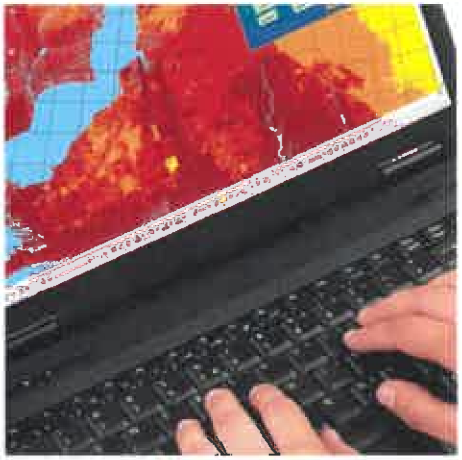
FLORIDA STATEWIDE REGIONAL EVACUATION STUDY PROGRAM



STORM TIDE ATLAS

SARASOTA COUNTY

VOLUME 7-9
BOOK 6 OF 6

FLORIDA DIVISION OF EMERGENCY MANAGEMENT

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

SOUTHWEST FLORIDA REGION

INCLUDES HURRICANE EVACUATION STUDY

STATEWIDE REGIONAL EVACUATION STUDY PROGRAM

Southwest Florida STORM TIDE ATLAS

Volume VII-9
Book 6
Sarasota County

This Book is part of Volume VII of the ***Statewide Regional Evacuation Study*** (SRES) Program and one of six county books in the Southwest Florida Storm Tide Atlas Series. Book 1 covers Charlotte County; Book 2 covers Collier County; Book 3 covers Glades County; Book 4 covers Hendry County; Book 5 covers Lee County and Book 6 covers Sarasota 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 NOAA's numerical storm surge model, SLOSH (updated 2009).

The Storm Tide Atlas, published in 2010, is the foundation of the hazards analysis for storm tide and a key component of the SRES. The Technical Data Report (Volume I) 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 will be published and made available on the Internet (www.swfrpc.org) in June 2010.

The Atlas was produced by the Southwest Florida Regional Planning Council with funding by the Florida Legislature and the Federal Emergency Management Agency through the Florida Division of Emergency Management.

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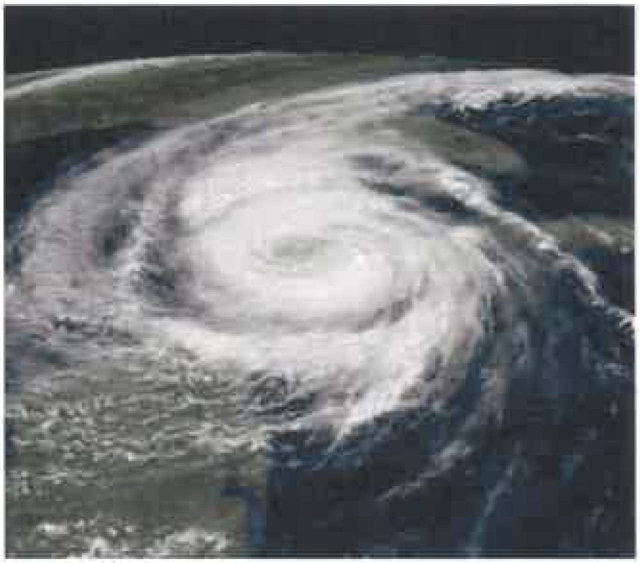

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Southwest Florida
STORM TIDE ATLAS

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Funding was authorized by the Florida Legislature through House Bill 7121, as a result of the 2004 and 2005 hurricane seasons. Provisions of this bill require the Division of Emergency Management to update all Regional Evacuation Studies in the State and inexorably tied the Evacuation Studies and Growth Management. As a result, this study addresses both Emergency Management and Growth Management data needs. Funds were also provided by the Federal Emergency Management Agency (FEMA) with all money administered through the Florida Division of Emergency Management (FDEM), 2555 Shumard Oak Blvd., Tallahassee, 32399. Web site: www.floridadisaster.org. Local match was provided by the counties of Charlotte, Collier, Glades, Hendry, Lee and Sarasota.

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INTRODUCTION

A comprehensive emergency management program requires attention to four (4) 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 Southwest Florida Region including Charlotte, Collier, Glades, Hendry, Lee, and Sarasota counties (Figure 1). It was 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 which depict storm tide heights and the extent of stillwater, storm surge coastal flooding inundation from hurricanes of five different intensities in the Southwest Florida area. The Atlas was prepared by the Southwest 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 Southwest Florida Region

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 Hurricane (**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 first Southwest Florida SLOSH model basin was completed in 1979 and 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 for the Southwest basin. 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 newest generation of the SLOSH model basin incorporated in the 2010 Statewide Regional Evacuation Study 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.

