

## **Appendix K**

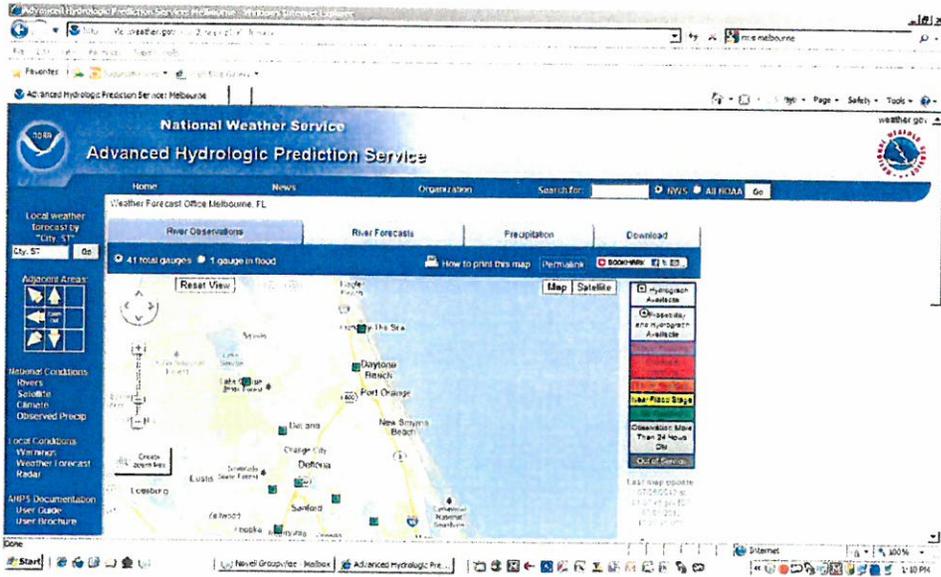
### **Flood Warning Plan**



Volusia County  
Flood Warning Program

March 2015

### VOLUSIA COUNTY FLOOD HAZARDS/ THREAT RECOGNITION SYSTEM (FTR)



**Volusia County Flood Hazards/ Flood Threat Recognition System**

## Volusia County Flood Hazards

## 1. Community information

Volusia County is located in the central portion of the Florida east coast. The land area of Volusia County is approximately 1,210 square miles, with 50 miles of Atlantic Ocean shoreline. Along the eastern side of the county, the Halifax River and Indian River/Mosquito Lagoon form long, narrow estuaries which separate the county's mainland from its barrier island. Ponce DeLeon Inlet, located near the middle of the coastline, serves as the county's only inlet through the barrier island and the major passage through which Atlantic Tides and storm surge propagate into the estuaries. The Tomoka River and St. Johns River are other major estuaries located in the county.

Volusia County has a subtropical climate, with long, warm, and humid summers and short, mild winters. The average annual precipitation is approximately 48 inches. Over half of this rainfall occurs from June 1 through November 30, the Atlantic hurricane season.

## 2. Types, causes, and sources of flooding

Flooding in Volusia County results from tidal surges associated with hurricanes, northeasters, and tropical storm activity and from overflow from streams and swamps associated with rainfall runoff. Major rainfall events occur from hurricanes, tropical storms, and thundershowers associated with frontal systems. During periods of intensive rainfall, smaller streams tend to reach peak flood flow concurrently due to a relatively short time of concentration, with elevated tailwater conditions associated with coastal storm surge. This greatly increases the likelihood of inundation of low-lying areas along the coast. Areas along the Halifax River, Tomoka River, Indian River, and Mosquito Lagoon are particularly vulnerable to this flooding. In the western part of the county, the St. Johns River periodically causing flooding from tidal surges and major rainfall events associated with hurricanes, tropical storms, and extended periods of heavy rainfall, such as during El Nino periods.

In eastern portions of the county, most of the flood prone areas feature relatively impermeable soil, a high water table, and flat terrain. These characteristics contribute significantly to flooding problems. Additionally, the flat slopes and heavily vegetated floodplains promote backwater effects and aggravate the flood problem by preventing the rapid drainage of floodwaters.

## 3. Depths and velocities

The USGS, NOAA, and the Florida Department of Transportation have installed discharge and stage gauges at several locations throughout the county. USGS stream gauges for the Tomoka River and B-19 canal provide significant historical flood data, and are useful for predicting future flood depths and velocities.

Storm surge associated with hurricanes and tropical storms can reach depths of up to 20+ feet, depending on the area of the county that is impacted and the category storm. Areas in and around the Indian River, Mosquito Lagoon, Ponce DeLeon Inlet, Spruce Creek, and the Tomoka River basin will experience the severest flooding associated with hurricanes and tropical storms. Other areas of the

county can expect to experience flooding associated with stormwater runoff due to hurricane/tropical storm associated rainfall. This shallow fresh water flooding occurs primarily due to poor drainage, and develops gradually. Depths countywide will vary from several inches to a foot or more depending upon storm intensity, duration, previous rainfall events, and tidal conditions.

Velocities of floodwaters will vary according to location. Summaries of expected velocities for the various floodways located throughout the county are summarized in the following table:

| Flooding Source | Mean Velocity (feet per second/max-min) |
|-----------------|---|
| B-19 Canal      | 11.1 – 0.3                              |
| Bulow Creek     | 1.9 – 0.5                               |
| Groover Branch  | 5.5 – 1.2                               |
| Misner Branch   | 2.6 – 0.6                               |
| Spruce Creek    | 4.2 – 0.9                               |
| Thompson Creek  | 3.0 – 0.9                               |
| Tomoka River    | 4.1 – 0.2                               |

#### 4. Warning times and special hazards

In all cases including storm surge, the amount of time necessary to notify the public that may be impacted by expected flooding is measured in relatively long amounts of time, from three to seventy-two hours or more, depending on the event. During these times, Volusia County Emergency Management will provide multiple notifications to the private and public sectors of the anticipated event, magnitude, and protective actions to be taken.

There are no dams in or near Volusia County, so any flooding that occurs is a gradual process, with the exception of hurricane-related storm surge. In the case of storm surge, there is adequate time to evacuate the population at risk (from 10 to 35 hours, depending on category storm and direction of travel) such that immediate notification is not necessary. "Flash-flooding", that is, flooding that occurs within six hours of a rain event, does occur in Volusia County. However, the geography of the county is such that the flooding that occurs is generally of the "ponding" type in low-lying areas and is not associated with large "walls of water."

Storm surge is the greatest potential special hazard threatening Volusia County. Sea water weights approximately 1,800 pounds per cubic yard, and possesses potentially catastrophic destructive capability. Volusia County has 50 miles of coastal high hazard area, and has incorporated several warning systems to notify those citizens (approximately 150,000) at risk to storm surge of the need to evacuate, should an approaching hurricane require evacuation of the storm surge areas.

## Flood Threat Recognition System

## 1. System Description/Emergency Warning Dissemination

The Volusia County Flood Threat Recognition System, located at the Volusia County Emergency Operations Center, consists of the following elements:

- Florida Emergency Warning and Information Network (EMWIN)
- River stage gauges throughout the County of Volusia rivers
- State Warning Point satellite communications telephone system (EMNET)
- Meterologix® Storm Sentry Weather Radar/WeatherWire® Alert System
- National Weather Service flood advisories, watches, and warnings; telephone notification, provided to the EOC when a potential flood event may impact Volusia County; NWS messages are promulgated to all affected jurisdictions upon receipt; in the case of tropical storms/hurricanes and well defined storms, usually several days in advance of arrival
- Audible notification/alert provided by county and municipal law enforcement officials in the form of public address system announcements from county/municipal patrol vehicles to areas expected to flood
- On-line, real-time flood prediction and storm surge modeling provided by Hurrevac and HurrTrak® software systems
- FirstCall "Reverse-911" System, which provides a recorded message which contains the specific information provided by the flood threat warning originating agency (able to reach 100% of Volusia County)
- Brighthouse Cable "cable over-ride," which permits the publishing, by the EOC, of flood alert messages to all households that subscribe to cable; procedure is to call Brighthouse to request message
- Twitter (@VCEmergencyInfo) and Facebook real-time social media (search "Volusia County Emergency Management" on Facebook)
- National Weather Service NOAA Weather Radio – numerous at the VCEOC; VCEM has distributed NWS NOAA Weather Radios to all school facilities in Volusia County
- A system of real-time weather stations located throughout Volusia County. Volusia County Emergency Management owns a system of 13 real-time weather stations purchased from WeatherBug. Each station provides real-time temperature, wind speed/direction, humidity, barometric pressure, and rainfall. Volusia County Emergency Management is able to monitor each station during a rain event and, based on the rate and amount of rainfall, is able to alert communities of the flood threat. Volusia County Emergency Management shares this data with the National Weather Service Melbourne office.

The river gauges placed by USGS, NOAA, and the Florida Department of Transportation provide adequate advance warning, usually days, before flooding can be expected to occur. Gauges have been placed at forecast points in the Tomoka River at 11<sup>th</sup> Street, U.S. Highway 92, Canal B-19 at Willow Run, State Road 415, Lake Harney, Sanford, Astor, Hydrologic data recorded by the gauges are reported to the Volusia County Emergency Operations Center on a daily basis, and are available "real time" 24/7 on-line from NOAA at the Advanced Hydrologic Prediction Center at <http://www.srh.noaa.gov/alr/> These

gauges enable a "real time" flood forecast to be promulgated in a timely manner, and provide accurate estimates of up-river arrival times and peak flows and elevations.

The gage information is utilized by the National Weather Service to forecast specific flooding conditions throughout the affected portion of Volusia County. The NWS promulgates the forecasted flooding through a variety of means: First notification is received over the EMWIN system, followed by an audible alert and hard-copy notification that is received via the Meteorologix® WeatherWire® Alert System. Finally, the Florida Department of Emergency Management notifies the Volusia County Emergency Operations Center via their satellite communications system. These systems are tested on at least an weekly basis; some systems, such as the State Warning Point satellite communications system and the 21st Century Communications "Reverse-911" system, are tested on a monthly basis. The flood warning system is tested on a year-round basis in the form of communications checks with the State and issuance of Twenty-First Century telephone notifications. Additionally, it is reviewed annually during the Statewide Hurricane Exercise every May prior to hurricane season.

The flood alert warnings provide explicit detail of the expected flooding, location(s) to be affected, time that the flooding is expected to begin, anticipated extent of the flooding in area and amount, and the time the flood alert expires. These alerts are provided for all anticipated flooding events, including storm surge, hurricane/tropical storm flooding from rainfall, and periods of brief, intense rainfall associated with localized weather events.

The HurrEvac®/HurrTrak® computerized storm surge prediction models also provide expected rain amounts, in inches, and areas expected to be most heavily impacted by the rain event.

Audible alerts are provided by county/municipal law enforcement agencies in the form of public announcements from their patrol vehicles. They are utilized extensively in the event an evacuation needs to be ordered for a hurricane or intense, localized flooding occurs. This system provides a back-up benefit to those residents who do not have telephones and have not received telephonic notification via the "Reverse-911" system.

The Volusia County Flood Warning Dissemination System is described in the Flood Information Section of the "Bell South Complete Phonebook Covering Volusia/Flagler Counties."

## 2. Local agency procedures

When a flood warning is received from the various notifying agencies, the information is immediately relayed by telephone to the communities/areas that are expected to be affected by the flooding, so that necessary precautions can be taken. The Duty Officer at the Volusia County Emergency Operations Center provides the flood warning data to all jurisdictions in the warning area, and to the Volusia County Sheriff's Office Dispatch Center; the Dispatch Center, in turn, provides the information/notification to the areas expected to be impacted by the flood event. After normal working hours, the Duty Officer at the Dispatch Center ("Central") becomes the primary notification source for all flood warnings. In the event a severe flood warning is issued, the Dispatch Duty Officer will notify the Emergency Operations Center Duty Officer, in the event other agencies need to be contacted to deal with the anticipated flooding (American Red Cross, Volusia County School District, etc.). These procedures are located in the Volusia County Emergency Operation Center's Operations Manual and Emergency Response Plan. Training on the various flood notification systems is conducted on an annual basis, or whenever a new hire occurs. It should be noted that Volusia County has been designated by

the National Weather Service as a "Storm Ready" community. Documentation can be reviewed on-line at <http://www.stormready.noaa.gov/com-maps/fl-com.htm>.

## SECTION 6: VULNERABILITY ASSESSMENT

## 6.10 COASTAL EROSION

All of the coastal areas in Volusia County are prone to coastal erosion, and nearly half of the 47 miles of shoreline are considered critically eroded. Coastal erosion is typically measured as the annual shoreline change for a given beach cross-section of profile over a long period of time. The NCDC has reported five events involving coastal erosion in Volusia County since 1998. However, these events also include losses from hurricane impacts such as storm surges. The NCDC reported events include losses for jurisdictions outside of Volusia County. As such, it is not possible to determine annualized losses from coastal erosion for the coastal jurisdictions in Volusia County.

