

Appendix A: Risk & Vulnerability Analyses Data

The risk and vulnerability data presented in this Appendix are submitted in partial fulfillment of the following FEMA requirements:

RISK ASSESSMENT: §201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Requirement §201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

Requirement §201.6(c)(2)(i): [The risk assessment **shall** include a] description of the ... location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.

Requirement §201.6(c)(2)(ii): [The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.

Additional information relating to these requirements is contained in Section 3, in the Palm Beach County Hazard Environment, in Appendix C, and in the new hazard write-up sections of the Plan.

This Appendix presents the results of updated risk, vulnerability and impact analyses for the original hazards identified in the 2004 Plan. The summary tables for these analyses are indicated below:

Table A-1	Relative Vulnerability to hazards by local government
Table A-2	Relative Probability of hazards by local government
Table A-3	Data Sources used for the Palm Beach County Hazard Vulnerability and Risk Assessment
Table A-4	Palm Beach County Hazard Vulnerability and Risk Assessments by Jurisdiction
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Table A-1: Relative Vulnerability to Hazards, by Local Government

Hazard Category	MUNICIPALITIES																																							
	Unincorporated County	Atlantis, City of	Belle Glade, City of	Boca Raton, City of	Boynton Beach, City of	Briny Breezes, Town of	Cloud Lake, Town of	Delray Beach, City of	Glen Ridge, Town of	Golf, Village of	Greenacres, City of	Gulf Stream, Town of	Haverhill, Town of	Highland Beach, Town of	Hypoluxo, Town of	Juno Beach, Town of	Jupiter, Town of	Jupiter Inlet Colony, Town of	Lake Clarke Shores, Town of	Lake Park, Town of	Lake Worth, City of	Lantana, Town of	Loxahatchee Groves	Manalapan, Town of	Mangonia Park, Town of	North Palm Beach, Village of	Ocean Ridge, Town of	Pahokee, City of	Palm Beach, Town of	Palm Beach Gardens, City of	Palm Beach Shores, Town of	Palm Springs, Village of	Riviera Beach, City of	Royal Palm Beach, Village of	South Bay, City of	South Palm Beach, City of	Tequesta, Village of	Wellington, Village of	West Palm Beach, City of	
NATURAL HAZARDS																																								
Flood	H	M	M	H	H	M	M	H	M	M	M	M	M	M	L	M	H	M	M	H	H	H	H	L	M	H	L	M	H	H	M	M	H	L	M	M	M	H	H	
Hurricane/tropical storm	H	M	H	H	H	H	M	H	M	M	M	H	M	H	M	H	H	H	M	H	H	H	H	M	M	H	H	H	H	H	M	H	M	H	M	H	H	M	M	H
Tornado	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Severe thunderstorm and lightning	H	M	M	M	M	H	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	H	M	M	M	M	M	H	M	M	M	M	M	H	M	M	M	M	H
Drought	H	L	H	M	M	L	L	M	H	H	L	M	L	H	L	M	M	M	L	L	L	L	H	L	L	M	L	H	M	M	L	M	L	L	H	L	L	H	M	
Temperature extremes	M	L	L	L	M	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	H	L	L	L	M	L	L	L	L	L	H	L	M	M	
Agricultural pests and disease	H	V	H	L	L	L	V	L	V	V	L	L	V	V	V	L	M	V	V	V	V	V	M	V	V	L	V	H	L	M	V	V	V	V	H	L	V	M	L	
Wildfire/urban interface zone	H	L	H	M	L	V	L	L	M	M	L	L	L	V	V	L	M	V	V	V	L	L	M	V	V	L	V	H	V	M	V	V	L	M	H	V	V	M	M	
Muck fire	H	V	H	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	L	V	V	V	V	H	V	V	V	V	V	L	H	V	V	L	L	
Soil/beach erosion	M	L	M	M	M	M	V	M	H	H	V	M	V	H	V	H	H	V	L	V	M	M	L	V	M	M	H	V	H	M	M	L	H	V	V	H	M	V	V	
Seismic hazards (sink holes/soils failure)	L	V	V	V	M	V	V	V	M	M	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
Tsunamis	L	M	V	H	H	H	M	H	M	M	L	M	L	H	H	H	H	H	H	H	H	H	V	H	L	H	H	V	H	M	H	L	L	V	V	H	V	V	L	
TECHNOLOGICAL HAZARDS																																								
Hazardous materials accident	M	L	M	M	M	V	L	H	H	H	M	V	M	V	H	L	H	V	M	M	M	M	M	H	M	M	V	L	V	M	V	M	H	L	M	L	V	M	H	

Table A-2: Relative Probability of Hazards, by Local Government

Hazard Category	MUNICIPALITIES																																								
	Unincorporated County	Atlantis, City of	Belle Glade, City of	Boca Raton, City of	Boynton Beach, City of	Briny Breezes, Town of	Cloud Lake, Town of	Delray Beach, City of	Glen Ridge, Town of	Golf, Village of	Greenacres, City of	Gulf Stream, Town of	Haverhill, Town of	Highland Beach, Town of	Hypoluxo, Town of	Juno Beach, Town of	Jupiter, Town of	Jupiter Inlet Colony, Town of	Lake Clarke Shores, Town of	Lake Park, Town of	Lake Worth, City of	Lantana, Town of	Loxahatchee Groves	Manalapan, Town of	Mangonia Park, Town of	North Palm Beach, Village of	Ocean Ridge, Town of	Pahokee, City of	Palm Beach, Town of	Palm Beach Gardens, City of	Palm Beach Shores, Town of	Palm Springs, Village of	Riviera Beach, City of	Royal Palm Beach, Village of	South Bay, City of	South Palm Beach, City of	Tequesta, Village of	Wellington, Village of	West Palm Beach, City of		
NATURAL HAZARDS																																									
Flood	H	M	M	H	H	M	M	H	M	M	M	H	H	H	H	H	H	M	H	H	M	M	H	M	H	H	M	H	H	H	M	H	L	M	H	M	M	H			
Hurricane/tropical storm	H	M	M	H	H	H	M	H	M	M	M	H	M	H	H	H	H	M	H	H	M	H	H	M	H	H	H	M	H	M	H	M	H	M	M	H	M	M	H		
Tornado	M	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L	M	L	L	L	L	L	M	L	M	M	M	L	L	L	M	M	M	L	M	H		
Severe thunderstorm/lightning	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	M	H	H
Drought	H	L	H	L	M	L	L	M	L	L	L	L	L	L	L	M	L	L	L	L	L	L	M	L	L	L	L	L	H	M	M	L	L	L	L	H	L	L	H	M	
Temperature extremes	M	L	M	L	L	V	L	L	L	L	L	V	L	V	V	V	H	V	L	V	V	L	M	V	L	L	V	M	L	L	V	L	L	L	M	L	L	M	M		
Agricultural pests and disease	H	V	H	L	M	V	V	M	V	V	L	V	L	V	V	M	V	L	V	V	L	M	V	L	V	V	H	L	L	V	L	L	V	H	L	V	M	L			
Wildfire/urban interface zone	H	V	H	L	M	V	V	L	V	V	L	V	L	V	V	M	V	L	V	L	L	H	V	L	L	V	H	V	L	V	V	L	M	H	V	V	M	M			
Muck fire	H	V	H	V	L	V	V	L	V	V	V	V	V	V	V	V	V	V	V	V	V	V	L	V	V	V	V	H	V	V	V	L	L	H	V	V	L	L			
Soil/beach erosion	M	V	L	M	M	M	V	M	V	V	V	M	V	M	M	H	H	H	V	V	M	V	V	H	V	M	H	L	H	V	H	V	H	V	L	H	M	V	L		
Seismic hazards (sink holes/soils failure)	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	L	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	
Tsunamis	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	L	
TECHNOLOGICAL HAZARDS																																									
Hazardous materials accident	M	L	L	M	M	V	V	L	L	V	V	V	V	V	V	L	V	V	L	L	V	L	V	L	M	V	M	V	L	V	L	M	L	M	L	V	M	H			

