Florida Statewide Regional Evacuation Study Program

Storm Tide Atlas

Broward

Volume 7-11

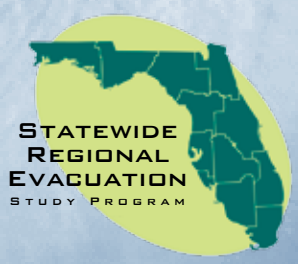
Book 1 of 3

Florida Division of Emergency Management

South Florida Regional Planning Council

South Florida Region

Includes Hurricane Evacuation Study



SOUTH FLORIDA STORM TIDE ATLAS

Volume 7-11
Book 1
Broward County

This Book is part of Volume 7 of the ***Statewide Regional Evacuation Study Program*** (SRESP), and one of three county books in the *South Florida Storm Tide Atlas* series. Book 1 covers Broward County; Book 2 covers Miami-Dade County; and Book 3 covers Monroe County. The Atlas maps identify those areas subject to potential storm tide flooding from the five categories of hurricane on the Saffir-Simpson Hurricane Wind Scale, as determined by the National Oceanic and Atmospheric Administration (NOAA) numerical storm surge model, Sea, Lake and Overland Surges from Hurricanes (SLOSH), updated in 2009.

The *Storm Tide Atlas* is the foundation of the hazards analysis for storm tide and a key component of the SRESP. The *Technical Data Report* (Volume 1-11) builds upon this analysis and includes the revised evacuation zones and population estimates, results of the evacuation behavioral data, shelter analysis and evacuation transportation analyses. The study, which provides vital information to state and local emergency management, forms the basis for county evacuation plans. The final documents with summary information are available on the Internet at www.sfrpc.com/sresp.htm.

This Atlas was prepared and published by the South Florida Regional Planning Council with funding from the Florida Legislature and the Federal Emergency Management Agency, through the Florida Division of Emergency Management.

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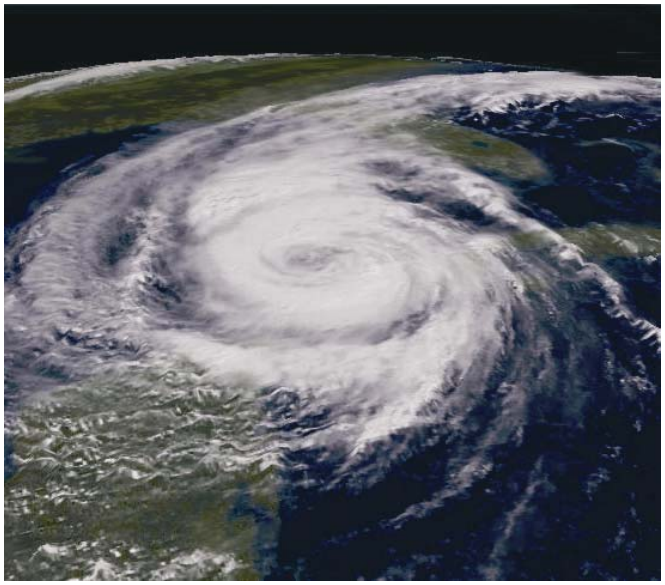

VOLUME 7-11
SOUTH FLORIDA

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A. Introduction

A comprehensive emergency management program requires attention to four key inter-related components: preparedness, response, recovery and mitigation. Preparing and avoiding or reducing potential loss of life and property damage – **preparedness and mitigation** – requires accurate and precise hazard and vulnerability analyses. These analyses are the foundation for evacuation and disaster response planning, as well as the development of local mitigation strategies designed to reduce the community's overall risk to disasters. This Atlas series provides information to state, county and local emergency management officials and planners for use in hurricane preparedness and coastal management in the South Florida Region, including Broward, Miami-Dade and Monroe Counties (Figure 1). It is part of a statewide effort to enhance our ability to respond to a hurricane threat, facilitate the evacuation of vulnerable residents to a point of relative safety and mitigate our vulnerability in the future. The ***Statewide Regional Evacuation Study Program*** provides a consistent, coordinated and improved approach to addressing the state and regional vulnerability to the hurricane threat.

The specific purpose of this Atlas is to provide maps that depict storm tide heights and the extent of stillwater, storm surge coastal flooding inundation from hurricanes of five different intensities in the South Florida area. The Atlas was prepared by the South Florida Regional Planning Council as part of the *Statewide Regional Evacuation Study Program.* The Study is a cooperative effort of the Florida Department of Community Affairs, Division of Emergency Management, the Florida Regional Planning Councils and the county emergency management agencies.

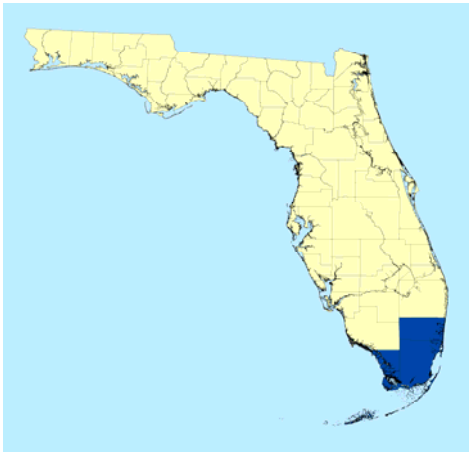
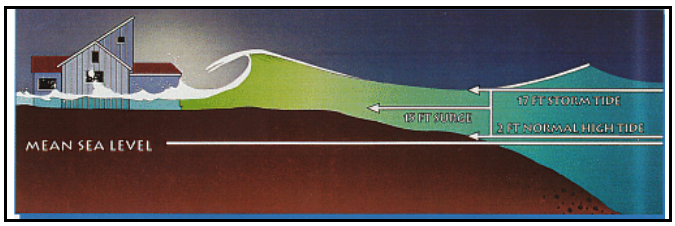


Figure 1 The South Florida Region

B. The SLOSH Model

The principal tool utilized in this study for analyzing the expected hazards from potential hurricanes affecting the study area is the Sea, Lake and Overland Surges from Hurricanes (**SLOSH**) numerical storm surge prediction model. The SLOSH computerized model predicts the storm tide heights that result from hypothetical hurricanes with selected various combinations of pressure, size, forward speed, track and winds. Originally developed for use by the National Hurricane Center (NHC) as a tool to give geographically specific warnings of expected surge heights during the approach of hurricanes, the SLOSH model is utilized in regional studies for several key hazard and vulnerability analyses.



The SLOSH modeling system consists of the model source code and the model basin or grid. SLOSH model grids must be developed for each specific geographic coastal area, individually

incorporating the unique local bay and river configuration, water depths, bridges, roads and other physical features. In addition to open coastline heights, one of the most valuable outputs of the SLOSH model for evacuation planning is its predictions of surge heights over land into inland areas.

The Tampa Bay SLOSH model basin completed in 1979 represented the first application of SLOSH storm surge dynamics to a major coastal area of the United States. The model was developed by the Techniques Development Lab of the National Oceanic and Atmospheric Administration (NOAA), under the direction of the late Dr. Chester P. Jelesnianski. In December 1990 the National Hurricane Center updated the SLOSH model. A major improvement to the model was the incorporation of wind speed degradation overland as the simulated storms moved inland. This duplicated the pressure "filling" and increases in the radii of maximum winds (RMW) as the hurricanes weaken after making landfall. The grid configuration also provided more detail and additional information.

The newest generation of the SLOSH model basin incorporated in the 2010 Statewide Regional Evacuation Study Program reflects major improvements, including higher resolution basin data and grid configurations. Faster computer speeds allowed additional hypothetical storms to be run for creation of the MOMs[1] or the maximum potential storm tide values for each category of storm.

1. Hypothetical Storm Simulations

Surge height depends strongly on the specifics of a given storm including, forward speed, angle of approach, intensity or maximum wind speed, storm size, storm shape, and landfall location. The SLOSH model was used to develop data for various combinations of hurricane strength, wind speed, and direction of movement. Storm strength was modeled using the central pressure (defined as the difference between the ambient sea level pressure and the minimum value in the storm's center), the storm eye size and the radius of maximum winds using the five categories of hurricane intensity as depicted in the Saffir-Simpson Hurricane Wind Scale (see Table 1).

Table 1 Saffir-Simpson Hurricane Wind Scale

Category	Wind Speeds	Potential Damage
Category 1	Sustained winds 74-95 mph	*Very dangerous winds will produce some damage*
Category 2	Sustained winds 96-110 mph	*Extremely dangerous winds will cause extensive damage*
Category 3	Sustained winds 111-130 mph	*Devastating damage will occur*
Category 4	Sustained winds 131-155 mph	*Catastrophic damage will occur*
Category 5	Sustained winds of 156 mph and above	*Catastrophic damage will occur*

[1] Maximum of MEOWs or Maximum of Maximums

The modeling for each tropical storm/hurricane category was conducted using the mid-range pressure difference (△p, millibars) for that category. The model also simulates the storm filling (weakening upon landfall) and radius of maximum winds (RMW) increase.

Ten storm track headings (E, ENE, NE, NNE, N, NNW, NW, WNW, W, and WSW) were selected as being representative of storm behavior in the South Florida region, based on observations by forecasters at the National Hurricane Center. And for each set of tracks in a specific direction storms were run at forward speeds of 5, 15 and 25 mph. And, for each direction, at each speed, storms were run at two different sizes (30 statute miles radius of maximum winds and 45 statute miles radius of maximum winds). Finally, each scenario was run at both mean tide and high tide. Both tide levels are now referenced to North American Vertical Datum of 1988 (NAVD88) as opposed to the National Geodetic Vertical Datum of 1929 (NGVD29) used in previous studies.

A total of 14,700 runs were made, consisting of the different parameters shown in Table 2.

Table 2 Biscayne Bay Basin Hypothetical Storm Parameters

Directions, speeds, sizes, (Saffir/Simpson) intensities, number of tracks and the number of runs.

Direction	Speeds (mph)	Size (Radius of Maximum Winds)	Intensity	Tides	Tracks	Runs
E	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	28	1,680
ENE	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	27	1,620
NE	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	22	1,320
NNE	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	19	1,140
N	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	21	1,260
NNW	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	23	1,380
NW	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	28	1,680
WNW	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	25	1,500
W	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	26	1,560
WSW	5, 15, 25 mph	30 statute miles, 45 statute miles	1 through 5	Mean/High	26	1,560
TOTAL						14,700

2. The Grid for the Biscayne Bay SLOSH Model

Figure 2 illustrates the area covered by the grid for the Biscayne Bay SLOSH Model. To determine the surge values the SLOSH model uses a telescoping elliptical grid as its unit of analysis with 124 arc lengths ($1 < I < 124$) and 189 radials ($1 < J < 189$). Use of the grid configuration allows for individual calculations per grid square, which is beneficial in two ways: (1) it provides increased resolution of the storm surge at the coastline and inside the harbors, bays and rivers, while decreasing the resolution in the deep water where detail is not as important; and (2) it allows economy in computation.

The grid size for the Biscayne Bay Model varies from approximately 0.02 square mile or 19 acres closest to the pole ($i = 1$) to the grids on the outer edges where each grid is approximately 4.83 square miles.

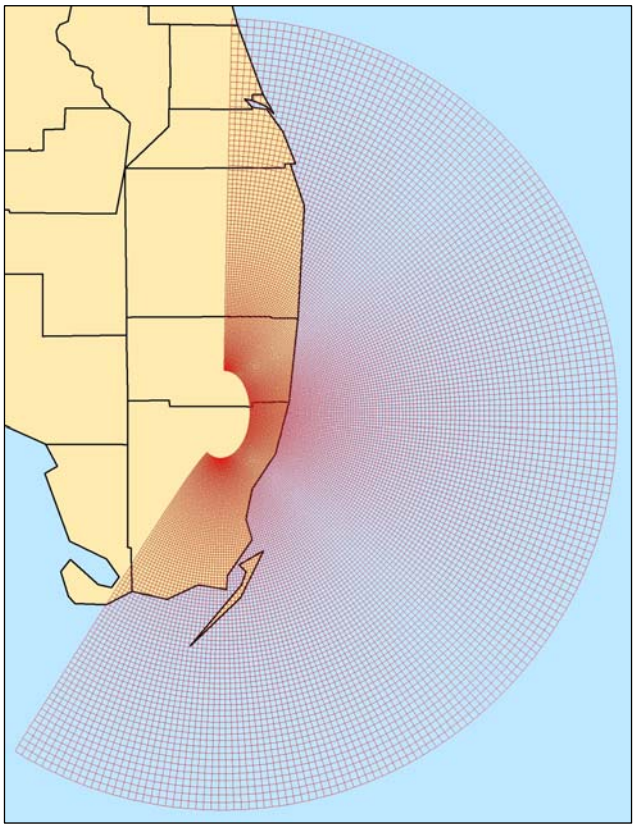


Figure 2 Biscayne Bay Basin Grid

3. Storm Scenario Determinations

As indicated, the SLOSH model is the basis for the "hazard analysis" portion of coastal hurricane evacuation plans. Thousands of hypothetical hurricanes are simulated with various Saffir-Simpson Wind categories, forward speeds, landfall directions, and landfall locations. An envelope of high water containing the maximum value a grid cell attains is generated at the end of each model run. These envelopes are combined by the NHC into various composites which depict the possible flooding. One useful composite is the MEOW (Maximum Envelopes of Water), which incorporates all the envelopes for a particular category, speed, and landfall direction. Once surge heights have been determined for the appropriate grids, the maximum surge heights are plotted by storm track and tropical storm/hurricane category.

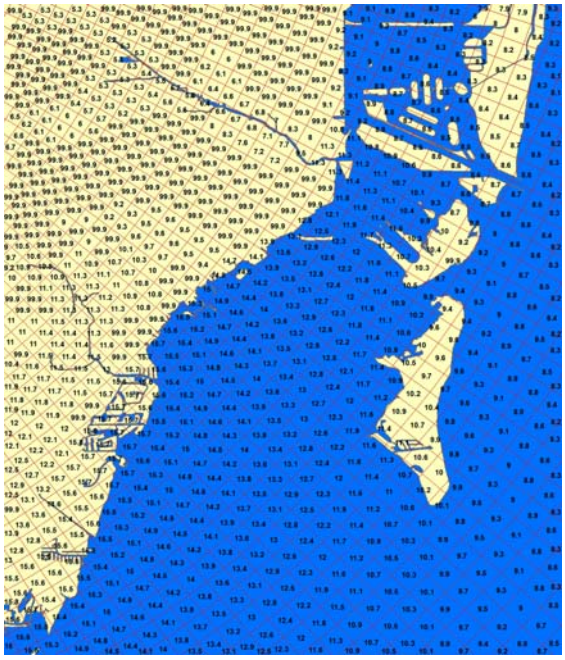


Figure 3 SLOSH Grid with Surge Values

These plots of maximum surge heights for a given storm category and track are referred to as Maximum Envelopes of Water (MEOWs). The MEOWs, or Reference Hurricanes, can be used in evacuation decision-making when and if sufficient forecast information is available to project storm track or type of storm (different landfalling, paralleling, or exiting storms).

The MEOWs provide information to the emergency managers in evacuation decision-making. However, in order to determine a scenario which may confront the county in a hurricane threat 24-48 hours before a storm is expected, a further compositing of the MEOWs into Maximums of the Maximums (MOMs) is usually required.

The MOM (Maximum of the MEOWs) combines all the MEOWs of a particular category. The MOMs represent the maximum surge expected to occur at any given location, regardless of the specific storm track/direction of the hurricane. The only variable is the intensity of the hurricane represented by category strength (Category 1-5).

The MOM surge heights, which were furnished by the National Hurricane Center, have 2 values, mean tide and high tide. Mean tide has 0' tide correction. High tide has a 1' tide correction added to it. The Storm Tide limits include the adjustment for mean high tide. All elevations are now referenced to the NAVD88 datum.

These surge heights were provided within the SLOSH grid system as illustrated on Figure 2. The range of maximum surge heights (low to high) for each scenario is provided for each category of storm (MOM) in Table 3. **It should be noted again that these surge heights represent the maximum surge height recorded in the county from the storm tide analysis, including inland and back bay areas where the surge can be magnified dependent upon storm parameters.**

Table 3 Potential Storm Tide Heights by County
(In feet above NAVD88)

*Storm Strength	Broward	Miami-Dade	Monroe
Category 1	Up to 3.1'	Up to 5.0'	Up to 7.9'
Category 2	Up to 4.7'	Up to 8.2'	Up to 12.2'
Category 3	Up to 6.2'	Up to 11.4'	Up to 16.4'
Category 4	Up to 8.3'	Up to 14.2'	Up to 20.0'
Category 5	Up to 9.5'	Up to 16.5'	Up to 23.3'

**Based on the category of storm on the Saffir-Simpson Hurricane Wind Scale*
*** Surge heights represent the maximum values from SLOSH MOMs.*

C. Creation of the Storm Tide Zones

The maps in this atlas depict SLOSH-modeled heights of storm tide and extent of flood inundation for hurricanes of five different intensities. As indicate above, the storm tide was modeled using the Maximum of Maximums (MOMs) representing the potential flooding from the five categories of storm intensity of the Saffir-Simpson Hurricane Wind Scale.

1. Determining Storm Tide Height and Flooding Depth

SLOSH and SLOSH-related products reference storm tide heights relative to the model vertical datum, NAVD88. In order to determine the inundation depth of surge flooding at a particular location the ground elevation (relative to NAVD88) at that location must be subtracted from the potential surge height.[2]

Surge elevation, or water height, is the output of the SLOSH model. At each SLOSH grid point, the maximum surge height is computed at that point.

Within the SLOSH model an average elevation is assumed within each grid square. Height of water above terrain was not calculated using the SLOSH average grid elevation because terrain height may vary significantly within a SLOSH grid square. For example, the altitude of a 1-mile grid square may be assigned a value of 1.8 meters (6 feet), but this value represents an average of land heights that may include values ranging from 0.9 to 2.7 meters (3 to 9 feet).

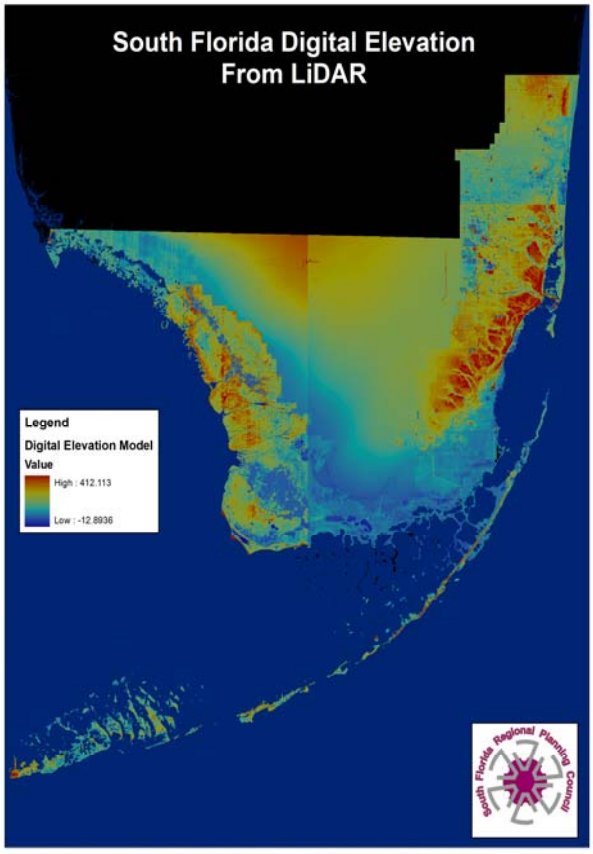


Figure 4 Digital Elevation from LIDAR

In this case, a surge value of 2.5 meters (8 feet) in this square would imply a 0.7 meters (2 feet) average depth of water over the grid's terrain. However, in reality within the grid area portion of the grid would be "dry" and other parts could experience as much as 1.5 meters (5 feet) of inundation. Therefore, in order to determine the storm tide limits, the depth of surge flooding above terrain at a specific site in the grid square is the result of subtracting the terrain height determined by remote sensing from the model-generated storm tide height in that grid square.[3]

[2] It is important to note that one must use a consistent vertical datum when post-processing SLOSH storm surge values.

[3] Note: This represents the regional post-processing procedure. When users view SLOSH output within the SLOSH Display Program, the system uses average grid cell height when subtracting land.

2. Storm Tide Post-Processing

The Atlas was created using a Toolset wrapped into ESRI's ArcGIS mapping application, ArcMap. The surge tool was developed for the Statewide Regional Evacuation Study Program by the Tampa Bay Regional Planning Council, which had used a similar tool for the previous Evacuation Study Update (2006). This tool enabled all regions within the state of Florida to process the SLOSH and elevation data with a consistent methodology.

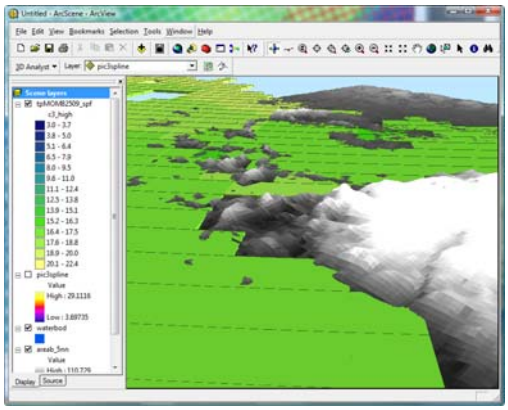


Figure 5 SLOSH Display

The tool basically performs the operation of translating the lower resolution SLOSH grid data into a smooth surface resembling actual storm tide and terrain, processing it with the high resolution elevation data derived from LiDAR. The image on the left represents how the data would look as it appears directly from SLOSH Model output.

Processing all the data in the raster realm, the tool is able to digest large amounts of data and output detailed representations of surge inundation.

The program first interpolates the SLOSH height values for each category into a raster surface using spline interpolation. This type of interpolation is best for smooth surfaces, such as water and slow changing terrain. The result is a raster surface representing the surge height for a category that can be processed against the raster Digital Elevation Model from the LIDAR. The "dry" values (represented as 99.9 in the SLOSH Model) are replaced by an average of the inundated grids surrounding the current processed grid. An algorithm performs this action utilizing the range of values in the current category of storm being processed.

Using this methodology, once the elevation is subtracted from the projected storm tide, the storm tide limits are determined. The output of the tool is a merged polygon file holding all the maximum inundation zones for Category 1 through Category 5. The output depicted in this Storm Tide Atlas is determined consistent with the coastal areas throughout the state. Figure 7 presents a compilation of the *Storm Tide Atlas* for the region.

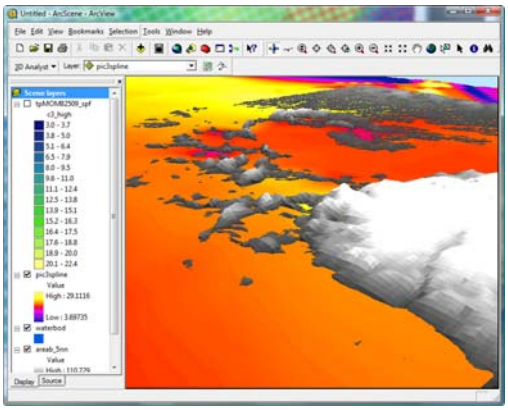
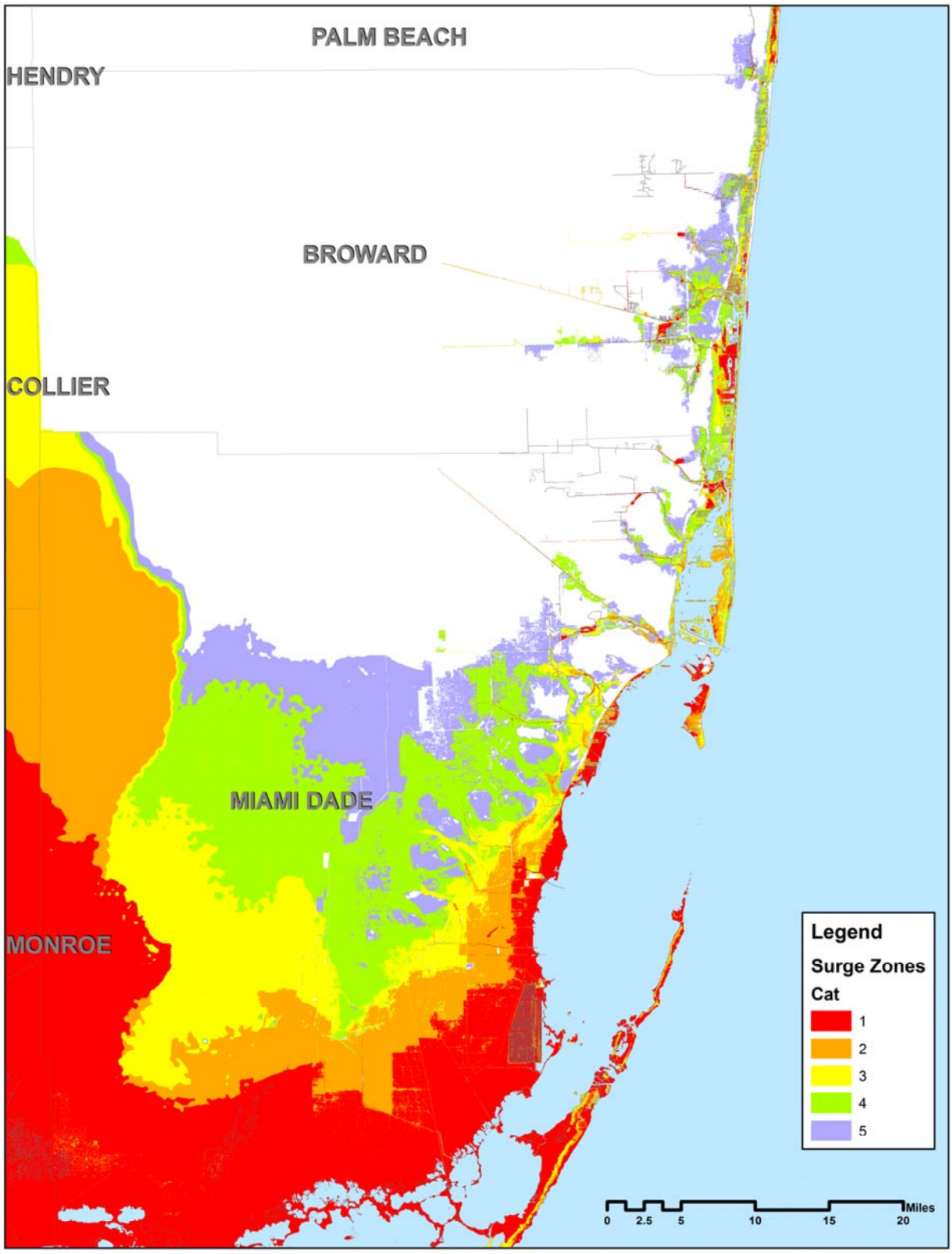


Figure 6 SLOSH Display Post-Processing

Figure 7 Storm Tide Limits for the South Florida Region
Biscayne Bay Basin



D. Variations to Consider

Variations between modeled versus actual measured storm tide elevations are typical of current technology in coastal storm surge modeling. In interpreting the data emergency planners should recognize the uncertainties characteristic of mathematical models and severe weather systems such as hurricanes. The storm tide elevations developed for this study and presented in the ***Storm Tide Atlas*** should be used as guideline information for planning purposes.

1. Storm Tide and Wave Height

Regarding interpretation of the data, it is important to understand that the configuration and depth (bathymetry) of the Ocean or Gulf bottom will have a bearing on surge and wave heights. A narrow shelf, or one that drops steeply from the shoreline and subsequently produces deep water in close proximity to the shoreline tends to produce a lower surge but a higher and more powerful wave. Those regions that have a gently sloping shelf and shallower normal water depths, can expect a higher surge but smaller waves. The reason this occurs is because a surge in deeper water can be dispersed down and out away from the hurricane. However, once that surge reaches a shallow gently sloping shelf it can no longer be dispersed away from the hurricane, consequently water "piles up" as it is driven ashore by the wind stresses of the hurricane. Wave height is NOT calculated by the SLOSH model and is not reflected within the storm tide delineations.

2. Forward Speed

Under actual storm conditions it may be expected that a hurricane moving at a slower speed could have higher coastal storm tides than those depicted from model results. At the same time, a fast moving hurricane would have less time to move storm surge water up river courses to more inland areas. For example, a minimal hurricane or a storm further off the coast, such as Hurricane Elena (1985), which stalled 90 miles off the Tampa Bay coast for several tidal cycles, could cause extensive beach erosion and move large quantities of water into interior lowland areas. In the newest version of the SLOSH model, for each set of tracks in a specific direction, storms were run at forward speeds of 5, 15 and 25 mph.

3. Radius of Maximum Winds

As indicated previously, the size of the storm or radius of maximum winds (RMW) can have a significant impact on storm surge especially in bay areas and along the Gulf of Mexico. All of the hypothetical storms were run at two different sizes, 30 nautical mile radius of maximum winds and 45 nautical mile radius of maximum winds.

4. Astronomical Tides

Surge heights were provided by NOAA for both mean tide and high tide. Both tide levels are referenced to North American Vertical Datum of 1988. The storm tide limits reflect high tide in the region.