Coastal erosion exposure was assessed by quantifying the number of people and property that are located within 0.5 miles inland from the shoreline in areas where critical erosion has been documented by the Florida Department of Environmental Protection.

Table 6.12 provides the number of people and number and value of improved properties that are susceptible to coastal erosion. Coastal erosion is very likely to continue impacting the coastal areas of Volusia County. There are currently over 5,000 improved properties that are at risk to coastal erosion in Daytona Beach, Daytona Beach Shores, New Smyrna Beach, Ormond Beach and areas in unincorporated Volusia County.

Jurisdictions with critically eroded beaches in Volusia County actively participate in the federal beach nourishment program.

TABLE 6.12: Total Exposure from Coastal Erosion

| JURISDICTION         | AT-RISK AREAS (within 0.5 miles of critical erosion) |                           |  |                          |
|----------------------|--|---------------------------|--|--------------------------|
|                      | Number of People at Risk                             | Number of Parcels at Risk | Percentage of Improved Parcels at Risk | Value of Parcels at Risk |
| Daytona Beach        | 4,502  | 1,428                     | 7.61%                                  | 299,158,596              |
| Daytona Beach Shores | 3,303  | 379                       | 70.71%                                 | 84,001,016               |
| New Smyrna Beach     | 2,661  | 1,356                     | 12.25%                                 | 157,731,953              |
| Ormond Beach         | 872  | 468                       | 3.01%                                  | 81,132,737               |
| Ponce Inlet          | 25   | 12                        | 1.09%                                  | 3,193,502                |
| Unincorporated       | 3,751  | 1,518                     | 3.32%                                  | 188,036,944              |
| <b>TOTAL</b>         | <b>15,114</b>  | <b>5,161</b>              | <b>2.76%</b>                           | <b>\$813,254,748</b>     |

Source: Florida Department of Environmental Protection and Volusia County GIS Department

## SECTION 6: VULNERABILITY ASSESSMENT

### 6.12 FLOOD

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using FEMA's preliminary Digital Flood Insurance Rate Map (DFIRM) data in combination with local tax assessor records (2009). The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for improved properties that were confirmed to be located within an identified Zone A/AE (100-year floodplain), Zone VE (100-year coastal flood zone, associated with wave action), and Zone X (500-year floodplain).

It is important to note that Volusia County recently updated their flood maps, which were released in the beginning of 2014. It is recommended that the flood analyses be revised once the new flood maps are available.

**Table 6.14** (on the next page of this document) lists the land uses of properties, the percentage of properties and the property values that are located in the 100-year (A/AE), coastal and 100-year (VE) floodplains. **Table 6.14** corresponds with **Figure 6.8**, which depicts all 100-year flood hazard zones.

For a listing and generalized maps of all Repetitive Loss Properties within the County and its 16 jurisdictions, please reference the 2013 Floodplain Management attachment (Appendix I).

**SECTION 6: VULNERABILITY ASSESSMENT**

**TABLE 6.14: 2014 Parcel Exposure to Flood Hazard Zones (2014 DFIRM)**

| Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones |                 |                       |                 |                 |                 |                 |
|---|-----------------|-----------------------|-----------------|-----------------|-----------------|-----------------|
| Hazard Zone   | Parcels in Zone | Built Parcels         | Land Value      | Building Value  | Assessed Value  | Taxable Value   |
| A   | 75,397<br>15.7% | 21,829<br>29.0% built | \$1,566,139,476 | \$1,658,053,211 | \$2,821,521,387 | \$1,883,285,788 |
| AE  | 59,111<br>12.3% | 37,718<br>63.8% built | \$2,589,902,259 | \$3,100,684,778 | \$5,537,361,006 | \$4,248,685,350 |
| AH  | 1,350<br>0.3%   | 821<br>60.8% built    | \$187,904,358   | \$357,214,128   | \$532,334,860   | \$410,640,777   |
| VE  | 1,637<br>0.3%   | 962<br>58.8% built    | \$516,287,916   | \$226,763,993   | \$726,174,280   | \$605,768,181   |

| Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone |               |                          |                         |                         |                         |                         |
|---|---------------|--------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Hazard Zone   | Built Parcels | Built Pre-1970           | Built 1970-1979         | Built 1980-1989         | Built 1990-1999         | Built 2000-2014         |
| A   | 21,829        | 6,018<br>27.6% of built  | 3,087<br>14.1% of built | 4,128<br>18.9% of built | 3,385<br>15.5% of built | 5,211<br>23.9% of built |
| AE  | 37,718        | 10,970<br>29.1% of built | 6,611<br>17.5% of built | 9,540<br>25.3% of built | 5,350<br>14.2% of built | 5,247<br>13.9% of built |
| AH  | 821           | 18<br>2.2% of built      | 137<br>16.7% of built   | 305<br>37.1% of built   | 110<br>13.4% of built   | 251<br>30.6% of built   |
| VE  | 962           | 530<br>55.1% of built    | 144<br>15.0% of built   | 123<br>12.8% of built   | 84<br>8.7% of built     | 81<br>8.4% of built     |

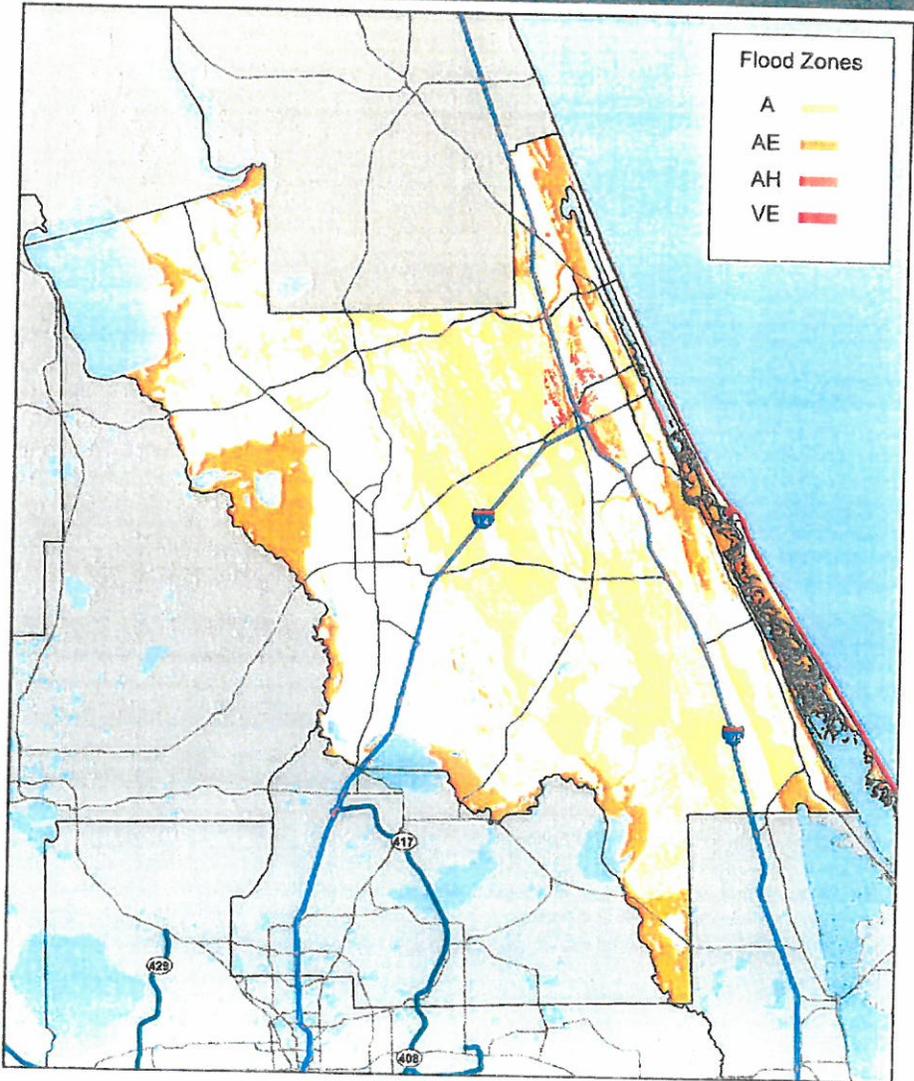
  

| Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use |                         |                             |                       |            |               |              |
|--|-------------------------|-----------------------------|-----------------------|------------|---------------|--------------|
| Hazard Zone  | Low Density Residential | Med/Hi. Density Residential | Commercial and Office | Industrial | Institutional | Agricultural |
| A  | 46,668                  | 1,041                       | 2,310                 | 973        | 9,155         | 12,324       |
| AE   | 37,647                  | 2,470                       | 3,976                 | 1,034      | 7,317         | 4,229        |
| AH   | 656                     | 132                         | 251                   | 69         | 124           | 36           |
| VE   | 722                     | 272                         | 453                   | 0          | 137           | 0            |

Source: FEMA Flood Insurance Rate Map (2014) and Volusia County GIS Department  
 For Jurisdiction-specific vulnerability data, view Appendix I (2013 Floodplain Management Plan – Jurisdiction Appx.)

SECTION 6: VULNERABILITY ASSESSMENT

FIGURE 6.8: Flood Insurance Rate Zones



Source: FEMA (2014)

## SECTION 6: VULNERABILITY ASSESSMENT

### 6.13 STORM SURGE

The storm surge assessment was conducted by identifying the people and property that are located in storm surge inundation zones using data provided by Volusia County<sup>9</sup>.

Tables 6.15 shows the number of residents at risk, per jurisdiction, to Category 1, Category 3 and Category 5 storm surge effects. Table 6.16 lists the land uses of properties, the percentage of properties and the property values that are located in the Category 1, 2, 3, 4 and 5 storm surge zones, respectively. Table 6.16 corresponds with Figure 6.9, which depicts the storm surge hazard zones.

**TABLE 6.15: Persons at Risk to Category 1/3/5 Storm Surge by Jurisdiction**

| JURISDICTION      | Persons at Risk (Cat. 1) | Persons at Risk (Cat. 3) | Persons at Risk (Cat. 5) |
|-------------------|--------------------------|--------------------------|--------------------------|
| Daytona Beach     | 2,203                    | 4,320                    | 29,031                   |
| Daytona B. Shores | 29                       | 36                       | 864                      |
| DeBary            | 0                        | 0                        | 0                        |
| DeLand            | 0                        | 0                        | 0                        |
| Deltona           | 0                        | 0                        | 0                        |
| Edgewater         | 128                      | 1,353                    | 17,042                   |
| Holly Hill        | 165                      | 695                      | 12,029                   |
| Lake Helen        | 0                        | 0                        | 0                        |
| New Smyrna Beach  | 3,891                    | 15,501                   | 18,553                   |
| Oak Hill          | 44                       | 88                       | 1,377                    |
| Orange City       | 0                        | 0                        | 0                        |
| Ormond Beach      | 961                      | 2,152                    | 16,093                   |
| Pierson           | 0                        | 0                        | 0                        |
| Ponce Inlet       | 356                      | 980                      | 1,481                    |
| Port Orange       | 1,896                    | 4,631                    | 22,220                   |
| South Daytona     | 1,223                    | 1,858                    | 13,273                   |
| Unincorporated    | 2,031                    | 5,595                    | 15,371                   |
| <b>TOTAL</b>      | <b>12,927</b>            | <b>37,209</b>            | <b>147,334</b>           |

Source: Volusia County GIS Department

<sup>9</sup> Volusia County provided surge inundation zones for Categories 1, 3 and 5.