Table A-3: Data sources used for the Palm Beach County Hazard Vulnerability and Risk Assessment

Natural Hazards - Hazards resulting from weather conditions, geologic conditions, or disruption of natural systems	
Hurricanes and Severe Storms (Includes Tropical Storms and Northeasters)	
Source	Data Type
Natural Hazards Research Center	Historical and current data on all types of natural hazards
Atlantic Hurricane Tracking Database	Historical data on hurricane tracks and intensities
NOAA Tropical Cyclone Database	Historical hurricane data
Colorado State University (Dr. Gray on-line site)	Hurricane probability
NASA Natural Disaster Reference Database	Historical data on all types of natural hazards
National Weather Service	Weather statistics
National Climate Data Center - On-Line Data Base	Weather statistics
Atlantic Ocean and Meteorological Laboratory, Hurricane Research Division	Hurricane forecast models
Federal Emergency Management Agency	Emergency management procedures
Tropical Storm Watch Database	Tropical storm data worldwide
Flood Insurance Rate Maps and Community Status Book	Areas vulnerable to potential rising water
Storm Surge Atlas for Palm Beach County (SLOSH model)	Areas vulnerable to storm surge flooding based on the SLOSH model
U. S. Geological Survey	Base maps and historical flood plane and elevation data
Florida State University (Meteorology Department)	Data and expertise concerning all Florida natural hazards
Florida Atlantic University	Data and expertise concerning all Florida natural hazards
National Severe Storms Laboratory	Storm effects data
Independent Insurance Agents of America (Natural Disaster Risk Database)	Probability data and estimated exposure Building code recommendations to reduce exposure
Florida Department of Community Affairs, Division of Emergency Management	<i>The Arbiter of Storms (TAOS)</i> @ maps and computer model projections as well as technical support and data

Florida Department of Environmental Protection	Environmental risk, exposure to hurricanes, environmental effects and hazards
Florida Game and Fresh Water Fish Commission	Hurricane effects of fish and wildlife
Florida Department of Corrections	Prison statistics and emergency management plans
Florida Department of Education	School and Board of Education emergency guidelines
South Florida Water Management District	Climatic and weather data, hydrologic data, water release schedules, and emergency management plans
Treasure Coast Regional Planning Council	Building codes and impacts of proposed statewide unified building code
Palm Beach County Airports Department	Weather data and hurricane protection procedures
Palm Beach County Comprehensive Growth Management Plan	Land management, zoning, and hurricane mitigation related ordinances
Palm Beach County Planning, Zoning, and Building Department	Building codes and zoning ordinances
Palm Beach County Property Appraiser	Tax assessor records for use in determining dollar value of exposed property
Palm Beach County Automated Information Management	Map products and GIS data
Palm Beach County Engineering and Public Works Department	Engineering, drainage, road elevations, and storm water data
Palm Beach County Environmental Resources Management Department	Environmental and beach erosion data
Palm Beach County Fire and Rescue Department	Critical facilities locations and emergency management plans
Palm Beach County Health Department	Critical facilities and health risk data
Palm Beach County School Board	Schools, shelter, and critical facilities data and emergency management plans
Palm Beach County Law Library	Building codes and ordinances
Palm Beach County Parks & Recreation Department	Environmental and recreational data and potential impacts data
Palm Beach County Public Safety Department Division of Emergency Management	Emergency management plans, historical data, critical facilities, special needs, and general guidance
Palm Beach County Division of Criminal Justice	County prison population and emergency management plans

Division of Emergency Medical Services	Emergency management plans
Division of Animal Regulation	Animal protection, regulation, and control plans following natural disasters (hurricanes)
Palm Beach County Sheriff Department	Emergency management plans and law enforcement procedures following a natural disaster
Palm Beach County Tourist Development Council	Potential economic loss and specific areas of economic vulnerability
Palm Beach County Water Utilities	Critical facilities locations and emergency management procedures
Palm Beach County has a total of 38 municipalities and all are participating in a unified LMS process with the County. Various departments corresponding to The Property Appraisers Office; Public Works; Public Safety; Health Department; Building, Planning, and Zoning; and Fire and Rescue will be contacted within each municipality.	All municipalities will be contacted to determine individual vulnerabilities, populations at risk, and dollar values of exposure. Emergency plans building codes, storm water management engineering, and police and fire emergency management plans will be reviewed
Palm Beach County Red Cross	Historical data, shelter data, and emergency management plans
Hospitals, Clinics, and Nursing Facilities	Critical facilities locations, special equipment, special needs, and evacuation plans
Florida Power and Light and Other Municipal/Private Power Companies (Lake Worth Utilities, etc.)	Power grid vulnerabilities, structure, and emergency management plans
Home Depot/Lowes	Emergency management supply plans for preparation and recovery
Publix/Winn Dixie	Emergency food supply plans
Southern Bell	Critical facilities locations, and emergency communication maintenance plans
AT&T Wireless Services	Critical facilities locations, and emergency communication maintenance plans
U. S. Cellular Wireless Communications	Critical facilities locations, and emergency communication maintenance plans
The Palm Beach Post	Historical hurricane data
Local Radio and Television Stations	Critical facilities location and emergency management plans (operating plans) during natural disaster
Tornadoes and Thunderstorms	
Natural Hazards Research Center	Historical and current data on all types of natural hazards

The Tornado Project On-Line	Historical data
Optical Transient Detector Data Base	Lightning associated with thunder storms (lightning statistics)
NASA Natural Disaster Reference Database	Historical data all types of natural hazards
National Weather Service	Weather statistics
National Climate Data Center - On-Line Data Base	Weather statistics
NOAA Wind Related Fatalities Data Base	Wind related fatalities
NOAA Tropical Prediction Center	Storm predictions
Florida State University	Data and expertise concerning all Florida natural hazards
Florida Atlantic University	Data and expertise concerning all Florida natural hazards
National Severe Storms Laboratory	Storm and tornado statistics and storm effects
Independent Insurance Agents of America (Natural Disaster Risk Database)	Financial data concerning losses resulting from thunder storms and tornadoes
Florida Department of Community Affairs, Division of Emergency Management	Incident reports and historical data
South Florida Water Management District	Climatic data
Palm Beach County Airports Department	Weather data and protection plans and procedures during thunderstorms and tornadoes
Palm Beach County Fire and Rescue Department	Thunderstorm and tornado fire and fatality data
Palm Beach County Public Safety Department Division of Emergency Management	Thunderstorm and tornado historical data
Palm Beach County Division of Emergency Medical Services	Historical data on thunderstorm and tornado related medical emergencies
Palm Beach County has a total of 38 municipalities and all are participating in a unified LMS process with the County. Various departments corresponding to Public Safety; Health Department; and Fire and Rescue will be contacted within each municipality.	Historical data on impacts of thunderstorms and tornadoes at the local level
Palm Beach County Red Cross	Historical data on impacts
Florida Power and Light and Other Municipal/Private Power Companies (Lake Worth Utilities, etc.)	Historical data on impacts to the power grid
Southern Bell	Historical data on communication impacts
AT&T Wireless Services	Historical data on communications disruptions