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).

1 Maximum of MEOWs

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*

The modeling for each tropical storm/hurricane category was conducted using the mid-range pressure difference (Δp, 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 (WSW, W, WNW, NW, NNW, N, NNE, NE, E, ENE) were selected as being representative of storm behavior in the West Central Florida regions, 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, 10, 15 and 25 mph. And, for each direction, at each speed, storms were run at two different sizes (20 statute mile radius of maximum winds and 35 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 the previous study.

A total of 12,000 runs were made consisting of the different parameters shown in Table 2.

Table 2 Southwest Florida Basin Hypothetical Storm Parameters

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

Direction	Speeds (mph)	Size (Radius of Maximum winds)	Intensity	Tides	Tracks	Runs
WSW	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	18	1440
W	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	14	1120
WNW	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	16	1280
NW	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	14	1120
NNW	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	14	1120
N	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	10	800
NNE	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	13	1040
NE	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	17	1360
ENE	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	17	1360
E	5,10,15, 25 mph	20 statute miles; 35 statute miles	1 through 5	Mean/High	17	1360
TOTAL						12,000

The Grid for the Southwest SLOSH Model

Figure 2 illustrates the area covered by the grid for the Southwest SLOSH Model. To determine the surge values the SLOSH model uses a bipolar elliptical grid as its unit of analysis with 105 arc lengths (1< I> 105) and 99 radials (1< J> 99). Use of the grid configuration allows for individual calculations per grid square which is beneficial in two ways: (1) 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) allows economy in computation.

The grid size for the Southwest model varies from approximately 0.001 square miles or 1.08 acres closest to the pole (I = 1) to the grids on the outer edges (Gulf of Mexico) where each grid is approximately 15.5 square miles.

Figure 2 Southwest Basin Grid

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 Envelope 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. 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).

Figure 3 SLOSH Grid with Surge Values

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) on 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 Height (s) by County

(In Feet above NAVD88)

*Storm Strength	Charlotte	Collier	Lee	Sarasota	Lake O 16ft	Lake O 20ft
TS	Up to 5.2	Up to 5.8	Up to 6.1	Up to 5.6	NA	NA
1	Up to 7	Up to 8.2	Up to 8.7	Up to 6.9	Up to 21.1	Up to 25
2	Up to 17	Up to 14.1	Up to 15.5	Up to 15.4	Up to 26.6	Up to 30.6
3	Up to 26	Up to 19.5	Up to 23	Up to 26	Up to 33.2	Up to 35.5
4	Up to 32.3	Up to 24.5	Up to 27.6	Up to 33.2	Up to 36.4	Up to 37.2
5	Up to 37.7	Up to 41.9	Up to 41.7	Up to 35.4	Up to 38.9	Up to 40

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

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.

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

Figure 4 Digital Elevation from LIDAR

ranging from 0.9 to 2.7 meters (3 to 9 feet). 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.

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, who 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.

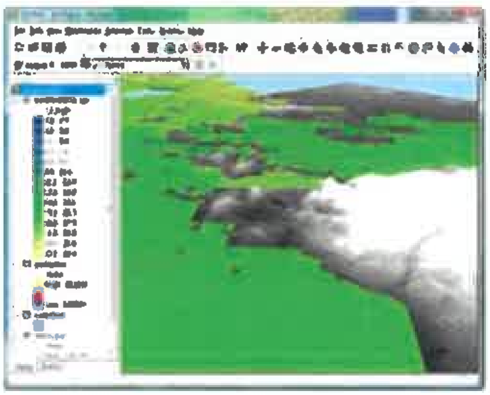


Figure 5 SLOSH Display

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.