**SECTION 6: VULNERABILITY ASSESSMENT**

**TABLE 6.16: 2014 Parcel Exposure to Storm Surge Zones (by Hurricane Category)**

| Financial Exposure to Hazard Zones – Cumulative Financial Values within Zones |                  |                        |                 |                 |                  |                  |
|---|------------------|------------------------|-----------------|-----------------|------------------|------------------|
| Hazard Zone   | Parcels in Zone  | Built Parcels          | Land Value      | Building Value  | Assessed Value   | Taxable Value    |
| Category 1  | 12,163<br>2.5%   | 7,235<br>59.5% built   | \$1,444,181,892 | \$764,514,315   | \$2,159,534,760  | \$1,743,941,309  |
| Category 2  | 25,270<br>5.3%   | 16,406<br>64.9% built  | \$1,999,988,212 | \$1,390,997,239 | \$3,329,352,505  | \$2,714,248,118  |
| Category 3  | 87,475<br>18.2%  | 64,163<br>73.4% built  | \$3,392,472,185 | \$3,812,465,872 | \$7,119,084,660  | \$5,777,339,089  |
| Category 4  | 148,567<br>31.0% | 114,705<br>77.2% built | \$4,847,311,189 | \$6,763,223,264 | \$11,509,123,619 | \$9,262,538,399  |
| Category 5  | 162,657<br>33.9% | 125,226<br>77.0% built | \$5,325,164,065 | \$7,764,980,964 | \$12,968,527,898 | \$10,503,169,298 |

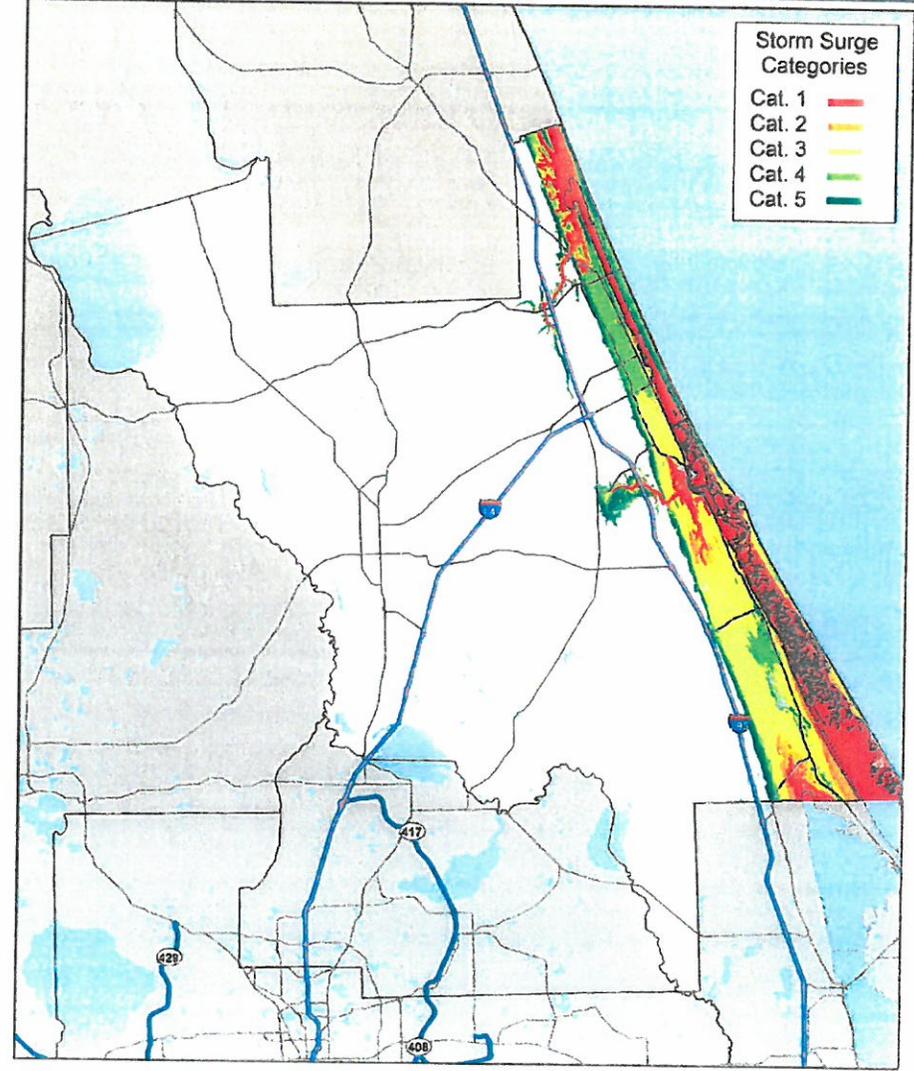
| Build-Year Summary of Built Parcels within Hazard Zones – Build Year Breakdown by Hazard Zone |               |                          |                          |                          |                          |                          |
|---|---------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Hazard Zone   | Built Parcels | Built Pre-1970           | Built 1970-1979          | Built 1980-1989          | Built 1990-1999          | Built 2000-2014          |
| Category 1  | 7,235         | 2,416<br>33.4% of built  | 1,369<br>18.9% of built  | 1,504<br>20.8% of built  | 902<br>12.5% of built    | 1,044<br>14.4% of built  |
| Category 2  | 16,406        | 5,711<br>34.8% of built  | 3,049<br>18.6% of built  | 3,394<br>20.7% of built  | 1,996<br>12.2% of built  | 2,156<br>13.1% of built  |
| Category 3  | 64,163        | 18,955<br>29.5% of built | 12,572<br>19.6% of built | 15,869<br>24.7% of built | 8,222<br>12.8% of built  | 8,445<br>13.2% of built  |
| Category 4  | 114,705       | 45,837<br>40.0% of built | 20,198<br>17.6% of built | 24,215<br>21.1% of built | 11,784<br>10.3% of built | 12,571<br>11.0% of built |
| Category 5  | 125,226       | 48,145<br>38.4% of built | 21,724<br>17.3% of built | 26,993<br>21.6% of built | 14,210<br>11.3% of built | 14,084<br>11.2% of built |

| Land Use Summary of Parcels within Hazard Zones – Number of Parcels Per Land Use |                         |                              |                       |            |               |              |
|--|-------------------------|------------------------------|-----------------------|------------|---------------|--------------|
| Hazard Zone  | Low Density Residential | Med./Hi. Density Residential | Commercial and Office | Industrial | Institutional | Agricultural |
| Category 1   | 7,621                   | 605                          | 425                   | 27         | 2,875         | 65           |
| Category 2   | 16,492                  | 1,339                        | 1,819                 | 128        | 4,107         | 273          |
| Category 3   | 62,328                  | 3,623                        | 7,017                 | 1,246      | 7,772         | 2,215        |
| Category 4   | 106,271                 | 6,689                        | 14,435                | 3,031      | 11,646        | 2,638        |
| Category 5   | 117,463                 | 7,425                        | 15,006                | 3,102      | 12,135        | 3,479        |

Source: SLOSH, Volusia County GIS (2014)  
 Note: All Storm Surge Zones are cumulative (ex: Category 3 zone includes Zone 1, Zone 2 and Zone 3 parcels)

SECTION 6: VULNERABILITY ASSESSMENT

FIGURE 6.9: Storm Surge Zones by Hurricane Category



Source: SLOSH

## SECTION 6: VULNERABILITY ASSESSMENT

### 6.15 TSUNAMI

Although, historically there have been no occurrences of tsunamis in Volusia County, the potential exists. The likelihood is low, but the consequences would be catastrophic.

Table 6.17 lists the number of people and properties, the percentage of properties and the property values that are located in the tsunami inundation zone, based on MEMPHIS data. There were several gaps in the MEMPHIS data that excluded the barrier islands along the shoreline. These areas appeared to be susceptible to tsunami inundation and/or potential inhabitability due to infrastructure loss in low lying areas. To be conservative, the analysis was performed by accounting for these barrier island areas as well.

**TABLE 6.17: Volusia County Improved Property at Risk to Tsunami**

| JURISDICTION      | Number of People at Risk | Number of Improved Parcels at Risk | Percentage of Improved Parcels at Risk | Value of Improved Parcels at Risk |
|-------------------|--------------------------|------------------------------------|--|-----------------------------------|
| Daytona Beach     | 45,910                   | 12,841                             | 68.46%                                 | 1,678,914,461                     |
| Daytona B. Shores | 4,343                    | 536                                | 100.00%                                | 108,379,184                       |
| DeBary            | 0                        | 0                                  | 0.00%                                  | 0                                 |
| DeLand            | 0                        | 0                                  | 0.00%                                  | 0                                 |
| Deltona           | 0                        | 0                                  | 0.00%                                  | 0                                 |
| Edgewater         | 19,504                   | 9,354                              | 99.99%                                 | 806,218,563                       |
| Holly Hill        | 12,201                   | 4,533                              | 99.89%                                 | 429,857,493                       |
| Lake Helen        | 0                        | 0                                  | 0.00%                                  | 0                                 |
| New Smyrna Beach  | 20,791                   | 10,110                             | 91.30%                                 | 1,253,431,731                     |
| Oak Hill          | 1,760                    | 888                                | 100.00%                                | 67,557,864                        |
| Orange City       | 0                        | 0                                  | 0.00%                                  | 0                                 |
| Ormond Beach      | 28,559                   | 11,384                             | 73.30%                                 | 1,545,623,219                     |
| Pierson           | 0                        | 0                                  | 0.00%                                  | 0                                 |
| Ponce Inlet       | 2,513                    | 1,102                              | 100.00%                                | 169,838,467                       |
| Port Orange       | 30,218                   | 11,397                             | 55.80%                                 | 1,131,602,766                     |
| South Daytona     | 13,453                   | 4,548                              | 99.87%                                 | 481,675,529                       |
| Unincorporated    | 29,382                   | 14,132                             | 30.87%                                 | 1,347,435,508                     |
| <b>TOTAL</b>      | <b>208,634</b>           | <b>80,825</b>                      | <b>43.21%</b>                          | <b>\$9,020,534,785</b>            |

Source: MEMPHIS and Volusia County GIS Department

**Volusia County Flood Response Plan**



## INTRODUCTION

- A. **Mission.** Coordinate and facilitate resources to minimize the impacts of flood incidents on people, property, the environment and the economy of Volusia County.
- B. **Purpose.** To establish responsibilities for agencies and organizations within Volusia County and document responsibilities of Volusia County Emergency Management in regard to preparation for, response to, recovery from and mitigating the effects of flood incidents within the County.
- C. **Scope.** The County of Volusia Flood Response Plan is incorporated in the Volusia County Comprehensive Emergency Management Plan. This plan addresses flooding incidents, as described in each of the anticipated Flood Event Scenarios, and provides the foundation for:
1. The establishment of an organization and responsibilities for efficient and effective use of government, private-sector and volunteer resources if a flood incident occurs within Volusia County.
  2. An outline of other participants' responsibilities in emergency management activities within Volusia County is described in the Basic Plan of the VCEMP.
- D. **Organization.** The Public Works Director of Volusia County functions as Incident Coordinator for all local agencies in regard to flood events within unincorporated Volusia County.
- E. **Plan update/revision.** As a part of the CEMP, this and all plans and annexes are living documents; once formally adopted by the Volusia County Council, Volusia County Emergency Management has the authority to modify/update any and all plans/annexes as conditions warrant. Any plan or annex updated will reflect the current revision date; however, the formal adoption date governs to formal adoption cycle. Every five years the plan, as a part of the Volusia County Comprehensive Emergency Management Plan, will be formally adopted by the Volusia County Council per Florida Division of Emergency Management and Florida Statute requirements. Other jurisdictions in Volusia County may formally adopt this plan and supporting documentation to meet Community Rating System Activity 610 requirements.

## II. POLICIES

- A. **Authority.** This plan was developed, promulgated, and is maintained pursuant to the following local, state, and federal agreements, statutes, and regulations:
1. The National Response Framework, January 2008
  2. Volusia County Flood Response Plan, 2014
  3. The Volusia County CEMP, 2011
  4. F.S. 252, 2011

B. Assignment of Responsibilities

During a countywide flood event, the Volusia County Emergency Managers Advisory Group (MAG) will coordinate the flood response activities. This plan will be activated and implemented whenever a flood event threatens Volusia County by the Director, Volusia County Emergency Management Division. Volusia County Emergency Management will notify the jurisdictions in Volusia County of any anticipated adverse weather and will forward National Weather Service advisory/watch/warning messages to the jurisdiction(s) that may be impacted by a flood event as soon as they are received.

The County emergency management program will provide for the overall organization and direction in the development of all emergency notification, mitigation, preparedness, response and recovery programs occurring within the County.

Volusia County Emergency Management will forward any National Weather Service flood advisories/watches/warnings to the affected jurisdictions. This DOES NOT alleviate the jurisdiction(s) that may be impacted by the flood event from its responsibility to prepare for, respond to, and notify its citizens of the event.

The MAG will perform all duties imposed by F.S. 252. The MAG will review and recommend for adoption emergency management and mutual aid plans and agreements, and such resolutions and rules and regulations as are necessary to implement such plans and agreements.

a. Emergency expenditures: Volusia County will authorize expenditure of County funds necessary to combat the disaster, protect health and safety of persons and property, and provide assistance to disaster victims, as appropriate. In a flood situation, the County will request mutual aid from State and Federal governments, once local resources are exhausted.

b. Prioritizing Volusia County resources: Policy-level decisions involving the acquisition and distribution of food and water, supplies, equipment and other material when critical shortages exist or are anticipated will be made by the MAG.