U. S. Cellular Wireless Communications	Historical data on communications disruptions
The Palm Beach Post	Historical data general
Local Radio and Television Stations	Historical data on losses and possible future losses
Lightning/electromagnetic disturbances (normally included under thunderstorms but along the Gold Coast we believe this hazard is significant enough to be considered alone)	
Natural Hazards Research Center	Lightning research and statistics
NASA Natural Disaster Reference Database	Lightning statistics
National Weather Service	Lightning strike data
National Climate Data Center - On-Line Data Base	Lightning strike data
NOAA Lightning Related Fatalities Data Base	Lightning fatalities
National Lightning Safety Institute (NLSI)	Lightning research and protection measures
Florida State University	Data and expertise concerning all natural hazards
Florida Atlantic University	Data and expertise concerning all natural hazards
University of Florida Lightning Research Laboratory	Current research on lightning causes and effects
National Severe Storms Laboratory	Lightning statistics
Independent Insurance Agents of America (Natural Disaster Risk Database)	Financial losses attributable to lightning and related electromagnetic discharges
Florida Department of Community Affairs, Division of Emergency Management	Data on major fires caused by lightning
Florida Fire Chief's Association	Data on fires caused by lightning
South Florida Water Management District	Data on lightning related losses
Palm Beach County Airports Department	Lightning data and protective measures
Palm Beach County Fire and Rescue Department	Lightning related fires and injuries
Palm Beach County Parks & Recreation Department	Data on lightning related losses
Palm Beach County Public Safety Department Division of Emergency Management	Lightning protection procedures
Division of Emergency Medical Services	Lightning related injuries
Palm Beach County Sheriff Department	Data on communication disruption
Florida Power and Light	Financial losses and power grid disruptions due to lightning
Southern Bell	Financial losses and communications disruptions due to lightning

AT&T Wireless Services	Financial losses and communications disruptions due to lightning
U. S. Cellular Wireless Communications	Financial losses and communications disruptions due to lightning
The Palm Beach Post	Historical data on significant lightning related events
Coastal and Riverine Flooding	
Association of State Floodplain Managers	Floodplain data, flooding statistics, and mitigation approaches
Natural Hazards Research Center	Technical data on all natural hazards
NOAA Flood Related Fatalities Data Base	Flood related fatalities
NOAA Hydrologic Information Center	Hydrologic data
NOAA Tropical Cyclone Database	Rainfall associated with storm type events
NASA Natural Disaster Reference Database	Specific flooding and mitigation data nationwide
NASA Flood Hazard Research Center	Flood research and mitigation approaches
National Weather Service	Climatic data
National Climate Data Center - On-Line Data Base	Weather/rain fall historical data
National Flood Proofing Committee Data Base	Mitigation procedures
National Association of Flood and Storm Water Management Agencies	Storm water management data and procedures
Atlantic Ocean and Meteorological Laboratory, Hurricane Research Division	Historical meteorological data
Federal Emergency Management Authority	Historical flooding data
Tropical Storm Watch Database	Rainfall events and flooding data
Flood Insurance Rate Maps and Community Status Book	Identification of properties within the flood plane
U. S. Geological Survey	Topographic maps
U. S. Army Corps of Engineers	Historical flooding data and flood prevention projects
Dartmouth Flood Observatory	Flooding research
Earth Satellite Corporation (EarthSat) Floodwatch Data Base	Historical flooding data
Florida State University	Data and expertise concerning all Florida natural hazards
Florida Atlantic University	Data and expertise concerning all Florida natural hazards

National Severe Storms Laboratory	Rainfall data and related flooding events
Independent Insurance Agents of America (Natural Disaster Risk Database)	Property and financial losses as a result of flooding
Florida Department of Community Affairs, Division of Emergency Management	Historical data on flooding events in Palm Beach County
Florida Association of Floodplain Managers	Flooding data specific to Florida
Florida Department of Environmental Protection	Environmental parameters and risk associated with flooding
Florida Game and Fresh Water Fish Commission	Wildlife resources impacted by flooding
South Florida Water Management District	Water management, hydrology, and flood prevention procedures
Palm Beach County Planning, Zoning, and Building Department	Zoning ordinances and building codes that affect flood protection
Palm Beach County Property Appraiser	Property value within flood zones
Palm Beach County Automated Information Management	Historical flooding and critical facilities in flood zones
Palm Beach County Engineering and Public Works Department	Highway and storm water management procedures
Palm Beach County Environmental Resources Management Department	Water resources and flooding data
Palm Beach County Fire and Rescue Department	Flooding associated fires and injuries
Palm Beach County Health Department	Disease risk and contamination potential associated with flooding
Palm Beach County Parks & Recreation Department	Recreational resources at risk due to flooding
Palm Beach County Public Safety Department Division of Emergency Management	Historical flooding data and emergency management procedures
Division of Emergency Medical Services	Flooding related injuries
Division of Animal Regulation	Animal control problems associated with flooding
Palm Beach County Sheriff Department	Emergency management procedures associated with flooding
Palm Beach County Water Utilities	Critical facilities at risk due to flooding and potential impacts
Municipal offices to be contacted in participating cities: The Property Appraiser's Office; Public Works; Public Safety; Health Department; Building, Planning, and Zoning; and Fire and Rescue	All municipalities will be contacted to determine individual vulnerabilities, populations at risk, and dollar values of exposure. Emergency plans building codes, storm water management engineering, and police and fire emergency management plans will be reviewed

Independent Drainage Districts	All independent drainage districts will be contacted for historical data and identified areas at risk
Palm Beach County Red Cross	Historical flooding data and repetitively damaged structures data
Florida Power and Light	Flooding emergency plans and critical facilities at risk
The Palm Beach Post	Historical data on flooding incidents
Freezing Temperatures	
National Weather Service	Historical records on freezing temperatures
National Climate Data Center - On-Line Data Base	Historical records on freezing temperatures
U. S. Department of Agriculture - County Extension Agents	Local agricultural data on frequency, impacts, and financial losses due to freezing temperatures
Florida Citrus Commission	Frequency and amount of financial losses to citrus crops due to freezing temperatures and long term industry impacts
Florida Department of Citrus	Frequency and amount of financial losses to citrus crops due to freezing temperatures and current mitigation strategies
Florida Department of Agriculture & Consumer Services	Frequency and amount of financial losses to all agricultural business as a result of freezing temperatures
Florida Farm Bureau	Frequency and amount of financial losses to all agricultural business as a result of freezing temperatures and current mitigation and risk reduction strategies
Florida State University	Agricultural research and new mitigative strategies to reduce freeze impacts
Florida Atlantic University	Freeze impacts to aquaculture industry
University of Florida	Agricultural research and new mitigative strategies to reduce freeze impacts
University of Miami	Agricultural research and new mitigative strategies to reduce freeze impacts
Florida Department of Environmental Protection	Environments at risk from freezing and environmental consequences of current agricultural mitigation strategies
South Florida Water Management District	Climate records and water demands associated with freeze mitigation
Palm Beach County Department of Agriculture	Historical impact and financial losses resulting from freezing temperatures in Palm Beach County

