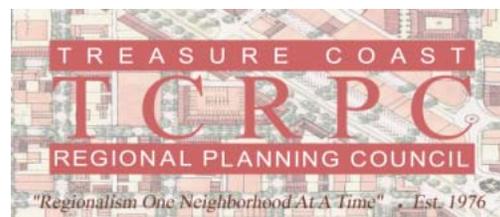




# Treasure Coast Region Statewide Regional Evacuation Study Program

For  
Indian River, Martin, Palm Beach, and St. Lucie Counties

Prepared by:  
Treasure Coast Regional Planning Council  
for the  
Florida Department of Community Affairs  
Division of Emergency Management



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## CREDITS & ACKNOWLEDGEMENTS

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

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The Statewide Regional Evacuation Study Program was completed by regional planning council staff in all eleven regions of the State. Oversight was provided by a small group, in order to facilitate an overall review of the program. Subject matter expertise was provided by section leads for the major portions of the Study. It was these leaders who ensured that the accepted methodology was utilized across the State and that each section was completed in a consistent manner.

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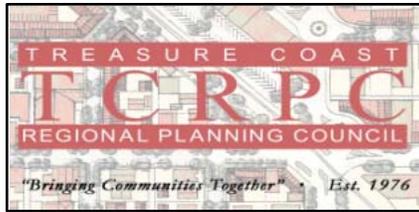
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In addition, sincere thanks for all those staff members, both past and present, of the Florida Division of Emergency Management (FDEM), whose contributions of time, interest and knowledge in all aspects of this project have made it a success.



The Treasure Coast Regional Planning Council (TCRPC), (Region 10), is one of 11 regional planning councils in Florida established under the authority of Chapter 186, Florida Statutes. It has been in operation since 1976 assisting public, private, and institutional sectors in a four-county area to address regional scale issues. The Treasure Coast Regional Planning Council offers services to the four counties of Indian River, Martin, Palm Beach, and St. Lucie.

The Council is comprised of local government elected officials and private citizen representatives within the region.

There are two distinct components of the RPC:

- The RPC’s Governing Board, or Council, a body of representatives that governs the agency.
- The staff, the professionals who provide technical support for Council decision-making and services for local governments throughout the region.

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## Statewide Regional Evacuation Study Program List of Volumes

### **Volume 1 – Technical Data Report**

The *Technical Data Report (TDR)* is the primary document of the Statewide Regional Evacuation Study Program. The TDR contains the summary analysis of all other supporting research, survey data and modeling.

### **Volume 2 – Regional Behavioral Analysis**

The *Regional Behavioral Analysis* was produced by the behavioral specialist Dr. Earl J. Baker, Hazards Management Group. The report includes a summary of the behavioral survey data and analysis which includes the regional behavioral assumptions incorporated in the calculation of evacuation population, evacuation participation rate (transportation analysis) and anticipated shelter demand.

### **Volume 3 – Regional Behavioral Survey Report**

The *Regional Behavioral Survey Report*, produced by Kerr and Downs, Inc., provides the survey data from the more than 2500 behavioral surveys conducted in 2009 as part of the SRES Program.

### **Volume 4 – Evacuation Transportation Analysis**

The *Regional Evacuation Transportation Analysis* is produced by the evacuation transportation team at Wilbur Smith Associates. It includes a summary description of the evacuation transportation model, study methodologies and assumptions and growth management impacts assessments on evacuation. The report includes the evacuation clearance times for the counties and the region for 2010 and 2015 under different planning and operational scenarios.

### **Volume 5 – Evacuation Transportation Supplemental Data Report**

The Supplemental Report, prepared by Wilbur Smith Associates contains the model run inputs and outputs and serves as the source data for the *Evacuation Transportation Analysis*.

### **Volume 6 – Emergency Management Evacuation Tool Kit**

The *Emergency Management Tool Kit* includes locally-selected data pertinent to the county emergency management agency. It is meant to be used as a quick reference guide for operations.

### **Volume 7 – Storm Tide Atlas**

The Storm Tide Atlas provides the storm tide boundaries based on the new SLOSH Analysis including the boundaries of the Coastal High Hazard Area (CHHA). It is provided in several formats including GIS files, PDF files and printed copy. There is one Book for each county in the region which has a potential for storm tide flooding.

### **Volume 8 – Methodology of Evacuation Transportation Modeling for the Statewide Regional Evacuation Study Program, 2010**

This volume provides a detailed description of the methodologies, model assumptions and the Transportation Interface for Modeling Evacuations (TIME) developed and utilized in the Statewide Regional Evacuation Study Program.

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# Technical Data Report

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Glossary of Terms/Definitions

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# Preface

## A. About the Region

The Treasure Coast Region is well known for its beautiful Atlantic beaches and its high quality of life. From Boca Raton in the south, the Region stretches 100 miles north to Sebastian Inlet, and from the Atlantic Ocean west to Lake Okeechobee. While recognized for its upscale communities along the ocean, the Region's population is primarily located in historic mainland cities such as Boca Raton, Delray Beach, West Palm Beach, Riviera Beach, Fort Pierce, and Vero Beach, and in rapidly growing "suburban" communities such as t St. Lucie, Jupiter, Palm Beach Gardens and Sebastian.