5. Accuracy

As part of the Statewide Regional Evacuation Study, all coastal areas, as well as areas surrounding Lake Okeechobee, were mapped using remote-sensing laser terrain mapping (LiDAR[4]) providing the most comprehensive, accurate and precise topographic data for this analysis. As a general rule, the vertical accuracy of the laser mapping is within a 15 centimeter tolerance. However, it should be noted that the accuracy of these elevations is limited to the precision and tolerance in which the horizontal accuracy for any given point is recorded. Other factors such as artifact removal algorithms (that remove buildings and trees) can affect the recorded elevation in a particular location. For the purposes of this study, the horizontal accuracy cannot be assumed to be greater than that of a standard USGS 7.5-minute quadrangle map, or a scale of 1:24,000.

E. Points of Reference

County emergency management agencies selected reference points, which include key facilities or locations critical for emergency operations. The table below includes the map identification number, descriptions of the selected points, and the elevation of the site. The elevation is based on the digital elevation data provided by the LiDAR. It should be noted that if the site is large, elevations may vary significantly. The table also provides the storm tide value from the SLOSH value and the depth of inundation (storm tide value minus the ground elevation) at the site.

[4] Light Imaging Detection and Ranging

Table 4 Selected Points of Reference – Broward County

Map ID	Name	Elevation	C1 DPTH[5]	C2 DPTH	C3 DPTH	C4 DPTH	C5 DPTH	C1 SURGE[6]	C2 SURGE	C3 SURGE	C4 SURGE	C5 SURGE
1	HOLLYWOOD BLVD. & A1A.	3.459	0.000	0.000	0.941	3.309	4.372	2.311	3.342	4.400	6.768	7.832
2	YOUNG CIRCLE.	7.954	0.000	0.000	0.000	0.000	0.000	1.340	2.190	3.121	4.699	7.698
3	HOLLYWOOD BLVD. & I-95.	7.598	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.704	4.296
4	JOHNSON ST.& I-95.	5.348	0.000	0.000	0.000	0.000	2.181	1.340	2.190	2.860	4.181	7.529
5	JOHNSON ST.& U.S. 1.	9.932	0.000	0.000	0.000	0.000	0.000	1.340	2.182	2.879	3.942	3.926
6	JOHNSON ST.& INTRA. W'TRY & WESTLAKE.	5.288	0.000	0.000	0.000	1.409	2.655	2.312	3.403	4.400	6.698	7.943
7	SHERIDAN ST.& INTRA. WATERWAY.	0.000	2.403	3.400	4.400	6.695	8.106	2.403	3.400	4.400	6.695	8.106
8	SHERIDAN ST.& U.S. 1.	10.064	0.000	0.000	0.000	0.000	0.000	1.340	2.206	2.885	3.967	5.242
9	SHERIDAN ST.& I-95.	6.772	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	5.084	6.001
10	STIRLING RD.& I-95.	7.646	0.000	0.000	0.000	0.000	0.000	1.346	2.197	2.868	4.614	4.750
11	STIRLING RD.& U.S. 1.	9.069	0.000	0.000	0.000	0.000	0.000	1.451	2.380	3.173	5.163	7.718
12	WESTLAKE.	0.000	2.408	3.400	4.400	6.886	8.010	2.408	3.400	4.400	6.886	8.010
13	DANIA CUTOFF & INTRA. WATERWAY.	0.000	2.400	3.400	4.600	6.800	8.000	2.400	3.400	4.600	6.800	8.000
14	DANIA CUTOFF & GRIFFIN & US 1.	-0.830	3.121	3.788	4.780	7.494	8.351	2.291	2.958	3.950	6.664	7.521
15	GRIFFIN & I-95.	8.789	0.000	0.000	0.000	0.000	0.000	2.051	2.767	3.739	5.444	5.715
16	FORT LAUDERDALE AIRPORT.	6.315	0.000	0.000	0.000	0.000	1.185	1.479	2.269	2.989	3.978	7.500
17	SOUTH ANDREWS AVE. & US 1.	4.609	0.000	0.000	0.000	0.924	3.291	1.340	2.192	2.868	5.532	7.900
18	PORT EXPANSION.	9.788	0.000	0.000	0.000	0.000	0.000	1.680	2.711	3.591	7.000	8.100
19	PORT & STRANAHAN RIVER.	0.000	2.340	3.756	4.966	7.960	9.255	2.340	3.756	4.966	7.960	9.255
20	PORT & US 1 & SR 84.	8.349	0.000	0.000	0.000	0.000	0.000	1.332	2.175	2.840	5.317	7.687
21	I-95 & NEW RIVER.	-0.350	2.089	3.057	3.659	5.391	7.669	1.739	2.707	3.309	5.041	7.319
22	US 441 & SR 84.	25.312	0.000	0.000	0.000	0.000	0.000	1.601	2.601	3.401	4.201	5.001
23	DAVIE BLVD. & US 1.(:SE 3 AVE & 17 ST).	7.306	0.000	0.000	0.000	0.000	0.595	1.383	2.262	2.952	4.804	7.900
24	LAS OLAS BLVD & NEW RIVER.	0.000	2.310	3.607	4.951	5.791	8.163	2.310	3.607	4.951	5.791	8.163
25	VICTORIA PARK RD.	7.353	0.000	0.000	0.000	0.000	0.773	2.132	3.440	4.376	5.685	8.126

[5] DPTH refers to the depth of inundation at the site (storm surge value minus the ground elevation)
[6] SURGE refers to the storm surge value from the SLOSH Model

Map ID	Name	Elevation	C1 DPTH[5]	C2 DPTH	C3 DPTH	C4 DPTH	C5 DPTH	C1 SURGE[6]	C2 SURGE	C3 SURGE	C4 SURGE	C5 SURGE
26	BROWARD BLVD. & US 1.	4.738	0.000	0.000	0.000	0.854	3.113	1.827	2.930	3.789	5.591	7.850
27	S ANDREWS AVE. & NEW RIVER CANAL.	0.269	2.007	3.290	4.112	5.286	7.524	2.276	3.559	4.382	5.556	7.794
28	BROWARD BLVD. & I-95.	7.760	0.000	0.000	0.000	0.000	0.000	2.395	3.684	4.091	5.315	7.376
29	SUNRISE BLVD. & POWERLINE RD.	5.873	0.000	0.000	0.000	0.000	1.742	1.351	2.220	2.899	4.861	7.615
30	SUNRISE BLVD. & ANDREWS AVE.	6.120	0.000	0.000	0.000	0.000	1.456	1.337	2.201	2.872	4.991	7.575
31	SUNRISE BLVD. & INTRA. WATERWAY.	0.000	2.345	3.729	5.001	5.675	8.000	2.345	3.729	5.001	5.675	8.000
32	NE 19TH ST. & US. 1.	2.810	0.000	0.000	0.647	1.921	4.088	1.510	2.502	3.457	4.731	6.899
33	MIDDLE RIVER & RAILROAD TRACKS.	-1.046	2.386	3.234	3.903	4.932	6.984	1.339	2.188	2.856	3.886	5.938
34	MIDDLE RIVER & POWERLINE RD.	-1.256	2.596	3.446	4.116	4.877	7.021	1.340	2.190	2.860	3.621	5.765
35	OAKLAND PARK BLVD. & POWERLINE RD.	5.112	0.000	0.000	0.000	0.000	0.895	1.340	2.190	2.860	3.620	6.007
36	OAKLAND PARK BLVD. & DIXIE HWY.	7.245	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.619	5.994
37	OAKLAND PARK BLVD. & INTRA. WATERWAY.	0.000	2.356	3.843	4.938	5.510	7.121	2.356	3.843	4.938	5.510	7.121
38	COMMERCIAL BLVD. & INTRA. WATERWAY.	0.000	2.266	3.761	4.556	5.477	7.079	2.266	3.761	4.556	5.477	7.079
39	FLORANADA RD & NE 45 @ US 1.	12.397	0.000	0.000	0.000	0.000	0.000	1.400	2.294	2.973	3.972	5.492
40	DIXIE HWY. & NW 44 ST.	5.900	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.620	5.209
41	DIXIE HWY. & NW 62ND ST.	7.346	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.810	6.505
42	IMPERIAL POINT & US 1.	5.501	0.000	0.000	0.000	0.000	1.515	1.572	2.764	3.458	5.314	7.016
43	CYPRESS RD & ATLANTIC BLVD.	11.403	0.000	0.000	0.000	0.000	0.000	1.342	2.251	2.897	3.971	6.113
44	US 1 & POMPANO CANAL.	-0.236	2.148	4.272	4.974	5.769	7.379	1.912	4.036	4.738	5.533	7.142
45	INTRA. WATERWAY & ATLANTIC BLVD.	0.000	2.356	3.879	5.028	6.401	8.057	2.356	3.879	5.028	6.401	8.057
46	INTRA. WATERWAY & NE 14TH ST.	0.000	2.304	3.775	5.280	6.494	7.811	2.304	3.775	5.280	6.494	7.811
47	US 1 & COPANS ROAD.	10.688	0.000	0.000	0.000	0.000	0.000	1.655	2.763	3.726	5.288	5.778
48	HILLSBORO BRIDGE.	0.000	2.402	3.858	5.285	6.530	7.906	2.402	3.858	5.285	6.530	7.906
49	LIGHTHOUSE POINT @ US 1.	10.734	0.000	0.000	0.000	0.000	0.000	1.495	2.477	3.734	4.880	5.050
50	TOWN OF HILLSBORO BEACH @ A1A.	5.454	0.000	0.000	0.000	1.159	2.461	2.311	3.707	5.183	6.614	7.915
51	A1A & HILLSBORO.	9.540	0.000	0.000	0.000	0.000	0.000	1.972	3.234	4.472	6.125	7.834
52	HILLSBORO CANAL & P.B. COUNTY	0.482	0.988	1.930	2.725	4.243	6.825	1.470	2.412	3.207	4.724	7.307

Map ID	Name	Elevation	C1 DPTH[5]	C2 DPTH	C3 DPTH	C4 DPTH	C5 DPTH	C1 SURGE[6]	C2 SURGE	C3 SURGE	C4 SURGE	C5 SURGE
	LINE.											
53	GULFSTREAM PARK (DADE LINE).	1.943	0.000	0.238	1.211	3.919	5.255	1.333	2.181	3.154	5.863	7.198
54	HALLANDALE BEACH BLVD & INTRA. WTRWY.	0.000	2.332	3.534	4.637	6.449	7.638	2.332	3.534	4.637	6.449	7.638
55	HALLANDALE BEACH BLVD & US 1.	5.442	0.000	0.000	0.000	0.844	1.964	1.338	2.188	3.551	6.286	7.406
56	HALLANDALE BEACH BLVD & I-95.	7.449	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.614	3.245
57	PEMBROKE RD & I-95.	9.156	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.620	2.890
58	PEMBROKE RD & US 1.	9.273	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.944	4.307	7.096
59	GRIFFIN RD & US 441.	6.938	0.000	0.000	0.000	0.000	0.000	1.517	2.443	3.130	3.979	5.603
60	UNIVERSITY DRIVE & SR 84.	29.323	0.000	0.000	0.000	0.000	0.000	1.700	2.900	4.000	4.700	4.901
61	US 1 & Green Rd (NE 48 St) Pompano Beach	8.300	0.000	0.000	0.000	0.000	0.000	1.561	2.548	3.486	4.952	5.729
62	US 1 & NE 10 St: Pompano Beach	8.667	0.000	0.000	0.000	0.000	0.000	1.955	3.225	4.220	6.026	6.668
63	N Dixie Hwy & Atlantic Blvd: Pompano Beach	12.318	0.000	0.000	0.000	0.000	0.000	1.340	2.195	2.850	3.833	5.996
64	N Dixie Hwy & McNab Rd: Pompano Beach	5.995	0.000	0.000	0.000	0.000	0.915	1.340	2.185	2.856	4.537	6.909
65	Andrews Av & Prospect Rd: Oakland Pk	5.921	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.620	4.114
66	NE 6 AV & 56 St: Oakland Pk	4.712	0.000	0.000	0.000	0.000	0.000	1.340	2.190	2.860	3.614	4.249
67	Broward Blvd & SW 4 Av: Ft Lauderdale	4.996	0.000	0.000	0.000	0.509	2.756	1.770	2.835	3.848	5.505	7.752
68	NE 15 AV & 13 St; Ft Lauderdale	8.544	0.000	0.000	0.000	0.000	0.000	1.344	2.216	3.097	5.139	7.825
69	Oakland Pk Blvd & NW 27 AV: Oakland Pk	4.075	0.000	0.000	0.000	0.000	0.000	1.340	2.191	2.860	3.620	3.739
70	NW 27 AV & 6 St: Ft Lauderdale	5.813	0.000	0.000	0.000	0.000	1.454	2.050	3.304	4.180	4.944	7.267
71	SW 17 ST & 9 AVE: Ft Lauderdale	4.121	0.000	0.000	0.000	1.406	3.505	1.606	2.557	3.251	5.526	7.625
72	NW 1 ST & Bryan Rd: Dania Beach	3.514	0.000	0.000	0.000	2.160	2.200	1.624	2.466	3.207	5.674	5.714
73	Tyler St & 9 AV: Hollywood	0.576	1.763	2.819	3.824	6.158	7.289	2.339	3.395	4.400	6.734	7.865
74	Moffett St & NE 14 AV: Hallandale	1.113	0.446	1.343	3.229	5.604	6.533	1.559	2.456	4.342	6.716	7.646
75	NE 6 ST & 8 AV: Hallandale	3.579	0.000	0.000	0.458	2.938	3.987	1.337	2.187	4.037	6.517	7.566

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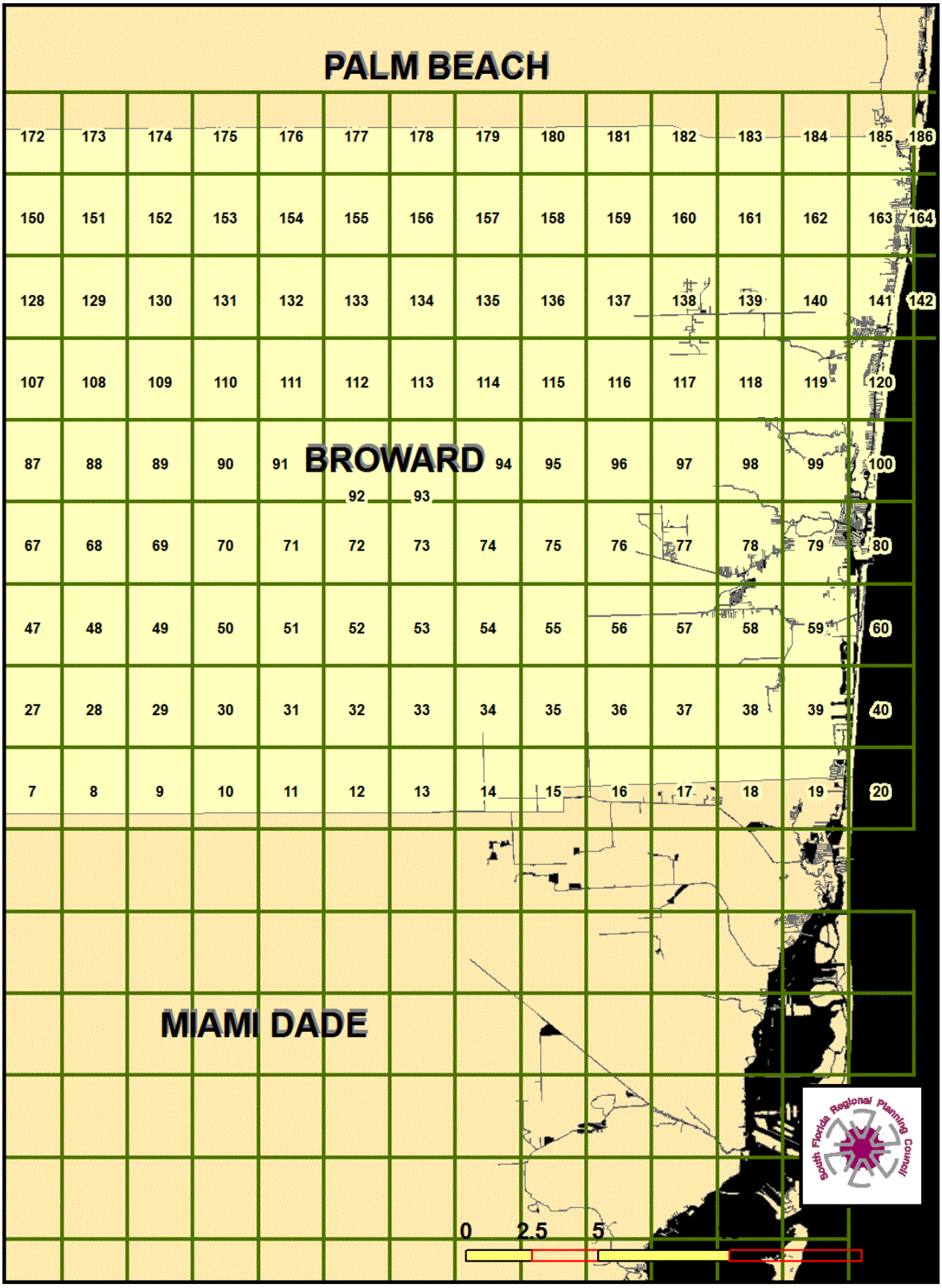
F. Storm Tide Atlas

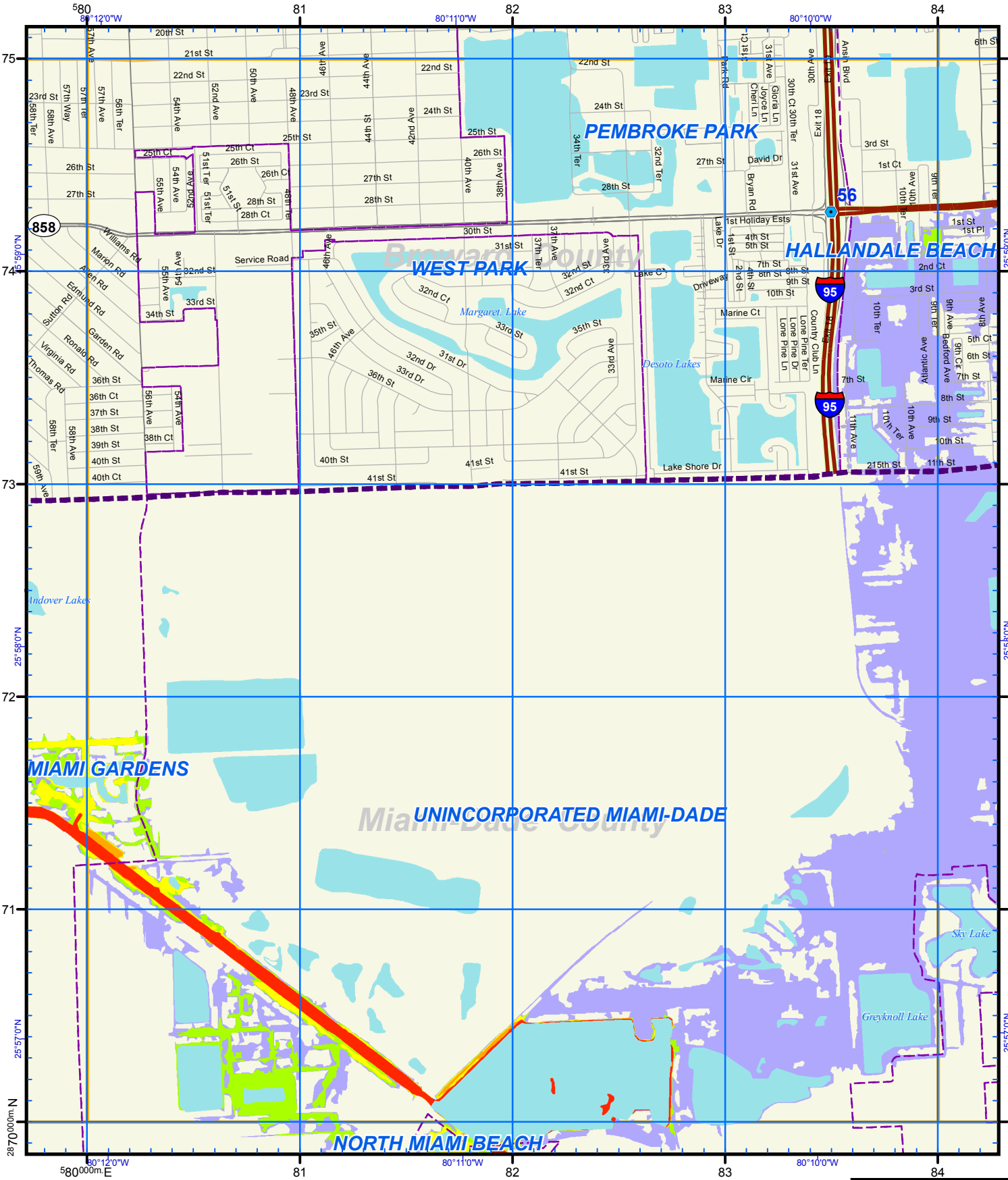
The surge inundation limits (MOM surge heights minus the ground elevations) are provided as GIS shape files and graphically displayed on maps in the *Hurricane Storm Tide Atlas for the South Florida Region*. The *Atlas* was prepared by the South Florida Regional Planning Council under contract to the State of Florida, Division of Emergency Management, as part of this study effort. The maps prepared for the *Atlas* consist of base maps (1:24000) including topographic, hydrographic and highway files (updated using 2008 county and state highway data). Detailed shoreline and storm tide limits for each category of storm were determined using the region's geographic information system (GIS).

The purpose of the maps contained in this Atlas is to reflect a "worst probable" scenario of the hurricane storm tide inundation and to provide a basis for the hurricane evacuation zones and study analyses. While the storm tide delineations include the addition of an astronomical mean high tide and tidal anomaly, it should be noted that the data reflects only stillwater saltwater flooding. **Local processes such as waves, rainfall and flooding from overflowing rivers, are usually included in observations of storm tide height, but are not surge and are not calculated by the SLOSH model. It is incumbent upon local emergency management officials and planners to estimate the degree and extent of freshwater flooding, as well as to determine the magnitude of the waves that will accompany the surge.**

Figure 8 provides an index of the map series for Broward County.

Figure 8 Atlas Map Index





US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
1. Surge limits are based on still water storm tide height elevation above NAVD88 at high tide with no wave setup.
2. Total Storm Tide limits were derived from Maximum of Maximums surge heights over LIDAR based digital elevation.
3. The Points of Reference are locations determined to be relevant to emergency management officials.

ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat	
1	
2	
3	
4	
5	

Storm Tide Zones

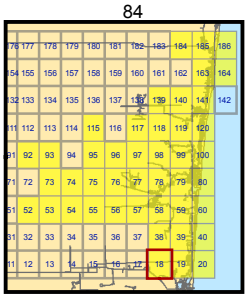
Broward County, 2010

Scale - 1:24,000

0 — 2,000 Feet

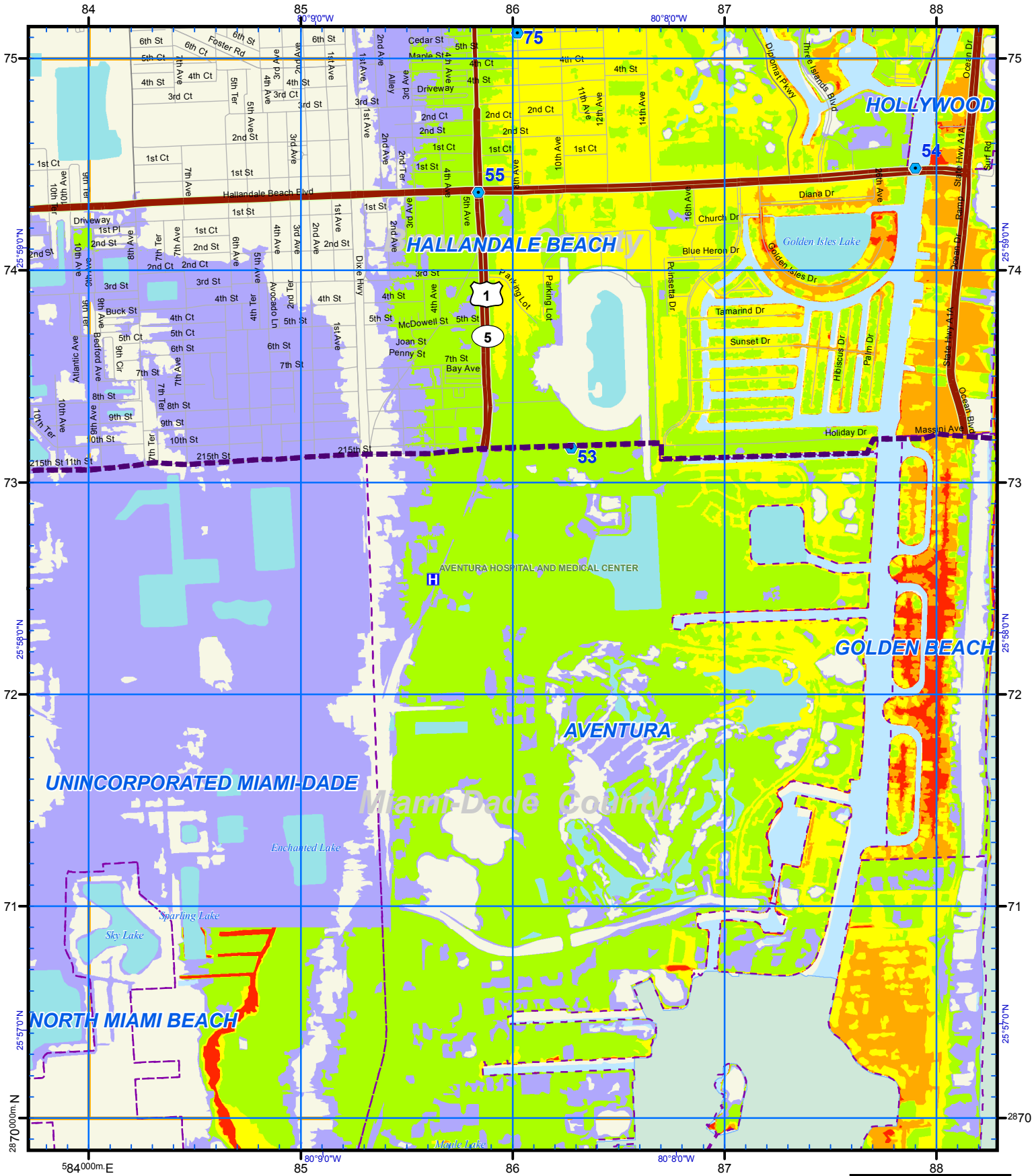
USNG Page **17R NJ 80 70**

Map Plate **18**



This map is for reference & planning purposes only. Hurricane evacuation decision-making and growth management implementation are local responsibilities. Please consult with local authorities.

Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
3
4
5

Storm Tide Zones

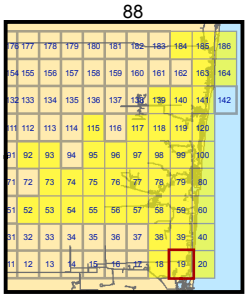
Broward County, 2010

Scale - 1:24,000

0 — 2,000 Feet

USNG Page **17R NJ 84 70**

Map Plate **19**



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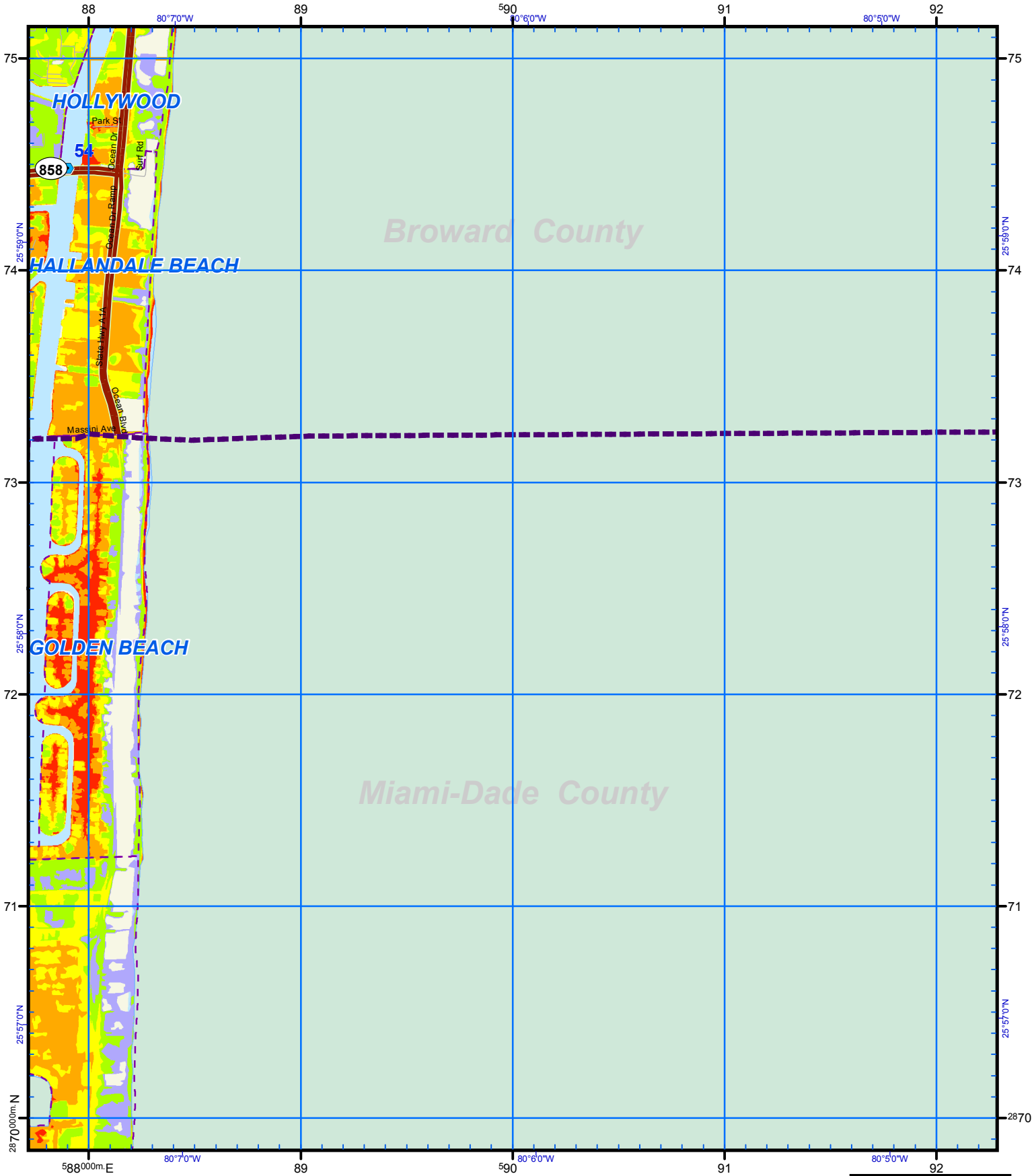

US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat: 1, 2, 3, 4, 5

Storm Tide Zones

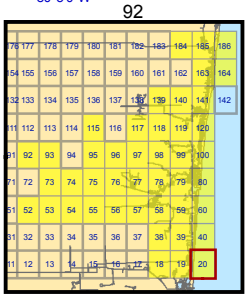
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 88 70**

Map Plate **20**



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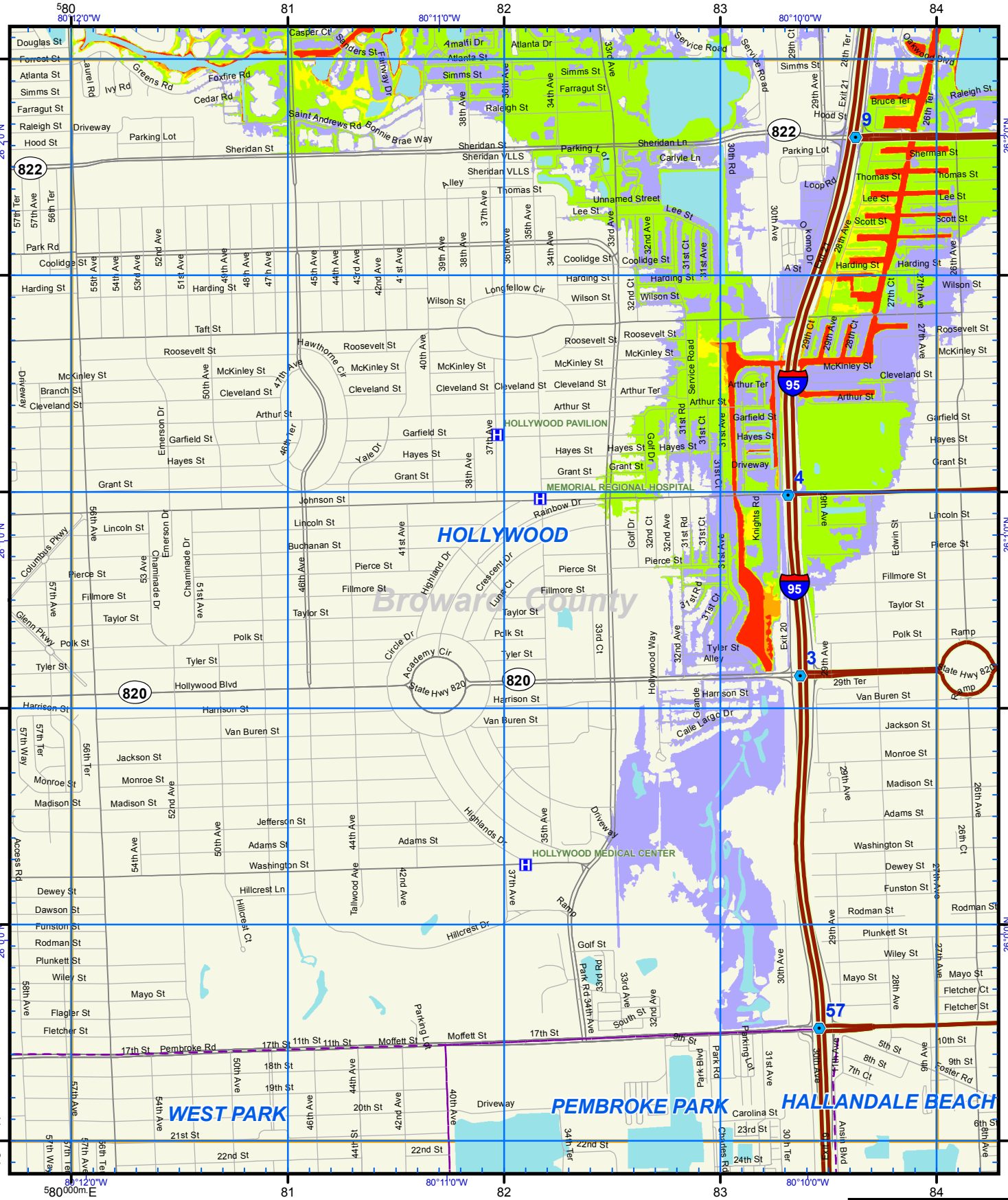
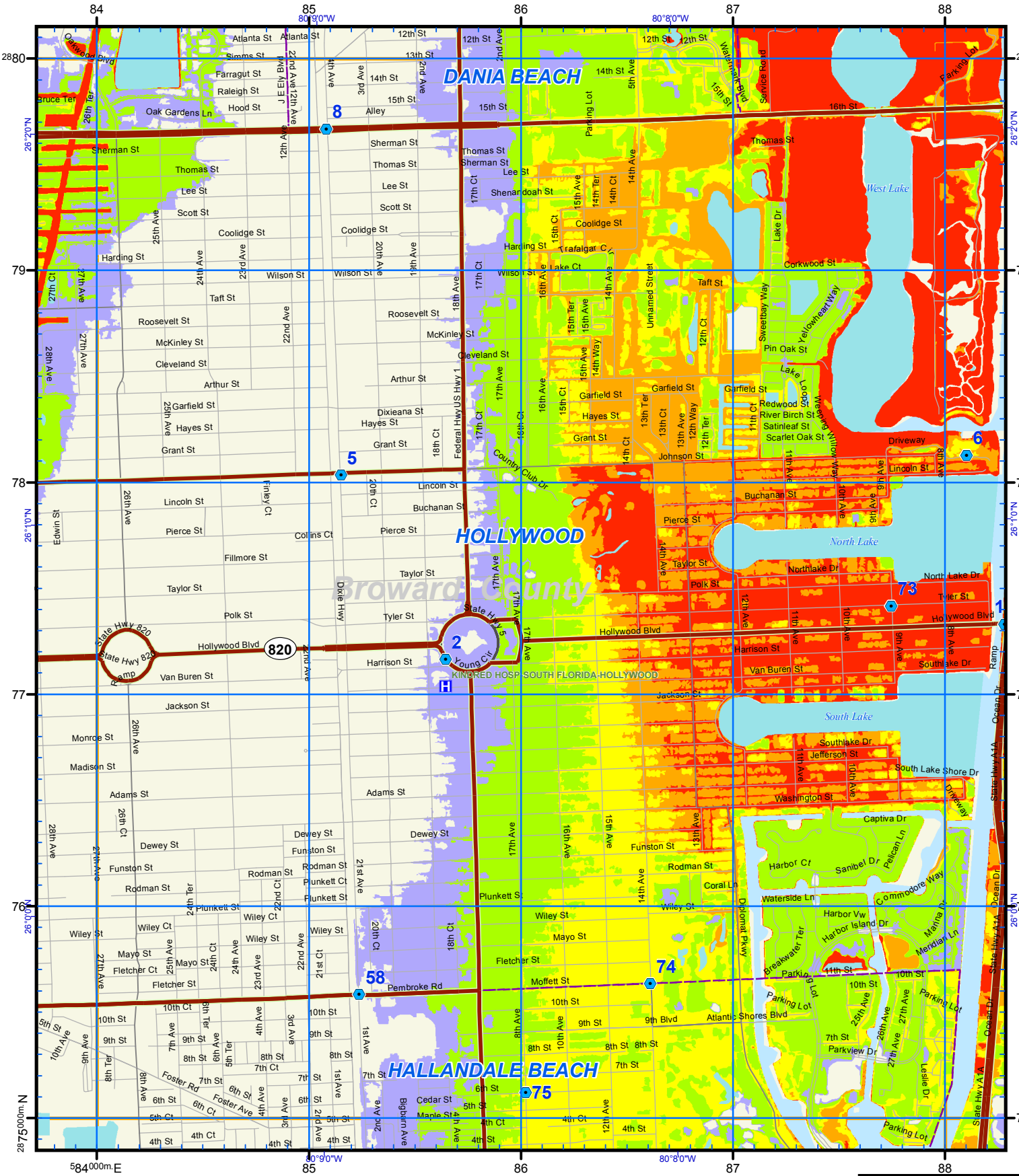
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010


HOLLYWOOD
WEST PARK
PEMBROKE PARK
HALLANDALE BEACH
Broward County
HOLLYWOOD PAVILION
MEMORIAL REGIONAL HOSPITAL
HOLLYWOOD MEDICAL CENTER
822
820
95
9
4
3
57
Hollywood Blvd
Pembroke Rd
Sheridan St
Harding St
Taft St
Johnson St
Lincoln St
Buchanan St
Pierce St
Fillmore St
Taylor St
Polk St
Tyler St
Harrison St
Van Buren St
Jackson St
Monroe St
Madison St
Adams St
Washington St
Dewey St
Funston St
Rodman St
Plunkett St
Wiley St
Mayo St
Fletcher St
Flagler St
Coolidge St
Wilson St
Roosevelt St
McKinley St
Cleveland St
Arthur St
Garfield St
Hayes St
Grant St
Lee St
Thomas St
Scott St
Sherman St
Raleigh St
Simms St
Farragut St
Atlanta St
Amalfi Dr
Casper Ct
Sanders St
Fairway Dr
Foxfire Rd
Cedar Rd
Greens Rd
Ivy Rd
Laurel Rd
Douglas St
Forrest St
Driveway
Parking Lot
Saint Andrews Rd
Bonnie Brae Way
Alley
Unnamed Street
Carlyle Ln
Loop Rd
Oakwood Blvd
Service Road
Exit 21
Exit 20
Rainbow Dr
Yale Dr
Hawthorne Cir
Longfellow Cir
Emerson Dr
Chaminade Dr
Columbus Pkwy
Glenn Pkwy
Circle Dr
Academy Cir
State Hwy 820
Ramp
Golf Dr
Golf St
Knights Rd
Calle Largo Dr
Grande Blvd
Highland Dr
Crescent Dr
Lunar Ct
Highlands Dr
Hillcrest Dr
Hillcrest Ln
Hillcrest Ct
Tallwood Ave
Access Rd
Moffett St
Park Rd
Park Blvd
Parking Lot
Carolina St
Charles Rd
Ansin Blvd
Foster Rd
Branch St
Circle
Ramp
Driveway
Alley
Golf Dr
Golf St
Park Rd
Parking Lot
Parking Lot
Parking Lot



US National Grid
100,000-m Square ID
NJ

Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN
Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat: 1, 2, 3, 4, 5

Storm Tide Zones

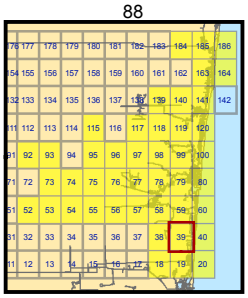
Broward County, 2010

Scale - 1:24,000

0 — Feet — 2,000

USNG Page **17R NJ 84 75**

Map Plate **39**



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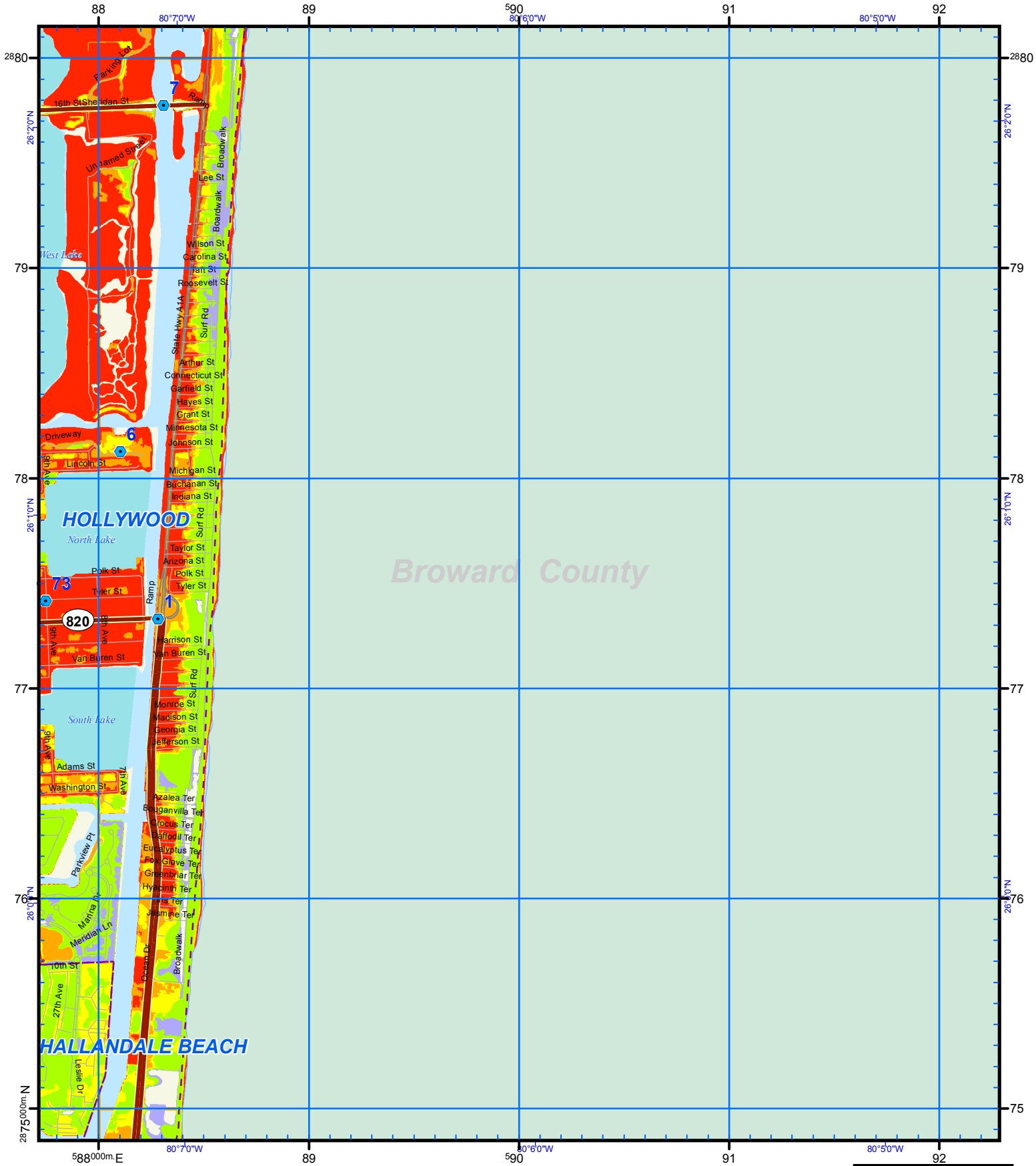
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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2. Total Storm Tide limits were derived from Maximum of Maximums surge heights over LIDAR based digital elevation.
3. The Points of Reference are locations determined to be relevant to emergency management officials.

ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
3
4
5

Storm Tide Zones

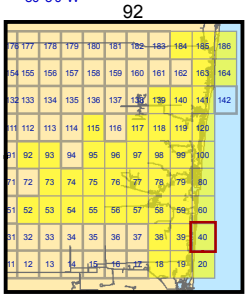
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 88 75**

Map Plate **40**



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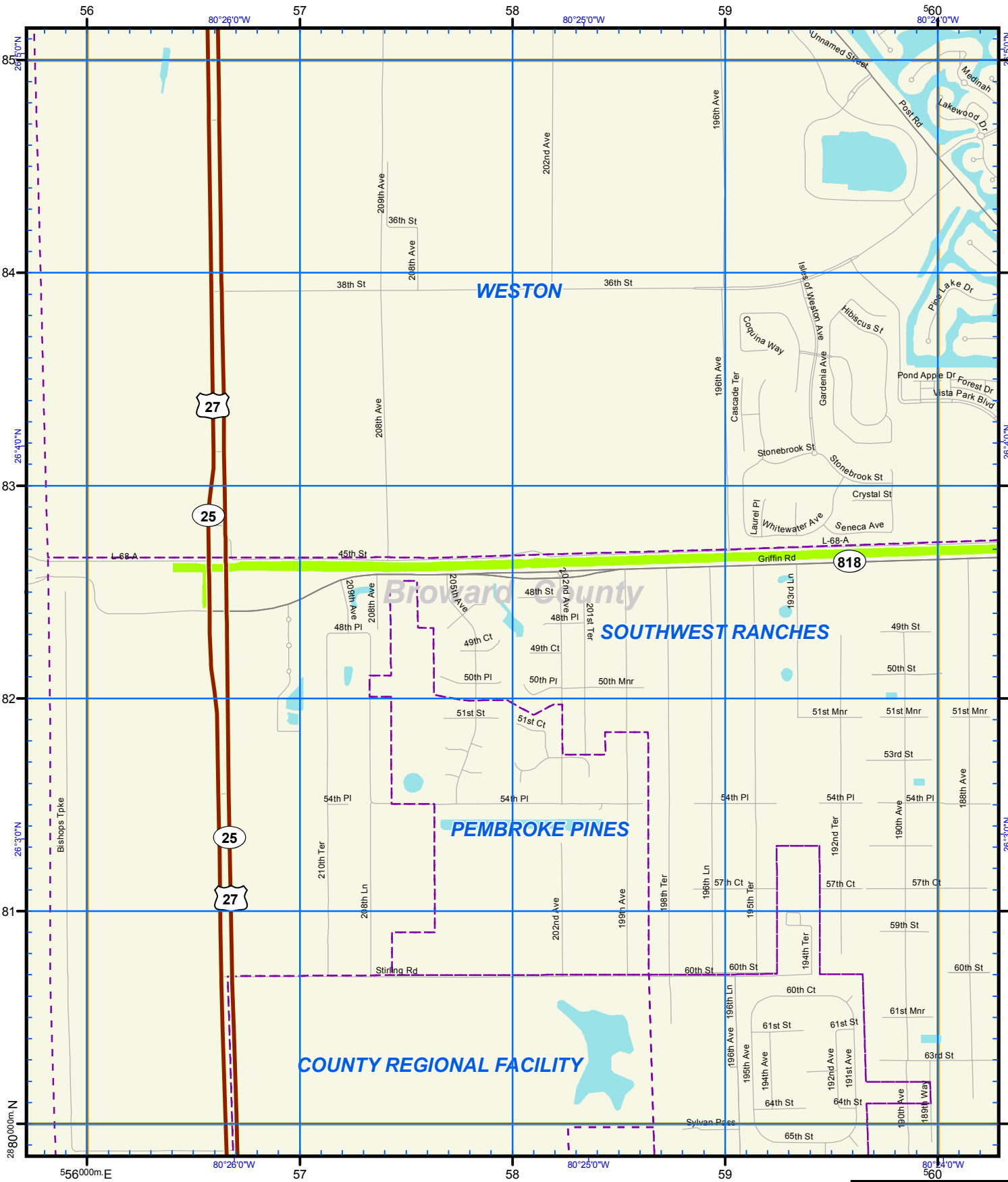
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat: 1, 2, 3, 4, 5

Storm Tide Zones

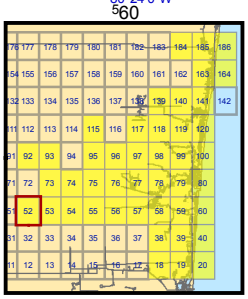
Broward County, 2010

Scale - 1:24,000

0 — 2,000 Feet

USNG Page **17R NJ 56 80**

Map Plate **52**



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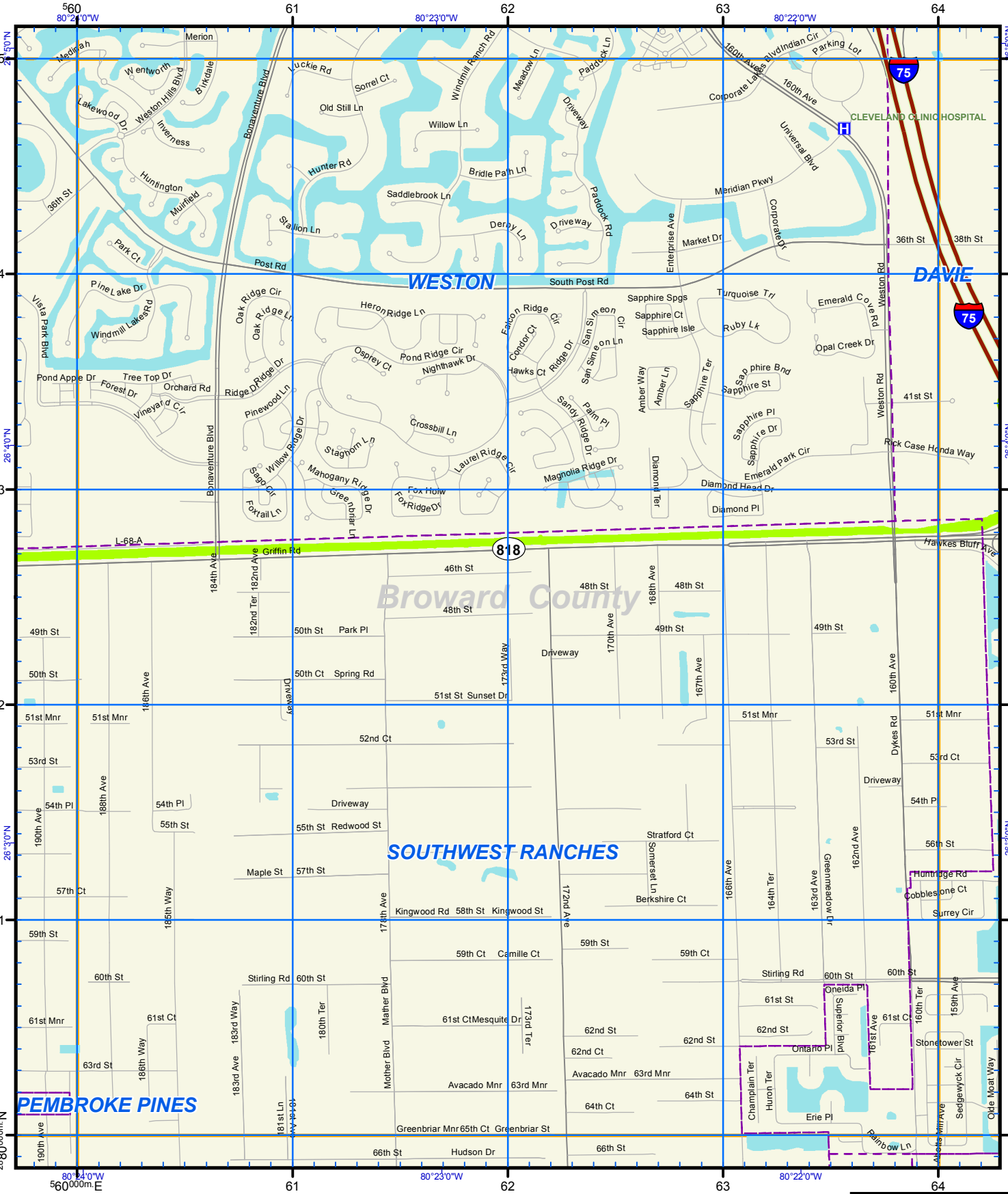
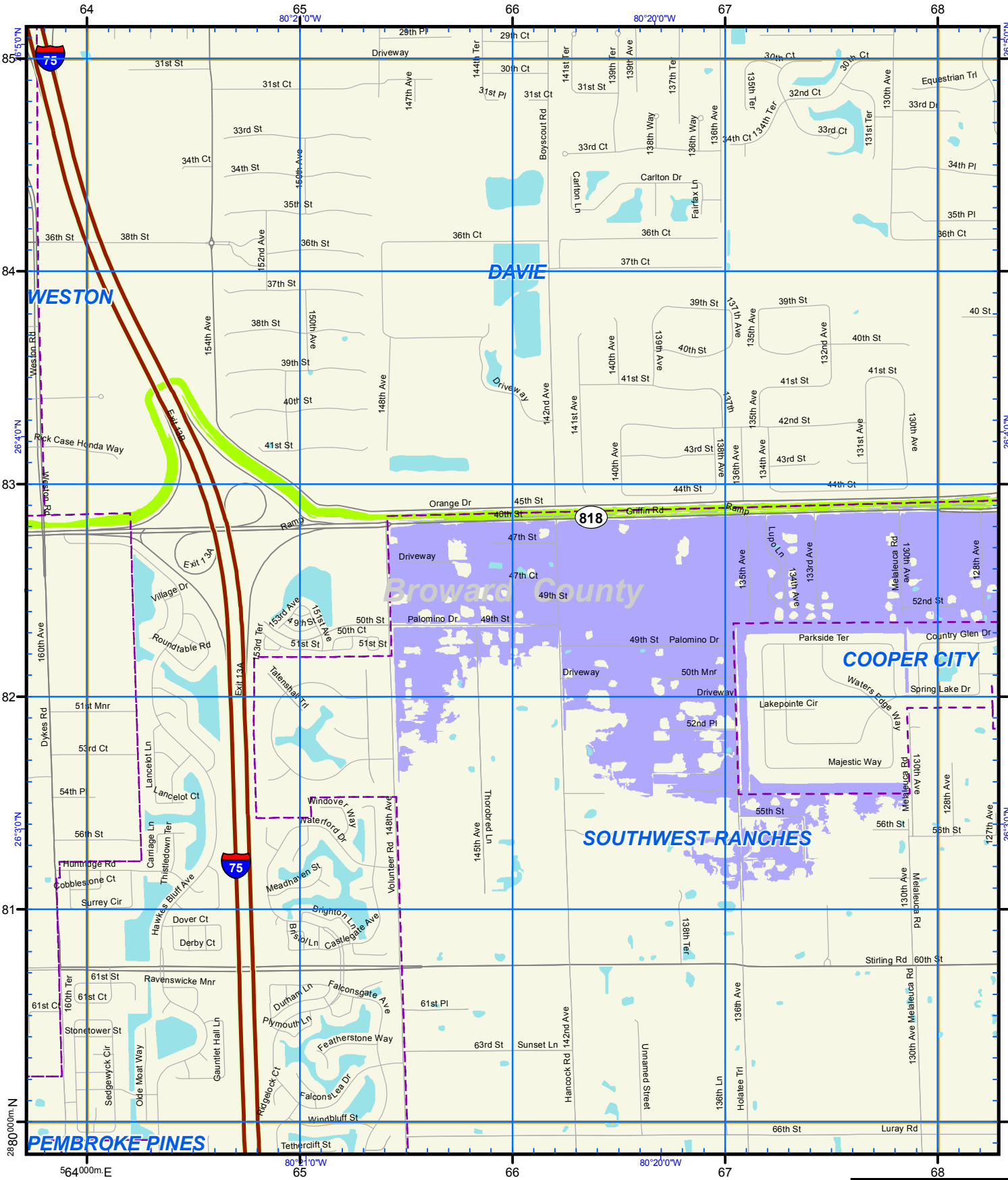
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010