Palm Beach County Citrus and Farming Interest	Historical freeze losses and current mitigation strategies
Palm Beach County Red Cross	Impacts to poor and homeless due to freezing temperatures
Wildfires (Urban interface wildfires and muck fires)	
National Weather Service	Climate data/drought predictions
National Interagency Coordination Center Reports	Wildfire reports
National Climate Data Center - On-Line Data Base	Climate data
U. S. Forest Service	Wildfire reports and preventative measures
U. S. Department of Agriculture - County Extension Agents	Controlled burning/muck deposits
U. S. Geological Survey	Soil types/muck deposits
Florida Geological Society	Soil types/muck deposits
The Wildfire Assessment System	Wildfire statistics and containment procedures
Florida Forest Protection Bureau	Florida specific wildfire statistics and current preventative practices
Florida Department of Environmental Protection	Natural resources at risk and protective measures
Florida Fire Chief's Association	Florida specific wildfire statistics, fire fighting technology, and potential mitigative measures for Florida communities
South Florida Water Management District	Water resources and right of way management practices
Palm Beach County Department of Agriculture	Land use patterns in Palm Beach County to establish areas at risk
Palm Beach County Planning Zoning & Building Department	Land use patterns in Palm Beach County to establish areas at risk
Palm Beach County Parks & Recreation Department	Land use patterns in Palm Beach County to establish areas at risk
Palm Beach County Fire Rescue Department - Fire Prevention Bureau	Land use patterns in Palm Beach County to establish areas at risk and current or in-place protective measures
Wildfire Magazine Data Base	Wildfire statistics
Palm Beach Post	Historical data on Palm Beach County wildfires/muck fires
Drought and High Temperatures	
National Weather Service	Climate data and drought predictions

National Climate Data Center - On-Line Data Base	Climate data
U.S.G.S. Historical and Real Time Data on Water Resources of South Florida	Water resources
U. S. Department of Agriculture - County Extension Agents	Historical data on droughts and the economic impacts to local agriculture
Florida Citrus Commission	Economic losses to the citrus industry from droughts
Florida Department of Citrus	Economic losses to the citrus industry from droughts and current irrigation technology
Florida Forest Protection Bureau	Drought statistics
Florida Department of Environmental Protection	Environmental impacts of droughts to natural ecosystems
Florida Department of Agriculture & Consumer Services	Agricultural losses due to droughts and current irrigation technology
South Florida Water Management District	Water allocations during drought conditions
Palm Beach County Department of Agriculture	County specific economic losses from drought and current economic vulnerability
Palm Beach County Parks & Recreation Department	Recreational resources impacted by droughts
Palm Beach County Water Utilities	Impacts from droughts of the potable water supplies and impacts in urban areas Water rationing plans
Municipal water utilities	Impacts of and water allotment plans during times of droughts in cities Water rationing plans
Erosion (Beach and Waterways)	
U. S. Army Corps of Engineers	Palm Beach County beach erosion statistics and beach restoration projects
Florida Inland Navigational District	Maintenance records for the Intracoastal Waterway and other Palm Beach County navigable waters
South Florida Water Management District	Canal maintenance and erosion
Palm Beach County Environmental Resources Department	Environmental problems associated with erosion control and natural resources threatened by erosion
Palm Beach County Engineering and Public Works Department	Current erosion prevention measures
Palm Beach County Parks & Recreation Department	Current erosion prevention measures
Palm Beach County Coastal Municipalities	Current erosion prevention measures

Jupiter Inlet District	Information on beach erosion in and around Jupiter Inlet
Port of Palm Beach	Information on beach erosion in and around channel and inlet
Agricultural Pest and Diseases	
U. S. Forest Service	Forest diseases and current problem/preventative measures
U. S. Dept. of Agriculture - County Extension Agents	Local agricultural pest and potential exotic treats
U. S. Customs	Current programs to prevent introduction of agricultural pest and diseases
Florida Farm Bureau	Economic losses due to agricultural pest and diseases
Florida Citrus Commission	Citrus losses due to agricultural pest and diseases
Florida Forest Protection Bureau	Forest diseases and current problem/preventative measures
Florida State University	Agricultural research and pest control
Florida Atlantic University	Agricultural research and pest control
University of Florida	Agricultural research and pest control
University of Miami	Agricultural research and pest control
Florida Department of Environmental Protection	Environmental resources at risk and environmental consequences of current or proposed control measures
Florida Department of Agriculture & Consumer Services	Economic losses from agricultural pest and diseases and current control technology
Palm Beach County Department of Agriculture	Economic losses and current control programs
Palm Beach County Parks & Recreation Department	Pest control programs on public lands
Seismic Hazards (Sinkholes, Tidal Waves, and Other Geologic Hazards)	
U. S. Geological Survey	Geologic structure and seismic risk
Florida Geological Society	Geologic structure and soil characteristics
Technological/Manmade Hazards - Hazards due to accidents involving man-made facilities or functions.	
Radiological Hazards	
U. S. Nuclear Regulatory Commission	Nuclear power plant regulation, accident statistics, and emergency procedures
Federal Emergency Management Agency	Nuclear power plant accident statistics, and emergency procedures

National Emergency Management Agency	Nuclear power plant and radiological emergency management procedures
Florida Division of Emergency Management	Nuclear power plant and radiological emergency management procedures
Florida Emergency Preparedness Association	Radiological emergency management procedures
State & Local Emergency Data Users Group Data Base	Radiological accident management database
Florida Power and Light Emergency Plan	Industry emergency management plans
Palm Beach County Division of Emergency Management Comprehensive Emergency Management Plan (CEMP)	Local radiological emergency management plan
Hospital Plans - Both Radiological Materials Disposal (Hazardous Waste) and Mass Radiation Casualties or Nuclear Accident Plans	Local radiological emergency plans and safeguards
Hazardous Material	
Federal Emergency Management Agency	Hazardous material emergency management guideline
National Transportation Safety Board	Hazardous material transport regulation, spill cleanup procedures, and spill statistics
Occupational Safety and Health Agency	Hazardous material handling requirements
U. S. Environmental Protection Agency	List of hazardous materials
Hazardous Chemicals Database (On-line)	Hazardous materials data
Material Safety Data Sheets (On-line)	Specific chemical facts
State Emergency Response Commission (SERC) Emergency Plan for Hazardous Materials	Spill response procedures
Florida District and Local Emergency Planning Committee (LEPC) Emergency Plan for Hazardous Materials	Local sources and emergency management plans (vulnerabilities)
Facilities Database for Users of Extremely Hazardous Substances (EHS) and Hazardous Materials	Geo-referenced local database of users
Florida Division of Emergency Management	Methodology for handling hazardous material releases
Florida Emergency Preparedness Association	Methodology for handling hazardous material releases
Florida Department of Transportation	Highway spill data for hazardous material spill data Methodology for handling hazardous material releases
State & Local Emergency Data Users Group Database	Spill and release of hazardous materials statistics