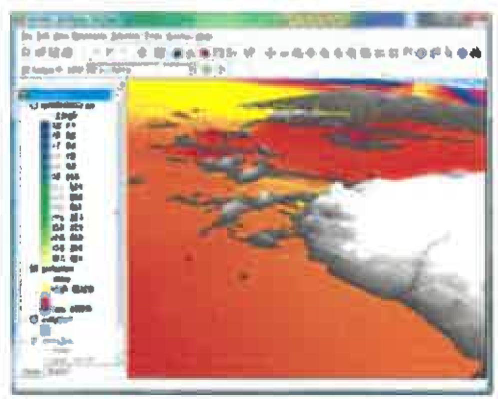
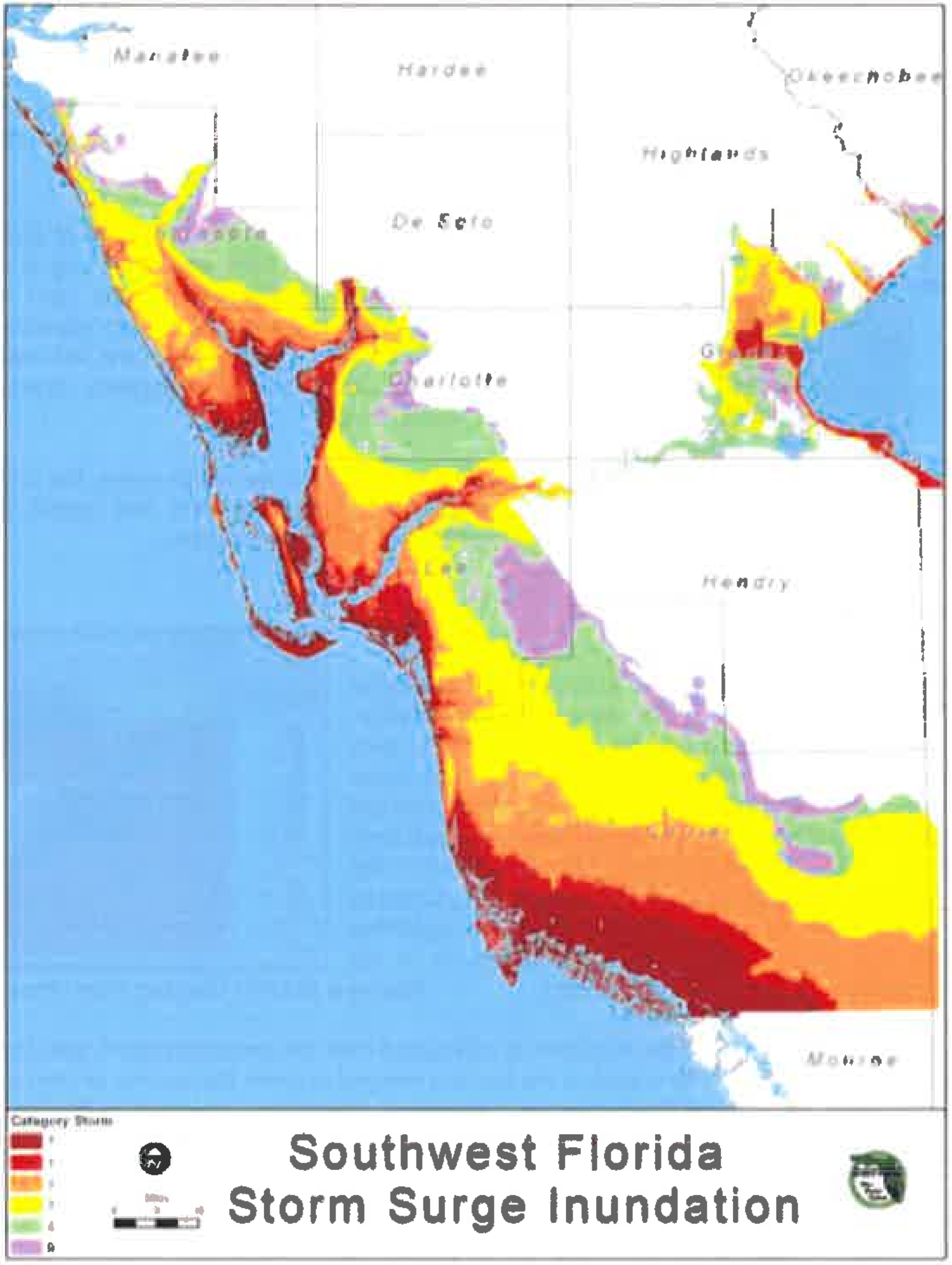


Figure 6 SLOSH Display Post-Processing

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 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 Tropical Storm 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 7 Storm Surge for the Southwest Region



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.

Storm Tide & Wave Height

Regarding interpretation of the data, it is important to understand that the configuration and depth (bathymetry) of the 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, like the Southwest Region, which 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.

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 Southwest SLOSH model, for each set of tracks in a specific direction, storms were run at forward speeds of 5, 10, 15 and 25 mph.