WESTON
DAVIE
SOUTHWEST RANCHES
PEMBROKE PINES
Broward County
CLEVELAND CLINIC HOSPITAL
818
75
Griffin Rd
South Post Rd
Post Rd
Pine Lake Dr
Windmill Lakes Rd
Vista Park Blvd
Oak Ridge Cir
Oak Ridge Ln
Heron Ridge Ln
Pond Ridge Cir
Nighthawk Dr
Osprey Ct
Hawks Ct
Ridge Dr
Falcon Ridge Cir
Condor Ct
San Simeon Cir
San Simeon Ln
Sapphire Spgs
Sapphire Ct
Sapphire Isle
Turquoise Trl
Ruby Lk
Emerald Cove Rd
Opal Creek Dr
Sapphire Blvd
Sapphire St
Sapphire Ter
Sapphire Pl
Sapphire Dr
Emerald Park Cir
Diamond Head Dr
Diamond Pl
Diamond Ter
Amber Way
Amber Ln
Sandy Ridge Dr
Palm Pl
Magnolia Ridge Dr
Laurel Ridge Cir
Crossbill Ln
Staghorn Ln
Willow Ridge Dr
Mahogany Ridge Dr
Greenbriar Ln
Fox Holw
FoxRidge Dr
Foxrail Ln
Sago Cir
Pinewood Ln
Ridge Dr
Orchard Rd
Tree Top Dr
Forest Dr
Pond Apple Dr
Vineyard Cir
Bonaventure Blvd
Luckie Rd
Sorrel Ct
Old Still Ln
Willow Ln
Hunter Rd
Bridle Path Ln
Saddlebrook Ln
Stallion Ln
Deroy Ln
Driveway
Windmill Ranch Rd
Meadow Ln
Paddock Ln
Paddock Rd
Enterprise Ave
Market Dr
Meridian Pkwy
Corporate Dr
Universal Blvd
160th Ave Blvd
Indian Cir
Parking Lot
Corporate Lakes
160th Ave
Weston Rd
36th St
38th St
41st St
Rick Case Honda Way
Hawkes Bluff Ave
L-68-A
184th Ave
182nd Ave
182nd Ter
46th St
48th St
49th St
50th St
50th Ct
Park Pl
Spring Rd
51st St
Sunset Dr
Redwood St
52nd Ct
53rd St
54th Pl
55th St
56th St
57th St
57th Ct
58th St
59th St
59th Ct
60th St
61st St
61st Ct
61st Mnr
62nd St
62nd Ct
63rd St
63rd Mnr
64th St
64th Ct
66th St
Kingwood Rd
Kingwood St
Stirling Rd
Maple St
Camille Ct
Mesquite Dr
Avacado Mnr
Greenbriar Mnr
Greenbriar St
Hudson Dr
Huntridge Rd
Cobblestone Ct
Surrey Cir
Stratford Ct
Somerset Ln
Berkshire Ct
Oneida Pl
Superior Blvd
Ontario Pl
Erie Pl
Champlain Ter
Huron Ter
Stonetower St
Sedgewyck Cir
Olde Moat Way
Rainbow Ln
Driveway
Dykes Rd
Greenmeadow Dr
Mather Blvd
Mother Blvd
Somerset Ln
Merion
Medinah
Wentworth
Weston Hills Blvd
Birkdale
Lakewood Dr
Inverness
Huntington
Muirfield
Park Ct
36th St
Parking Lot
Driveway
Driveway
Driveway



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
3
4
5

Storm Tide Zones

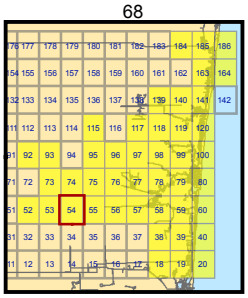
Broward County, 2010

Scale - 1:24,000

0 — Feet — 2,000

USNG Page **17R NJ 64 80**

Map Plate **54**



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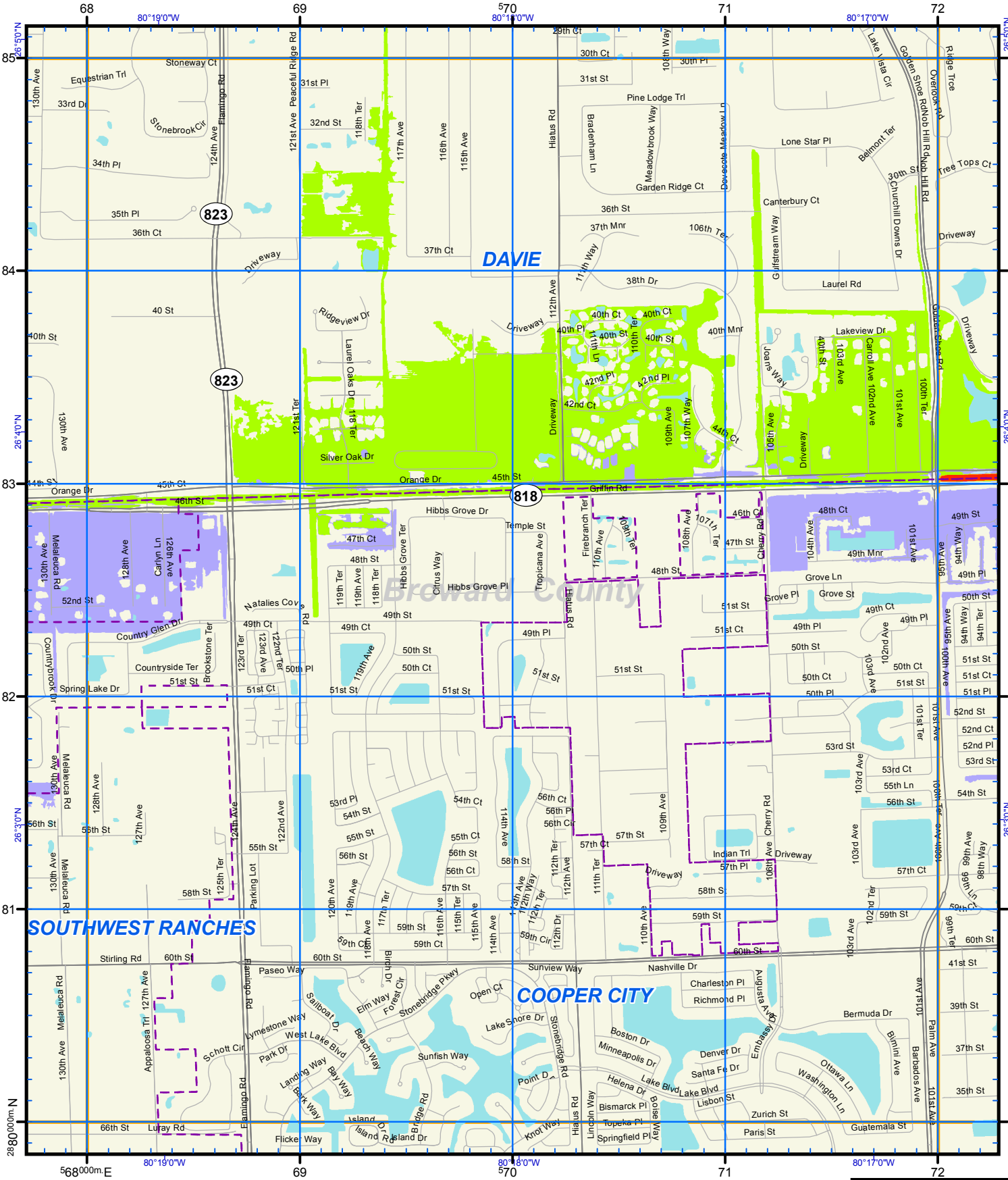
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
1. Surge limits are based on still water storm tide height elevation above NAVD88 at high tide with no wave setup.
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
3
4
5

Storm Tide Zones

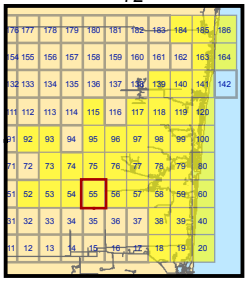
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 68 80**

Map Plate **55**



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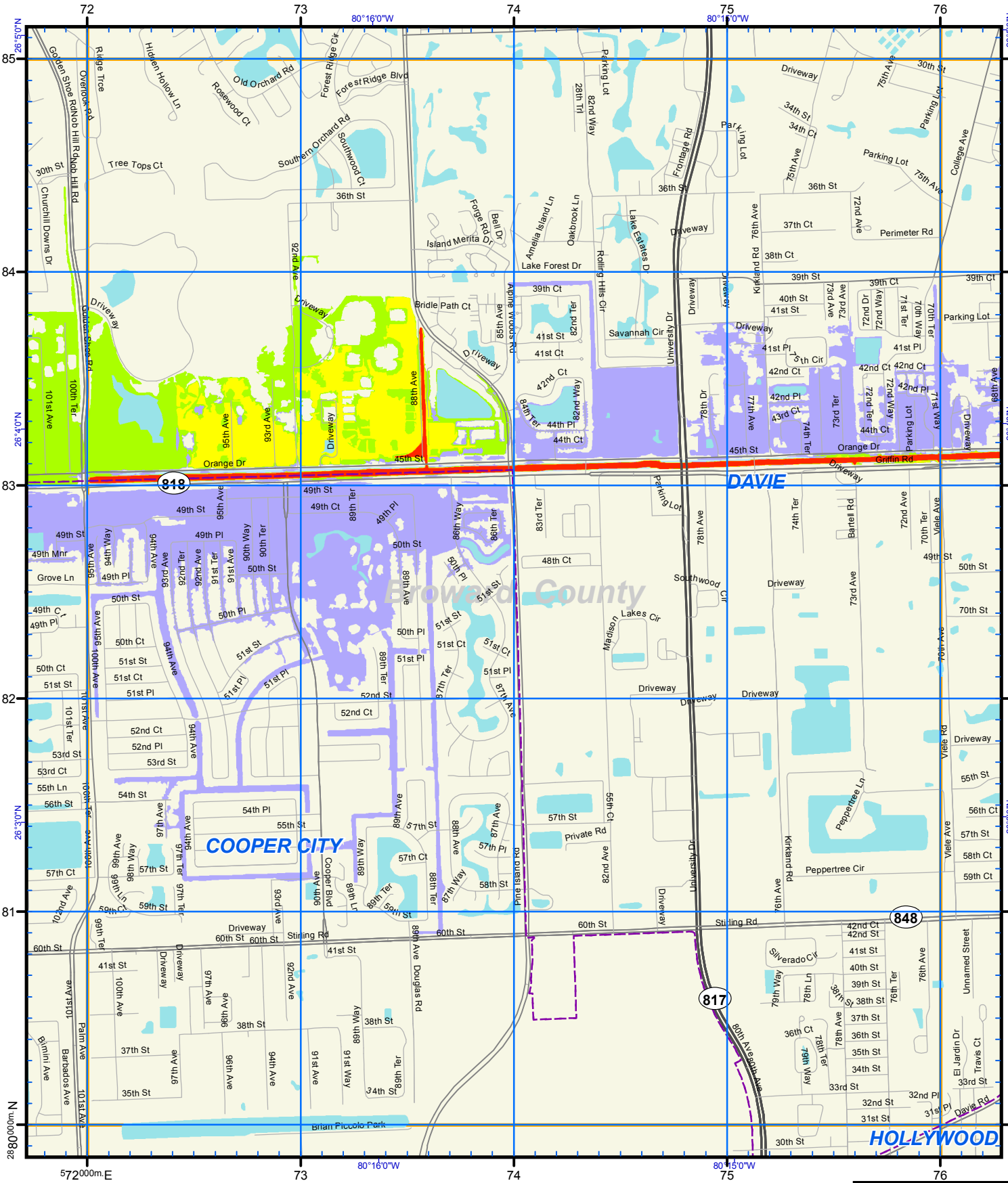
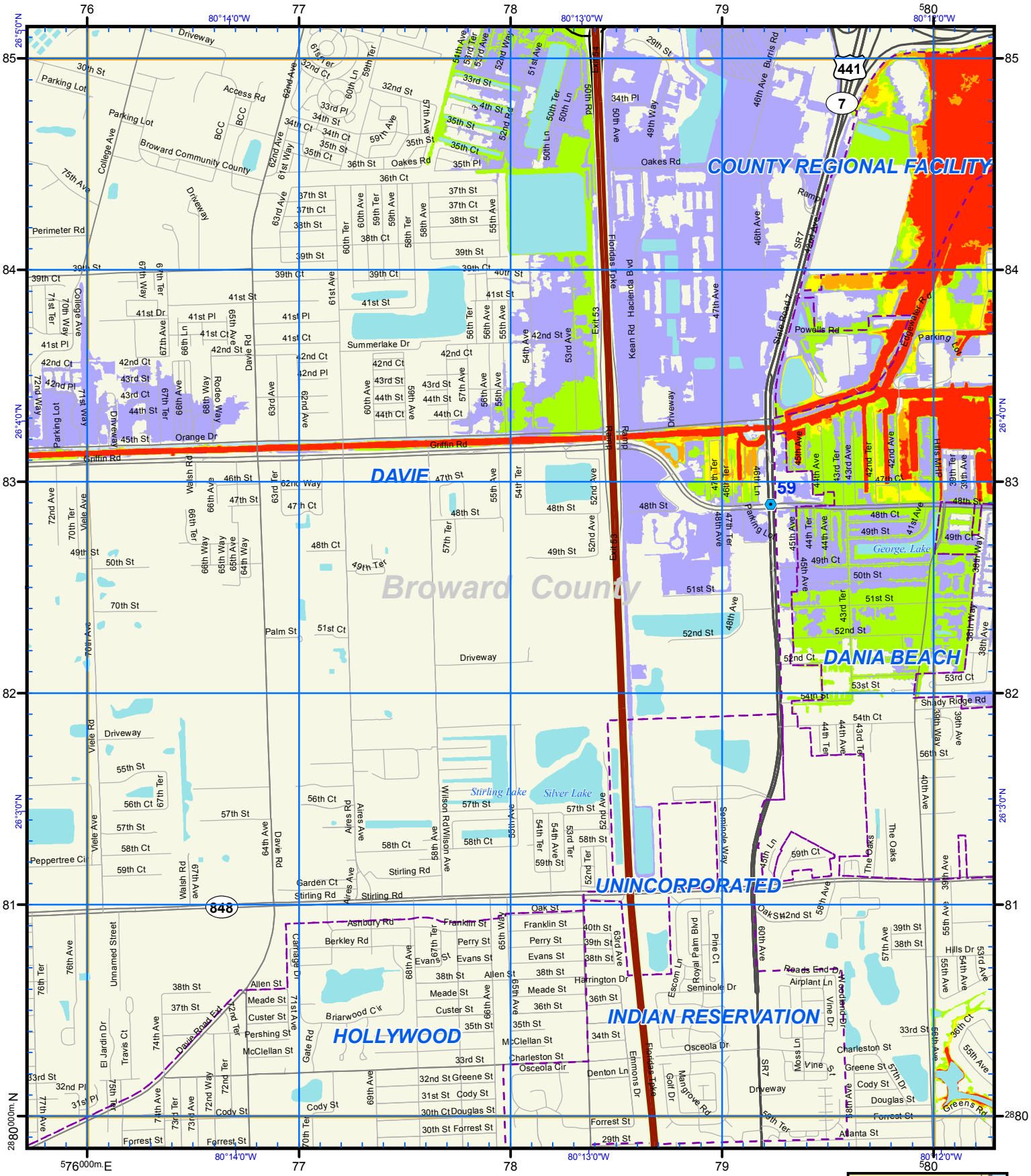
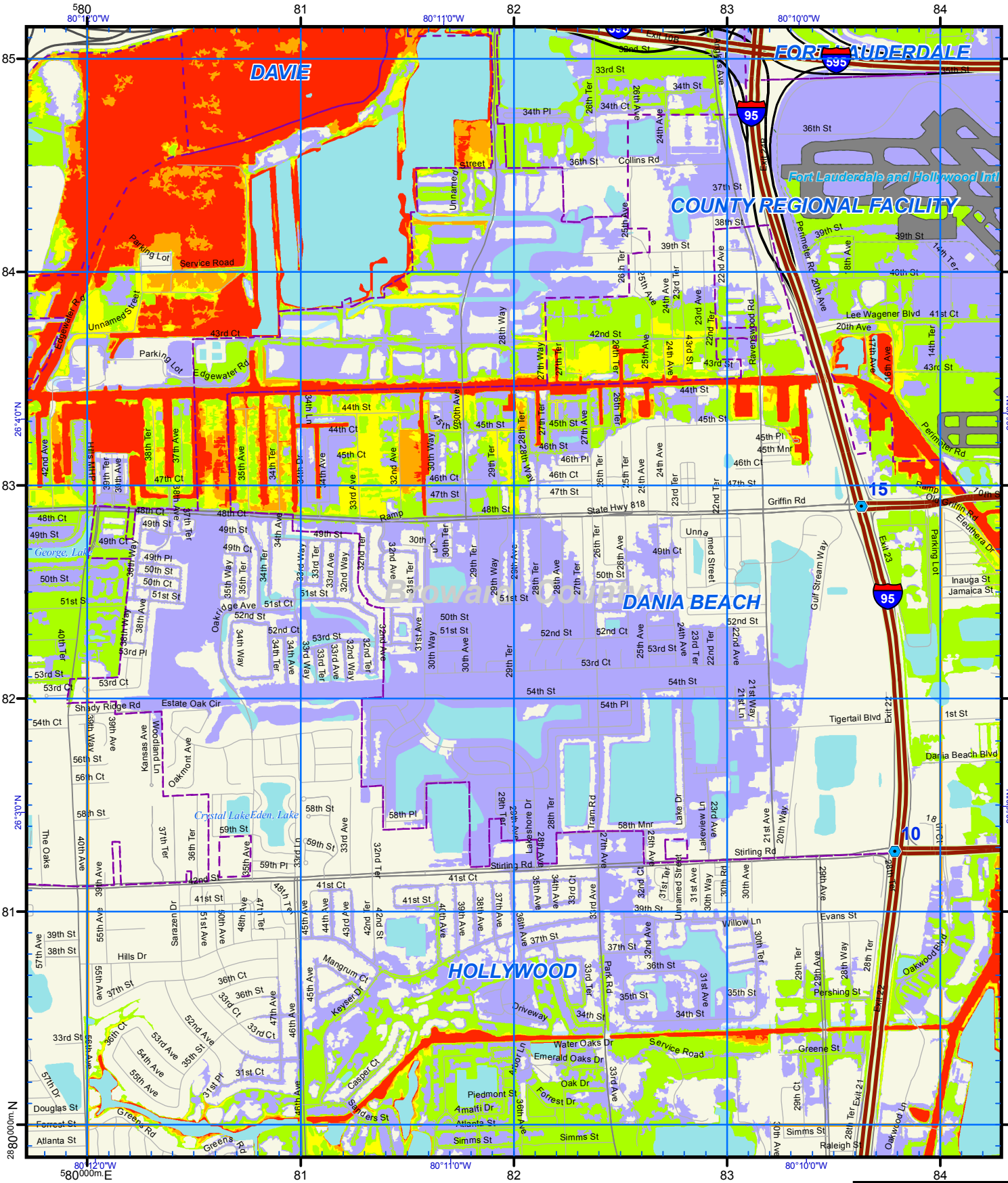

COOPER CITY
DAVIE
HOLLYWOOD
Broward County
818
817
848
Orange Dr
Griffin Rd
Stirling Rd
Davie Rd
Southwest Ranches
Pine Island Rd
University Dr
Flamingo Rd
Hiatus Rd
Nob Hill Rd
Golden Shoe Rd
Southwest Ranches
Sheridan St
Hollywood
Hollywood Blvd
Hollywood Hills
Hollywood Hills
Hollywood Hills


COUNTY REGIONAL FACILITY
DAVIE
Broward County
DANIA BEACH
UNINCORPORATED
INDIAN RESERVATION
HOLLYWOOD
George, Lake
Stirling Lake
Silver Lake
441
7
595
848
Griffin Rd
Stirling Rd
Oakes Rd
Sheridan St
Hollywood Blvd
Pembroke Rd
Dania Beach Blvd
Davie Blvd
Florida's Turnpike
Exit 53
Exit 54
Kean Rd
Hacienda Blvd
Summerlake Dr
Powells Rd
Edgewater Rd
Parking Lot
Ramp
Driveway
Broward Community County
Perimeter Rd
College Ave
Davie Rd
Viele Ave
Walsh Rd
Aires Rd
Wilson Rd
Stirling Rd
Garden Ct
Palm St
Peppertree Ci
Ashbury Rd
Berkley Rd
Carriage Dr
Unnamed Street
Dave Road Ext
Gate Rd
Briarwood Cir
Allen St
Meade St
Custer St
Pershing St
McClellan St
Evans St
Perry St
Franklin St
Oak St
Harrington Dr
Seminole Dr
Seminole Way
Royal Palm Blvd
Pine Ct
Escom Ln
Airplant Ln
Reads End Dr
Woodland Dr
Vine Dr
Osceola Dr
Osceola Cir
Charleston St
Greene St
Cody St
Douglas St
Forrest St
Denton Ln
Ehmons Dr
Golf Dr
Mangrove Rd
Moss Ln
SR7
State Road 7
Ramp
Hills Dr
Shady Ridge Rd
The Oaks
Atlanta St
Greens Rd
Florida's Turnpike
Unincorporated
Parking Lot
Access Rd
BCC
Driveway
Orange Dr
Summerlake Dr
Powells Rd
Edgewater Rd
Shady Ridge Rd
Hills Dr
Atlanta St
Greens Rd
Seminole Way
The Oaks
Reads End Dr
Airplant Ln
Woodland Dr
Vine Dr
Moss Ln
Mangrove Rd
Golf Dr
Ehmons Dr
Denton Ln
Osceola Dr
Osceola Cir
Charleston St
Greene St
Cody St
Douglas St
Forrest St
Atlanta St
Greens Rd
Florida's Turnpike
Ramp
Parking Lot
Driveway
Broward Community County
Perimeter Rd
Orange Dr
Griffin Rd



US National Grid	
100,000-m Square ID	NJ
Grid Zone Designation	17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
3
4
5

Storm Tide Zones

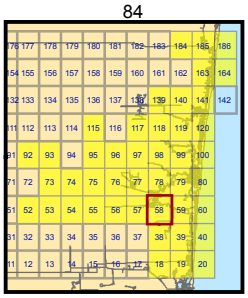
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 80 80**

Map Plate **58**



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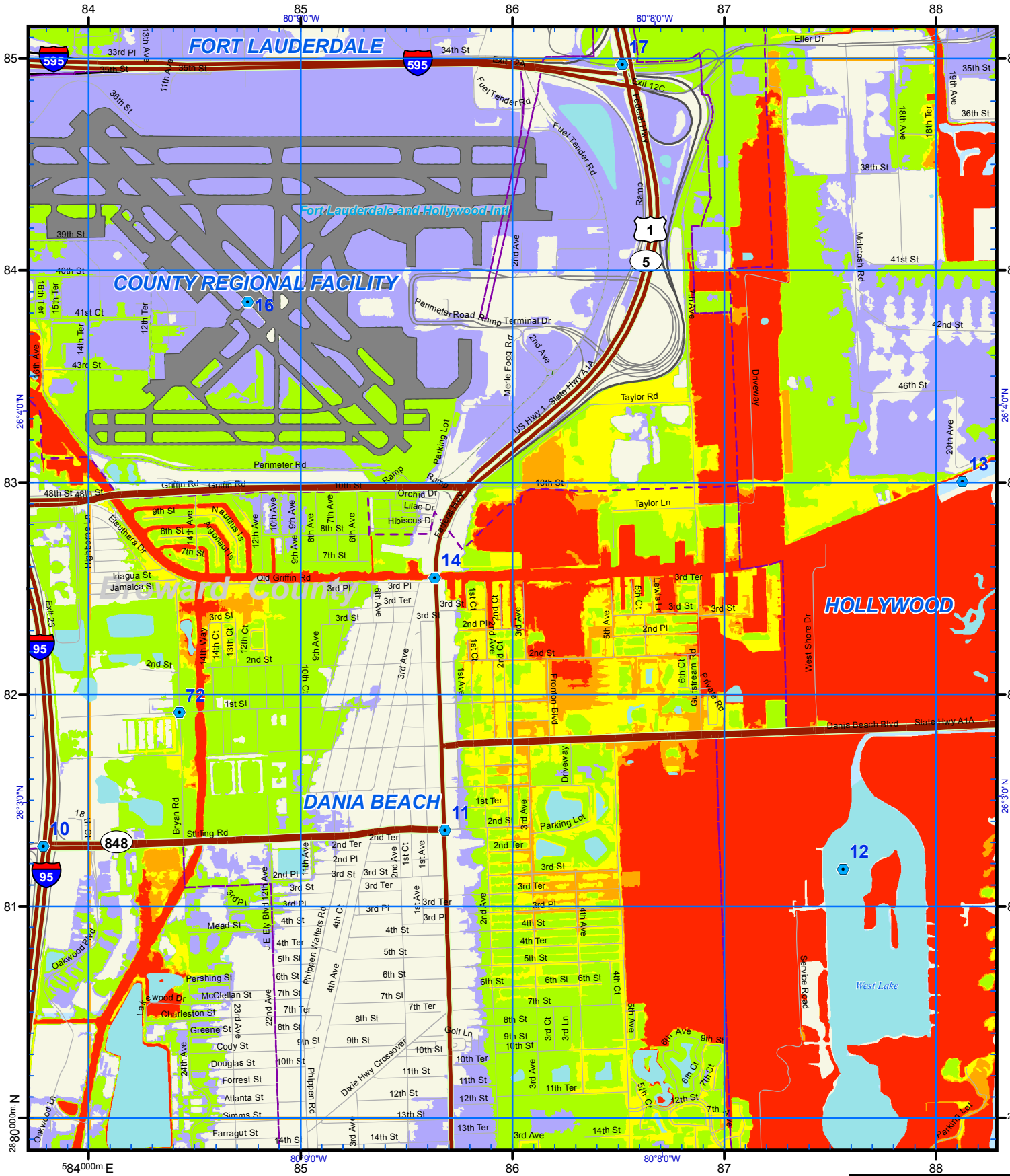

US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
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4
5

Storm Tide Zones

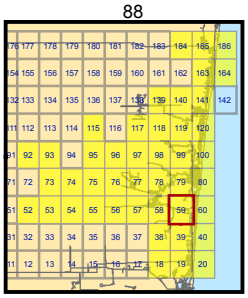
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 84 80**

Map Plate **59**



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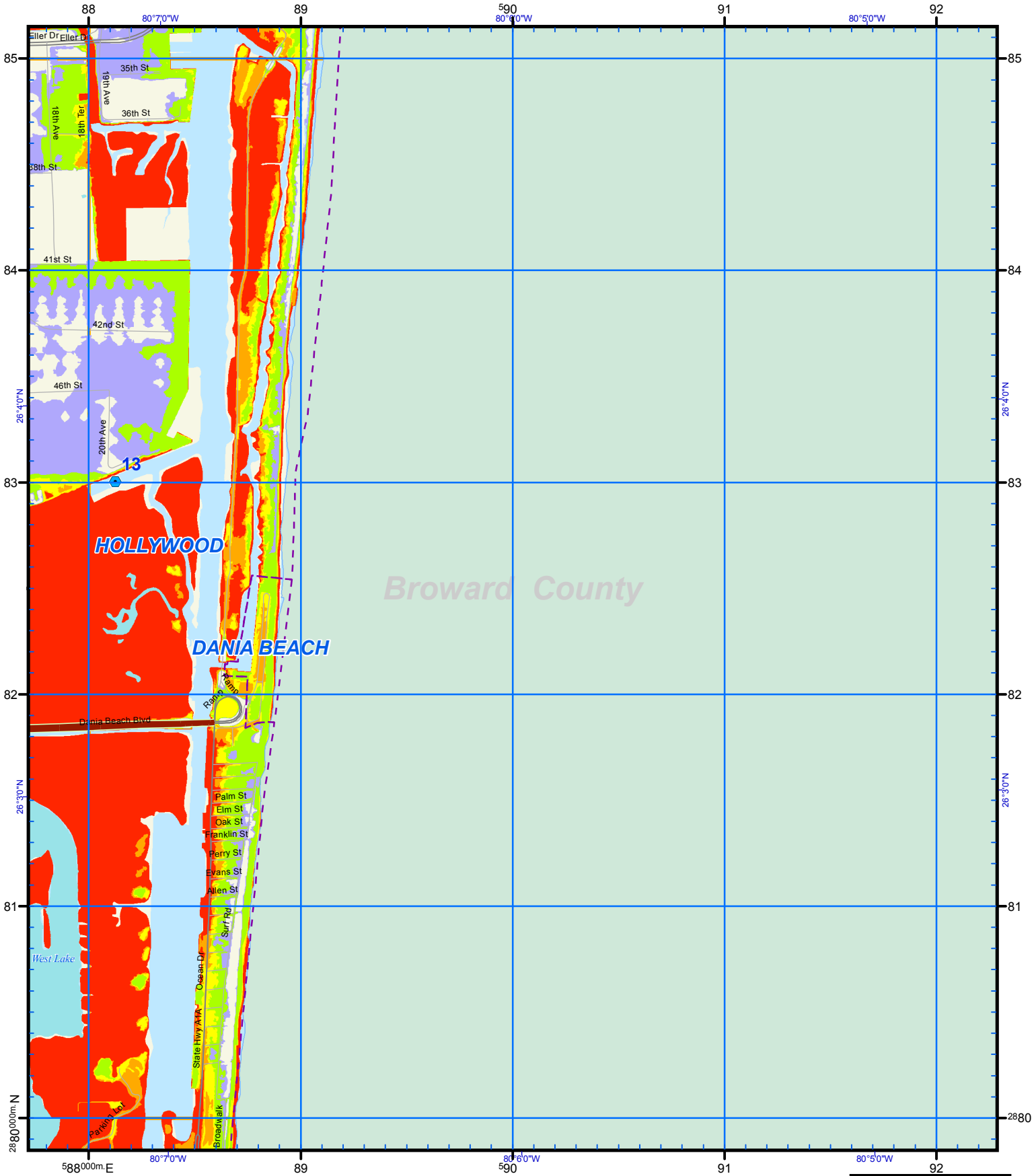

US National Grid
100,000-m Square ID
NJ

Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN
Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
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4
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Storm Tide Zones

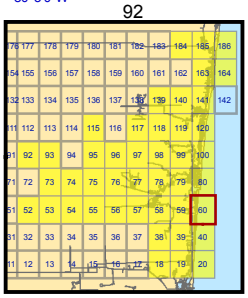
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 88 80**