Florida Fire Chiefs Association	Hazardous material emergency plans and containment procedures Spill/release statistics
Palm Beach County Division of Emergency Management	Methodology for handling hazardous material releases
Palm Beach County Fire Rescue Department	Methodology for handling hazardous material releases
Municipal Fire and Police Departments	Methodology for handling hazardous material releases
Palm Beach County Health Department	Methodology for handling hazardous material releases and emergency treatment procedures
Identified Users of EHS Emergency Plans	Industry control and emergency management plans for hazardous material
Local Gasoline and Natural Gas Companies	Location of critical facilities/infrastructure elements
Transportation System Accidents	
Federal Aeronautical Administration	Aircraft accident statistics and airport safety procedures
National Transportation Safety Board	Aircraft accident statistics
U. S. Coast Guard	Boating/shipping accidents (including oil and hazardous materials releases) and spill containment procedures
Florida Department of Transportation - Motor Carrier Compliance Division	Truck accidents (including oil and hazardous materials releases)
Florida Highway Patrol	Truck accidents (including oil and hazardous materials releases)
Florida Marine Patrol	Boating/shipping accidents (including oil and hazardous materials releases) and spill containment procedures
Palm Beach County Airports Department	Aircraft accident statistics and airport safety procedures
Palm Beach International Airport	Aircraft accident statistics and airport safety procedures
Port of Palm Beach Port Authority	Port management, accident statistics, and emergency management procedures
Palm Beach County Sheriff's Department - Marine Unit and Environmental Crimes Unit	Boating/shipping accidents (including oil and hazardous materials releases), spill containment procedures, and environmental crimes statistics
Florida East Coast Railway	Railway accident statistics (including oil and hazardous materials releases), and safety procedures

CSX Rail	Railway accident statistics (including oil and hazardous materials releases), and safety procedures
Palm Beach County Fire Rescue Department and Emergency Medical Services	Accident statistics involving injuries in Palm Beach County
Municipal police and fire departments	Accident statistics involving injuries in the cities
Power/Communications/Computer Gird System Failures	
Florida Power and Light Emergency Management Plans and Historical Database	Historical data and emergency management plans
Bell South Emergency Management Plan and Historical Database	Historical data and emergency management plans
Cellular and Satellite Communication Companies	Historical data and emergency management plans
The Banking Industry (Large Area Network - LANs Protection and Emergency Restoration Plans, as well as historical data on system failures)	Historical data and emergency management plans
Societal Hazards - Hazards arising from disruptions in normal government and community function.	
Civil Disturbance	
Federal Bureau of Investigation Database	Historical data
National Security Council Database	Historical data and risk analysis
Drug Enforcement Agency Database	Historical data
Immigration and Naturalization Service Database	Historical data
U. S. Customs Service	Historical data
U. S. Census Database	Population demographics
Florida Department of Law Enforcement	Historical data and situation plans
Florida Department of Health Education and Welfare	Historical data
Palm Beach County Sheriff's Department	Historical data and situation plans
Municipal Police Departments	Historical data and situation plans
Palm Beach County Fire Rescue Department	Historical data and situation plans
Palm Beach County Public Safety Department, Emergency Medical Services Division	Historical data and situation plans
Terrorism and Sabotage	
Federal Bureau of Investigation Database	Historical data, situation plans, and risk analysis
National Security Council Database	Historical data, situation plans, and risk analysis
Drug Enforcement Agency Database	Historical data

Immigration and Naturalization Service Database	Historical data and preventative measures
U. S. Census Database	Population demographics
Florida Department of Law Enforcement	Historical data, situation plans, and risk analysis
Florida Department of Health Education and Welfare	Population demographics
Palm Beach County Sheriff Department	Historical data, situation plans, and risk analysis
Municipal Police Departments	Historical data, situation plans, and risk analysis
Palm Beach County Fire Rescue Department	Historical data, situation plans, and risk analysis
Palm Beach County Public Safety Department, Emergency Medical Services Division	Historical data on injuries
American Society for Industrial Security	Risk analysis techniques and database
Mass Immigration	
U. S. Coast Guard	Historical data and situation plans
Immigration and Naturalization Service	Historical data, situation plans, and risk analysis
Florida Marine Patrol	Situation plans and interagency coordination
Florida Department of Law Enforcement	Historical data, situation plans, risk analysis, and interagency coordination
Florida Department of Health, Education and Welfare	Population demographics
Palm Beach County Sheriff Department	Historical data, situation plans, risk analysis, and interagency coordination
Municipal Police Departments	Historical data, situation plans, risk analysis, and interagency coordination
Palm Beach County Fire Rescue Department	Situation plans and interagency coordination
Palm Beach County Public Safety Department, Emergency Medical Services Division	Historical data and medical risk analysis
Other Hazards - Crime, Drug Abuse, Economic Crises, Communicable Diseases	
Federal Bureau of Investigation Database	Historical data
National Security Council Database	Historical data
Drug Enforcement Agency Database	Historical data
Immigration and Naturalization Service Database	Historical data
U. S. Census Database	Population demographics
U. S. Public Health Service - Center for Communicable Disease	Disease risk
Florida Department of Law Enforcement	Historical data
Florida Department of Health Education and Welfare	Historical data

Florida Department of Labor	Historical data
Palm Beach County Sheriff Department	Historical data
Municipal Police Departments	Historical data
Palm Beach County Fire Rescue Department	Historical data
Palm Beach County Public Safety Department, Emergency Medical Services Division	Historical data
Palm Beach County Health Department	Historical data