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, 20 mile radius of maximum winds and 35 mile radius of maximum winds.

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.

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 terrains 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 minute quadrangle map, or a scale of 1:24,000.

POINTS OF REFERENCE

County emergency management agency 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

ID	NAME	SURGE	BASE_ELEV	TS_DEPTH	C1_DEPTH	C2_DEPTH	C3_DEPTH	C4_DEPTH	C5_DEPTH
1	LONGBOAT KEY	2	9.21	DRY	DRY	1.61	5.94	10.16	14.53
2	GOLDEN GATE POINT	TS	3.86	0.97	2.09	7.39	12.11	16.10	20.84
3	BIRD KEY	TS	2.25	2.60	4.09	8.82	13.21	17.23	21.77
4	US 41 / PANAMA DR	2	8.63	DRY	DRY	2.26	7.25	11.29	16.06
5	SIESTA KEY	TS	3.01	1.79	3.19	7.89	12.29	16.29	20.79
6	BLACKBURN POINT BRIDGE	2	7.59	DRY	DRY	3.70	8.03	11.84	16.25
7	VENICE BEACH	2	8.14	DRY	DRY	2.57	6.74	10.89	15.31
8	VENICE AVE BRIDGE	2	10.28	DRY	DRY	0.72	4.75	9.10	13.65
9	ALLIGATOR CREEK / US 41	2	10.37	DRY	DRY	0.19	5.33	9.43	14.06
10	MANASOTA BEACH	2	7.56	DRY	DRY	3.41	7.43	11.25	15.87
11	MANASOTA KEY RD	2	7.36	DRY	DRY	3.29	7.50	11.20	15.83
12	STATE HWY 776 / LEMON BAY	2	8.79	DRY	DRY	2.17	6.41	10.32	14.86
13	SOUTH RIVER RD / 41	2	7.82	DRY	DRY	3.68	9.48	14.68	19.48
14	MYAKKA RIVER / I-75	2	5.41	DRY	DRY	6.45	11.67	17.36	21.95

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 Southwest Florida Region*. The *Atlas* was prepared by Southwest 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.

NOTES ON STORM TIDE LIMITS

Historically, the SLOSH storm surge analysis had focused on "average" storm parameters (size and forward speed), although the intensity and angle of approach was modeled to include direct strikes and catastrophic intensity. In the 2010 Regional Evacuation Study Update, 12,000 hypothetical hurricanes were included in the SLOSH suite of storms modeled varying forward speeds and the radii of maximum winds to include the large storm events and different forward speeds. This allowed for the development of a truer picture of the storm surge vulnerability in the region. The five categories of hurricane reflect a "worst probable" storm tide limit for hurricanes holding the wind speed constant (consistent with the Saffir Simpson Hurricane Wind Scale) while varying storm parameters include size, forward speed, and angle of approach.

This has led to some confusion regarding evacuation decision-making since hurricane evacuations are based primarily on storm surge vulnerability. The National Oceanic and Atmospheric Administration (NOAA) is working to enhance the analysis and prediction of storm surge. Direct estimates of inundation are being communicated in the NHC's Public Advisories and in the Weather Forecast Office's (WFO) Hurricane Local Statements. NHC's probabilistic storm surge product, which provides the likelihood of a specific range of storm surge values, became operational in 2009, and the NWS Meteorological Development Laboratory is providing experimental, probabilistic storm surge products for 2010. In addition, coastal weather forecast offices will provide experimental Tropical

Cyclone Impacts Graphics in 2010; these include a qualitative graphic on the expected storm surge impacts. Finally, the NWS is exploring the possibility of issuing explicit Storm Surge Warnings which could be implemented in the next couple of years. In all of these efforts, the NWS is working to provide specific and quantitative information to support decision-making at the local level[1]. NOAA continues to emphasize that the hurricane forecasts are not 100% accurate and dependent upon many factors.