(1) Volusia County maintains flood prevention materials such as sand and sand bags at various Barns around the County.

i. Citizens will be allowed fill sandbags and obtain plastic sheeting from the County prior to an anticipated flood event.

C. Provide the services and equipment to private citizens within Volusia County as necessary in response to the disaster after proclamation by the governor.

- Providing necessary staff, participating in training and exercises, providing representatives to incident management as a point of contact during

emergencies, and allocating equipment and resources to the event.

- Providing for the effective utilization of resources within or from outside the County to assist in an effective response to a flood event. Requests for assistance will be made through established emergency management channels.
- Providing emergency disaster coordination through the Emergency Operations Center.

D. Managers Advisory Group shall act as the single point of contact for the legislative body of their jurisdiction for emergency policy decisions.

E. Public Works Director and/or Incident Commander: Responsible for establishing and maintaining emergency response coordination, including planning, training, development of incident management facilities, dissemination and implementation of plans.

F. Establishing an on-site Incident Command post. Assume field command of the incident and request needs for support to the incident through the County Emergency Operations Center.

G. Army Corps of Engineers

1. Upon request by officials of the local jurisdiction and the County Emergency Management Director, the Corps of Engineers may serve as a resource provider to emergencies within Volusia County, with the authority to deploy personnel to assist under an all-hazards emergency response.

2. Technical, material, and direct assistance are the forms of response the US Army Corps of Engineers can provide to water-related disasters within the County. Technical assistance includes providing guidance on flood fight techniques and emergency construction methods; inspecting flood protection projects and dams to identify problems and recommend corrective measures; and providing hydraulic or hydrologic analysis, geotechnical evaluations, topography and stream data, maps, and historic flood or storm information. Material assistance includes issuing supplies (primarily sandbags) and loaning pumps. Direct assistance includes rescue operations, and on-the-ground flood fight operations.

### III. SITUATION

A. Volusia County consists of approximately 1,210 square miles with 50 miles of Atlantic coastline. Approximately 982 square miles are located in unincorporated Volusia County. On the east side of the County, the Halifax River and the Indian River North/Mosquito Lagoon make up the Intracoastal Waterway and form long, narrow estuaries which separate the mainland from the barrier island. There is one inlet, Ponce DeLeon Inlet, located near the middle of the coastline which serves as the County's only passage through which ocean tides and hurricane

surges propagate into the Intracoastal Waterway. The St. Johns River is the largest river in the County and flows along the west side of the County, flowing south to north. Besides the St. Johns River, the other two major streams are the Tomoka River and Spruce Creek located on the eastern side of the County. The Tomoka River has a tributary area of 159 square miles, which serves the northeastern and central portions of the County. The river flows from south to north and discharges through the Tomoka Basin to the Halifax River, which can be subject to storm surge. Spruce Creek also flows from the south to the north and then west to east until it discharges into Strickland Bay and then ultimately into the Halifax River. Spruce Creek has a tributary area of approximately 91 square miles, which serves southeastern Volusia County. This system also includes Spruce Creek Swamp, Turnbull Creek and the B-19 Canal.

B. Emergencies or disasters can occur at any time causing significant human suffering; injury and death; public and private property damage; environmental degradation; loss of essential services; economic hardships to businesses, families and individuals; and disruption of governmental entities.

1. Local government officials recognize their responsibilities with regard to public safety and accept them in the implementation of this plan. Coordination exists between emergency response organizations on a daily basis. This interaction is based on the frequent and routine practice of day-to-day responses.
2. Demand on emergency response agencies becomes much greater in times of crisis, and the prioritization of response to an emergency becomes critical. In addition, the resource of many of the supporting public and private organizations that normally do not interact except in a crisis need to be mobilized on a cooperative basis.
3. Citizens, businesses, government agencies, and industries will utilize their own resources and should provide for themselves during the first three – five days of an emergency or disaster.
4. Nothing in this plan is intended to diminish the emergency preparedness responsibilities of Volusia County. Its first priority is meeting the needs of the citizens within its jurisdiction; and each jurisdiction maintains their right to attend to their own circumstances before committing resources to cooperative disaster response. Participation in mutual aid agreements with other agencies is entirely voluntary. Nothing in this plan is intended to diminish the emergency preparedness responsibilities of individual citizens. Circumstances during disasters may not allow immediate response to meet all the needs of the public. Every individual should be prepared and able to provide for themselves during the first three – five days of an emergency or disaster. A free-market economy and existing distribution systems should be maintained as the primary means for continuing operations of the economic and private-sector systems. Normal

business procedures may require modification to provide essential resources and services.

5. In situations not specifically addressed in this plan, responding agencies will have to improvise and carry out their responsibilities to the best of their abilities under the circumstances.

6. When a disaster occurs, or when one is imminent, the Emergency Management Director will activate the County Emergency Operations Center (CEOC).

7. In a major event, the resources within the County will be overwhelmed and outside assistance will be requested through CEOC to State.

C. Flood response planning requires knowing how much time warnings may provide for flooding conditions. The more time available for a response, the more options are open to the responders. In Volusia County, there is normally at least 72 hours advance warning prior to a rain event, often times more in the case of a tropical storm/hurricane. There is no single item, report or warning that will "predict" flooding. The decision to implement a flood response plan lies with the elected officials of the impacted community, although that decision can be based on the decisions of other communities or governments. Promulgating NWS severe weather advisories, watches, and warnings to affected jurisdictions will occur when the messages are received.

D. The best approach to ensure maximum possible response time is to develop a monitoring plan for locations that give maximum warning of rising levels. Those locations should be easily monitored by gauges placed by the South East River Forecast Center (SERFC). SERFC provides ample flood warnings via their river level prediction forecast available at <http://www.srh.noaa.gov/serfc/>. As soon as the SERFC river gauges indicate that any of the water bodies monitored will reach the action stage, public notification messages will be issued through the various means available: press releases, advisories, "reverse-911", twitter, Facebook, e-mail alert, and law enforcement vehicle loud speaker notification to select areas.

#### **IV. Concept of operations**

1. The responsibility for on-site field command and leadership, and operations during flood emergency situations in Volusia County, resides in the County Public Works Director.

2. The PWD is responsible for carrying out flood response and recovery in the County.

3. Emergency Management in the County is conducted under the universally accepted emergency management phases of mitigation, preparedness, response and recovery. Mitigation and preparedness are constant and continuous processes.

4. This Flood Response Plan reflects the roles and responsibilities of agencies and jurisdictions within the County for emergency management operations.

5. Department Heads may augment County staff to perform emergency functions as directed by the MAG.

6. Departments will retain their identity and autonomy during flood response operations. When County agencies assist each other, personnel will remain under the supervision of their own agency. They will receive mission assignments from the coordinating agency.

7. Departments not having an assigned emergency mission will carry out such duties as may be directed by the MAG, Public Works Director and/or Incident Commander

8. The County plan will make provisions for actions necessary to minimize injuries and damage, and expedite recovery from the effects of a disaster. Priority throughout the emergency period will be the preservation of life and protection of property.

9. If the situation exceeds or threatens to exceed the initial response capabilities, the Incident Commander will contact the Volusia County Emergency Management Director to activate additional response capabilities through established procedures.

10. The Volusia County Sheriff's Office Dispatch Center ("Central") is the designated 24-hour County Warning Point.

A. Incident Command System. The Incident Command System (ICS) is the basis for all direction, control and coordination of emergency response and recovery efforts conducted under this plan. The authority of the Incident Commander is limited to those powers specifically granted by statute, legislative authority or derived from the plan. Emergency response and supporting agencies and organizations agree to carry out their objectives in support of the incident command structure to the fullest extent possible.

B. Designation of the Incident Commander is made by the first responding agency.

C. Operational direction and control of emergency management response and recovery activities will be conducted on-site by the Incident Commander. Requests for assistance will be made through normal channels until the County Emergency Operations Center has been activated, at which time requests for assistance and resources will be directed to the EOC.

D. The County Public Works Director, upon notification of an actual emergency or disaster, will evaluate the situation, alert the appropriate local response agencies, request activation of local warning and emergency public information systems, submit resource requests, initiate response activities, and coordinate the situation analysis and damage assessment.

E. Volusia County Emergency Management will coordinate disaster recovery and restoration efforts to include collection, evaluation, compilation, and forwarding of reports and damage assistance requests; restoration of essential services; State, Federal and other disaster assistance programs; identify potential future mitigation initiatives; conduct reviews and critiques of emergency plans and procedures; issue an after-action report identifying areas needing improvement and recommend actions to correct deficiencies.

#### V. Plan maintenance

A. The Volusia County Flood Response Plan will be reviewed and updated annually during the Statewide Hurricane Exercise or as conditions warrant.

B. Stakeholder input will be solicited and recommended changes will be incorporated into the FRP.

#### VI. Definitions

A. **Flooding.** Flooding is an overflowing of water onto land that is normally dry. It can happen during heavy rains, when ocean waves come onshore, when snow melts too fast, or when dams or levees break. Flooding may happen with only a few inches of water, or it may cover a house to the rooftop. The most dangerous flood event, the **flash flood**, happens quickly with little or no warning; other flooding events occur over a long period and may last days, weeks, or longer. Volusia County does not experience 'flash flooding.' Flood events in the County result after an extended period of heavy rainfall. Ponding and road flooding can occur in low-lying areas during brief heavy rainfall events associated with fast moving thunder storms.

B. **Coastal flooding.** Coastal flooding occurs when a hurricane, tropical storm, or tropical depression produces a deadly storm surge that overwhelms coastal areas as it makes landfall. Storm surge is water pushed on shore by the force of the winds swirling around the storm. This advancing surge combines with the normal tides to create the hurricane storm tide, which can increase the average water level 15 feet or more. The greatest natural disaster in the United States, in terms of loss of life, was caused by a storm surge and associated coastal flooding from the great Galveston, Texas, hurricane of 1900. At least 8,000 people lost their lives.

C. **Inland flooding.** When tropical cyclones move inland, they are typically accompanied by torrential rain. If the decaying storm moves slowly over land, it can produce rainfall amounts of 20 to 40 inches over several days. Widespread flash flooding and river flooding can result.

D. **Flash flood.** A flash flood is a **rapid rise of water** along a stream or low-lying urban area. Flash flooding occurs within six hours of a significant rain event and is usually caused by intense storms that produce heavy rainfall in a short amount of time. Excessive rainfall that causes rivers and streams to swell rapidly and overflow their banks is frequently associated with hurricanes and tropical storms, large clusters of thunderstorms, supercells, or squall lines.

## VII. Citizens information on floods

### A. Preparing for a flood. To prepare for a flood, you should:

- Build an emergency kit and make a family communications plan.
- Avoid building in a floodplain unless you elevate and reinforce your home.
- Elevate the furnace, water heater and electric panel in your home if you live in an area that has a high flood risk.
- Consider installing "check valves" to prevent flood water from backing up into the drains of your home.
- If feasible, construct barriers to stop floodwater from entering the building and seal walls in basements with waterproofing compounds.

### B. Driving. Flood facts:

The following are important points to remember when driving in flood conditions:

- Six inches of water will reach the bottom of most passenger cars causing loss of control and possible stalling.
- A foot of water will float most vehicles.
- Two feet of rushing water can carry away most vehicles including sport utility vehicles (SUV's) and pick-ups.
- Do not attempt to drive through a flooded road. The depth of water is not always obvious. The road bed may be washed out under the water, and you could be stranded or trapped.
- Do not drive around a barricade. Barricades are there for your protection. Turn around and go the other way. Remember: "Turn Around, Don't Drown!"
- Do not try to take short cuts. They may be blocked. Stick to designated evacuation routes.
- Be especially cautious driving at night when it is harder to recognize flood dangers.

### C. Flood facts & flood insurance

- Floods and flash floods happen in all 50 states. Floods are our #1 natural disaster.
- Everyone lives in a flood zone. (For more information, [visit Flood Zones FAQs.](#))
- Most homeowners insurance does not cover flood damage.

- If you live in a Special Flood Hazard Area (SFHA) or high-risk area and have a Federally backed mortgage, your mortgage lender requires you to have flood insurance. (To find your flood risk, fill out the Flood Risk Profile.)
- Just an inch of water can cause costly damage to your property.
- Flash floods often bring walls of water 10 to 20 feet high (N/A for Volusia County).
- A car can easily be carried away by just one foot of floodwater.
- Hurricanes and winter storms are common (but often overlooked) causes of flooding.
- New land development can increase flood risk, especially if the construction changes natural runoff paths.
- Federal disaster assistance is usually a loan that must be paid back with interest. For a \$50,000 loan at 4% interest, your monthly payment would be around \$240 a month (\$2,880 a year) for 30 years. Compare that to a \$100,000 flood insurance premium, which is about \$400 a year (\$33 a month).
- If you live in a moderate-to-low risk area and are eligible for the Preferred Risk Policy, your flood insurance premium may be as low as \$129 a year, including coverage for your property's contents.
- You are eligible to purchase flood insurance as long as your community participates in the National Flood Insurance Program. Check the Community Status Book to see if your community is already an NFIP partner.
- It takes 30 days after purchase for a policy to take effect, so it's important to buy insurance before the floodwaters start to rise.