Appendix A- 4: Risk Assessment Hazard Evaluation for Palm Beach County

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
NATURAL HAZARDS					
Flood	Flooding significant enough to damage property has occurred 4 times in the last decade and twice in the last 12 months	Damages resulting from the 1999 flooding totaled \$7,823,330 Countywide vulnerability is high, but area specific	Property damage along the coast of Palm Beach County occurs most often in the late winter or early spring and is associated with winter storms and northeasters. Flooding in the inland portions of the county occurs most often in the fall and is often associated with tropical depressions and tropical storms. Incidences of flooding in specific areas of Palm Beach County seem to be on the increase. Flooding exposure for Palm Beach County based on the tropical storm flooding data from the TAOS database is: \$373,723,710	Frequency	HIGH
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	HIGH
Hurricane/Tropical storm					
Tropical Storm	Pass within 100 miles of Palm Beach County once or twice every year	High from rain-associated flooding damages; relatively low from wind damage	The major cause of damage associated with tropical storms are heavy rain and flooding. Many communities within Palm Beach County have particularly high vulnerabilities to flooding associated with these storms. Tropical Storm Exposure for Palm Beach County based on the TAOS model is: \$647,366,005	Frequency	HIGH
				Vulnerability	HIGH
				Exposure	MODERATE
				Risk	HIGH
Category 1 Hurricane	Pass within 100 miles of Palm Beach County once every 3.1 years	High from rain-associated flooding; moderate from wind damage.	The continental shelf off Palm Beach County is the narrowest along the entire U.S. Atlantic coast. Consequently, Palm Beach County's vulnerability to storm surge from the Atlantic is relatively low. Palm Beach County is, however, extremely vulnerable to storm surge from Lake Okeechobee. Category 1 Hurricane exposure for Palm Beach County based on the TAOS model is: \$3,663,876,408	Frequency	HIGH
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	HIGH
Category 2 Hurricane	Pass within 100 miles of Palm Beach County once every 5.3 years	High from rain-associated flooding; significant from wind damage.	Winds in category 2 storms range from 96 to 110 mph. Significant damage is possible in older wood frame residential construction. Category 2 hurricane exposure for Palm Beach County based on the TAOS model is: \$10,587,319,465	Frequency	HIGH
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	HIGH
Category 3 Hurricane	Pass within 100 miles of Palm Beach County once every 11.5 years	Very high from rain-associated flooding coupled with storm surge; major from wind damage.	Winds in category 3 storms range from 111 to 130 mph. These winds can do major damage to most residential construction. Category 3 Hurricane exposure for Palm Beach County based on the TAOS model is: \$25,072,808,943	Frequency	MODERATE
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	HIGH

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
Category 4 Hurricane	Pass within 100 miles of Palm Beach County once every 202 years	Very high from rain-associated flooding coupled with storm surge; massive from wind damage	Sustained winds in a category 4 hurricane range from 131 to 155 mph. There are very few commercial structures in Palm Beach County engineered to withstand such winds. Category 4 hurricane exposure for Palm Beach County based on the TAOS model is: \$52,040,209,850	Frequency	LOW
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	MODERATE
Category 5 Hurricane	Pass within 100 miles of Palm Beach County once every 1,500 years	High from rain-associated flooding; catastrophic in terms of wind damage.	Sustained winds in a category 5 hurricane range upward from 155 mph. Very few structures can withstand these winds. Massive flooding may occur in the western part of the county resulting from the storm surge in Lake Okeechobee. Category 5 Hurricane exposure for Palm Beach County based on the TAOS model is: \$101,344,978,155	Frequency	VERY LOW
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	LOW
Tornado	Between 1950 and 1998 there were 135 tornadoes, waterspouts, and funnel clouds reported within Palm Beach County. Of these, 91 touched down on land and were officially classified as tornadoes (1.90 tornadoes per year). In tornado prone Southeast Florida, the odds of a tornado striking any specific location are once every 250 years.	During the 48 years from 1950 to 1998, 73 people were killed by tornadoes (1.52 deaths per year). Total property damage by tornadoes over this same time period has been estimated at \$21 million or approximately \$440,000 per year.	Tornadoes are rated from 0 to 5 based on their path length and mean width (Fujita-Pearson Scale). F0 tornadoes cause light damage and F5 tornadoes cause incredible or catastrophic damage. Of the 91 tornadoes recorded in Palm Beach County between 1950 and 1998, 54 were classified as F0 (59%), 28 (31%) were classified F1, 8 (9%) were classified as F2, and 1 (1%) was classified as an F3 tornado.	Frequency	MODERATE
				Vulnerability	LOW
				Exposure	LOW
				Risk	LOW
Severe Thunderstorm/Lightning	Between May 1996 and July 1997, 22 severe thunderstorms were reported in Palm Beach County (1.69 per month).	These storms resulted in 1 fatality and 18 injuries (from lightning), and a total of \$50,000 in reported property damage (also from lightning). This represents an average of \$3,846 in damages per month.	Thunderstorms with strong wind, down bursts, hail, and lightning are very common on Florida's southeast coast. Property losses due to lightning are poorly documented. Based on statewide insurance claims, it is estimated that the actual property damage from lightning is close to \$390,000 or \$32,500 per month.	Frequency	HIGH
				Vulnerability	MODERATE
				Exposure	MODERATE
				Risk	MODERATE
Drought	Every year, some portion of the U.S. endures drought conditions. Florida has recently experienced drought conditions annually in the spring and summer.	Palm Beach County's most direct exposure to drought is the economic loss endured by its agricultural community. The average annual market value of agricultural products from Palm Beach County is approximately \$900 million. In addition to this direct impact, Palm Beach County is also particularly vulnerable in terms of potable water resources. Countywide potable water reserves are not extensive, and drought increases salt water contamination of critical well fields.	Palm Beach County's vulnerability to drought related damage and economic loss can occur in many areas. Direct impacts include reduced crop yield, increased fire hazard, reduced water levels, increased livestock and wildlife mortality rates, and damage to wildlife and fishery habitat. Social impacts include public safety, health, conflicts between water users, and general reduction in the quality of life.	Frequency	HIGH
				Vulnerability	HIGH
				Exposure	MODERATE
				Risk	MODERATE

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
Temperature Extremes	<p>Between 1970 and 1999, 7 significant freezes have affected Palm Beach County.</p> <p>Prolonged periods of extremely high temperatures are relatively rare in Palm Beach County; however, due to the consistently high humidity the local heat index is often significantly above the actual temperature during the summer months.</p>	<p>Palm Beach County as a whole has a high economic vulnerability to freezing temperatures. The most significant area of impact is the commercial agricultural segment of the community, but countywide, cold-sensitive ornamental landscaping also leaves many entities, public and private, open for significant economic loss.</p> <p>While the frequency of "heat waves" is low, the frequency of heat indexes within the range of causing health problems is moderate to high during the summer months.</p>	<p>While the loss of life from either extreme low or high temperatures in Palm Beach County is not great compared to national statistics, the county does have a significant economic exposure to low temperatures in both the public and private sectors.</p>	Frequency	LOW
				Vulnerability	MODERATE
				Exposure	MODERATE
				Risk	MODERATE
Tsunamis	<p>There has never been a tsunami to affect Palm Beach County.</p>	<p>The vulnerability is high since Palm Beach County has a vast coast line however the probability of one occurring is low.</p>	<p>Exposure is high if one were to occur since Palm Beach County has a vast coast line with most of the population concentrate along the coast</p>	Frequency	LOW
				Vulnerability	MODERATE
				Exposure	MODERATE
				Risk	LOW
Agricultural Pests and Disease	<p>The most significant agricultural pests and diseases affecting Palm Beach County are as follows:</p> <ul style="list-style-type: none"> § Citrus canker; § Mediterranean fruit fly; § Sugarcane pest; and § Tomato Yellow Leaf Curl Virus. <p>These pests are a constant problem for the agricultural community.</p>	<p>Palm Beach County is highly vulnerable to agricultural diseases and pests due to its location and the importation of agricultural products through its port.</p> <p>Mitigation for these types of agricultural pests largely involves public and private participation and works best when a county or region-wide approach is used.</p>	<p>Exposure to these pests is high in terms of the county's agricultural community.</p>	Frequency	MODERATE
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	MODERATE
Wildfire/Urban Interface Zone	<p>Wildfires have become a common annual occurrence in wooded areas during Florida's dry season.</p>	<p>Wildfire is a significant and frequent hazard in specific areas of Palm Beach County.</p> <p>Vulnerability varies extensively with location.</p>	<p>Exposure to wildfire varies greatly across Palm Beach County. While exposure is relatively low along the county's urbanized coastline, it is quite high in some of the landlocked communities.</p> <p>Mitigation projects addressing this issue need to be evaluated on a case by case basis.</p>	Frequency	MODERATE
				Vulnerability	MODERATE
				Exposure	LOW (Countywide)
				Risk	MODERATE
Muck Fires	<p>Muck fires are not a frequent threat to Palm Beach County. They occur during periods of extreme drought, when the swamp muck becomes dried out and is ignited. Once ignited, these fires burn deep within the muck and are extremely difficult to extinguish.</p>	<p>Communities and areas with the highest exposure to this hazard are on the western side of the county.</p>	<p>There have been no significant muck fires in Palm Beach County in the last 30 years and this hazard is considered to be a limited danger. There were significant muck fires in the everglades in the 1980's. Because the fires are so difficult to extinguish, they become significant air quality problems. Specific mitigation projects must be evaluated based on location and potential danger.</p>	Frequency	LOW
				Vulnerability	LOW
				Exposure	LOW
				Risk	LOW