Map Plate **60**



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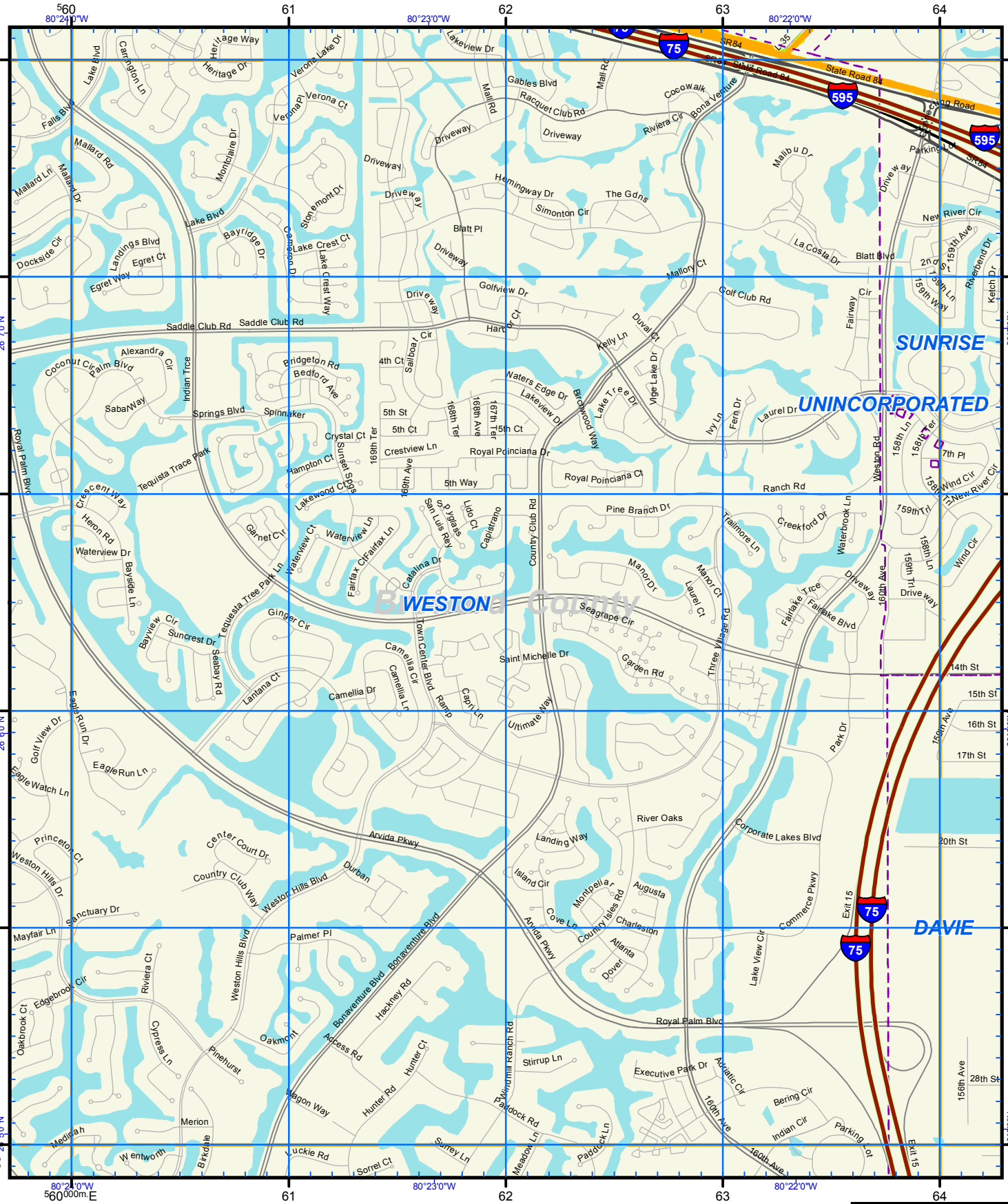

US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
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4
5

Storm Tide Zones

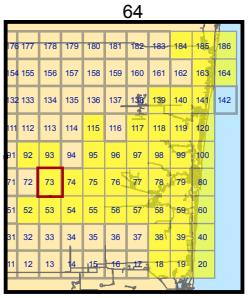
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 60 85**

Map Plate **73**



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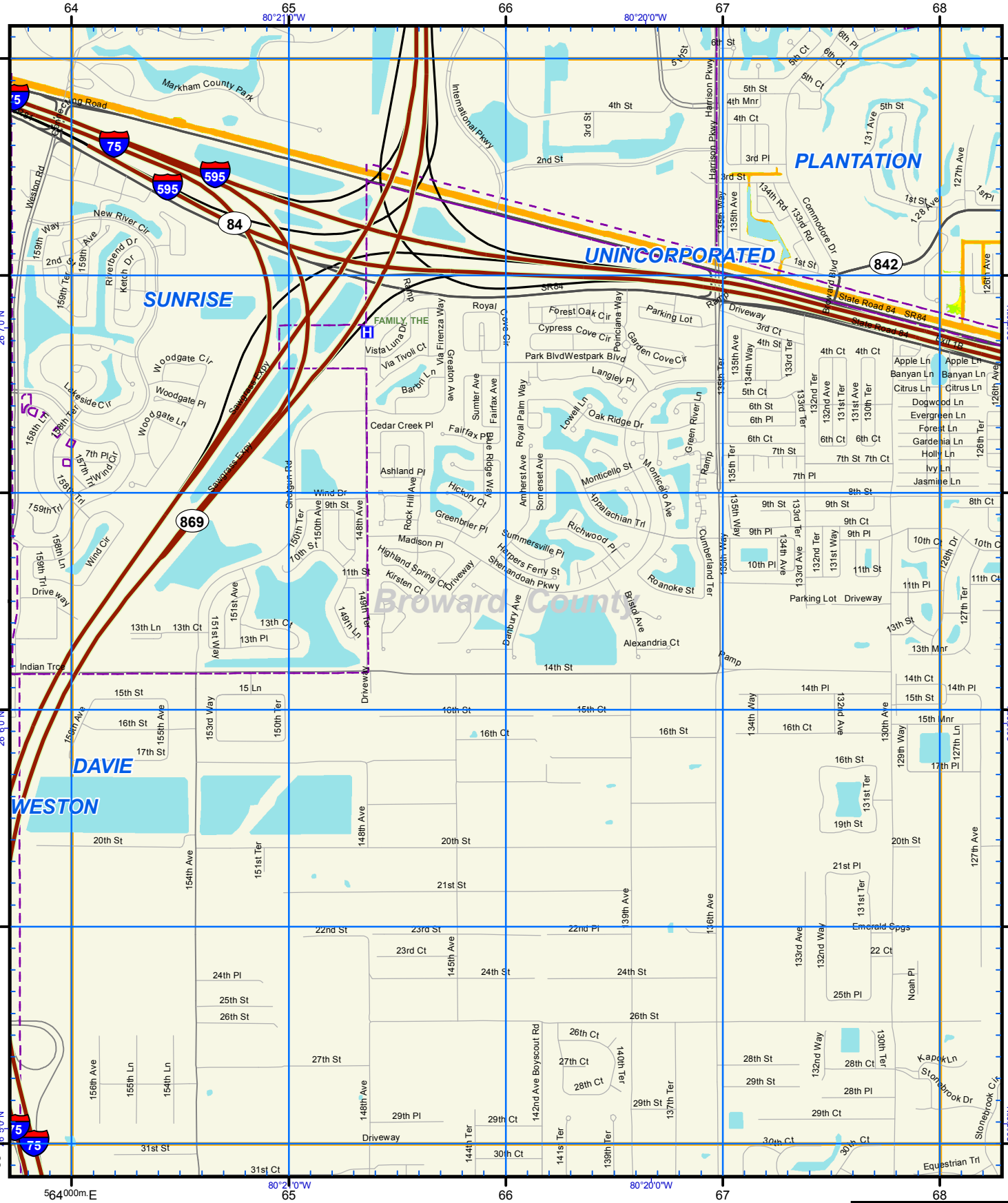

US National Grid	
100,000-m Square ID	NJ
Grid Zone Designation	17R

Datum = NAD 1983, 1,000-m USNG

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
3
4
5

Storm Tide Zones

Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 64 85**

Map Plate **74**

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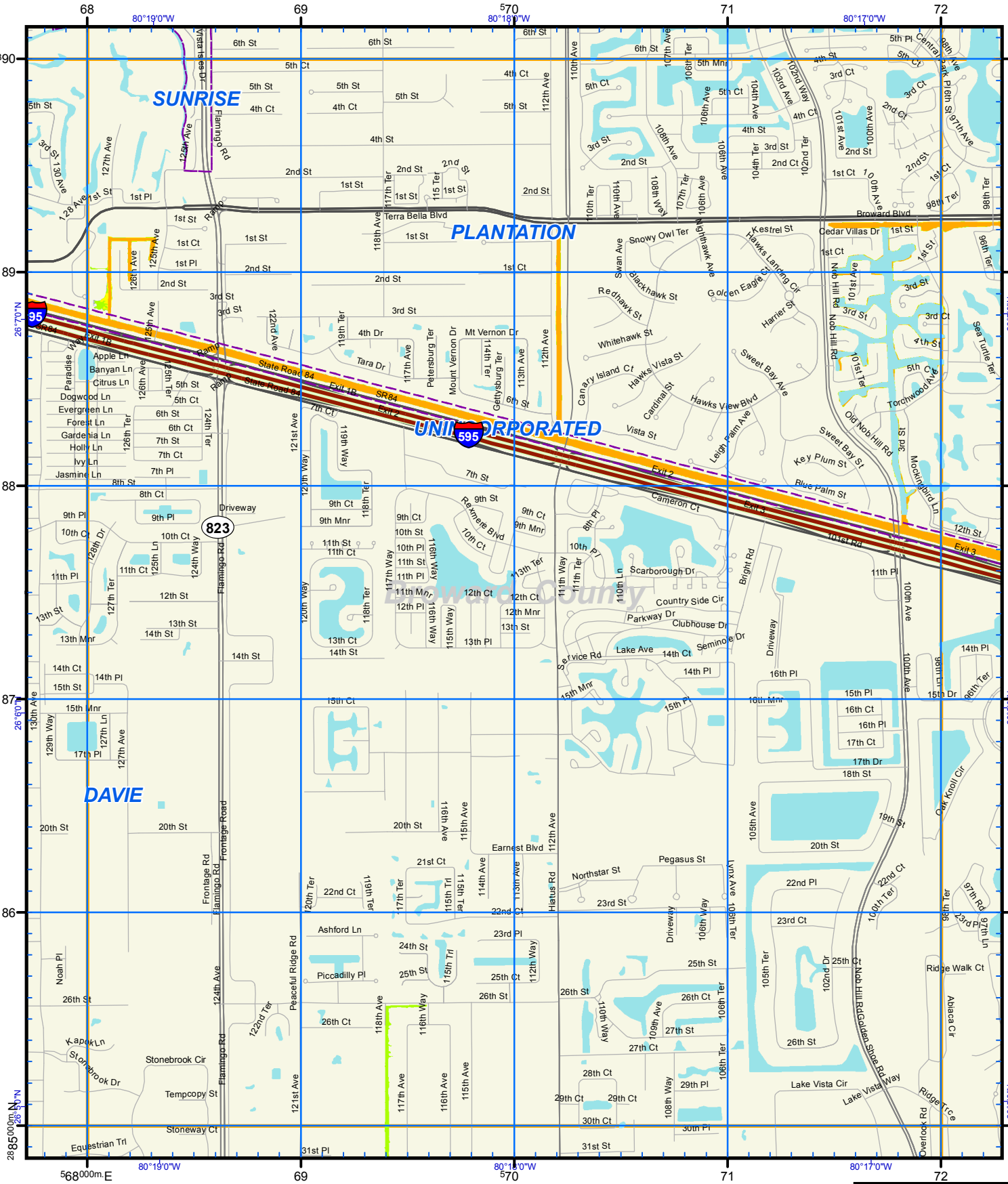
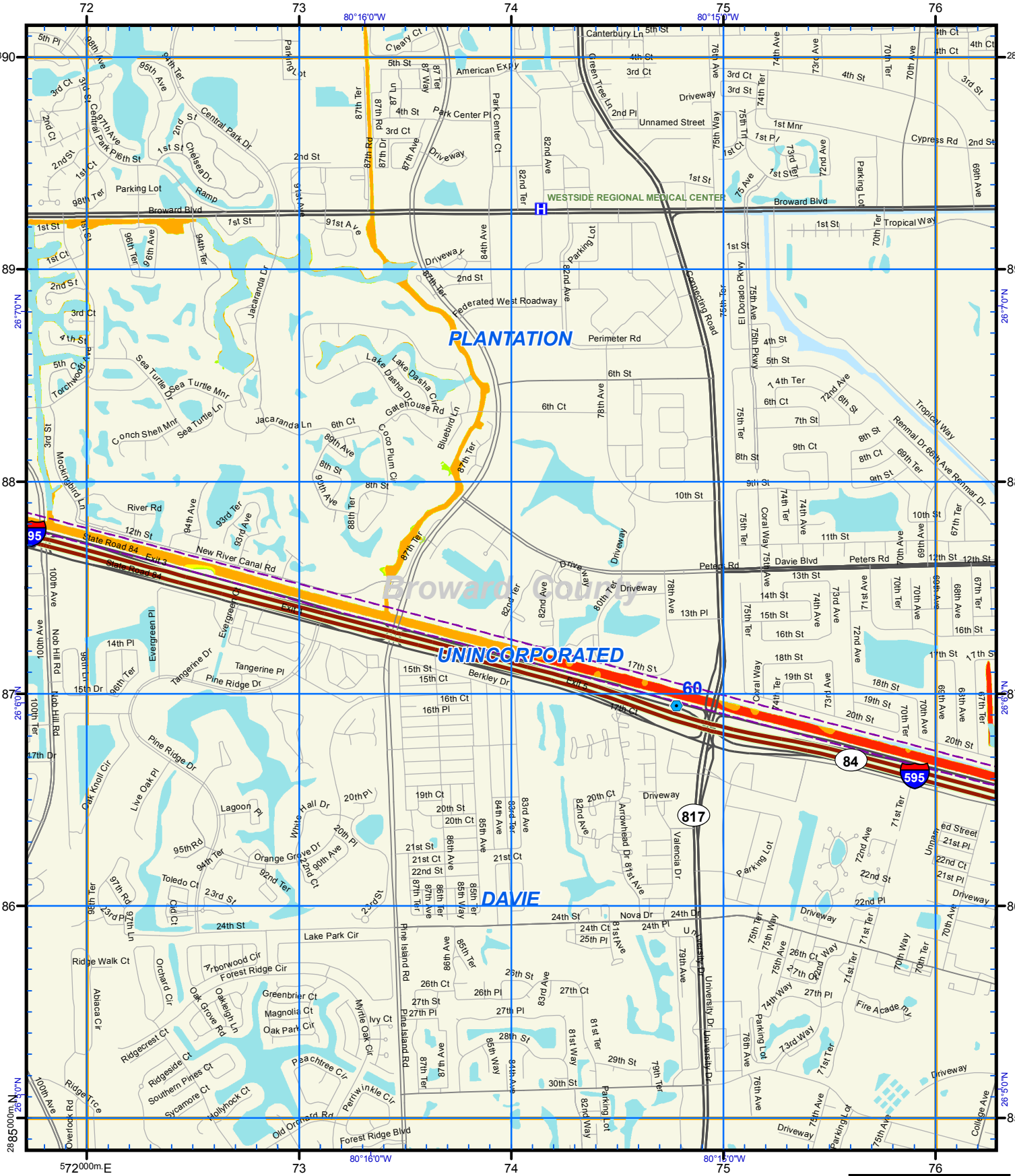
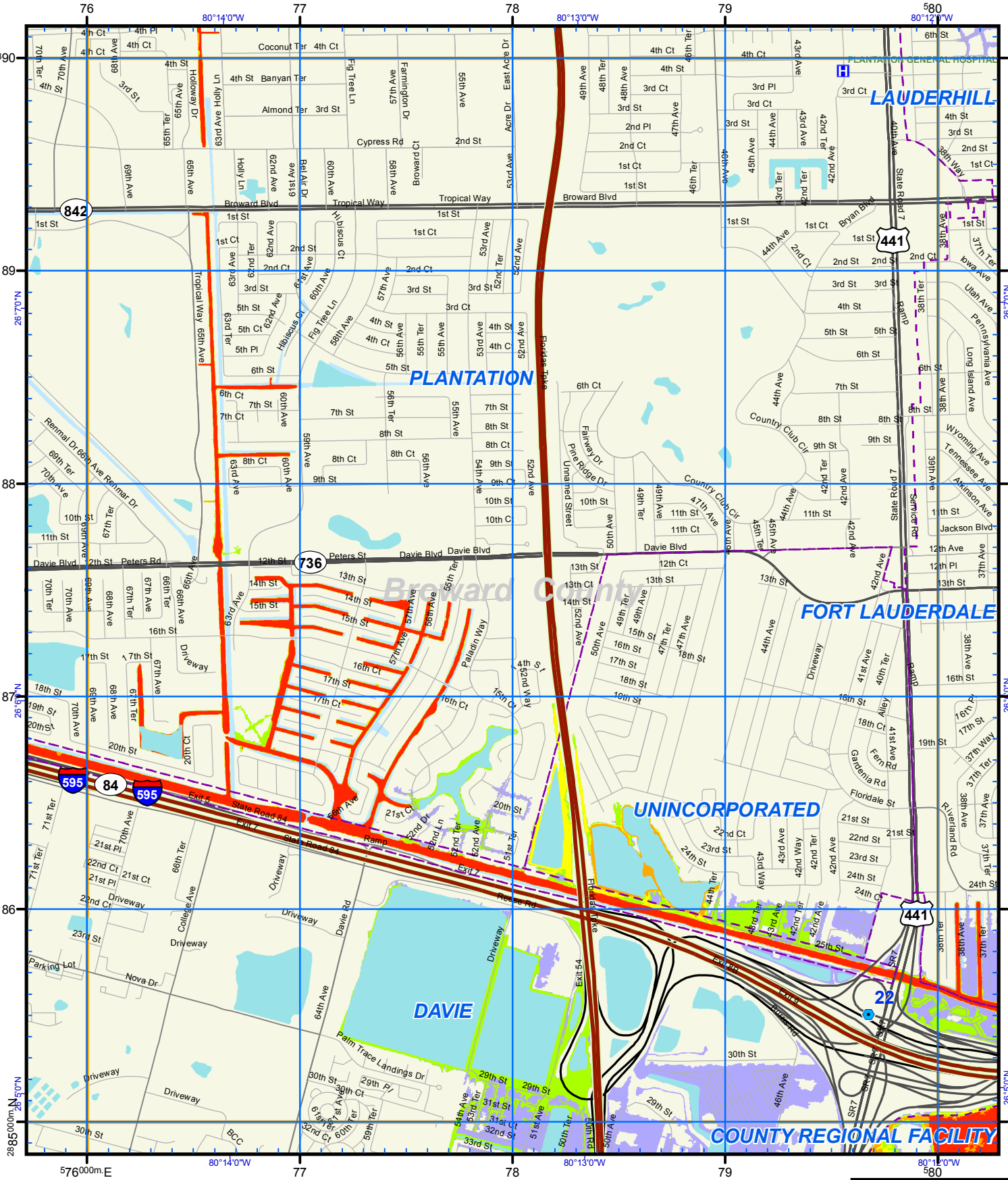
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010


SUNRISE
PLANTATION
UNINCORPORATED
DAVIE
Broward County
State Road 84
SR84
Exit 1B
Exit 2
Exit 3
595
823
Flamingo Rd
Frontage Rd
Terra Bella Blvd
Broward Blvd
Cameron Ct
Earnest Blvd
Stonebrook Cir
Stonebrook Dr
Tempcopy St
Stoneway Ct
Equestrian Trl
Ashford Ln
Piccadilly Pl
Peaceful Ridge Rd
Kapok Ln
Noah Pl
Apple Ln
Banyan Ln
Citrus Ln
Dogwood Ln
Evergreen Ln
Forest Ln
Gardenia Ln
Holly Ln
Ivy Ln
Jasmine Ln
Paradise Way
Scarborough Dr
Country Side Cir
Parkway Dr
Clubhouse Dr
Seminole Dr
Lake Ave
Service Rd
Northstar St
Pegasus St
Redhawk St
Whitehawk St
Blackhawk St
Golden Eagle Cir
Hawks Landing Cir
Kestrel St
Snowy Owl Ter
Nighthawk Ave
Swan Ave
Canary Island Ct
Hawks Vista St
Cardinal St
Harrier St
Hawks View Blvd
Sweet Bay Ave
Sweet Bay St
Key Plum St
Blue Palm St
Vista St
Leigh Palm Ave
Old Nob Hill Rd
Nob Hill Rd
Golden Shore Rd
Lake Vista Cir
Lake Vista Way
Ridge Walk Ct
Ridge Trce
Abaca Cir
Oak Knoll Cir
Torchwood Ave
Mockingbird Ln
Sea Turtle Ter
Cedar Villas Dr
Bright Rd
Driveway
Mt Vernon Dr
Petersburg Ter
Gettysburg Ter
Mount Vernon Dr
Tara Dr
Rexmere Blvd
Hatus Rd
Lynx Ave
Overlook Rd
Golden Shore Rd
Ramp
Exit 1B
Exit 2
Exit 3
Driveway
Frontage Road
Flamingo Road
Flamingo Rd
Ramp
Ramp
Ramp


PLANTATION
UNINCORPORATED
DAVIE
WESTSIDE REGIONAL MEDICAL CENTER
Broward County
Broward Blvd
Federated West Roadway
Perimeter Rd
Connecting Road
El Dorado Pkwy
American Expy
Park Center Pl
Park Center Ct
Canterbury Ln
Green Tree Ln
Unnamed Street
Cypress Rd
Tropical Way
Renmar Dr
Lake Dasha Dr
Lake Dasha Cir
Gatehouse Rd
Bluebird Ln
Coco Plum Cir
Jacaranda Dr
Jacaranda Ln
Sea Turtle Dr
Sea Turtle Mnr
Sea Turtle Ln
Conch Shell Mnr
Mockingbird Ln
Torchwood Ave
Central Park Dr
Central Park Plaza
Chelsea Dr
Parking Lot
Ramp
River Rd
State Road 84
Exit 3
New River Canal Rd
Peters Rd
Davie Blvd
Berkley Dr
Exit 4
Exit 5
Pine Ridge Dr
Tangerine Dr
Tangerine Pl
Evergreen Ct
Evergreen Pl
Nob Hill Rd
Oak Knoll Cir
Live Oak Pl
Lagoon Pl
White Hall Dr
Orange Grove Dr
Toledo Ct
Lake Park Cir
Ridge Walk Ct
Forest Ridge Cir
Forest Ridge Blvd
Old Orchard Rd
Ridge Trce
Overlook Rd
Orchard Cir
Abiaca Cir
Oakleigh Ln
Oak Grove Rd
Greenbrier Ct
Magnolia Ct
Oak Park Cir
Ridgecrest Ct
Ridgeside Ct
Southern Pines Ct
Sycamore Ct
Hollyrock Ct
Peachtree Cir
Periwinkle Cir
Myrtle Oak Cir
Ivy Ct
Pine Island Rd
Arrowhead Dr
Valencia Dr
Nova Dr
University Dr
Fire Academy
Parking Lot
Driveway
Unnamed Street
Coral Way
Tropical Way
Renmar Dr
Cleary Ct
Parking Lot
Ramp
Driveway
Unnamed Street
Parking Lot
Fire Academy
Parking Lot
Parking Lot
Parking Lot



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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3. The Points of Reference are locations determined to be relevant to emergency management officials.

ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
2
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Storm Tide Zones

Broward County, 2010

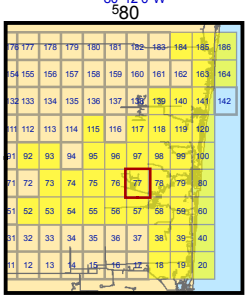
Scale - 1:24,000

Feet

0 2,000

USNG Page **17R NJ 76 85**

Map Plate **77**



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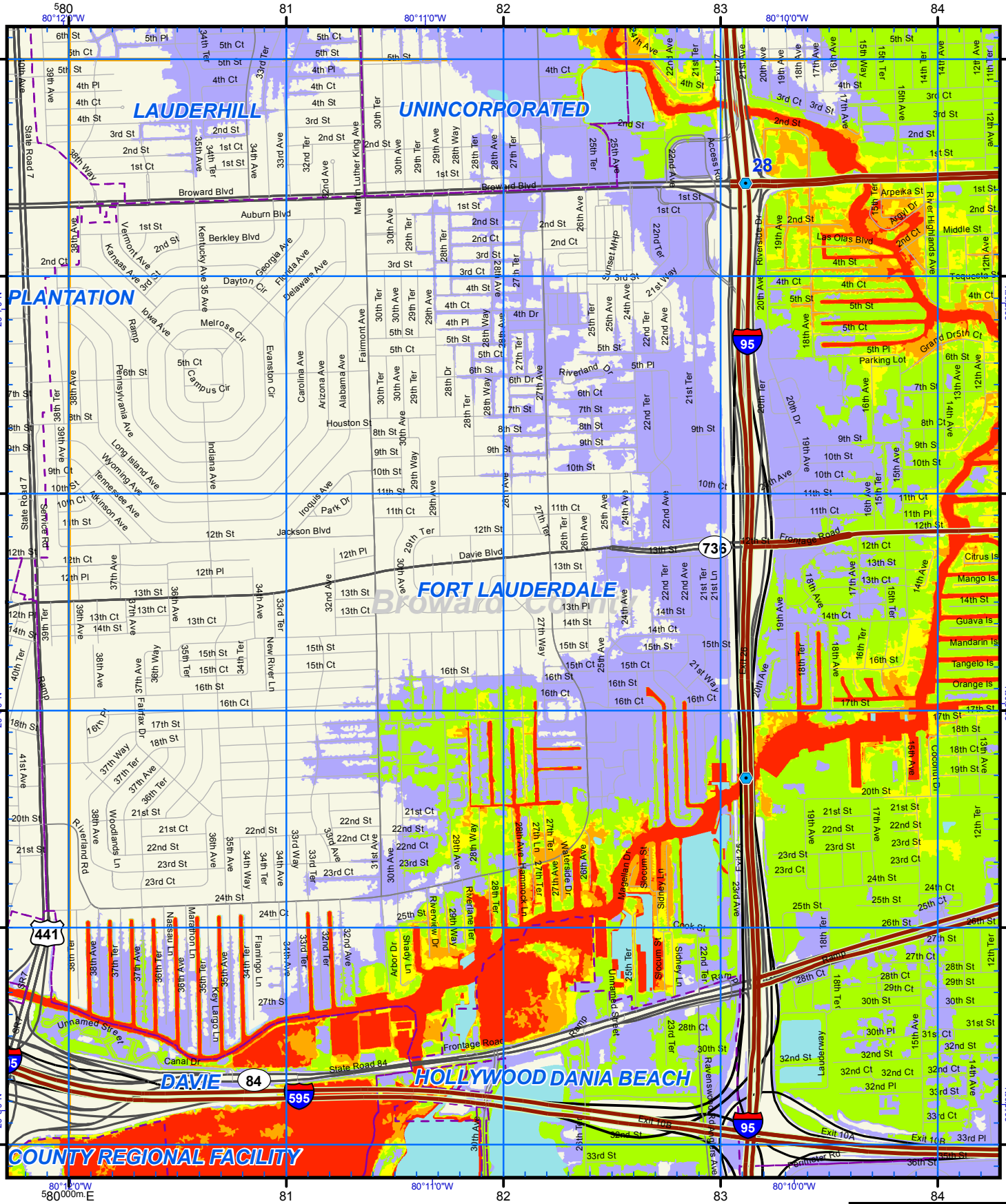
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

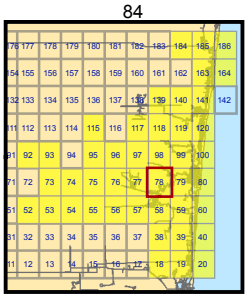
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 80 85**