- In a high-risk area, your home is more than twice as likely to be damaged by flood than by fire.
- Anyone can be financially vulnerable to floods. People outside of high-risk areas file over 20% of NFIP claims and receive one-third of disaster assistance for flooding.
- The average annual U.S. flood losses in the past 10 years (2001-2010) were more than \$2.7 billion.
- When your community participates in the Community Rating System (CRS), you can qualify for an insurance premium discount of up to 45%. [Read more about CRS Ratings.](#)
- Since 1978, the NFIP has paid over \$36.9 billion for flood insurance claims and related costs (as of 12/31/10).
- Over 5.5 million people currently hold flood insurance policies in more than 21,000 communities across the U.S.

For more policy and claim statistics, [visit the National Flood Insurance Program.](#)

#### D. During an event

- Monitor [www.weather.gov](http://www.weather.gov) and [www.volusia.org/emergency](http://www.volusia.org/emergency) for the latest watches, warnings, and current conditions.
- Listen to area radio and television stations. Consider purchasing a [NOAA Weather Radio](#) to receive continuous weather information, flood warnings, reports of flooding in progress, and other critical information directly from a nearby NWS local Weather Forecast Office.
- Keep abreast of [road conditions](#).
- Be prepared to evacuate at a moment's notice. When a storm surge, flood, or flash flood warning is issued for your area, follow your evacuation plan and head for higher ground, and stay there.
- Stay away from floodwaters. If you come upon a flowing stream where water is above your ankles, stop, turn around, and go another way. Six inches of swiftly moving water can sweep you off your feet. Be especially cautious at night when it is harder to recognize flood danger.

- Keep children out of the water. They are curious and often lack judgment about running water or contaminated water.
- If you come upon a flooded road while driving, DO NOT attempt to cross flowing water. **TURN AROUND DON'T DROWN**. If you are caught on a flooded road and waters are rising rapidly around you, get out of the car quickly and move to higher ground. Most cars can be swept away by less than two feet of moving water.

#### E. Re-entering your flooded home

When returning to a home that's been flooded after natural disasters such as hurricanes, tornadoes, and floods, be aware that your house may be contaminated with mold or sewage, which can cause health risks for your family.

- If you have standing water in your home and can turn off the main power from a dry location, then go ahead and turn off the power, even if it delays cleaning. If you must enter standing water to access the main power switch, then call an electrician to turn it off. **NEVER turn power on or off yourself or use an electric tool or appliance while standing in water.**
- Have an electrician check the house's electrical system before turning the power on again.
- If the house has been closed up for several days, enter briefly to open doors and windows to let the house air out for awhile (at least 30 minutes) before you stay for any length of time.
- If your home has been flooded and has been closed up for several days, presume your home has been contaminated with mold. (See Protect Yourself from Mold.)
- If your home has been flooded, it also may be contaminated with sewage. (See After a Hurricane or Flood: Cleanup of Flood Water.)
- If flood or storm water has entered your home, dry it out as soon as possible. Follow these steps:
  - If you have electricity and an electrician has determined that it's safe to turn it on, use a "wet-dry" shop vacuum (or the vacuum function of a carpet steam cleaner), an electric-powered water transfer pump, or sump pump to remove standing water. If you are operating equipment in wet areas, be sure to wear rubber boots.
  - If you do not have electricity, or it is not safe to turn it on, you can use a portable generator to power equipment to remove standing water. **Note: If you must use a gasoline-powered pump, generator, pressure washer, or any other gasoline-powered tools to clean your home, never operate the gasoline engine inside a home, basement, garage, carport, porch, or other enclosed or partially enclosed structures, even if the**

**windows and doors are open. Such improper use can create dangerously high levels of carbon monoxide and cause carbon monoxide poisoning.**

- If weather permits, open windows and doors of the house to aid in the drying-out process.
- Use fans and dehumidifiers to remove excess moisture. Fans should be placed at a window or door to blow the air outwards rather than inwards, so not to spread the mold.
- Have your home heating, ventilating, and air-conditioning (HVAC) system checked and cleaned by a maintenance or service professional who is experienced in mold clean-up **before you turn it on**. If the HVAC system was flooded with water, turning on the mold-contaminated HVAC will spread mold throughout the house. Professional cleaning will kill the mold and prevent later mold growth. When the service determines that your system is clean and if it is safe to do so, you can turn it on and use it to help remove excess moisture from your home.
- Prevent water outdoors from reentering your home. For example, rain water from gutters or the roof should drain away from the house; the ground around the house should slope away from the house to keep basements and crawl spaces dry.
- Ensure that crawl spaces in basements have proper drainage to limit water seepage. Ventilate to allow the area to dry out.
- If your home is severely damaged and you have flood insurance, you may be eligible for a federal loan to mitigate your home against future flood losses. Call Volusia County Emergency Management for more information.

#### **VIII. Important phone numbers**

|                                     |              |
|-------------------------------------|--------------|
| Volusia County Emergency Management | 386-254-1500 |
| Volusia County Sheriff's Office     | 386-248-1777 |
| American Red Cross                  | 866-438-4636 |
| Florida Department of Health        | 850-245-4321 |
| Florida Emergency Information Line  | 800-342-3557 |
| National Weather Service Melbourne  | 321-255-0212 |

#### **IX. Flood warning dissemination and example messages**

##### **1. System Description/Emergency Warning Dissemination**

The Volusia County Flood Threat Recognition System, located at the Volusia County Emergency Operations Center, consists of the following elements:

- Florida Emergency Warning and Information Network (EMWIN)
- River stage gauges throughout the County of Volusia rivers and estuaries
- State Warning Point satellite communications telephone system (EMNET)
- Meteorologix® Storm Sentry Weather Radar/WeatherWire® Alert System
- Baron's "Threat Net" Spotter Net weather message notification system
- National Weather Service telephone notification, provided to the EOC when a potential flood event may impact Volusia County
- Audible notification/alert provided by county and municipal law enforcement officials in the form of public address system announcements from county/municipal patrol vehicles
- On-line, real-time flood prediction and storm surge modeling provided by Hurrevac and HurrTrak® software systems
- 21st Century Communications "Reverse-911" System, which provides a recorded message which contains the specific information provided by the flood threat warning originating agency (able to reach 100% of Volusia County). Text messaging is also available through this system.
- Brighthouse Cable "cable over-ride," which permits the publishing, by the EOC, of flood alert messages to all households that subscribe to cable.
- Twitter (@VolusiaEmergencyInfo) and Facebook real-time social media (search "Volusia County Emergency Management" on Facebook).
- E-mail alerts through the Volusia County e-mail alert system, available at <http://www.volusia.org/listserv.htm>
- Advisories that are issued every 12 hours during a flood event. The advisories are disseminated to all municipal EM Coordinators, ESF's, local media (newspapers and television stations), and critical facilities (school board, hospitals, health department).

The river gauges placed by USGS, NOAA, and the Florida Department of Transportation provide adequate advance warning, usually days, before flooding can be expected to occur. Gauges have been placed in the Tomoka River at 11<sup>th</sup> Street, U.S. Highway 92, Canal B-19 at Willow Run and at State Road 415. Hydrologic data recorded by the gauges are reported to the Volusia County Emergency Operations Center on a daily basis, and are available "real time" 24/7 on-line from NOAA at the Advanced Hydrologic Prediction Center at <http://www.srh.noaa.gov/alr/> These gauges enable a "real time" flood forecast to be promulgated in a timely manner, and provide accurate estimates of up-river arrival times and peak flows and elevations.

The gage information is utilized by the National Weather Service to forecast specific flooding conditions throughout the affected portion of Volusia County. The NWS promulgates the forecasted flooding through a variety of means: First notification is received over the EMWIN system, followed by an audible alert and hard-copy notification that is received via the Meteorologix® WeatherWire® Alert System. Finally, the Florida Department of Emergency Management notifies the Volusia County Emergency Operations Center via their satellite

communications system (EmNet). These systems are tested on at least an weekly basis; some systems, such as the State Warning Point satellite communications system and the 21st Century Communications "Reverse-911" system, are tested on a monthly basis. The flood warning system is tested on a year-round basis in the form of communications checks with the State and issuance of Twenty-First Century telephone notifications. Additionally, it is reviewed annually during the Statewide Hurricane Exercise every May prior to hurricane season.

The flood alert warnings provide explicit detail of the expected flooding, location(s) to be affected, time that the flooding is expected to begin, anticipated extent of the flooding in area and amount, and the time the flood alert expires. These alerts are provided for all anticipated flooding events, including storm surge, hurricane/tropical storm flooding from rainfall, and periods of brief, intense rainfall associated with localized weather events.

The HurrEvac©/HurrTrak© computerized storm surge prediction models also provide expected rain amounts, in inches, and areas expected to be most heavily impacted by the rain event.

Audible alerts are provided by county/municipal law enforcement agencies in the form of public announcements from their patrol vehicles. They are utilized extensively in the event an evacuation needs to be ordered for a hurricane or intense, localized flooding occurs. This system provides a back-up benefit to those residents who do not have telephones and have not received telephonic notification via the "Reverse-911" system.

The Volusia County Flood Warning Dissemination System is described in the Flood Information Section of the "Bell South Complete Phonebook Covering Volusia/Flagler Counties."

## 2. Sample message

The following is a typical flood warning message issued by the Melbourne Office of the National Weather Service. When issued, these messages are disseminated to EM Coordinators, ESF's, critical facilities, and the public.

FLASH FLOOD WARNING  
NATIONAL WEATHER SERVICE MELBOURNE FL  
807 AM EDT FRI MAY 22 2009

THE NATIONAL WEATHER SERVICE IN MELBOURNE HAS ISSUED A

\* FLASH FLOOD WARNING FOR...NORTHEASTERN VOLUSIA COUNTY IN FLORIDA... THIS INCLUDES THE CITIES OF...NEW SMYRNA BEACH...SOUTH DAYTONA... PORT ORANGE...PONCE INLET...ORMOND BEACH...HOLLY HILL... EDGEWATER...DAYTONA BEACH...

\* UNTIL 1100 AM EDT.

\* AT 805 AM EDT...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A PERSISTENT BAND OF SHOWERS AND STORMS MOVING ONSHORE FROM THE ATLANTIC. THIS RAINFALL IS MOVING INTO AN AREA THAT HAS ALREADY RECEIVED TORRENTIAL RAINFALL AMOUNTS IN THE PAST FEW DAYS AND THE ADDITIONAL RAINS WILL ACT TO FURTHER WORSEN AN ALREADY SERIOUS FLOODING SITUATION. ADDITIONAL RAINFALL AMOUNTS OF TWO TO FOUR INCHES WITH ISOLATED HIGHER AMOUNTS MAY OCCUR THROUGH LATE MORNING. PERSONS IN THESE AREAS SHOULD TAKE QUICK ACTION TO PROTECT LIFE AND PROPERTY.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

FLOODING IS OCCURRING OR IS IMMINENT. MOST FLOOD RELATED DEATHS OCCUR IN AUTOMOBILES. DO NOT ATTEMPT TO CROSS WATER COVERED BRIDGES... DIPS...OR LOW WATER CROSSINGS. NEVER TRY TO CROSS A FLOWING STREAM... EVEN A SMALL ONE...ON FOOT.

AFFECTED COUNTIES: IN FLORIDA: VOLUSIA.

#### **X. Development exposed to flooding in Volusia County**

##### **1. Number and types of buildings vulnerable to flooding**

A. Residential –

B. Commercial -

#### **XI. Impacts of flooding on health, safety, and community functions**

The health, social and economic impacts of major floods are devastating, affecting people's physical and mental health and disrupting and dispersing communities.

Impacts can range from immediate death, injury and harm from contaminated water, through lasting psychological consequences caused by damaged homes, loss of personal possessions and financial issues. Populations may be isolated by floodwaters, particularly in the southern, rural part of Volusia County, and the barrier island.

In Volusia County, following a flood, snakes and other creatures will be displaced from their normal habitat. Fire ants and other insects will also be displaced from their nests. Sewage from septic tanks may contaminate flood waters, posing a risk to health. Sharp objects, broken glass, rocks, holes, and other obstacles will be hidden by floodwaters. Due to these risks, avoid walking through flood waters without adequate foot and leg protection. Use a stout walking stick or cane to assist with mobility.