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
Soil/Beach Erosion	<p>Beach erosion constantly occurs along Palm Beach County's coastline. In some areas, specific structures are threatened.</p> <p>Other specific sites where erosion is a persistent problem are along stormwater drainage points into the Intra-Coastal Waterway and along canals.</p>	<p>All the coastal communities have high vulnerability relative to beach erosion. Beach erosion problems require public and private cooperation to address.</p> <p>Potential long term mitigation will focus on overall sand budgets and sand transport rates. Mitigation projects in this area should be evaluated carefully by experienced coastal engineers.</p> <p>The erosion vulnerability is associated with stormwater outfalls and canals is limited and site-specific in nature.</p>	<p>Some specific locations have a higher "immediate exposure" than others.</p> <p>Stormwater drainage outfall and canal bank stabilization projects should be evaluated based on site specifics.</p>	Frequency	HIGH
				Vulnerability	MODERATE
				Exposure	LOW
Seismic Hazards (sinkhole; soil failure)	<p>Sinkholes are not considered to be a significant hazard in Palm Beach County.</p> <p>Soil failure or collapse is rare in Palm Beach County and is generally related to some other natural hazard, such as dam or levee failure during a period of flooding.</p>	<p>Countrywide vulnerability to this type of hazard is low, however areas that might be affected by dam or levee failure need to be evaluated carefully.</p> <p>The most significant levee in the county is the dyke around Lake Okeechobee.</p>	<p>Overall, the frequency and community exposure to these type hazards is low other than in specific locations and under specific circumstances.</p> <p>There is a significant exposure of life and property in the western portion of the county should storm surge breach the Okeechobee dyke.</p>	Frequency	LOW
				Vulnerability	MODERATE
				Exposure	MODERATE
				Risk	MODERATE
TECHNOLOGICAL					
Hazardous Materials Accident	<p>The frequency with which hazardous materials incidents occur in Palm Beach County is relatively high when compared to other counties located along the major Florida east coast transportation corridor. Minor spills occur with a moderate frequency.</p>	<p>Countywide, Palm Beach County has a moderate vulnerability with respect to hazardous materials releases.</p> <p>Some areas such as the City of West Palm Beach have a high vulnerability to this hazard due to specific circumstances.</p>	<p>Countywide, the exposure relative to a site specific hazardous materials releases is low.</p>	Frequency	MODERATE
				Vulnerability	MODERATE
				Exposure	LOW
				Risk	MODERATE
Radiological Accidents (including nuclear power plant accidents)	<p>To date, the frequency of radiological accidents and releases has been very low.</p>	<p>Palm Beach County is moderately vulnerable to radiological accidents due to its location with respect to the St. Lucie Nuclear Power Plant.</p>	<p>Countywide, the exposure to a nuclear power plant accident must be considered moderate and exposure to other types of radioactive materials releases is considered low.</p>	Frequency	VERY LOW
				Vulnerability	MODERATE
				Exposure	MODERATE
				Risk	LOW
Communications Failure	<p>Major communications failures have occurred infrequently in Palm Beach County to date.</p>	<p>Palm Beach County is a center of business and commerce along Florida's east coast. As such, it has a higher than average vulnerability to communication system break down.</p>	<p>Palm Beach County's exposure in the event of a major communication system failure is relatively high due to the major banking, finance, and governmental centers located here.</p>	Frequency	LOW
				Vulnerability	MODERATE

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
				Exposure HIGH	
Hazardous Material Release	Palm Beach County has over 1,100 reported (Section 302) hazardous material sites, most of which are located in urban areas. To date, the frequency of releases from these facilities has been low compared to the number of releases from transportation accidents.	Due to the number and location of hazardous material sites within the community, Palm Beach County must be considered to have a moderate vulnerability with respect to this hazard.	Countywide exposure in terms of life and property from toxic material release is considered moderate to high.	Risk	MODERATE
				Frequency	LOW
				Vulnerability	MODERATE
				Exposure	MODERATE
Transportation System Accidents	Palm Beach County has major rail lines, north-south highway corridors, an international port, and an international airport. Minor transportation accidents occur quite frequently. Major transportation accidents such as rail and plane crashes are less frequent.	Due to this concentration of transportation industries and activities throughout Palm Beach County, the county has a high vulnerability to transportation system accidents.	Low countywide, but high in specific areas.	Frequency	LOW
				Vulnerability	HIGH
				Exposure	LOW (Countywide)
				Risk	MODERATE
Wellfield Contamination	There have been incidences of wellfield contamination in Palm Beach County and the County maintains a program designed to monitor this risk.	The eastern part of the county along the coastline is particularly vulnerable to this hazard. This is the area with the greatest population and the most industrialization. During times of drought, this area is also vulnerable to wellfield contamination from salt water intrusion.	Exposure in terms of property value is high with regard to this hazard.	Frequency	LOW
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	MODERATE
Power Failure (outages)	Business and industry in Palm Beach County are regularly affected by power fluctuation and short term power outages. Major, long term outages are rare.	All modern societies are highly vulnerable to prolonged power failures. Even power failures of 12 to 24 hours would have significant impacts on both the county's economy and on human health and safety.	Short term power loss has a significant, but hard to quantify economic impact in terms of equipment damage and lost productivity. Prolonged power failures lasting days or weeks would be a major disaster for Palm Beach County, both economically and in terms of human health and safety.	Frequency	LOW (For major power disruptions)
				Vulnerability	HIGH
				Exposure	HIGH
				Risk	MODERATE
Civil Disturbance	There have been significant civil disturbances in Palm Beach County. Minor civil disturbances occur with moderate frequency in specific jurisdictions.	Overall vulnerability to civil disturbance in Palm Beach County is low, however there are several specific areas and jurisdictions which are moderately, if not highly vulnerable to this hazard.	Exposure in terms of dollars to the effects of civil disturbances must be considered low within the overall perspective of the county. Exposure in terms of human health and safety is moderate.	Frequency	LOW
				Vulnerability	LOW (Countywide)
				Exposure	MODERATE
				Risk	LOW