Sarasota County Legend

CATEGORY : OVERALL HGT

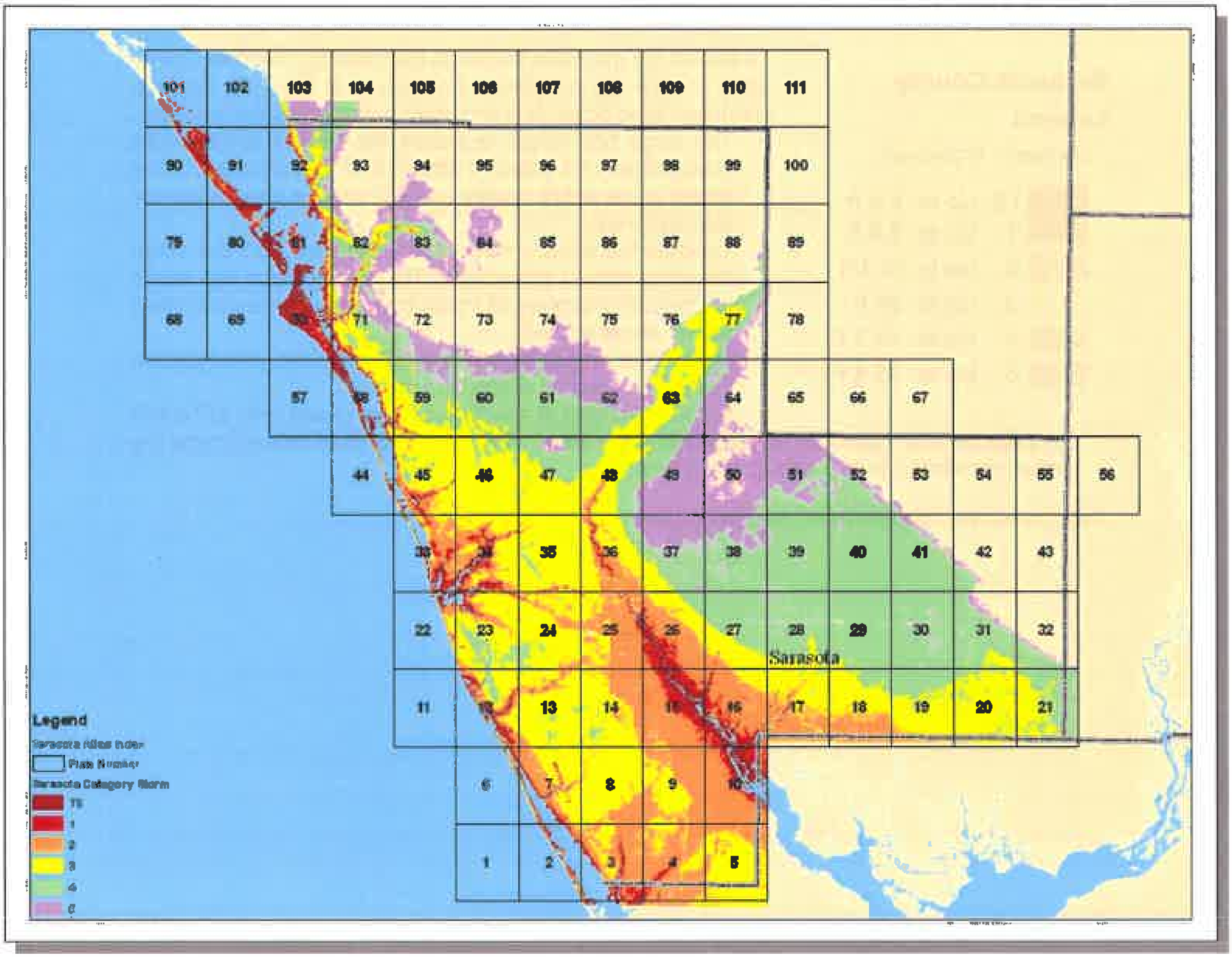
TS:	Up to 5.6 ft
1 :	Up to 6.9 ft
2 :	Up to 15.4 ft
3 :	Up to 26 ft
4 :	Up to 33.2 ft
5 :	Up to 35.4 ft

To the left are the storm tide limits identified for Sarasota County under the five (5) categories of hurricane on the Saffir Simpson Hurricane Wind Scale. It is important to recognize the following:

- The surge tide values represent the highest surge height elevation above a standard datum (NAVD88) predicted by the model in the entire county and will only be appropriate for selected areas.
- Typically the highest surge tide values are NOT the surge heights predicted at the coast. The highest storm tide values are typically experienced inside bays and up rivers and inlets (water above ground).
- Storm Tide ranges by category of storm are presented on Table 3 on page 12 of this document.
- For surge heights at specific locations, please refer to Table 4 on page 18 which provides the expected storm surge elevation at points of reference and the actual inundation (water depth) at that site.