The adverse human health consequences of flooding are complex, far-reaching and difficult to attribute to the flood event itself. There is very limited quantitative evidence of the health impacts of floods. The main health impacts are deaths, injuries and mental health illnesses during the flood event itself, during the restoration process, or from effects brought about by damage to major infrastructure, including displacement of populations.

On average, the higher the water depth and the greater the flow velocity of a flood, the greater the damage to property. Most flood-related deaths can be attributed to rapid-rise floods. Floods with fewer deaths and severe injuries were attributed to mild temperatures, government rescue plans, civilian rescue operations and disaster occurrence at times when most people were at home. Other health problems and injuries were reduced by measures taken by trained military personnel and by distribution of boots and gloves to responders. Driving into flood waters is dangerous, as cars can become buoyant and swept away by a foot of water. The fatal effects of slow-rise river floods proved to be lower if people were aware of the risk of flooding and better prepared for a potential disaster. Sprains, strains, lacerations, abrasions and contusions are the most commonly reported injuries following floods. The risk of communicable disease outbreaks following flooding is small in industrialized countries (excluding tropical regions of industrialized countries like Australia) due to effective water treatment and sewage pumping, safe drinking-water, and public health infrastructure. However, national ministries and governments might need to take additional action on case-by-case bases.

Providing accurate information on safe management of flood water during evacuation and clean-up and on the actual situation is essential. Chronic health effects followed by flooding are explained by exposure to human and animal viruses during evacuation, or substantial psychological or physical stress at the time of flooding. Furthermore, flooding is associated with increased rates of anxiety and depression stemming from the experience itself, troubles brought about by geographic displacement, damage to the home or loss of familiar possessions and stress in dealing with builders and other repair people in the aftermath. The persistence of flood-related health effects is directly related to flood intensity. A comprehensive surveillance of morbidity from floods is limited, however. Hospitals, ambulances, retirement homes, schools and kindergarten in flood-prone areas are at risk, and evacuation of patients and vulnerable groups might represent a further risk.

The potential impacts on community property and functions from flooding and flood events is significant. The Volusia County Local Mitigation Strategy, Chapter 6, Vulnerability Assessment pages 6:28 and 6:31 – 6:36; and 6:38, provides a detailed analysis of the potential impact to people and built property to flood damage.

As noted by the number of critical facilities located in the Special Flood Hazard Area, the potential disruption to community services could be significant. Wide spread power outages, loss of lift stations, inability of response vehicles to access flooded neighborhoods, and hazardous materials incidents are some of the impacts that have occurred in Volusia County due to flooding.

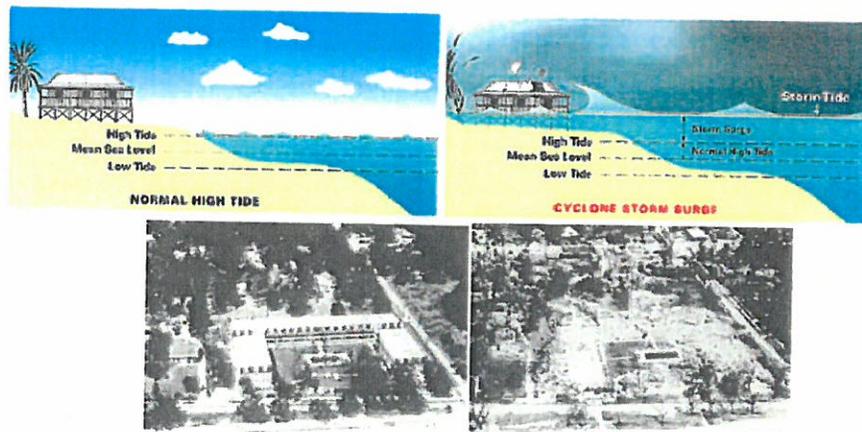
Secondary and tertiary effects due to flooding also occur. Secondary effects are those that occur because of the primary effects and tertiary effects are the long term changes that take place. Among the secondary effects of a flood are:

- Disruption of services -
  - Drinking water supplies may become polluted, especially if sewerage treatment plants are flooded. This may result in disease and other health effects, especially in under developed countries.
  - Gas and electrical service may be disrupted.
  - Transportation systems may be disrupted, resulting in shortages of food and clean-up supplies. In under developed countries food shortages often lead to starvation.
  - Soil erosion and Land degradation - Soil erosion removes valuable top soil which is the most productive part of the soil profile. This results in lower yields and higher costs of production.
- Health impacts
  - Heart attacks
  - Drowning
  - Poisonings
  - Injuries
  - Snake and insect bites
  - Heat exhaustion
  - Mental illness
- Long - term effects (secondary effects)
  - Location of river channels may change as the result of flooding, new channels develop, leaving the old channels dry.
  - Sediment deposited by flooding may destroy farm land (although silt deposited by floodwaters could also help to increase agricultural productivity).
  - Jobs may be lost due to the disruption of services, destruction of business, etc. (although jobs may be gained in the construction industry to help rebuild or repair flood damage).
  - Insurance rates may increase.
  - Corruption may result from misuse of relief funds.
  - Destruction of wildlife habitat.
  - Population relocation to less flood-prone areas (out-of-county migration).

## XII. Storm Surge

### *What is Storm Surge?*

A storm surge is a rise above the normal water level along a shore resulting from strong onshore winds and / or reduced atmospheric pressure. Storm surges accompany a tropical cyclone as it comes ashore. They may also be formed by intense low-pressure systems in non-tropical areas.



Richelieu Apartments before and after Hurricane Camille. A seven metre storm surge devastated all in its path (Pass Christian, Mississippi, August 1969)

### **Storm Surge + Normal Tide = Storm Tide**

The combination of storm surge and normal (astronomical) tide is known as a 'storm tide'. The worst impacts occur when the storm surge arrives on top of a high tide. When this happens, the storm tide can reach areas that might otherwise have been safe. On top of this are pounding waves generated by the powerful winds.

The area of sea water flooding may extend along the coast for over 100 miles, with water pushing several miles inland if the land is low lying.

The combined effects of the storm tide and waves can knock down buildings, wash away roads and run ships aground. If you are caught in your home or in a car when a significant storm surge arrives, you may not survive.

The paths of cyclones are often erratic, which makes it hard to forecast exactly when and where a cyclone will cross the coast. This makes it difficult to predict how high the astronomical tide will be when the storm surge strikes, since the time difference between high and low tide is

only a few hours. As a result the Bureau of Meteorology, in its warnings to the public, makes the 'worst case' assumption that the cyclone will cross the coast at high tide.

Had Cyclone Tracy arrived in Darwin during a high tide, the devastation would have been even worse. Similarly, a low tide saved Townsville from a dangerous storm surge that accompanied Cyclone Althea in 1971.

#### **Storm surges and tsunami**

Storm surges and tsunamis are generated by quite different phenomena. While both can cause inundation and significant damage in coastal regions, they have quite different characteristics.

A *storm surge* is generated by weather systems forcing water onshore over a generally limited stretch of coastline. It will normally build up over a time frame of a few hours, as the cyclone or similar weather system approaches. Normally wind-waves on top of the surge will contribute to its effect.

A *Tsunami* is generated by earthquakes, undersea landslides, volcanic eruptions, explosions or meteorites. These travel great distances, sometimes across entire oceans affecting vast lengths of coastal land.

#### ***What should you do?***

You need to plan well ahead of time.

##### **Are you under threat?**

If you live or work in the coastal tropics or subtropics, find out from your local Emergency Services or local council whether you are in a surge-prone area. If you are, decide where you will go in the event of a storm surge. You might have a friend living on higher ground with whom you could go and stay. Wherever your nearest safe high ground shelter might be, work out the safest way to get there.

To find out if you live in a storm surge area, go to [www.volusia.org](http://www.volusia.org), scroll down to the middle of the page and click on "[Do I live in a hurricane storm surge zone?](#)"

##### **Are you ready to evacuate?**

Now is the time to plan for what you will do in the event of evacuation. Will you have essential medicines? What about vital documents? What will you do with your pets? Talk with your local council or Emergency Services about what you plan to do.

**Time to evacuate!**

Be prepared to evacuate as soon as you are advised to do so. This makes it easier for Emergency Services to manage the difficult task of moving a lot of people all at once, especially if the weather is getting worse. If you choose to leave of your own accord, tell your neighbors. Don't forget your pets, important papers, medications, cash, emergency food and water, bedding,

When a hurricane threat develops, keep listening to official warnings issued by Volusia County Emergency Management and the National Weather Service. These will advise if high tides and coastal flooding are expected.

## Appendix A

## Volusia County Flood Response Plan – Flood Response Actions

1. Volusia County Emergency Management Division is the agency responsible for forwarding National Weather Service flood advisory, watch, and warnings to the jurisdictions in Volusia County. However, per Florida Statue, this does not alleviate the responsibility of local governments to notify its citizens of an impending flood event or its responsibility to help its citizens prepare for and respond to a flood event. Volusia County Emergency Management will coordinate with jurisdictional Emergency Management Coordinators to assist in promulgating NWS flood advisory, watch, and warning messaging.

2. Volusia County has a distinctive geology that requires somewhat different flood response actions based on location. On the west side of the county – west of the DeLand Ridge – the county consists of closed basins; that is, there is no natural drainage to rivers or the ocean. Communities along the St Johns River – which flows south to north – are impacted by rising waters as the result of rainfall events.

Significant rainfall events can and do occur south of Volusia County that do not directly impact the county itself. However, as the St Johns flows south to north, a tropical storm that impacts the southeast part of the state can cause major flooding along the St Johns days, or even weeks, after the event.

Fortunately there is enough advance notice (several days, usually) provided by the NOAA South East River Forecast Center and the real-time river gauges located along the St Johns to allow residents and government officials sufficient time to prepare to respond to the event.

West Volusia County areas other than those along the St Johns River are impacted by significant rain events much as the east side of the county – that is, low lying areas will flood whenever there is a major rain event. The major difference is rainfall is directed to detention/retention areas, whereas on the east side of the county rainfall is directed to the Halifax and Tomoka Rivers, either directly via swales and outfalls, or from detention/retention areas, then to the two rivers.

3. On the east side of the county – east of the DeLand Ridge – rainfall drains to the Halifax and Tomoka Rivers and then to the Atlantic Ocean. This is known as an "open basin". Flooding in the east side of the county occurs in low-lying areas when the stormwater system is overwhelmed, and water is no longer able to flow into the Halifax and Tomoka Rivers. This occurs when there is a strong "Nor'easter" that pushes the water to the west, preventing water from flowing from the Halifax and Tomoka Rivers into the Atlantic Ocean. This condition is exacerbated by high tides, and particularly during high tides when there is a full moon. Flooding also occurs during periods of unusually heavy rain over an extended period of time, such as the "No-Name" rain event of 2009.

While there is one real time river gauge located on the Tomoka River near Holly Hill, to date flood categories have not been established, nor are historic flood crest data available. However, anecdotal data is sufficient to indicate that when the Tomoka and Halifax Rivers approach 9 feet, yards and some structures along both rivers will flood.

Fortunately Volusia County does not experience true "flash flood" events anywhere in the county. Floods occur only after extended periods of heavy rainfall. This provides sufficient time to alert citizens to prepare for the event.

### Volusia County west of the DeLand Ridge

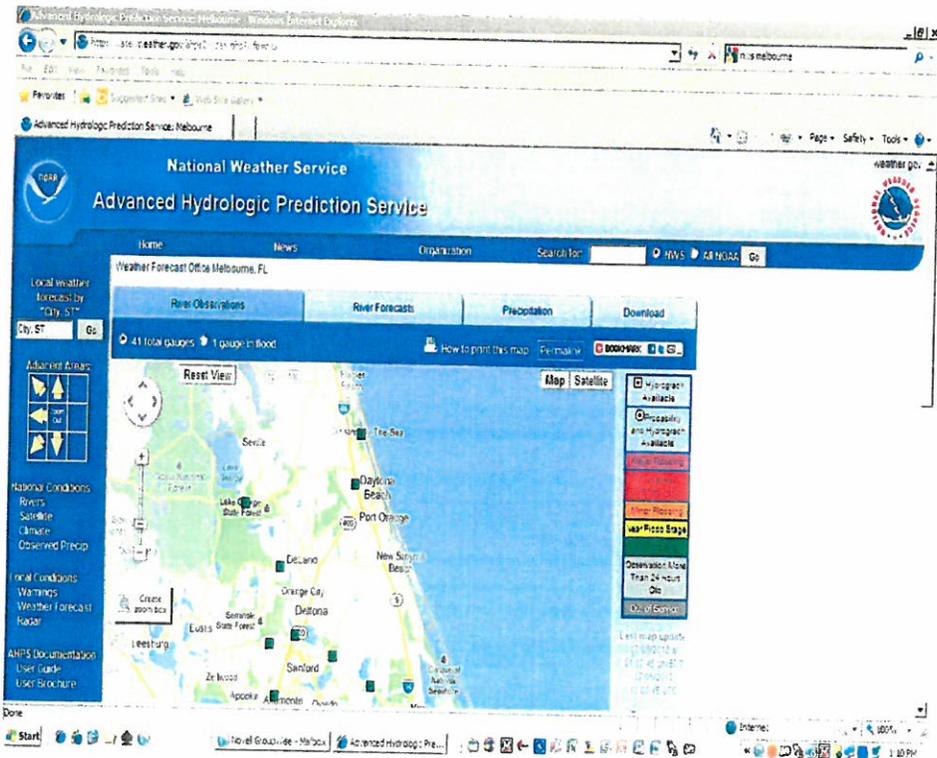
The following charts illustrate various river heights at different locations along the St Johns River with actions that will be taken when the forecast indicates that the river will reach various levels at each site.

