\$244,392.69	0.08%
Franklin	129	1.17%	\$4,513,987.47	1.46%
Gadsden	2	0.02%	\$42,836.36	0.01%
Gilchrist	22	0.20%	\$422,446.09	0.14%
Gulf	50	0.45%	\$2,920,734.54	0.94%
Hamilton	15	0.14%	\$271,947.03	0.09%
Hardee	5	0.05%	\$239,476.19	0.08%
Henry	1	0.01%	\$13,969.21	0.00%
Hernando	129	1.17%	\$6,062,893.04	1.96%
Highlands	2	0.02%	\$28,672.34	0.01%
Hillsborough	396	3.60%	\$19,628,687.06	6.34%
Holmes	22	0.20%	\$864,678.40	0.28%
Indian River	64	0.58%	\$4,799,230.66	1.55%
Jackson	1	0.01%	\$8,070.16	0.00%
Lafayette	20	0.18%	\$604,046.75	0.20%
Lake	1	0.01%	\$19,385.26	0.01%
Lee	493	4.48%	\$18,231,466.43	5.89%
Leon	68	0.62%	\$3,383,191.15	1.09%
Levy	74	0.67%	\$3,532,350.41	1.14%
Madison	8	0.07%	\$312,846.80	0.10%
Manatee	387	3.52%	\$14,289,395.92	4.61%
Marion	3	0.03%	\$73,523.19	0.02%
Martin	77	0.70%	\$4,342,652.29	1.40%
Monroe	224	2.04%	\$8,401,300.14	2.71%
Nassau	13	0.12%	\$629,627.48	0.20%
Okaloosa	270	2.45%	\$25,671,948.42	8.29%

Okeechobee	1	0.01%	\$30,137.73	0.01%
Orange	12	0.11%	\$536,209.26	0.17%
Osceola	6	0.05%	\$66,375.56	0.02%
Palm Beach	210	1.91%	\$7,948,702.92	2.57%
Pasco	642	5.83%	\$30,086,271.20	9.72%
Pinellas	1503	13.66%	\$67,976,750.33	21.95%
Polk	20	0.18%	\$1,123,382.98	0.36%
Putnam	9	0.08%	\$239,659.53	0.08%
Santa Rosa	287	2.61%	\$32,964,873.49	10.65%
Sarasota	346	3.14%	\$16,890,631.46	5.45%
Seminole	7	0.06%	\$278,716.82	0.09%
St. Johns	57	0.52%	\$2,505,415.47	0.81%
St. Lucie	60	0.55%	\$2,536,193.88	0.82%
Sumter	2	0.02%	\$82,691.48	0.03%
Suwannee	18	0.16%	\$478,412.76	0.15%
Taylor	18	0.16%	\$649,087.49	0.21%
Union	1	0.01%	\$72,649.06	0.02%
Volusia	125	1.14%	\$5,769,574.51	1.86%
Wakulla	108	0.98%	\$3,096,549.14	1.00%
Walton	89	0.81%	\$5,641,224.27	1.82%
Washington	6	0.05%	\$158,778.34	0.05%