Map Plate **78**



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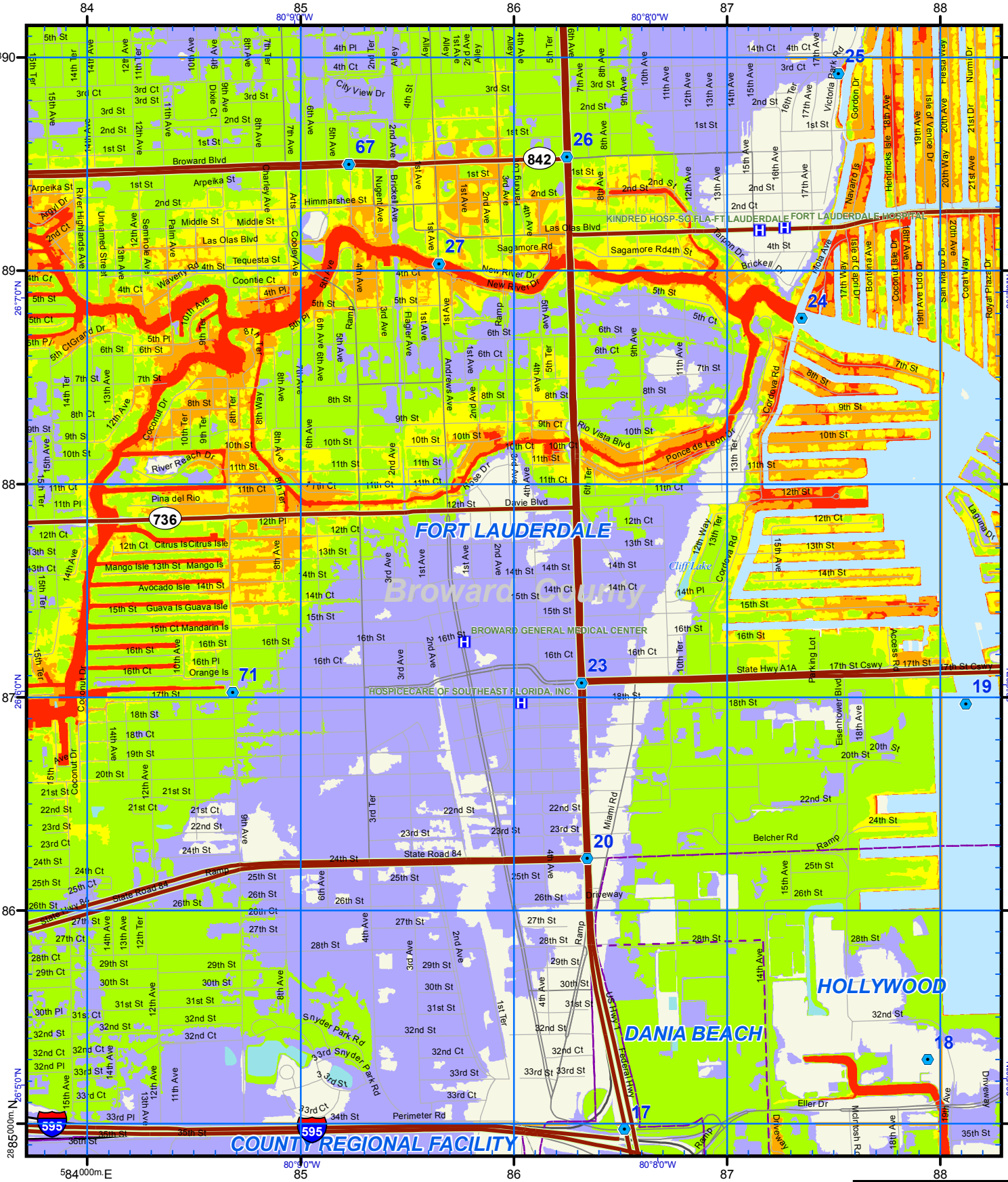
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- H HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

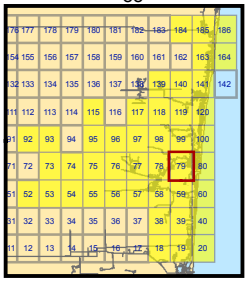
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 84 85**

Map Plate **79**



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Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010

US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

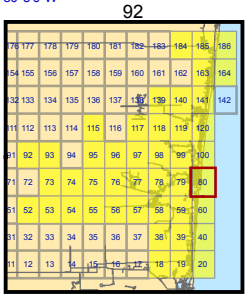
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 88 85**

Map Plate **80**



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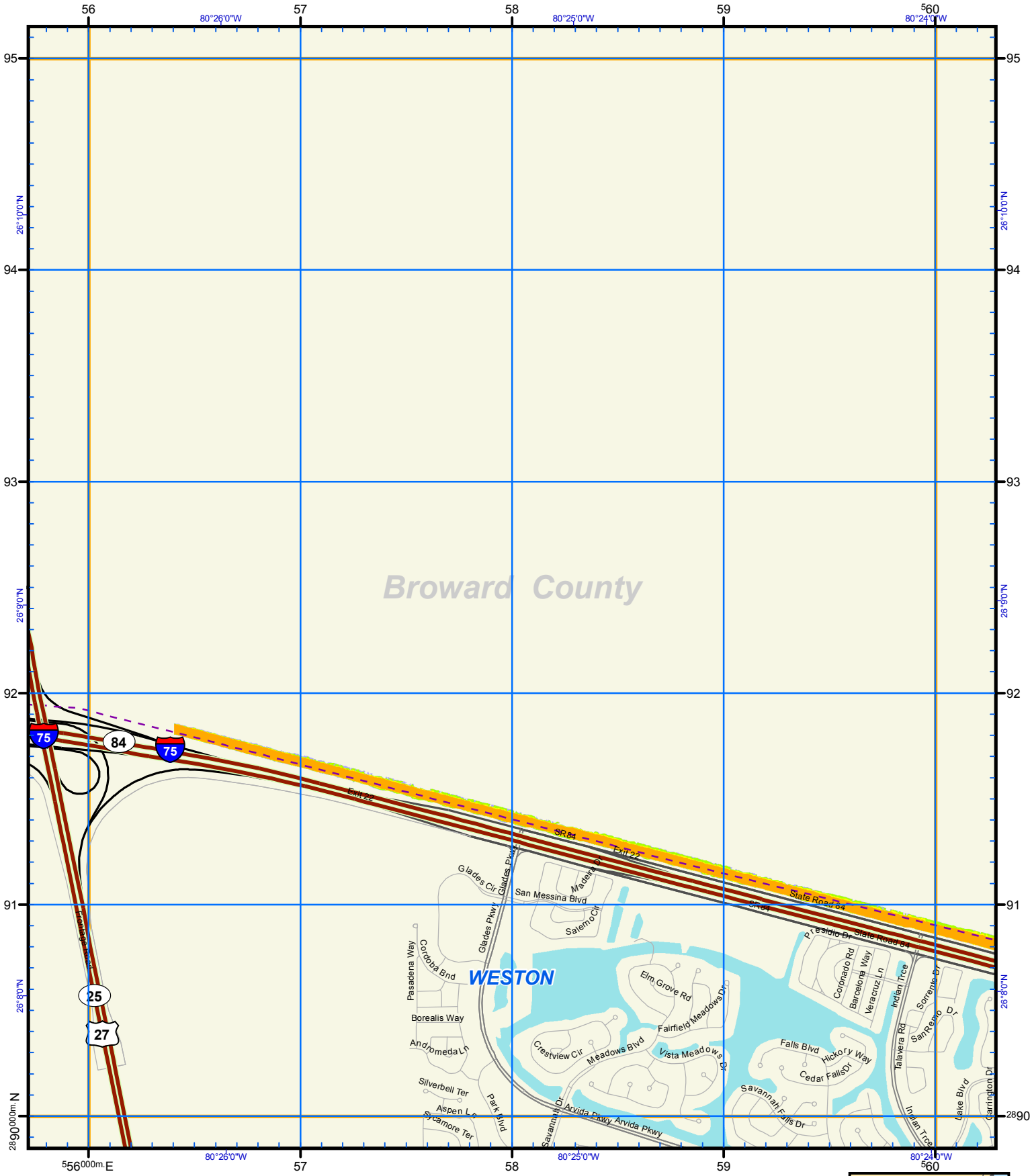

US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

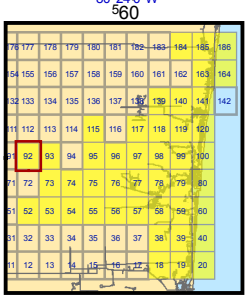
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 56 90**

Map Plate **92**



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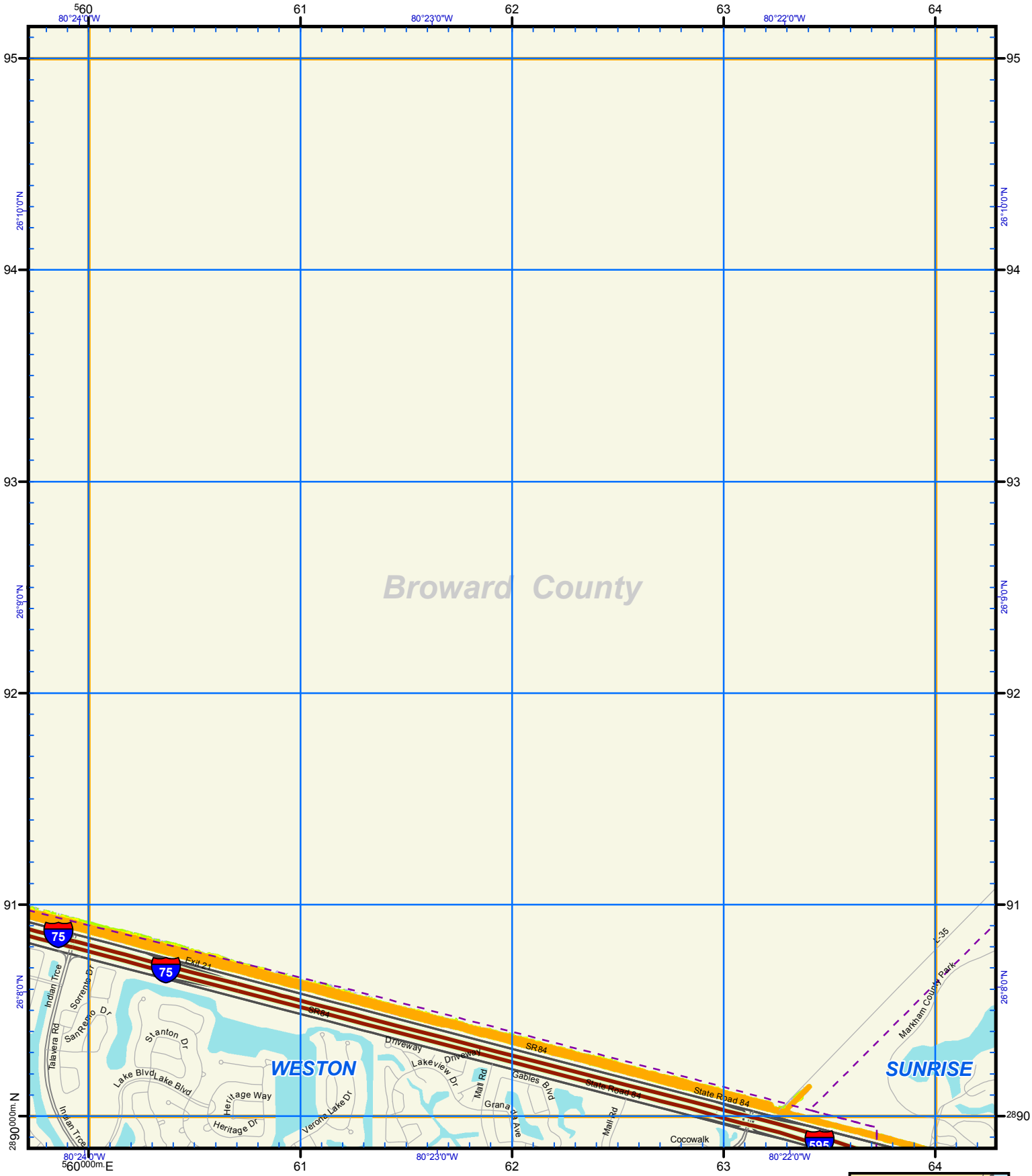
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid
100,000-m Square ID
NJ

Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN
Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

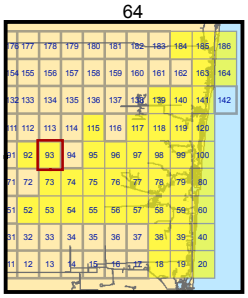
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 60 90**

Map Plate **93**



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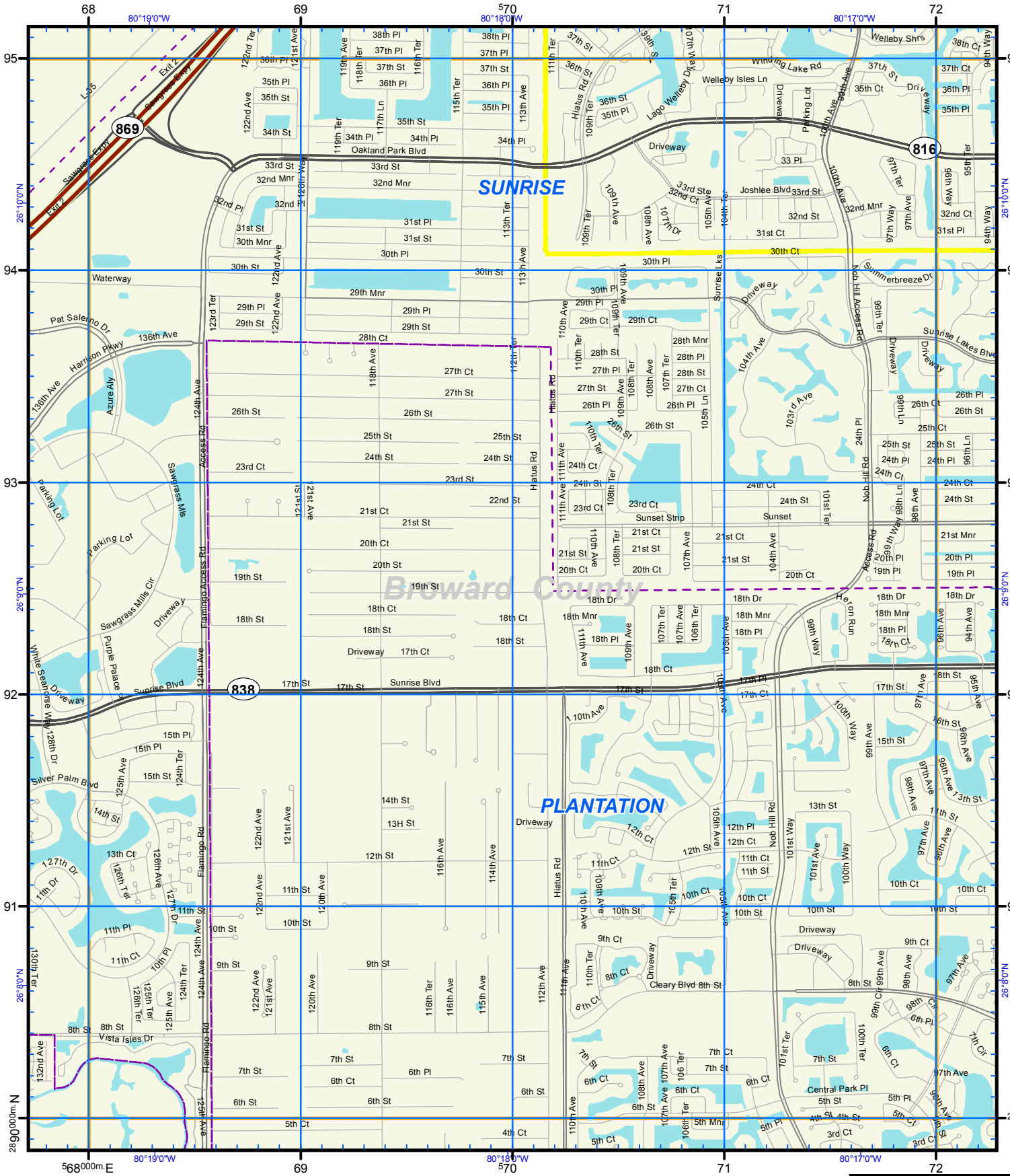
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

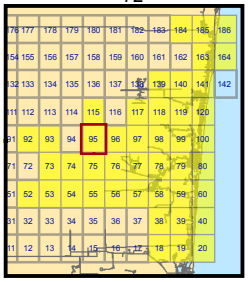
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 68 90**

Map Plate **95**



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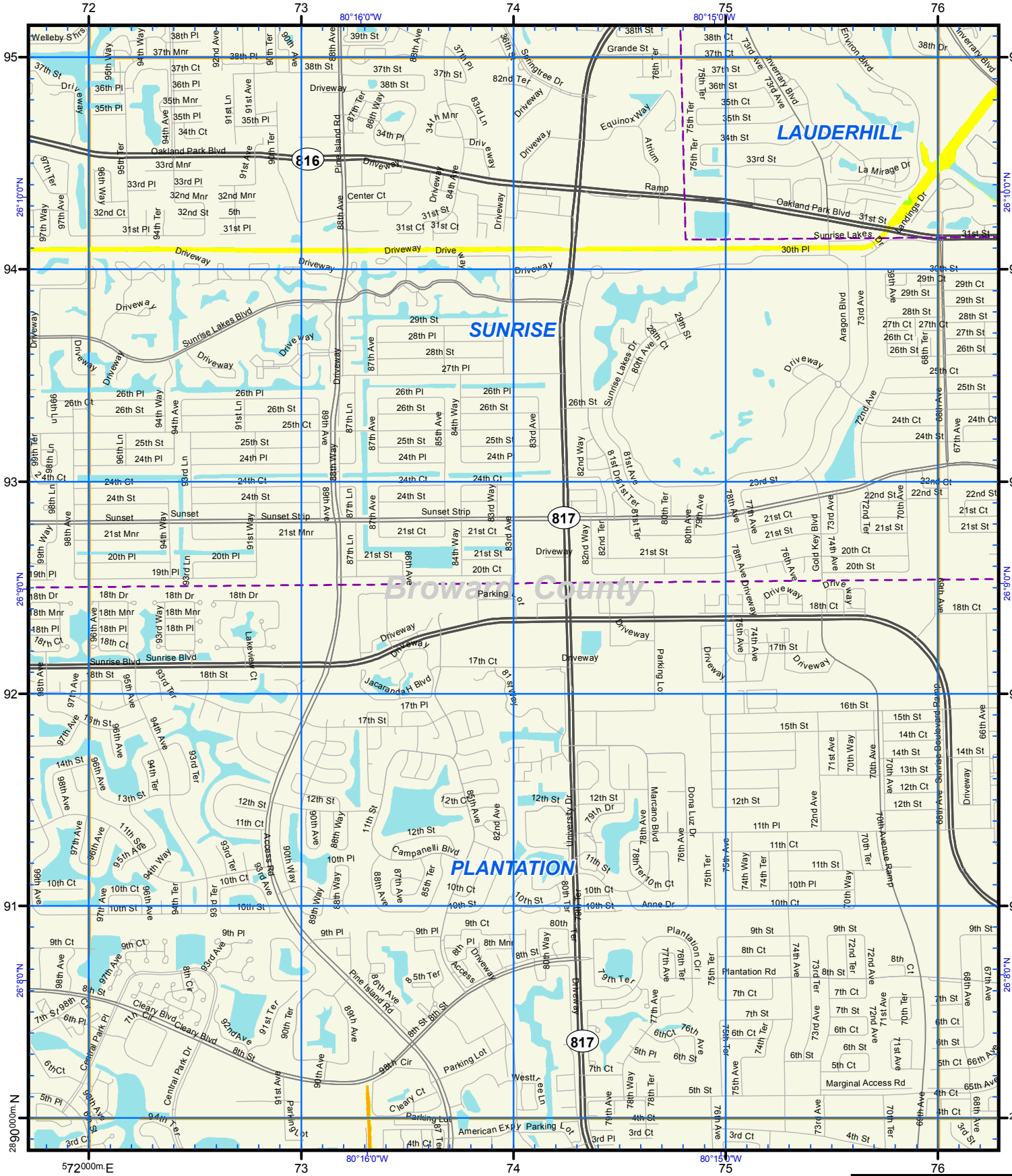
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

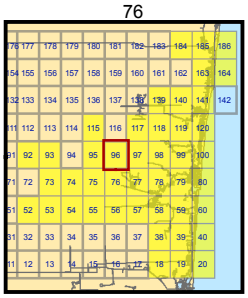
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 72 90**

Map Plate **96**



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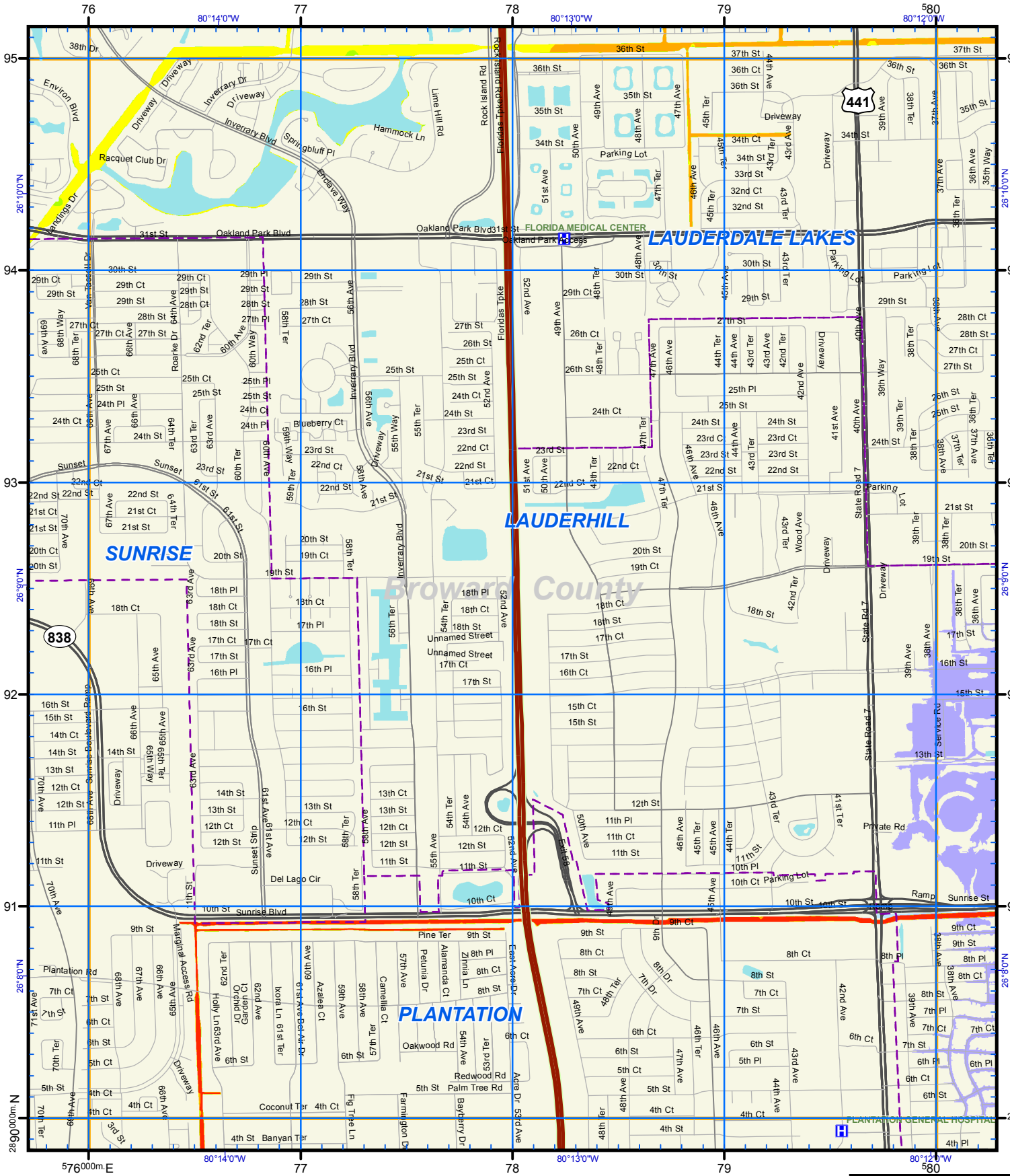
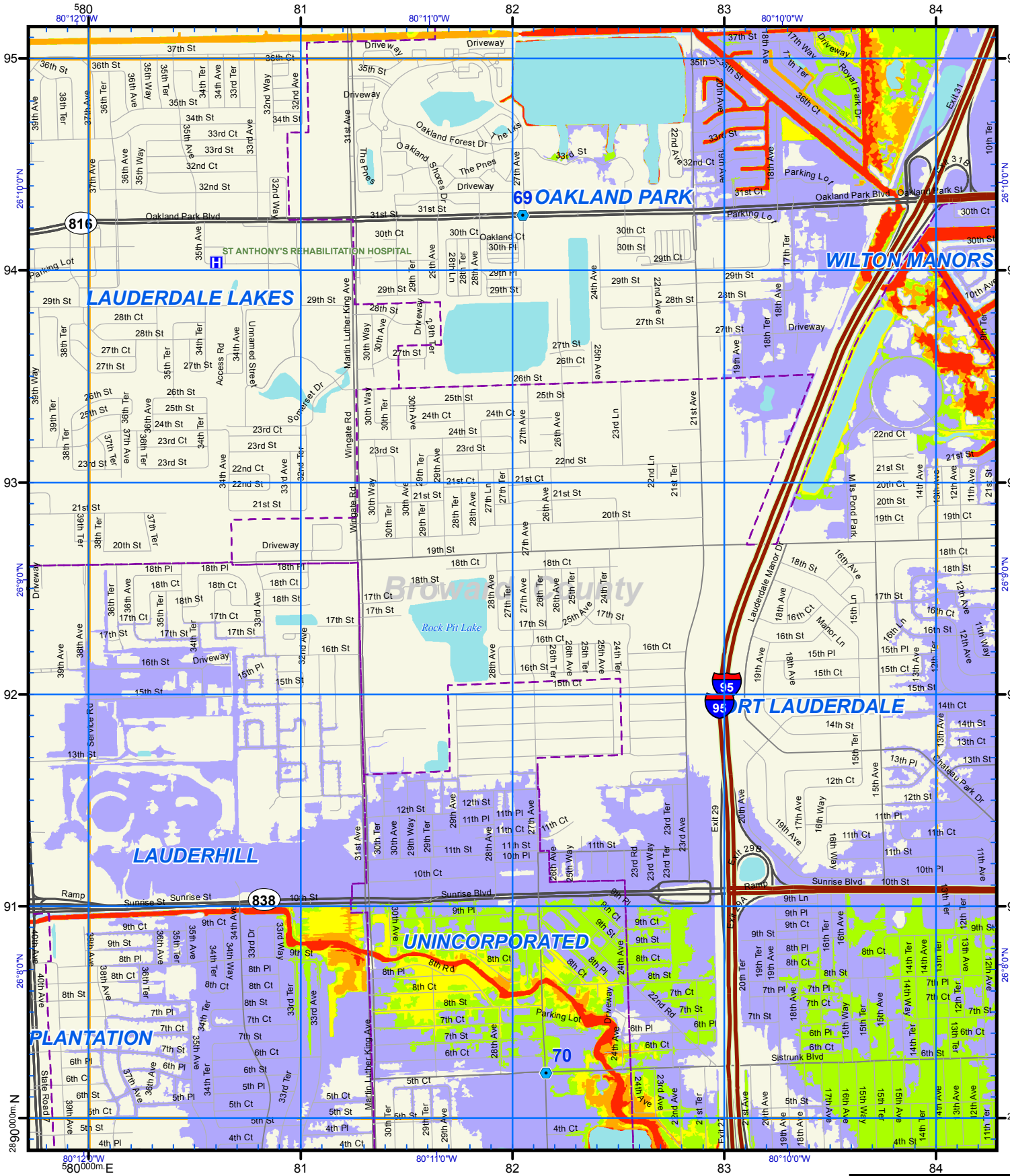

LAUDERDALE LAKES
LAUDERHILL
SUNRISE
PLANTATION
Broward County
FLORIDA MEDICAL CENTER
PLANTATION GENERAL HOSPITAL
441
838
Oakland Park Blvd
Sunrise Blvd
Sunset Strip
Rock Island Rd
Floridas Turnpike
Inverrary Blvd
Hammock Ln
Lime Hill Rd
Springbluff Pl
Racquet Club Dr
Driveway
Parking Lot
Blueberry Ct
Del Lago Cir
Unnamed Street
Oakwood Rd
Redwood Rd
Palm Tree Rd
Coconut Ter
Banyan Ter
Fig Tree Ln
Pine Ter
Private Rd
State Road 7
Service Rd
Ramp
Sunset Blvd
Sunrise Boulevard Ramp
Marginal Access Rd
East Access Dr
Acre Dr
Farmington Dr
Bayberry Dr
Holly Ln
Orchid Dr
Garden Ct
Ixora Ln
Azalea Ct
Petunia Dr
Alamanda Ct
Camellia Ct
Zinnia Ln
Tamarind Ter
Bel Air Dr
Roarke Dr
Van Teesell Dr
Environ Blvd
Inverrary Dr
Springbluff Pl
Broadway
Rock Island Rd
Floridas Turnpike
Oakland Park Access
Parking Lot
Unnamed Street
Ramp
Driveway
Sunset Strip



US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
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Storm Tide Zones

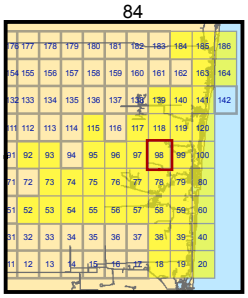
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 80 90**