In general, the causes of increase river height include:

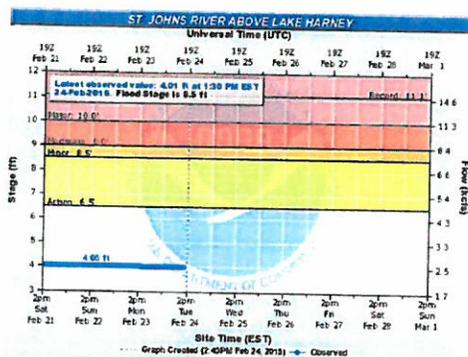
1. Large amounts of rainfall over a short period of time.
2. Small, steady amounts of rainfall over a long period of time.

As conditions warrant, the on-duty Volusia County Operations Officer will monitor all gauges every four hours.

### River gauge locations – St Johns River

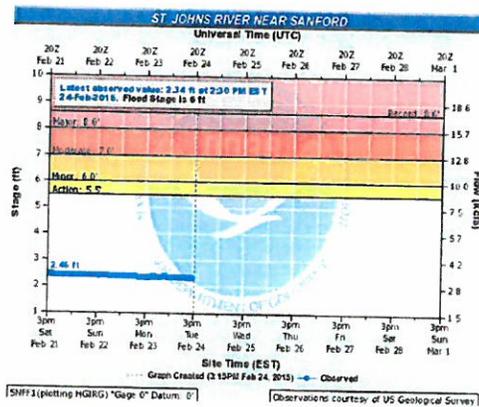


1. St Johns River above Lake Harney



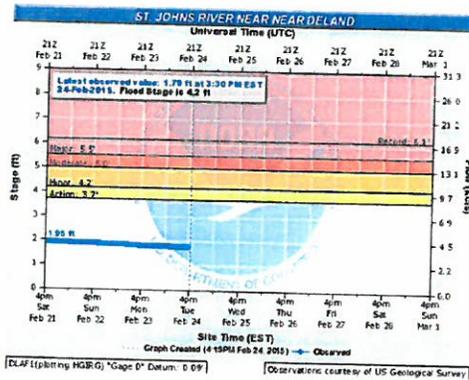
| Gauge height | Category          | NOAA Description of Flood  | Action  |
|--------------|-------------------|--|---|
| 6.5'         | Action stage      | Mullet Lake Park boat ramp and dock under water. Park will be closed.  | Coordinate with FWC/VCSD to increase no-wake zones. Notify residents to take precautions. Coordinate with PIO to issue press releases/social media messages. Alert PW that sandbags may be necessary.                   |
| 8.5'         | Minor flooding    | Water surrounds homes on stilts on Prevatt road, entering garages on the first story. Water fills yards and ditches along Whitcomb drive and lake Harney road. Roads flood in the palm shores and mullet lake areas. | Make sandbags available to residents of affected areas. Coordinate with ARC to put shelters on stand-by. Continue to issue press releases/social media messages. Prepare for road closures. Prepare to activate VC EOC. |
| 9.0'         | Moderate flooding | Water enters the first story of homes on Whitcomb drive between crossover lane and lake Harney road. Water covers mullet lake park.  | Partially activate VC EOC. Continue actions as described previously. Prepare local state of emergency declaration.  |
| 10.0'        | Major flooding    | Flooding of homes in low lying areas becomes more significant. Many secondary roads are impassable, limiting access to homes.  | Close roads as needed. Provide emergency sheltering (as required). Begin pumping where feasible. Continue media messaging. Declare local state of emergency.  |

2. St Johns River near Sanford



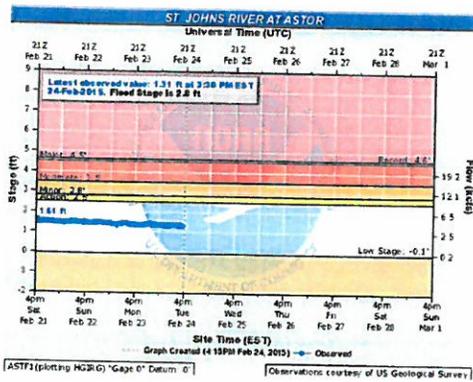
| Gauge height | Category          | NOAA Description of Flood  | Action  |
|--------------|-------------------|--|---|
| 5.5'         | Action stage      | Water moves up into yards and covers some driveways in stone island subdivision near Enterprise  | Coordinate with FWC/VCSO to increase no-wake zones. Notify residents to take precautions. Coordinate with PIO to issue press releases/social media messages. Alert PW that sandbags may be necessary.                   |
| 6.0'         | Minor flooding    | Water encroaches on low lying roads, also pool enclosures and patios in the stone island subdivision.  | Make sandbags available to residents of affected areas. Coordinate with ARC to put shelters on stand-by. Continue to issue press releases/social media messages. Prepare for road closures. Prepare to activate VC EOC. |
| 7.0'         | Moderate flooding | Water begins to move over sea wall around Lake Monroe and rises into grassy areas around the sea wall. Water begins to encroach on Seminole Boulevard                  | Partially activate VC EOC. Continue actions as described previously. Prepare local state of emergency declaration.  |
| 8.0'         | Major flooding    | Flooding becomes more significant to low lying structures and marinas along the river in Volusia and Seminole counties, including Sanford, enterprise and lake Monroe. | Close roads as needed. Provide emergency sheltering (as required). Begin pumping where feasible. Continue media messaging. Declare local state of emergency .   |

3. St Johns River near DeLand



| Gauge height | Category          | NOAA Description of Flood   | Action  |
|--------------|-------------------|---|---|
| 3.7'         | Action stage      | Flooding of campsites and trails occurs at Hontoon Island State Park.   | Coordinate with FWC/VCSO to increase no-wake zones. Notify residents to take precautions. Coordinate with PIO to issue press releases/social media messages. Alert PW that sandbags may be necessary.                   |
| 4.2'         | Minor flooding    | Docks and piers are completely submerged at pier 44 marina. Many docks are partially submerged at Hontoon landing marina. | Make sandbags available to residents of affected areas. Coordinate with ARC to put shelters on stand-by. Continue to issue press releases/social media messages. Prepare for road closures. Prepare to activate VC EOC. |
| 5.0'         | Moderate flooding | Water starts to enter buildings around Hontoon island. Many secondary roads and homes in low lying areas are flooded.     | Partially activate VC EOC. Continue actions as described previously. Prepare local state of emergency declaration.  |
| 5.5'         | Major flooding    | Significant flooding occurs to many structures and marinas along the river and in the Hontoon island area                 | Close roads as needed. Provide emergency sheltering (as required). Begin pumping where feasible. Continue media messaging. Declare local state of emergency .   |

4. St Johns River near Astor



| Gauge height | Category          | NOAA Description of Flood  | Action  |
|--------------|-------------------|--|---|
| 2.5'         | Action stage      | Water begins to cover docks at South Moon Fish Camp. Water begins to move into yards and cover boat ramps in low lying areas along the river.  | Coordinate with FWC/VCISO to increase no-wake zones. Notify residents to take precautions. Coordinate with PIO to issue press releases/social media messages. Alert PW that sandbags may be necessary.                  |
| 2.8'         | Minor flooding    | Minor flooding occurs to a few homes in low lying areas along the river. Flooding of low lying streets and yards north of Fox Road on the Lake County side of Astor, and from River Road northward on the Volusia side of the river. Docks covered at South Moon Fish Camp and approaching sea wall at Blair's Jungle Den.                     | Make sandbags available to residents of affected areas. Coordinate with ARC to put shelters on stand-by. Continue to issue press releases/social media messages. Prepare for road closures. Prepare to activate VC EOC. |
| 3.5'         | Moderate flooding | Moderate flooding occurs with many yards and streets along the river and with canals flooded, water enters the first floor of low lying homes. Flooding to docks and yards at condominiums on Juno Trail and docks at Astor Bridge Marina. Roads flooded in South Moon Fish Camp and starting to move over the sea wall at Blair's Jungle Den. | Partially activate VC EOC. Continue actions as described previously. Prepare local state of emergency declaration.  |
| 4.5'         | Major flooding    | Major flooding occurs to homes and businesses along the river  | Close roads as needed. Provide emergency sheltering (as required).  |

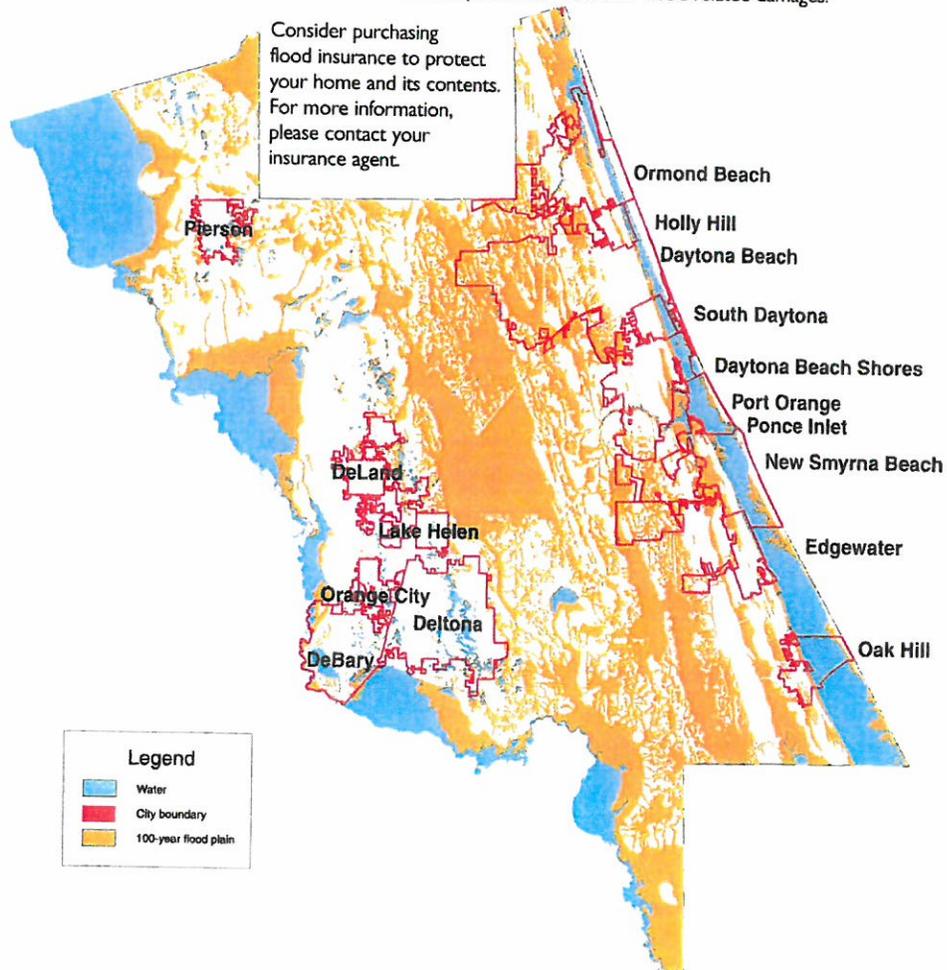
|  |  |  |  |
|--|--|--|--|
|  |  |  | Begin pumping where feasible. Continue media messaging. Declare local state of emergency . |
|--|--|--|--|

C10

## 100-year flood plain

If you live in or near the 100-year flood plain, your house may flood during heavy rain. Homeowner insurance policies do not cover flood-related damages.

Consider purchasing flood insurance to protect your home and its contents. For more information, please contact your insurance agent.