Although the Region houses a permanent population of 1.8 million and devotes over one million acres to agricultural uses, it also contains a significant number of important natural resources. Examples include the Loxahatchee National Wildlife Refuge, Lake Okeechobee, Loxahatchee National Wild and Scenic River, the J.W. Corbett Wildlife Management area, Indian River Lagoon, Lake Worth Lagoon, St. Lucie River, Savannas (the largest remaining coastal freshwater wetland on the Atlantic Coast) and St. Johns Marsh.

The Region's economy focuses heavily on tourism, agriculture and construction to meet the needs of a rapidly expanding population is evolving. With the recent establishment of the Scripps Research Institute and the Max Planck Florida Institute on the Jupiter Campus of Florida Atlantic University (FAU), the Torrey Pines Institute for Molecular Studies, Oregon Health & Science University's Vaccine and Gene Therapy Institute and the Mann Research Center establishing facilities in Port St. Lucie, a new teaching hospital at Florida Atlantic University and other related operations, the region is rapidly expanding its economy in the area of biotechnology and life sciences.

At the same time, the greatest number of jobs are still in services, retail trade, and government. The Region attracts tens of thousands of seasonal residents and tourists, primarily during the winter months. While tourism is a leading income producing sector of the Region's economy, the health care and social assistance is rapidly growing.

Although employment in agriculture is declining, the Region maintains a primary role in agricultural production. Palm Beach County ranks first in the state in income from agricultural sales, and is of national prominence in the production of sugar cane and winter vegetables. St. Lucie County is the largest grapefruit producing county in the state, and the Region is Florida's largest producer of citrus.

## B. Background

The first Regional Hurricane Evacuation Study for the Treasure Coast Regional Planning Council was conducted in 1984. The Treasure Coast Region Hurricane Evacuation Study: Technical Data Report was done in 1994, and the Regional Transportation Analysis was updated in 2003.

The Statewide Regional Evacuation Study, which commenced in 2006, accounts for population growth and land use changes that have occurred since the last study in 1999. This study is a first time effort in creating a statewide standardized study and methodology across Florida. In addition to focusing on hurricane hazards and evacuation, the study addresses issues concerning other hazards which may warrant an evacuation, thus affecting the region. Additional hazards addressed are tornadoes, freshwater flooding, wildfires, and nuclear. Using the most up to date shelter and state critical facility, population, transportation and new behavioral survey data, the Statewide Regional Evacuation Study for the Treasure Coast Region will replace the study from 1994 and 2003 and will not only be used in emergency management planning, but transportation and land use planning as well.

## C. Objective and Scope



A major hurricane making landfall reaches beyond county lines and effects areas not directly hit by the storm. Jurisdictions and counties can share one bay or estuary which can experience drastic storm surge. Evacuation routes can bring residents from one town or county into a completely different jurisdiction or state. Therefore, it is important for local governments to communicate across governmental lines in order to plan for the potential impacts neighboring jurisdictions may have on safely evacuating the threatened population.

The primary purpose of this study was to coordinate a statewide, regionally consistent, comprehensive and quantitative evacuation study, primarily for hurricanes. The major components of the study consisted of the following:

- Hazards Analysis - A comprehensive analysis of potential hurricane hazards in the Treasure Coast Region utilizing the Sea, Lake and Overland Surges from Hurricanes (SLOSH) model and new topographic data, Light Detection and Ranging (LiDAR).
- Vulnerability Analysis – Identifies the vulnerable areas and population to hurricane, wind and flooding hazards.
- Demographic and Land Use Analysis – Describes population and demographics for the region and counties using current socioeconomic data for 2006, 2010 and 2015.
- Behavioral Analysis – A survey and analysis to determine how vulnerable evacuees may respond to a hurricane threat as well as other hazards.

- Shelter Analysis – A quantitative analysis of shelter availability, deficit, and special needs (medical and pets).
- Transportation Analysis – Development of hurricane evacuation clearance times for each county and storm scenario associated with the movement of the current and projected vulnerable population from specific evacuation areas to specific evacuation destinations for a Year 2006 base year and projected for years 2010 and 2015.

Objectives of the new study include:

- Ensure consistency in evacuating population and routes with adjacent regions.
- Update and standardize the DEM facilities database to provide all counties with consistent, accurate and standardized emergency management data.
- Establish standardized analysis and methodology for use in deriving impacts and determining mitigation needs as required in F.S. 163.3178.

As a result of this study, an abbreviated model called "TIME" was developed that can be used as a planning tool by local emergency management officials, city and county planning staff, state emergency preparedness officials, and others to recalculate clearance times based upon land use and transportation system changes.

The *Treasure Coast Statewide Regional Evacuation Study* is not intended to serve as the detailed operations plan for each unit of local government in the region. Rather, it is intended to provide the data needed to develop local, regional and state plans. The implementation of any evacuation plan is a local function. Therefore, the actual deployment and assignment of manpower and equipment to carry out the evacuation is best planned for at the local level. The data provided by this report will enable the local governments of the region to update specific operating procedures for the relocation of their vulnerable populations and recovery to recover from a hurricane strike and other hazards with local and regional impacts.