Map Plate **98**



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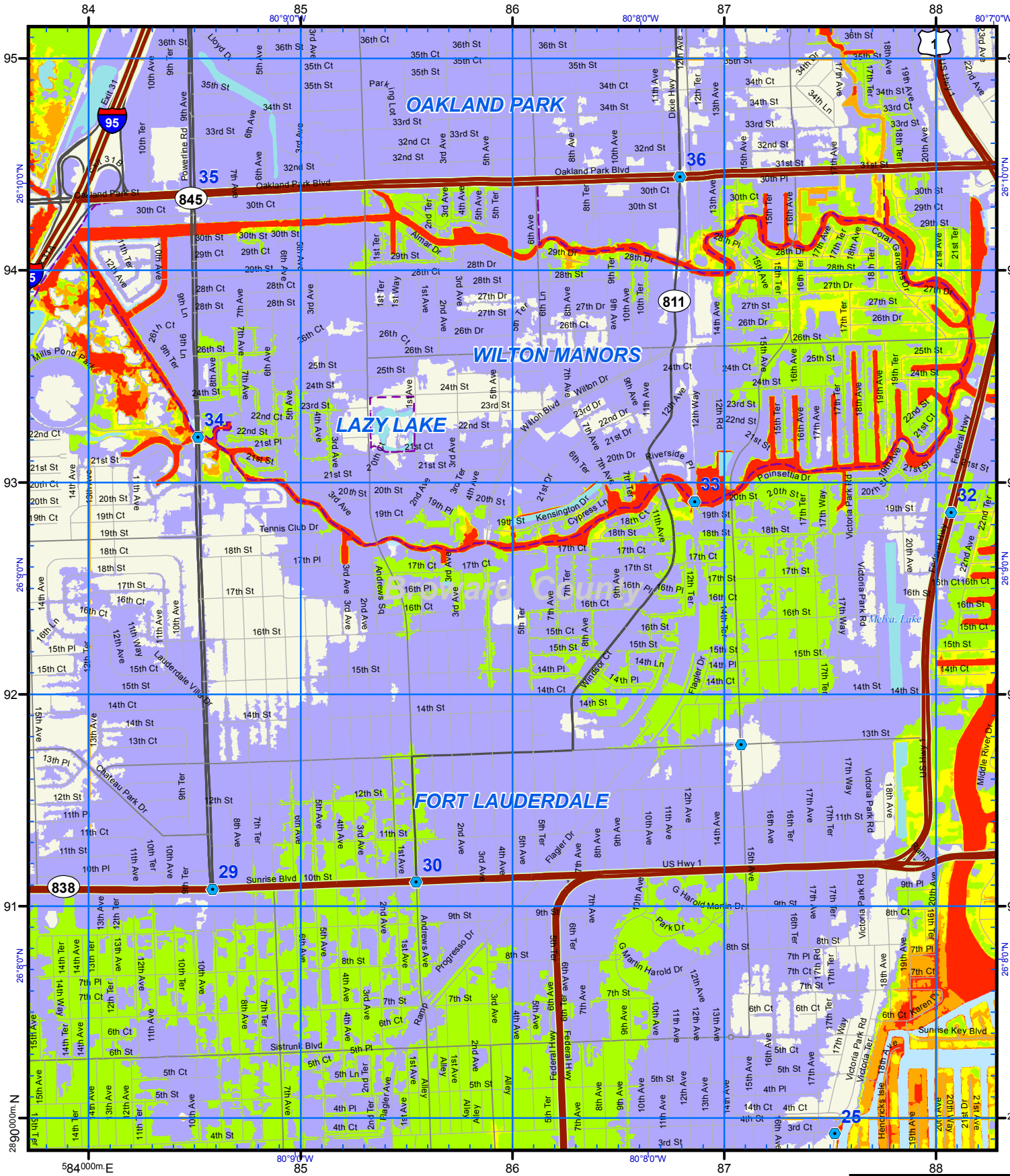

US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

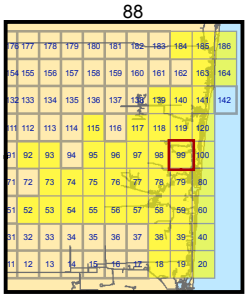
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 84 90**

Map Plate **99**



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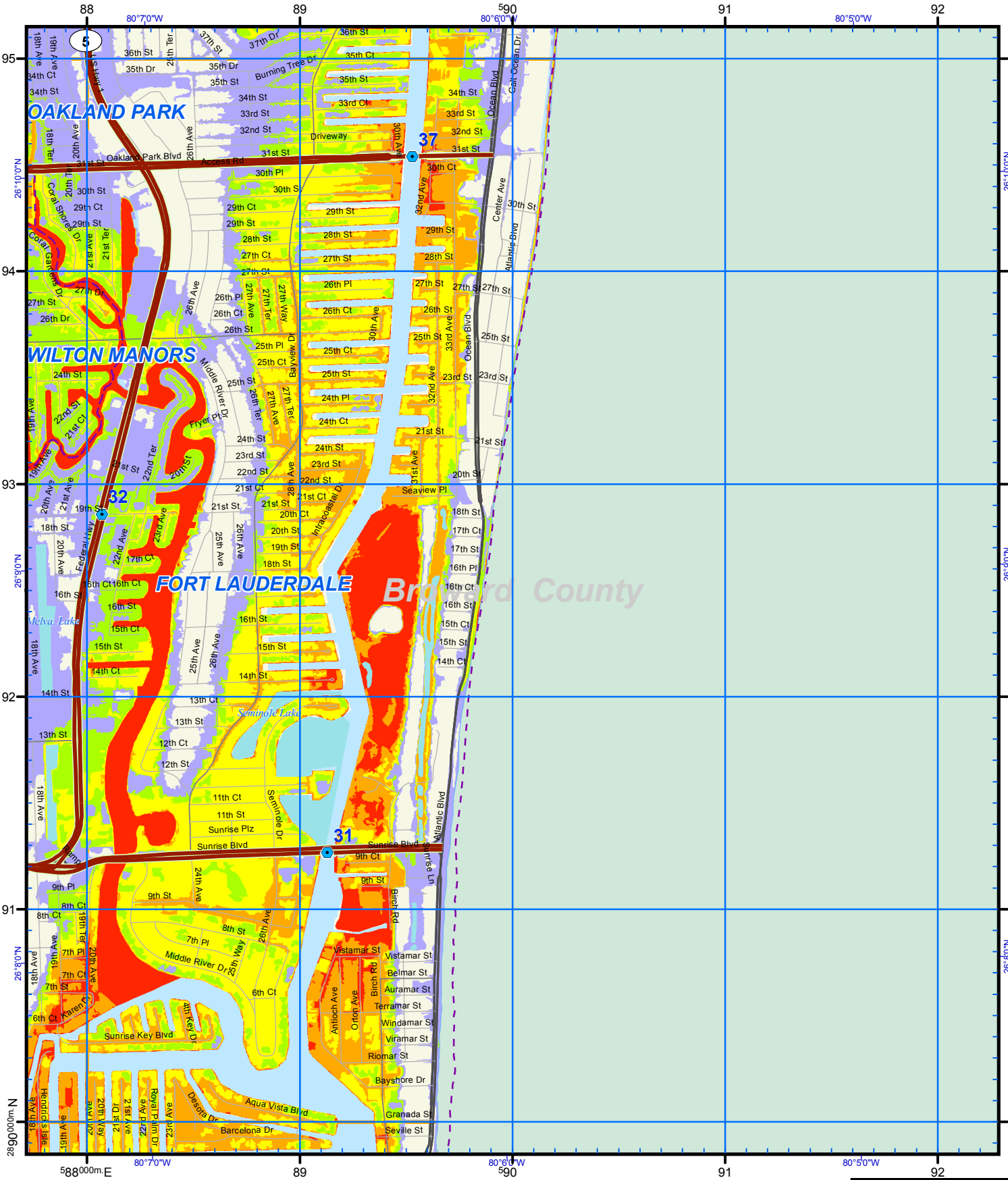

US National Grid
100,000-m Square ID
NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat: 1, 2, 3, 4, 5

Storm Tide Zones

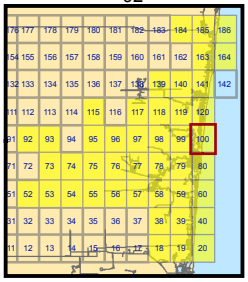
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 88 90**

Map Plate **100**



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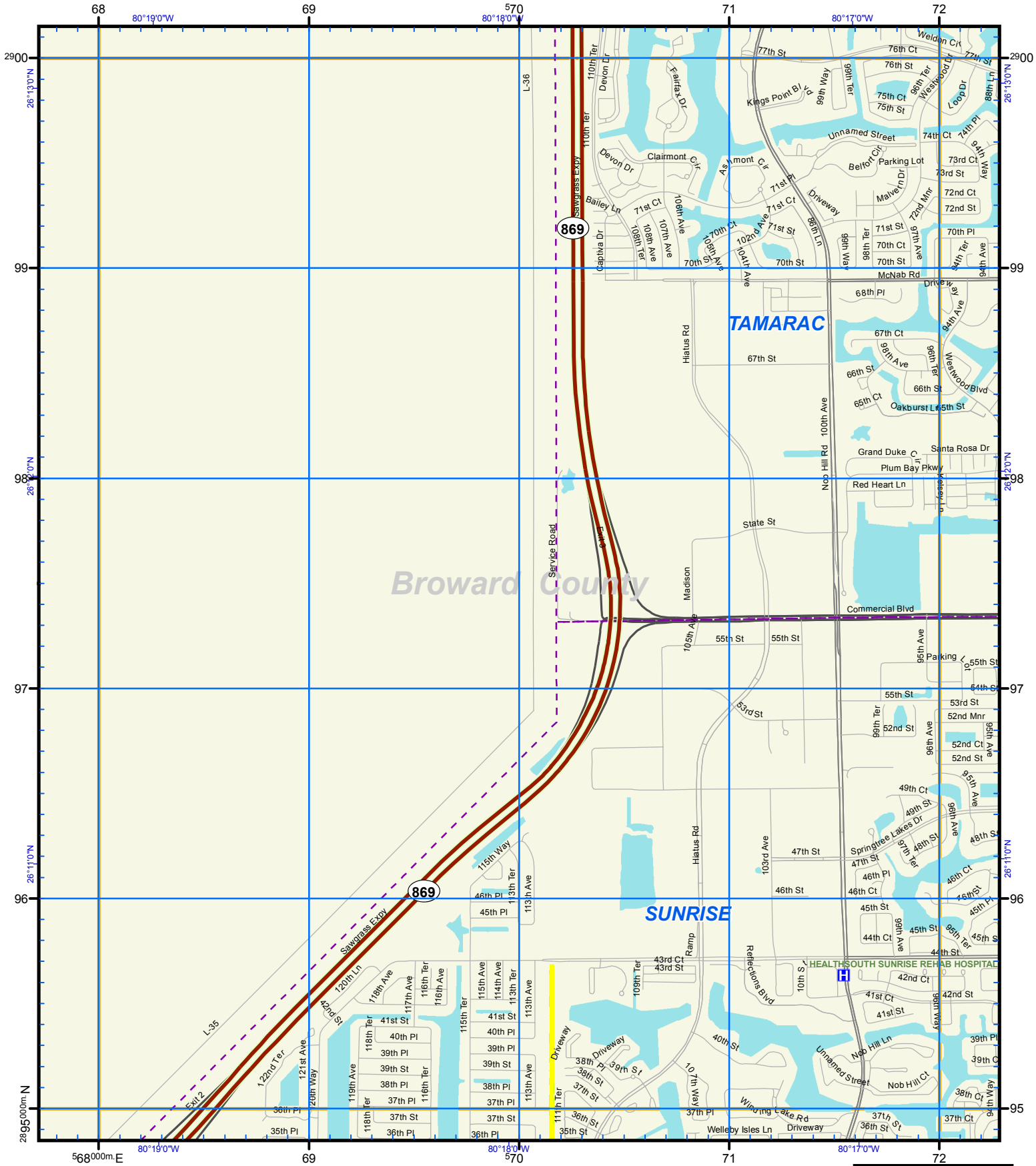

US National Grid
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NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
1
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Storm Tide Zones

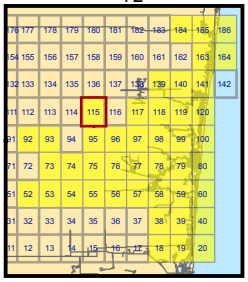
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 68 95**

Map Plate **115**



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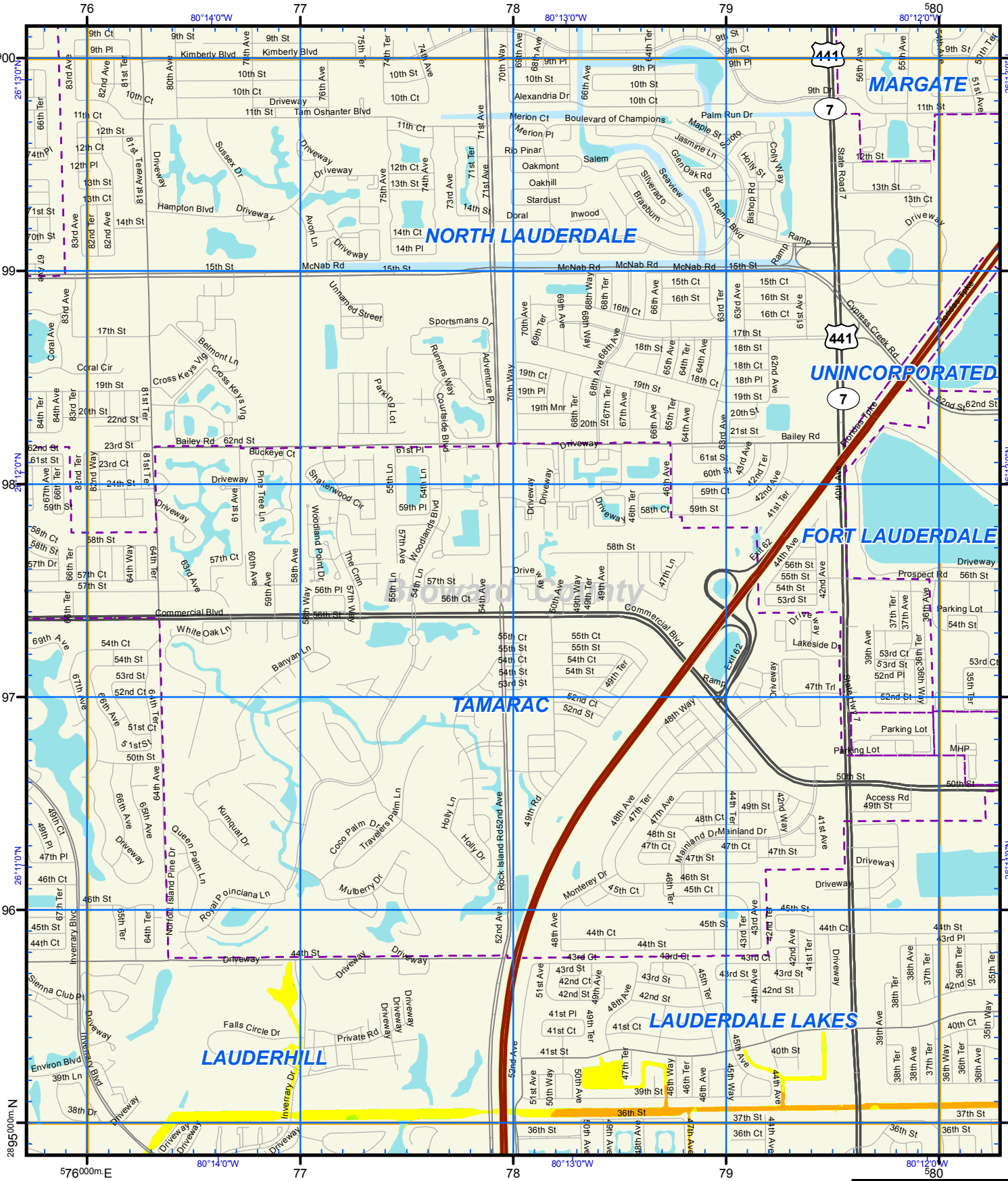

US National Grid
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NJ
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat: 1, 2, 3, 4, 5

Storm Tide Zones

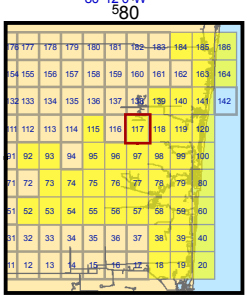
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 76 95**

Map Plate **117**



This map is for reference & planning purposes only. Hurricane evacuation decision-making and growth management implementation are local responsibilities. Please consult with local authorities.

Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010

US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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3. The Points of Reference are locations determined to be relevant to emergency management officials.

ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

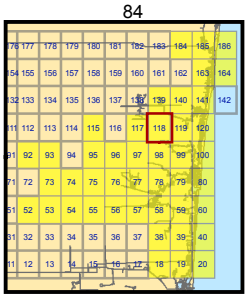
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 80 95**

Map Plate **118**



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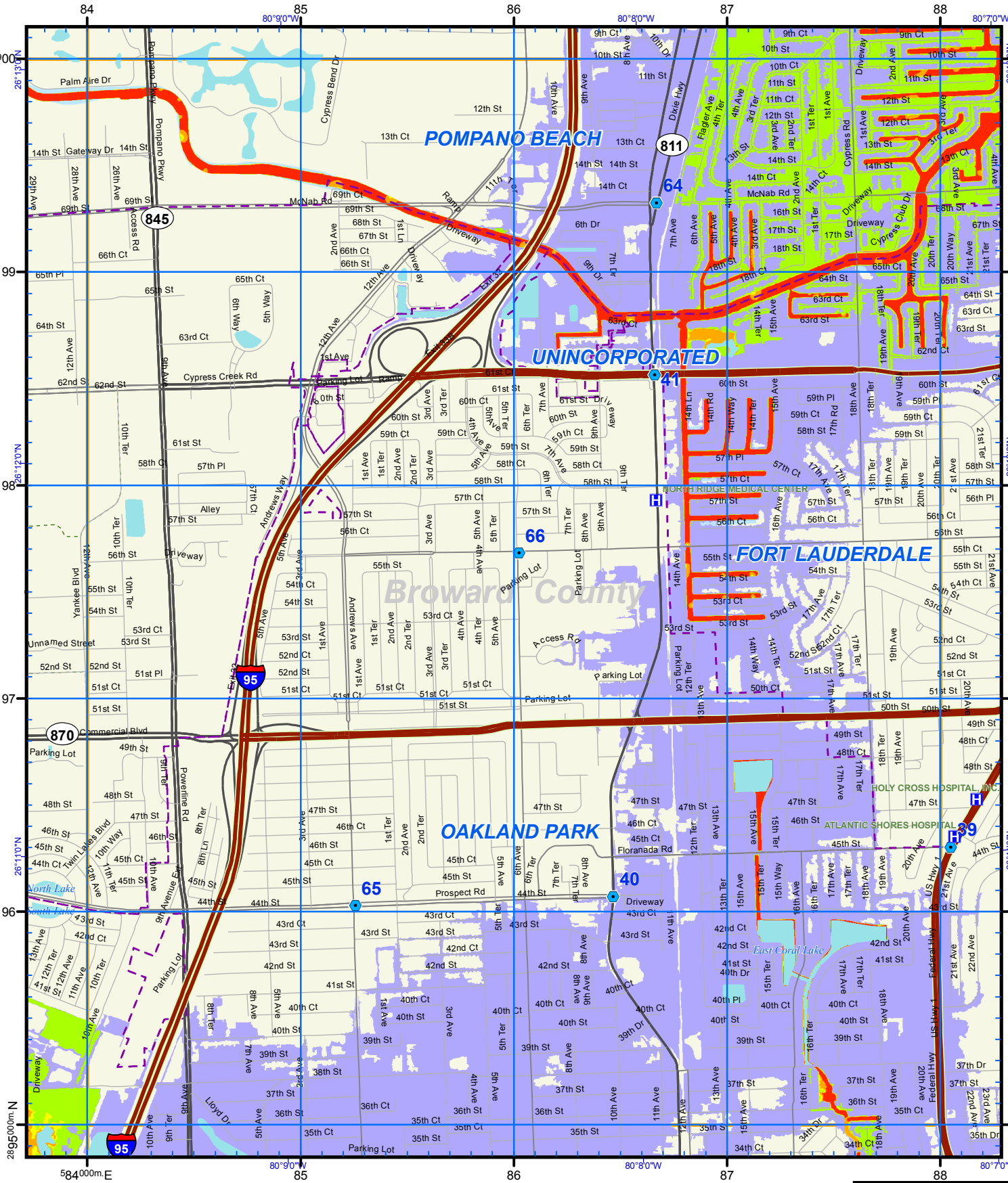
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

Cat
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Storm Tide Zones

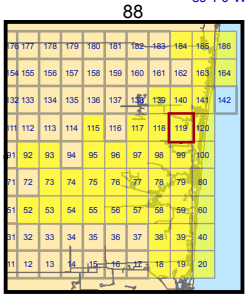
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 84 95**

Map Plate **119**



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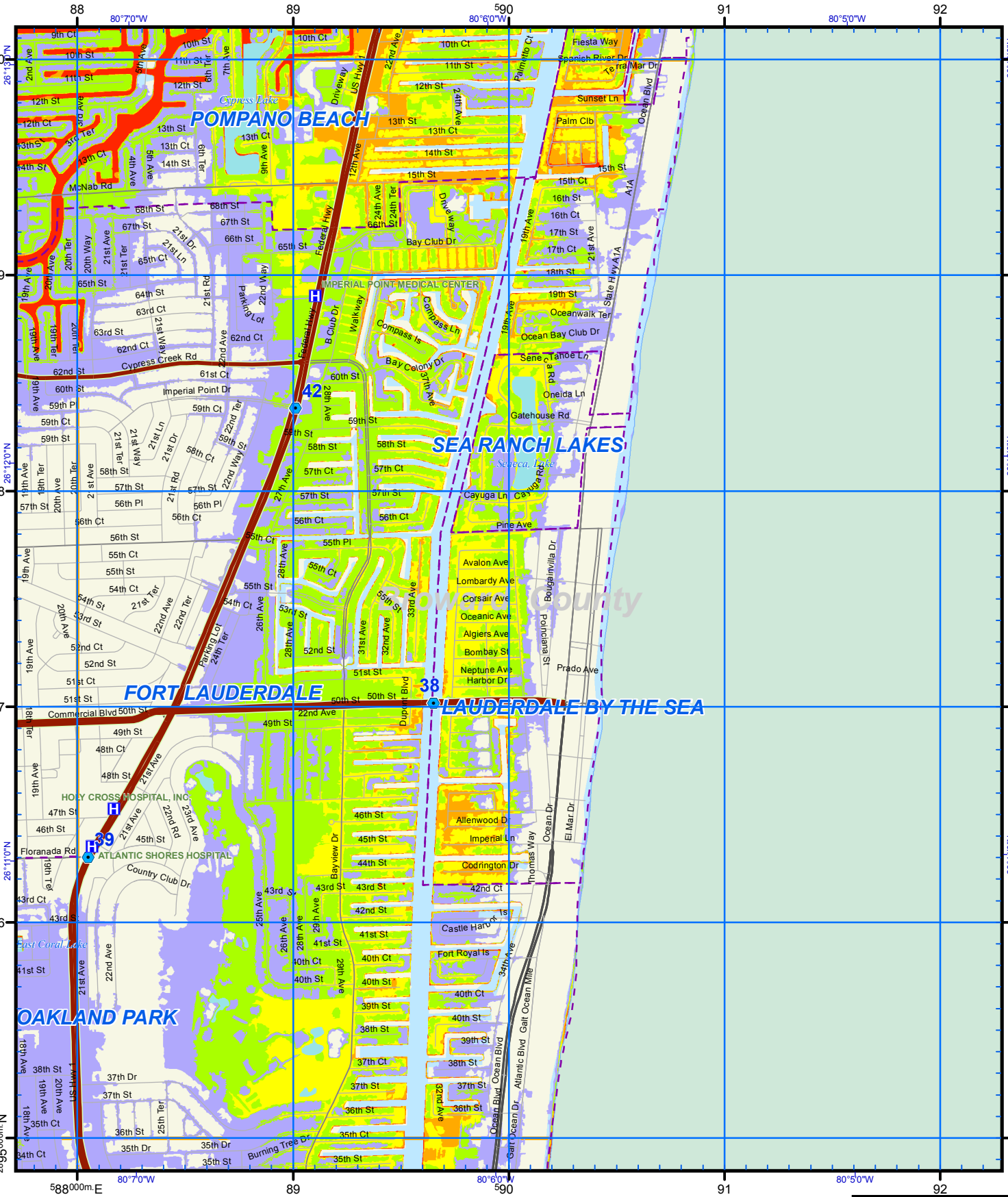
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NJ**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NJ 88 95**

Map Plate **120**

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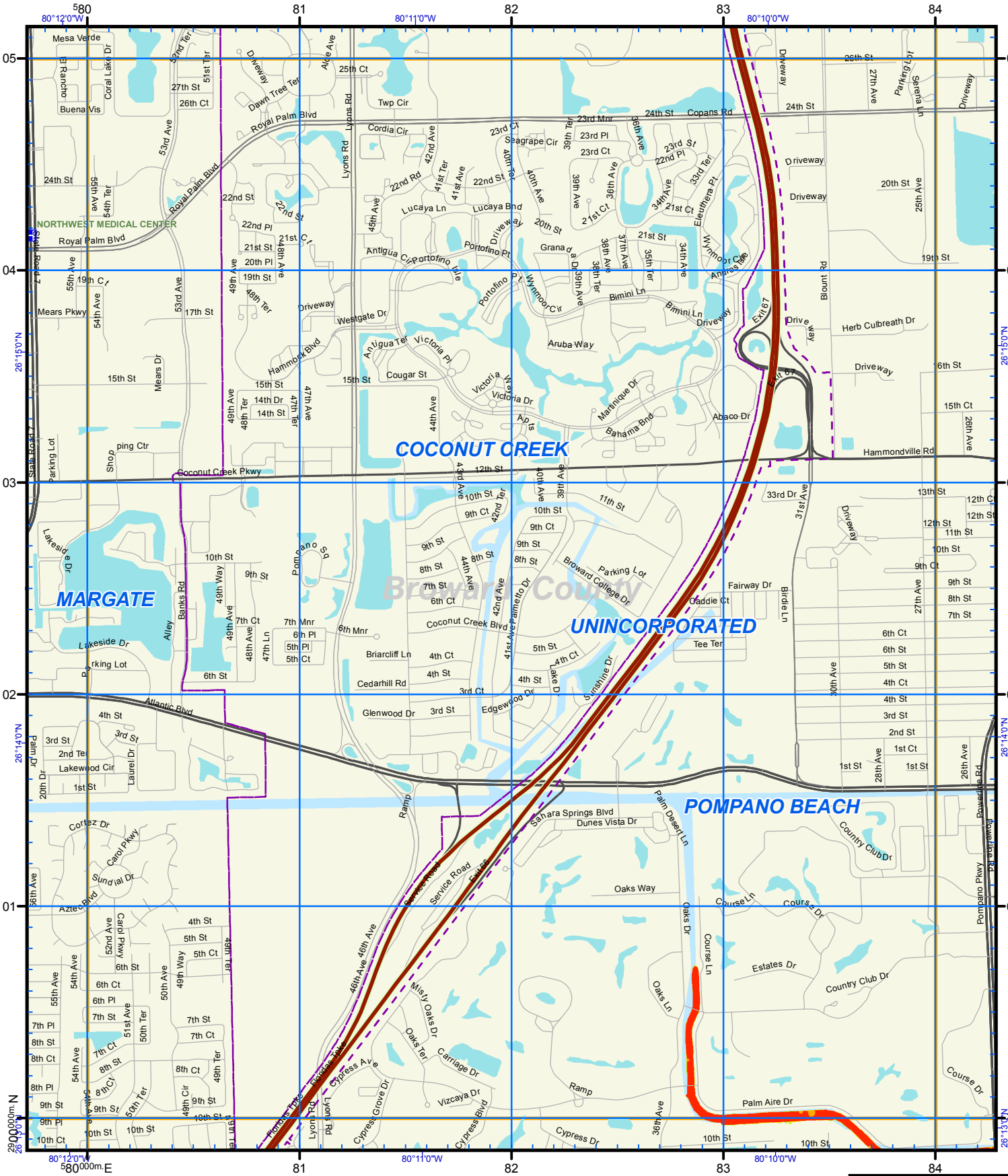
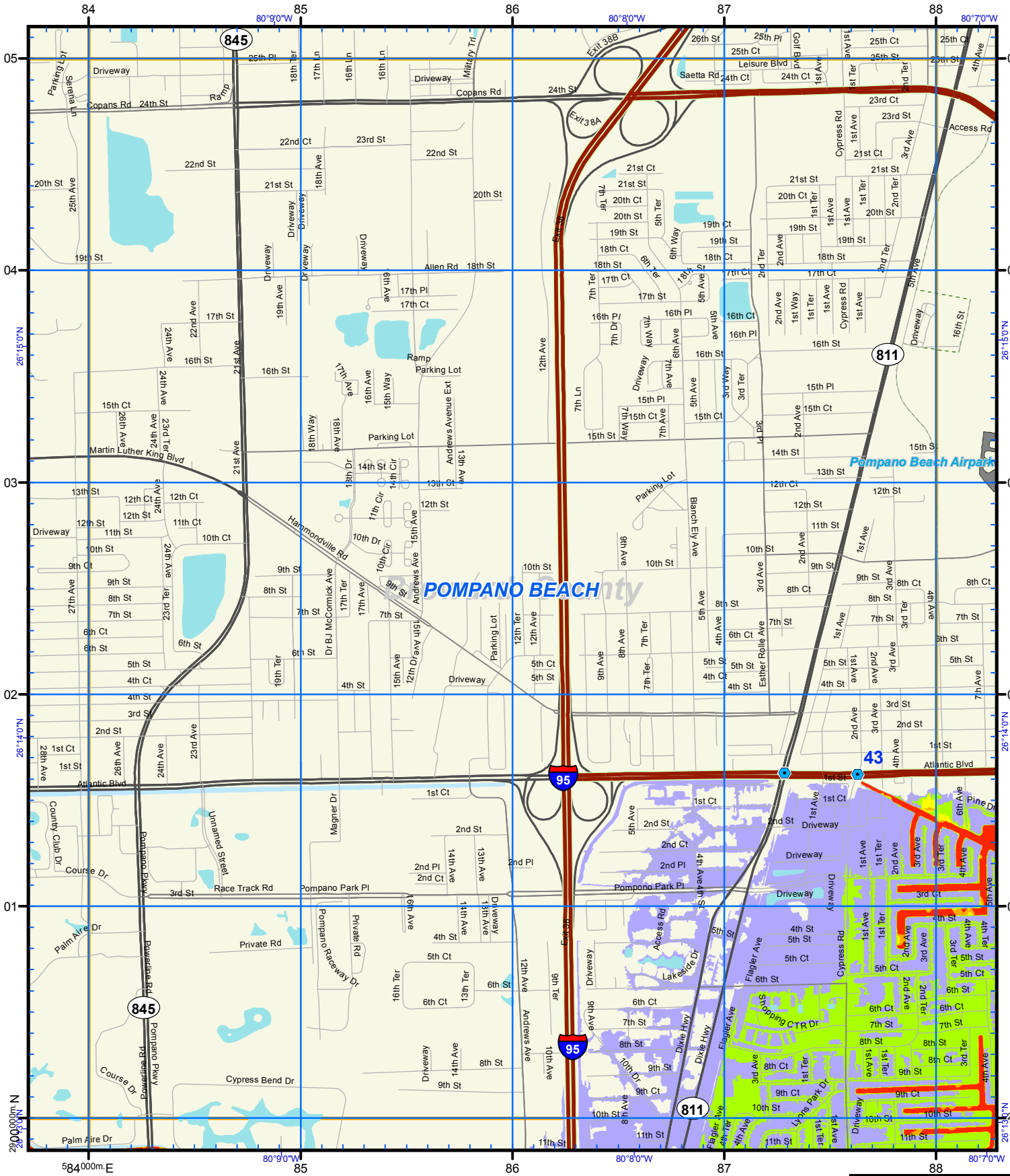
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010