Hazard Category	Hazard Evaluation				
	Frequency	Vulnerability	Exposure	Risk (Potential for Loss)	
Terrorism and Sabotage	Other than random "hate crimes," there have never been any significant acts of terrorism or sabotage in Palm Beach County.	<p>Palm Beach County has two areas of vulnerability with respect to this hazard. These are:</p> <ul style="list-style-type: none"> ! Celebrity Terrorism potentially directed at some of its wealthy and internationally known residents. In this area Palm Beach County is more vulnerable than many places in the United States just because of the nature of its population; and ! Target specific terrorism directed against specific government buildings and businesses. As a seat of government in an industrialized county, Palm Beach's vulnerability here is higher than some rural Florida counties, but no more than any other center of business and industry in modern America. 	<p>Palm Beach County's exposure to this hazard is greater than some other areas, but overall must be considered only moderate. There are many other areas offering equally attractive targets in the U.S., and there are several climatological, geographic, and infrastructure aspects to Palm Beach County which reduce its attractiveness to large scale acts of terrorism. The warm temperatures, onshore winds, high rates of sunlight (UV exposure), and rainfall in Palm Beach County make this area a less favorable target for biological or chemical terrorism than many other areas of the United States. The population here is dispersed when compared to major cities in the northeastern U.S., and the transportation system infrastructure is highly dependent upon individual vehicles. Both of these features make Palm Beach County a less desirable target for transportation system or conventional type (bomb related) terrorist acts.</p>	Frequency	LOW
				Vulnerability	MODERATE
				Exposure	LOW
				Risk	MODERATE TO LOW
Immigration Crisis	<p>Illegal immigration has and continues to impact Palm Beach County. While major immigration crises are rare, Palm Beach County has been affected by most of those that have occurred.</p>	<p>Because of its demographics and large agricultural industry, Palm Beach County has a high vulnerability to immigration crisis arising from anywhere in the Caribbean, Latin America, or South America.</p>	<p>Exposure in terms of dollars from an immigration crisis would result mainly from the stress on local police and health services. Exposure in terms of human health and safety would result from the possible introduction of diseases and stress on the existing health care network.</p>	Frequency	MODERATE (Over the last decade)
				Vulnerability	HIGH
				Exposure	MODERATE
				Risk	MODERATE

Table A-5: Impact Analysis

With the assistance of Palm Beach County Division of Emergency Management, the LMS conducted impact analyses to assess the potential for detrimental impacts from all identified natural, technological and societal hazards. Results of these analyses are summarized below. Impacts were categorized into the following groupings: health and safety of the resident population in the affected area; health and safety of incident responders; impacts on the continuity of government and non-government operations; impacts to property, facilities and infrastructure; impacts to the critical community services; impacts to the environment; economic and financial impacts; impacts on regulatory and contractual obligations; and impacts negatively affecting the county's reputation, image, and/or ability to attract public and commercial interests.

An impact rating of "Low" for any hazard type means the hazard is not likely to have any measurable or lasting detrimental impact of a particular type and consequences will likely be rectified promptly with locally available resources. An impact rating of "Medium" means there will likely be a measurable detrimental impact which may require some time to rectify and may require outside resources and/or assistance.

An impact rating of "High" means the impact will likely be severe and of longer duration, and require substantial time, resources, and/or outside assistance to rectify. Multiple ratings indicate detrimental impacts might easily vary within the range indicated.

Table A-5: Impact Analysis

Potential Detrimental Impacts

Hazard	Health & Safety Residents	Health & Safety Responders	Continuity of Operations	Property, Facilities Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory Contractual Obligations	Reputation of County
Natural										
Flood	Medium	Medium	Low	Medium	Medium/	Medium	Medium	Medium	Low	Low
Tropical Storm	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 1	Medium	Medium	Low	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 2	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Low	Low
Hurricane Cat 3	Medium/High	Medium/High	Medium/High	Medium/High	Medium/High	Medium/High	High	Medium/High	Medium	Low/Medium
Hurricane Cat 4	High	High	High	High	High	High	High	High	High	Medium/High
Hurricane Cat 5	High	High	High	High	High	High	High	High	High	Medium/High
Tornado	Low/Medium	Medium	Low	Low/Medium	Low/High	Low	Low/Medium	Medium	Low	Low
Severe Thunder Storm/Lightning	Low	Low	Low	Low	Low/Medium	Low	Low	Low	Low	Low
Drought	Low	Low	Low	Low	Low	Low	Low/Medium	Medium/High	Low	Low
Temp. Extremes	Low/Medium	Low	Low	Low	Low	Low	Low/Medium	Medium	Low	Low
Agricultural Pest/Disease	Low	Low	Low	Low	Low	Low	Low/Medium	Medium/High	Low	Low/Medium
Wildfire/Urban Interface Zone	Low/Medium	Medium/High	Low	Medium/High	Low	Low	Low/Medium	Medium/High	Low	Low
Muck Fires	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Soil/Beach Erosion	Low	Low	Low	Low/Medium	Low/High	Low	Medium/High	Medium/High	Low	Low/Medium
Seismic Hazards (Sinkhole, soil failure)	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low

Hazard	Health & Safety Residents	Health & Safety Responders	Continuity of Operations	Property, Facilities Infrastructure	Historical Resources	Delivery of Services	Environment	Economic & Financial Conditions	Regulatory Contractual Obligations	Reputation of County
Technological										
Hazardous Materials Accident	Medium/High	Medium/High	Low/Medium	Low	Low	Low	Medium/High	Low/Medium	Low	Low
Radiological Accidents	Low/Medium	Low/Medium	Low	Low	Low	Low	Low/Medium	Low/Financial	Low	Low/Medium
Communication Failure	Medium	Medium	Medium/High	Low	Low	Medium/High	Low	Medium/High	Low	Low
Hazardous Material Release	Medium/High	Medium/High	Low/Medium	Low	Low	Low	Medium/High	Low/High	Medium	Low/Medium
Transportation Accidents	Low/High	Low/High	Low/High	Low/High	Low	Low/Medium	Low	Low/High	Low	Low/Medium
Wellfield Contamination	Low/Medium	Low	Low	Low/Medium	Low	Low/Medium	Medium/High	Low/Medium	Low	Low
Power Failure (Outage)	Medium/High	Medium/High	Medium/High	Low/Medium	Low	Medium/High	Low	Medium/High	Low	Low/Medium
Societal										
Civil Disturbance	Low/High	Low/High	Low/High	Low/High	Low	Low/High	Low	Low/High	Low	Low/High
Terrorism & Sabotage	Medium/High	High	Medium/High	Low/High	Low	Medium/High	Low/High	Low/High	Low/Medium	Medium/High
Immigration Crisis	Low/Medium	Low/Medium	Low	Low	Low	Low	Low	Low/Medium	Low	Low/Medium