[1]http://www.nhc.noaa.gov/sshws_statement.shtml

Figure 8 Sarasota County Atlas Map Index



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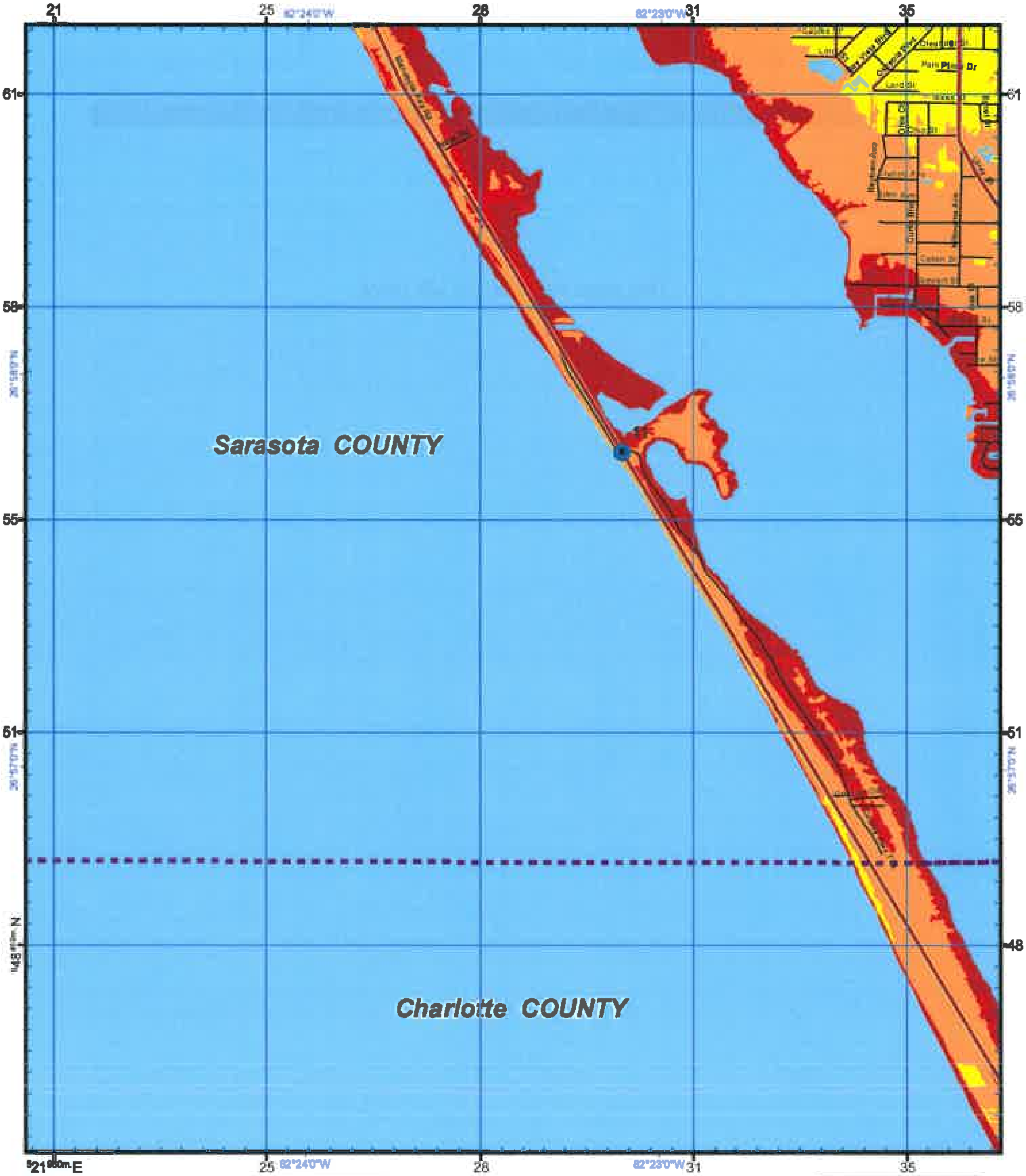

US National Grid
100,000-m Square ID
LK
Grid Zone Designation
17R

Datum = NAD 1983, 1,000-m USNG

GN

Diagram Not to Scale

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

Notes:

Storm Tide Zones

Sarasota County, 2010

Scale - 1:24,000

0 — 2,000 Feet

USNG Page 17R LK 60 80

Map Plate 2

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Legend

- Ref Point
- HOSPITAL
- City Limits
- Evacuation Route
- Existing Water

Cat

- TS
- 1
- 2
- 3
- 4
- 5

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