COCONUT CREEK
MARGATE
UNINCORPORATED
POMPANO BEACH
Broward County
NORTHWEST MEDICAL CENTER
Coconut Creek Pkwy
Atlantic Blvd
Royal Palm Blvd
Hammondville Rd
Sample Road
Lyons Rd
Banks Rd
Powerline Rd
Dixie Hwy
Florida Turnpike
Exit 67
Service Road
Ramp
Lakeside Dr
Coconut Creek Blvd
Cypress Ave
Cypress Grove Dr
Cypress Blvd
Sahara Springs Blvd
Oaks Way
Estates Dr
Country Club Dr
Course Ln
Course Dr
Palm Aire Dr
Broward College Dr
Parking Lot
Driveway
Mesa Verde
Buena Vis
Twp Cir
Copans Rd
Lucaya Ln
Lucaya Blvd
Portofino Pt
Antigua Cir
Aruba Way
Bimini Ln
Victoria Pl
Victoria Dr
Cougar St
Westgate Dr
Hammock Blvd
Martinique Dr
Bahama Blvd
Abaco Dr
Fairway Dr
Caddie Ct
Tee Ter
Briarcliff Ln
Cedarhill Rd
Glenwood Dr
Edgewood Dr
Sunshine Dr
Lake Dr
Lakewood Cir
Laurel Dr
Cortez Dr
Carol Pkwy
Sundial Dr
Azteca Blvd
Misty Oaks Dr
Oaks Ter
Carriage Dr
Vizcaya Dr
Oaks Dr
Oaks Ln
Palm Desert Ln
Dunes Vista Dr
Herb Culbreath Dr
Blount Rd
Eleuthera Pl
Wynmoor Cir
Wynmoor Cove
Andros Cir
Portofino Isle
Granada Dr
Seagrape Cir
Dawn Tree Ter
Alder Ave
Cordia Cir
Twp Cir
Mears Pkwy
Mears Dr
Shopping Ctr
Parking Lot
Lakeside Dr
Alley
Ramp
Driveway
Parking Lot
Exit 67
Drive way
Driveway
Driveway
Driveway



US National Grid
100,000-m Square ID
NK

Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

Broward County, 2010

Scale - 1:24,000

0 — 2,000 Feet

USNG Page **17R NK 84 00**

Map Plate **140**

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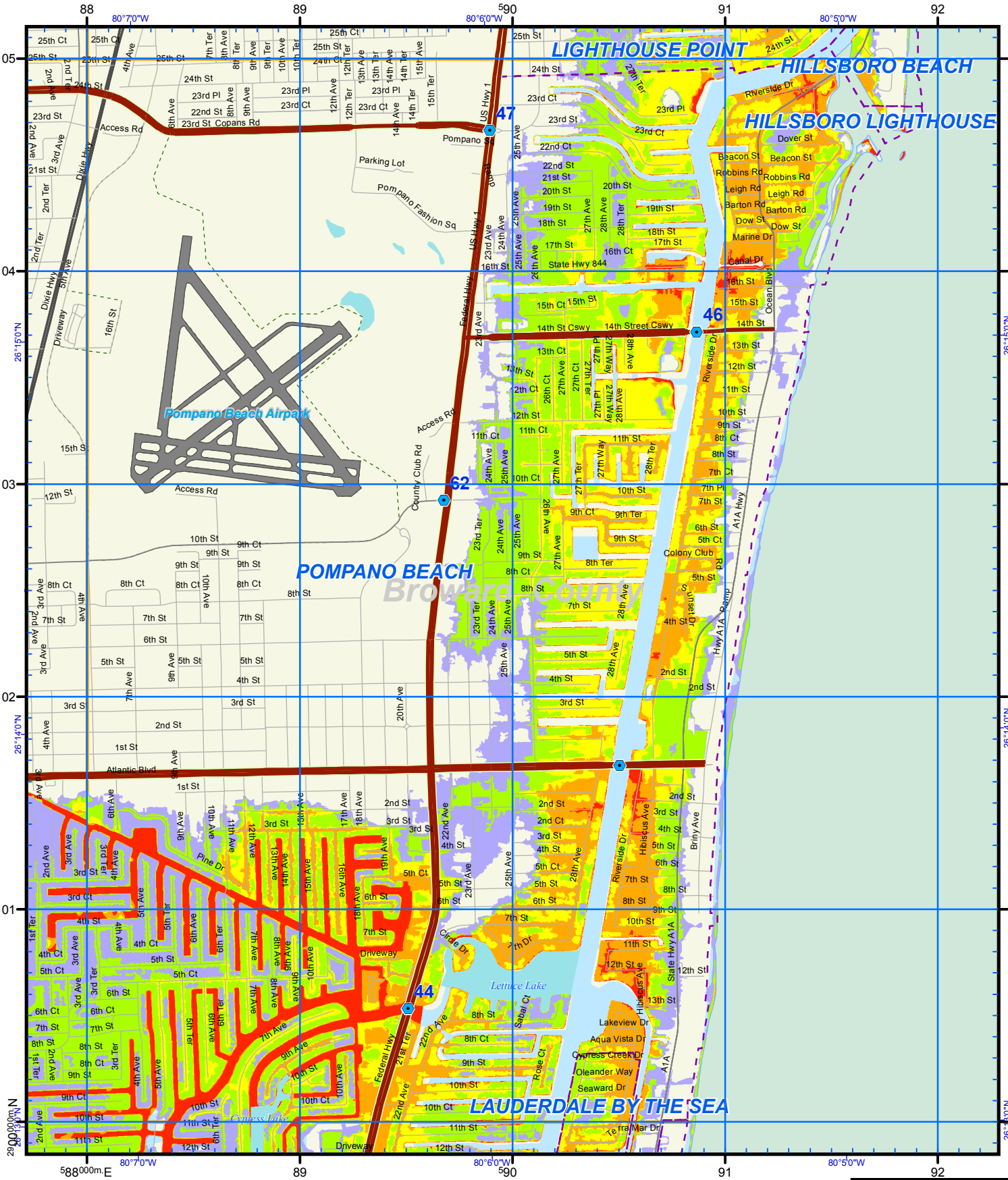
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid	
100,000-m Square ID	**NK**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

Broward County, 2010

Scale - 1:24,000

Feet
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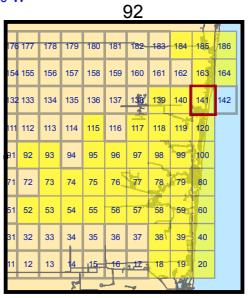
USNG Page **17R NK 88 00**

Map Plate **141**



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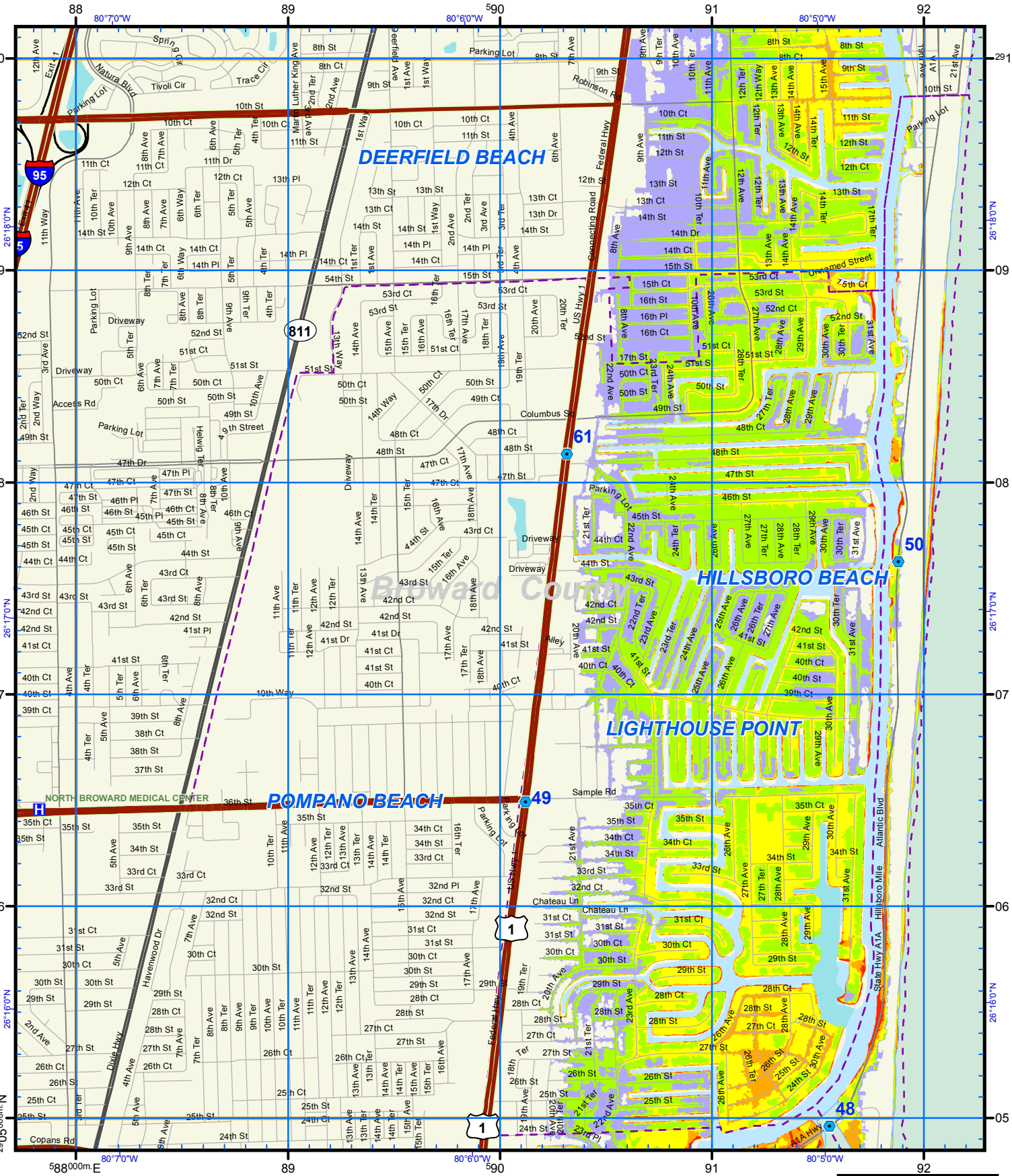
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid
100,000-m Square ID
NK

Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

Broward County, 2010

Scale - 1:24,000

0 — Feet — 2,000

USNG Page **17R NK 88 05**

Map Plate **163**

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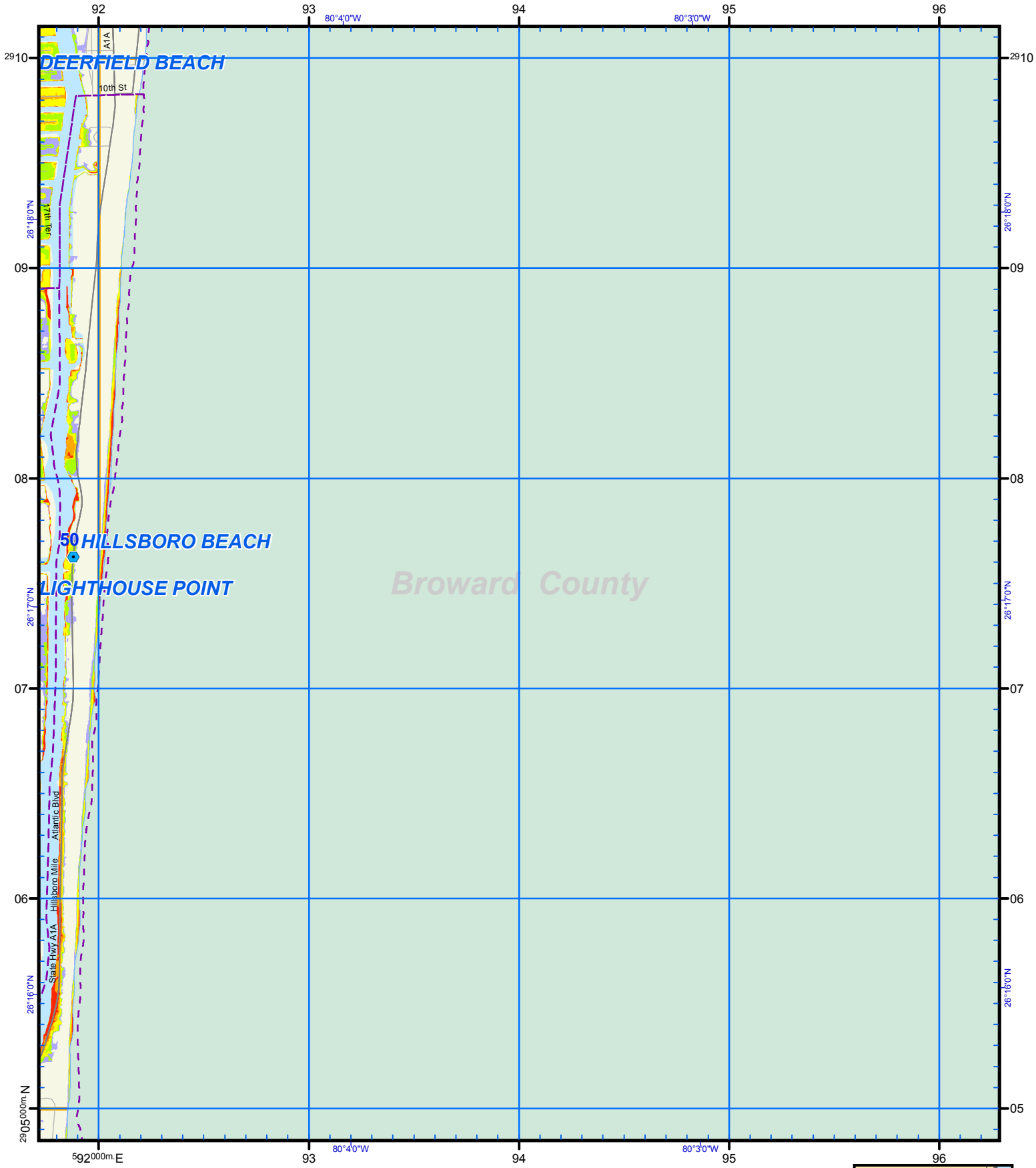
Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010



US National Grid
100,000-m Square ID
NK
Grid Zone Designation
17R
Datum = NAD 1983, 1,000-m USNG

GN
Diagram Not to Scale

Notes:
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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

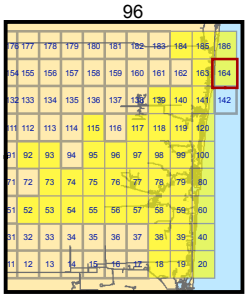
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NK 92 05**

Map Plate **164**



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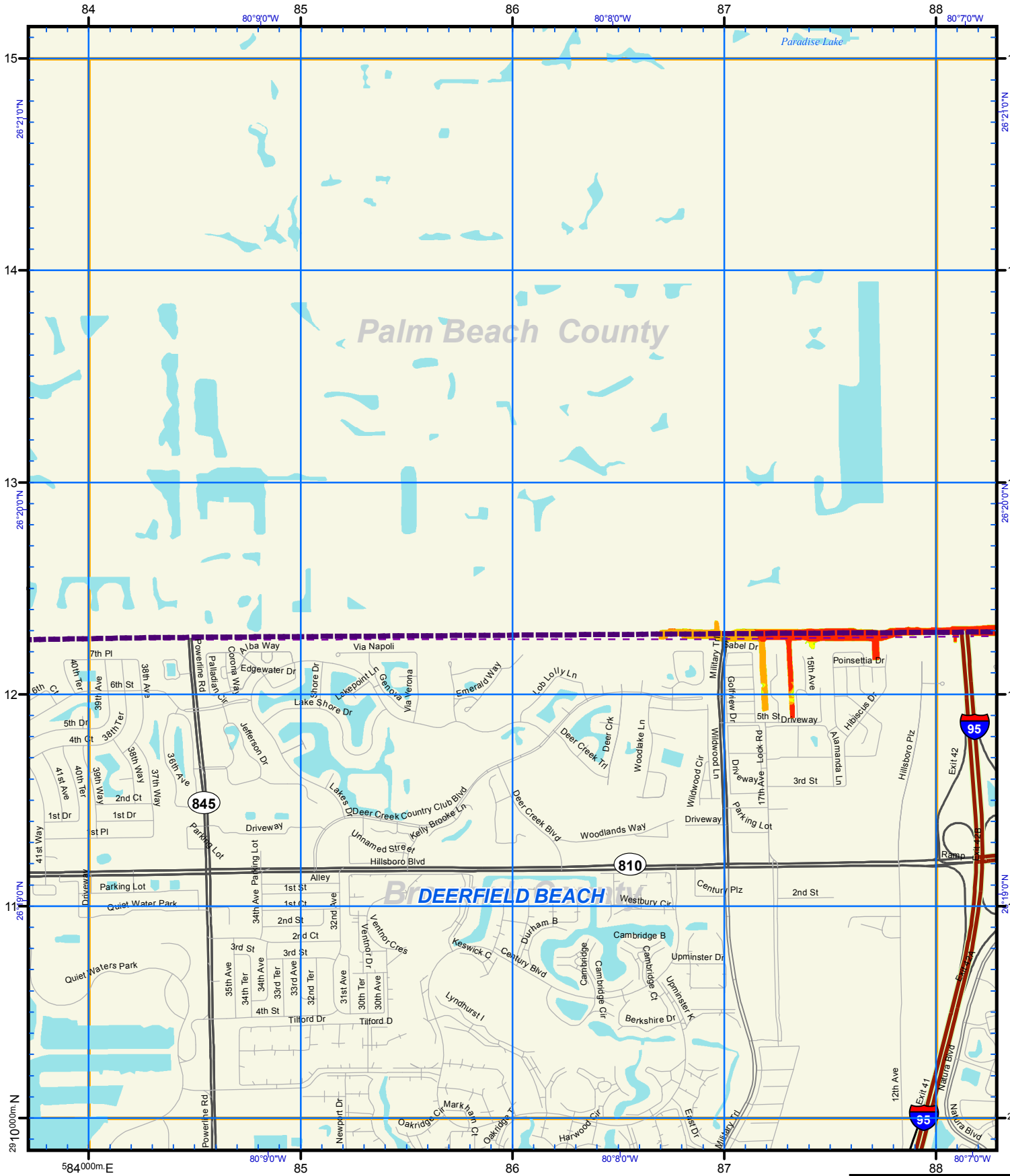

US National Grid
100,000-m Square ID
NK
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

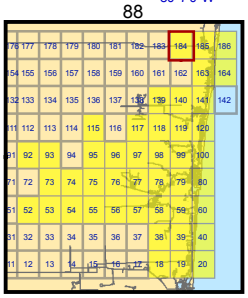
Broward County, 2010

Scale - 1:24,000

0 Feet 2,000

USNG Page **17R NK 84 10**

Map Plate **184**



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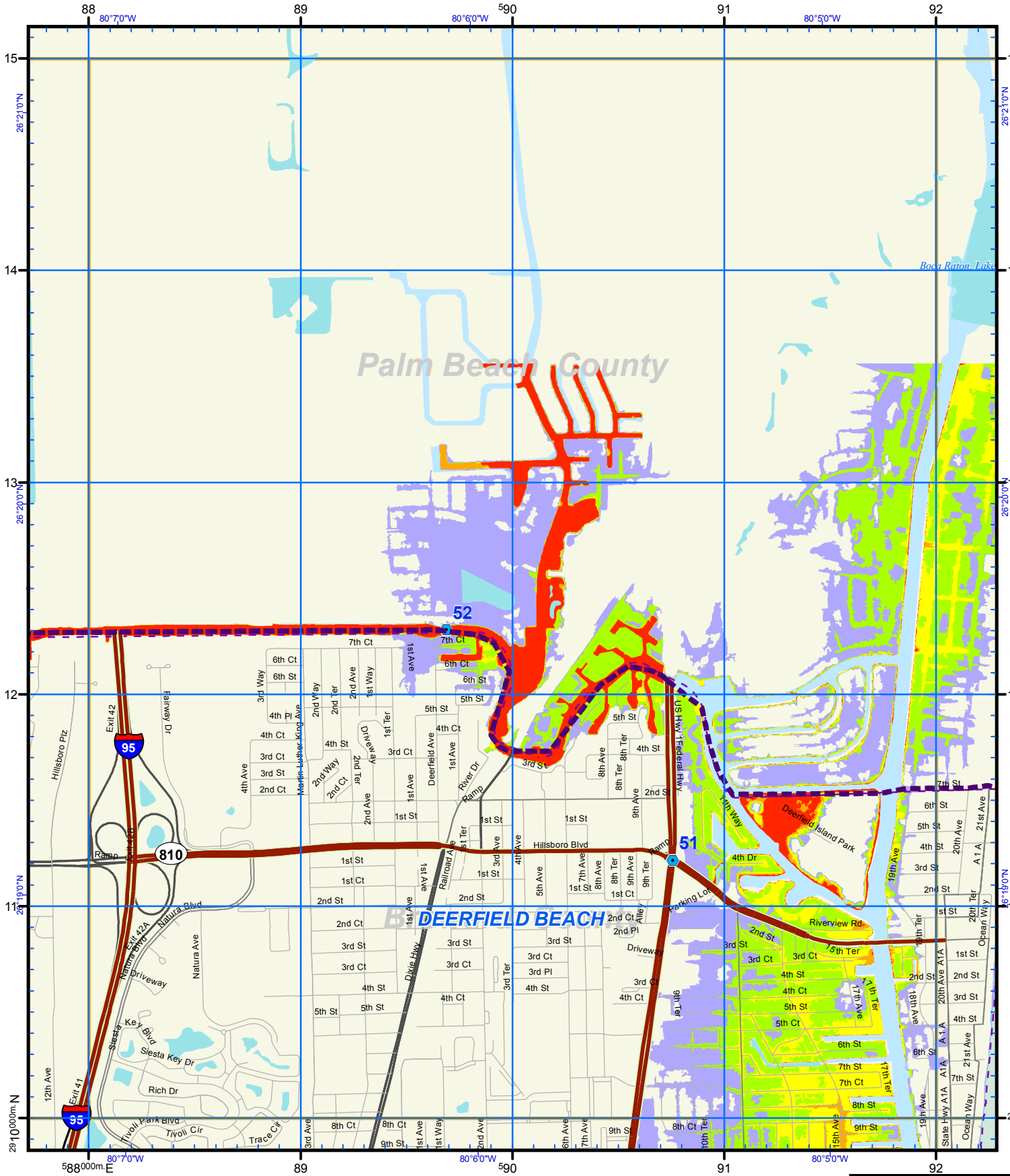

US National Grid	
100,000-m Square ID	**NK**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

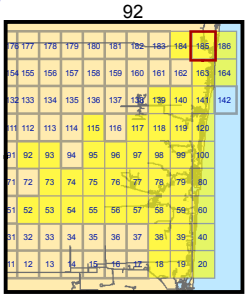
Broward County, 2010

Scale - 1:24,000

0 — Feet — 2,000

USNG Page **17R NK 88 10**

Map Plate **185**



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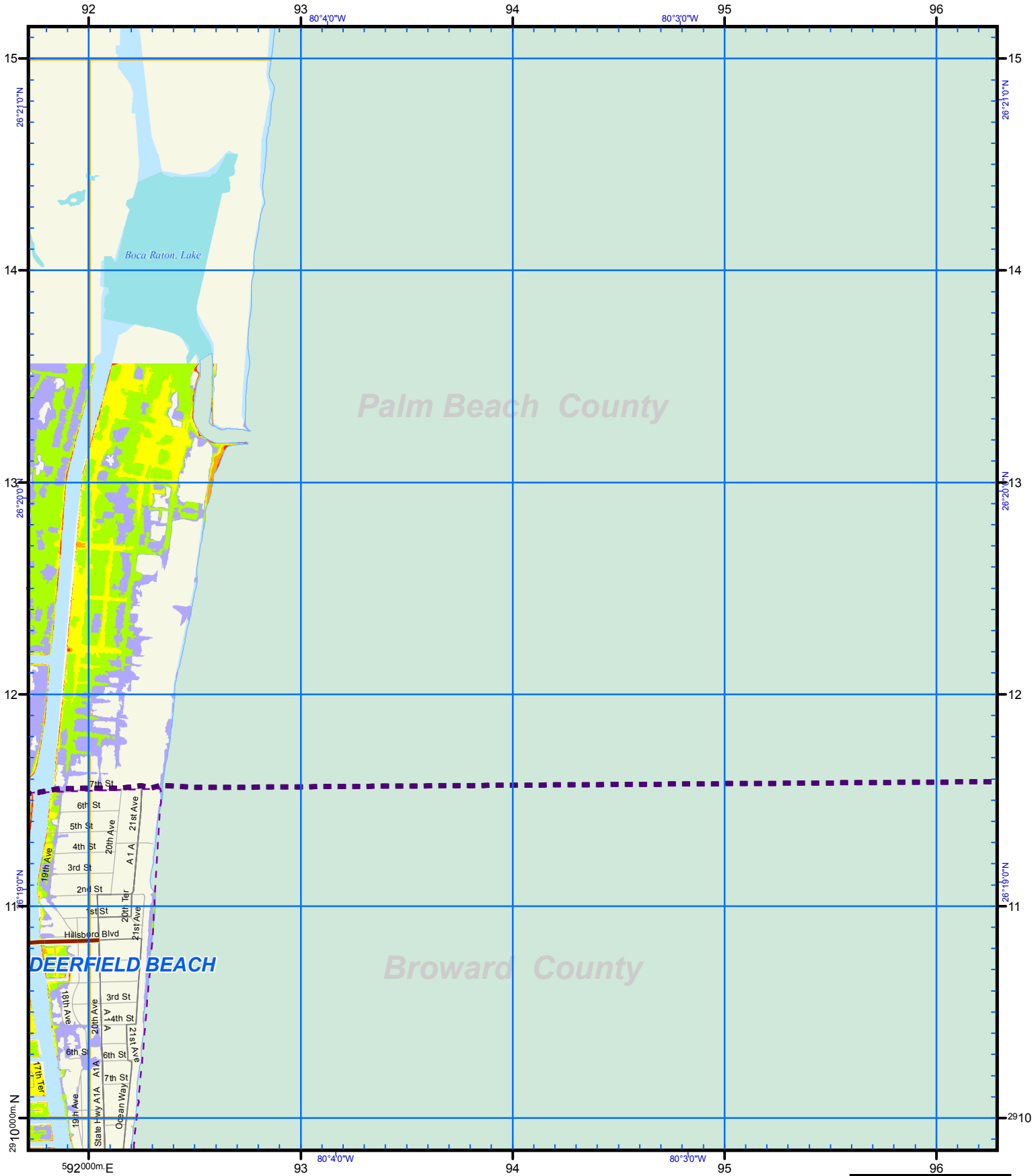

US National Grid	
100,000-m Square ID	**NK**
Grid Zone Designation	**17R**

Datum = NAD 1983, 1,000-m USNG

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ATLAS LEGEND

- HOSPITAL
- Points of Reference
- Evacuation Route
- City Limits
- NHD Lakes
- NHD Major Water

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Storm Tide Zones

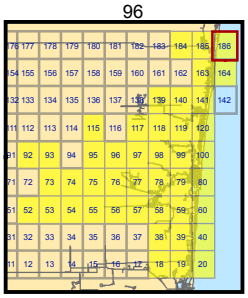
Broward County, 2010

Scale - 1:24,000

0 — 2,000 Feet

USNG Page **17R NK 92 10**

Map Plate **186**



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Produced by South Florida Regional Planning Council for Florida Division of Emergency Management, 2009-2010

Funding was provided by the Florida Legislature with funding from the Federal Emergency Management Agency (FEMA) through the Florida Division of Emergency Management. Local match was provided by the South Florida Regional Planning Council and the counties of Broward, Miami-Dade and Monroe.

Florida Division of Emergency Management
David Halstead, Director
2255 Shumard Oak Boulevard
Tallahassee, Florida 32399

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