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## Volusia County Communications, Notification & Warning System Standard Operating Guideline

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Volusia County Division of Emergency Management  
Initial Publication: July 2012/V11.14.13

### I. INTRODUCTION

There are many hazards that could require the coordinated response of public and private agencies within Volusia County. Timely and accurate alert notifications to emergency responders and the public are critical during any emergency or disaster. Any given communication, notification or warning system may fail; this possibility requires that multiple methods of communication, notification and alerts be available.

#### a. PURPOSE

This Standard Operating Guideline (SOG) describes the methods for the dissemination of information, alerts and warnings to both the response community and members of the general public. This document describes the various components of the alert/warning system employed to communicate emergency or disaster information in order to exhibit the system in its entirety. The communication methods identified are designated as primary, secondary, or tertiary means of communication with relation to the Emergency Management office; these systems may be the primary means of communication by other organizations. The systems are also classified under their Emergency Management use to initiate, receive, and/or relay alerts to internal and external organizations.

#### b. SCOPE

This SOG covers communication and notification to the public and the response community within Volusia County. Connectivity of the County Warning Point to the State Watch Office (SWO) aligns information flow out of the County and into a much larger communication network. Information also flows from the SWO to the County. While the nations system of alert, warning, and notification is presented in general terms the scope of this document is centered on actions taken within and by the County itself.

### II. ROLES AND RESPONSIBILITIES

Responsibilities for monitoring, communication, notification and warning are shared among many agencies and involve the cooperative efforts of governmental entities as well as public/private partnerships and contracted services with private industry.

#### A. Organizations

The following organizations and components share monitoring and notification responsibilities relevant to this SOG:

- a) Volusia County Emergency Management Division (VCEMD)
- b) Volusia County Sherriff's Communications Center (County Warning Point)
- c) Volusia County I.T. Division and the Financial and Administrative Services Department (ESF-2 Lead)
- d) Volusia County Community Information (ESF-14 Lead)
- e) State of Florida Division of Emergency Management (State Watch Office)

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- f) FEMA and the Emergency Alert System (EAS)
- g) NOAA, the Storm Prediction Center , and the National Weather Service

### **B. Monitoring, Detection, Notifications**

Volusia County Sheriff's Communications Division is the County Warning Point and is responsible for the notification of county personnel with a primary emergency response and/or recovery tasking. Information flow comes from a variety of sources such as emergency management officials, municipal law enforcement, Central Florida Information Exchange, private citizens, the National Weather Service, utility providers, and private industry, amongst others. The County Warning Point is manned 24/7/365 and utilizes these resources to maintain a high level of situational awareness.

Detection of actual or suspected hazards often occurs through the consolidated dispatch center which is the County Warning Point. The County Warning Point monitors events unfolding in the County and in turn notifies the County Emergency Management Office and the State Watch Office when State Watch Office guidelines are met.

#### County Warning Point Detection Includes

- 911
- Law enforcement intelligence efforts
- Warnings or announcements by the perpetrators
- The characteristics of the event, such as explosion or chemical recognition
- Witness accounts
- The medical or physical symptoms of victims
- Laboratory results from samples taken at the scene or from victim's bodies
- Monitoring of a community's morbidity and mortality on a routine basis
- Unexplained disruption or failure of a computer network, telecommunications system or Internet service.

#### a. **Volusia County Emergency Management Division (VCEMD)**

The Volusia County Emergency Management Division is always at a Level-3 activation monitoring all hazards, both natural and man-made, which may impact the safety and well-being of Volusia County citizens, visitors and property. Volusia County Emergency Management maintains a call down list for notifications of Emergency Management staff by the County Warning Pointy under State Watch Office Criteria. This call down list is provided to the County Warning Point and is used to contact Emergency

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Management Staff during events that meet State Watch Office notification guidelines which encompass all hazards both man-made and natural.

VCEMD monitors NAWAS, EMnet, NOAA Weather Radio, 800MHZ radio system, and also maintains emergency contact lists for all Emergency Support Functions, City Emergency Management Coordinators, Fire Chiefs, Police Chiefs, and the Executive Management Group referred to as the Managers Advisory Group (MAG). VCEMD also monitors email notifications from the National Oceanic and Atmospheric Associations- National Weather Service Office, Central Florida Intelligence Exchange, and the State Warning Point; these will be disseminated to other agencies as needed.

As a hazard becomes more imminent the VCEMD may issue advisories or forward information in order to raise awareness of the potential event among the local response community, and/or partially activate to bring in additional support to establish information flow to the public through additional organizations or ESFs such as ESF-14 Public Information. VCEMD will forward all flood advisories, watches, and warning issued by the National Weather Service to potentially impacted jurisdictions. VCEMD will provide advance notification of severe weather events (tropical storms/hurricanes/forecast flood events) to the current PSN list, Health Care Facility list, and all public schools in Volusia County in order to ensure that facilities that may need to evacuate have sufficient time to notify transport companies, close schools, and in general prepare for the event.

VCEMD maintains the contracted services for Satellite Phones and the Public emergency notification system FirstCall Communications. VCEMD also maintains a Memorandum of Understanding with the Volusia Amateur Radio Emergency Services (ARES) group.

On a quarterly basis, administrative staff update the contact database that contains information for all of the municipalities, ESFs, support staff, and the Manager's Advisory Group. Each agency provides a primary contact and alternates to reach during an emergency event. This includes groups used on a daily basis as well as advisory groups that are sent information during an event. The contact database and the wide variety of email groups allow us the capability to communicate with all Emergency Management stakeholders, personnel, and elected officials. Testing and correction of failures in the email groups also occurs regularly with email invitations to training and exercises.

Volusia County Emergency Management will ensure annual tests occur including the "Open Text" (formerly Easy Link) system, Satellite Phones, 21<sup>st</sup> Century, the Citizens Information Center number, back-up EOC phone lines, and the SLERS radio.

The current operations section of Volusia County Emergency Management is responsible for review and update of this plan. At a minimum this

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document will be reviewed by Current Operations staff on a biennial schedule.

### **Volusia County Sheriff's Communications Center (County Warning Point, CWP)**

The Volusia County Sheriff's Communications Center communicates critical information to VCEMD and the State Watch Office (SWO) triggered in accordance with the SWO notification guidelines. The Sheriff's Communications Center is also the designated County Warning Point (CWP) and is responsible for 24/7 monitoring of the Federal NAWAS (National Alert Warning System), and the State of Florida EMnet. Volusia County Emergency Management Division currently maintains the contract for the FirstCall emergency notification system, while the CWP maintains the ability and staffing to distribute alerts with this notification system.

- b. Volusia County Information and Technology Division Financial and Administrative Services Department ESF-2 Communications**  
The mission of Emergency Support Function #2, Communications, is to plan and implement a multifaceted communications network to support the functioning of county government at the time of a disaster, including the ability to effectively interface with federal, state and local government agencies and organizations involved in the emergency response and disaster recovery efforts. The communications network must be resilient, redundant, and capable of providing support during any emergency or special situation.  
ESF-2 is also responsible for coordinating with VCEMD and the Amateur Radio Emergency Services. Volusia County Communications Department maintains the County's 800 MHz radio system.
- c. Volusia County Community Information ESF-14 Public Information**  
Emergency Support Function 14 disseminates disaster related information to the Public. During times of CEOC activation this is accomplished through press releases and the posting of information to the County's web site and through communication with a network of Public Information professionals called the Volusia/Flagler Public Information Network (PIN).
- d. State of Florida Division of Emergency Management**  
The State Division of Emergency Management operates the State Emergency Operations Center which houses the State Watch Office (SWO). The SWO is a 24/7 operation and serves to provide a single point of information and warning dissemination to Federal, State, and/or Local governmental officials. The Division also provides, utilizes and monitors the EMnet Voice Manager and Message Manager, NAWAS, and is the State entry point for the Emergency Alert System (EAS) messages.
- e. FEMA, and the Emergency Alert System (EAS)**  
FEMA, the FCC and NOAA/NWS jointly coordinate the EAS to allow the dissemination of local emergency messages via this system. The EAS is used on AM, FM and Land Mobile Radio Service, as well as VHF, UHF,

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FiOS (wireline video providers), and cable television including low-power stations.

**f. National Weather Service NOAA Weather Radio System**

NOAAs Storm Prediction Center and the National Weather Service are responsible for the preparation and issuance of severe weather forecasts and warnings designed for the protection of life and property of the general public. They are responsible for the operation and maintenance of the NOAA Weather Radio All Hazards (NWR)

### III. COMMUNICATION COMPONENTS

#### 1) Radio, Telephone, and Computer Infrastructure

**a. County-wide 800 MHz Harris EDACS (Enhanced Digital Access Communications System) radio system**

**Overview (primary/initiate, receive and relay)**

Volusia County currently operates a Harris 800 MHz EDACS Trunking radio system. The system consists of 2 Multi-Site Simulcast radio systems. (System "A" is 14 chs. and System "B" is 16 chs. Totaling 30 chs. to achieve County coverage. It is "Dual Mode" capable allowing both analog and digital voice transmissions. There are over 400 trunked talk groups available. There are approximately 10,000 radios within Volusia County.

In the event of a failure this system will revert fail-soft and continue trunking. As a backup to total system failure, there is access to 5 conventional State Mutual Aid frequencies, Volusia County's UHF MEDCOM system and a portable trailer radio system with a 100' tower.

Volusia County maintains regional interoperability with 5 surrounding counties with the existing system and interoperability to unlimited users with the use of communications equipment designed to cross patch systems and frequencies. (ie. FIN and VIDA Gateway).

As a 3<sup>rd</sup> level of backup, we have a Standalone 5ch. Trunked system at EVAC ambulance for redundancy and use for special events.

**Application**

This system is suitable for public safety communications and notifications across all hazards to those individuals utilizing both the mobile and portable radio system.

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### Testing

This is a daily use system. Preventative maintenance is done every 6 months, conducting extensive testing of every component in the system. **Telephone Systems (Land-line, Fax, TTY/TDD)**

### Overview (primary/initiate, receive and relay)

The Volusia County Emergency Management Division maintains land-line telephones on the County's digital switch as well as analog lines. In the event of failure of the internal switching network, a system of analog direct dial telephones are available. Facsimile machines are available in the CEOC and Message Center and a TTY/TDD device is operational to facilitate communications with the hearing impaired.

### Application

This system is suitable for communications and notifications across all hazards to those individuals utilizing land-line telephone systems including facsimile and TTY/TDD devices.

### Testing

This is a daily use system and the back-up phone lines and CIC number are tested annually by VCEMD staff.

#### b. Cellular Phone

### Overview (secondary/initiate, receive and relay)

Volusia County currently provides cellular phone service to Emergency Support Function Leads through Sprint and ATT. A list of cellular phone contact numbers for all ESFs is maintained by VCEMD.

### Application

This system is applicable across all hazards for notification to those possessing cellular phones.

### Testing

This is a daily use system. The phone contact lists are updated quarterly by the VCEMD.

#### c. Satellite Telephones

### Overview (secondary/initiate, receive)

A contract for satellite radio/telephones is maintained by VCEMD. Base units are located in the CWP and CEOC. Portable units can be issued to key personnel. County Communications also has a satellite communication trailer(Trak-Star) capable of both voice and data transmission.

### Application

This system is applicable across all hazards.

### Testing

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## Volusia County Communications, Notification & Warning System Standard Operating Guideline

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This system is tested annually. The telephone system is tested by placing calls to the satellite telephone service provider.

### d. Computer Systems (Internet, Email, Cellular Broadband Aircards)

#### Overview (primary/initiate, receive and relay)

Computer networks and the ability to communicate via Internet based applications and E-mail is widespread and is utilized for daily business use.

VCEMD staff maintain multiple email groups that are used during times of emergency. Many of these groups are used on a regular basis and updates are made upon email failure.

Many have portable access to the Internet and E-mail through the use of laptop computers and wireless broadband services. Email failures in these groups are addressed.

In addition to the standard email lists Volusia County Emergency Management maintains E-Update, which allows the Public to sign up for email alerts through the VCEMD web site: <http://volusia.org/emergency/>

Volusia County Emergency Management Staff also receive alerts and warnings from the State Watch Office specific to Volusia County via the FDEM email alert notification system in alignment with the State Watch Office notification standards.

#### Application

This system is applicable across all hazards and is especially useful for providing information about impending events. The State Watch Office email groups provide timely notifications which continue through incidents specific to Volusia County. This information is produced in

#### Testing

These are daily use systems and are tested in nearly real time. However, the email notification groups and contact database that Emergency Management Maintains is updated quarterly. Also, all of the groups are tested at least twice a year with the release of Hurcon 2 on June 1<sup>st</sup> and Hurcon 1 on November 30th.

## 2) Internal Notifications and Public Warnings

### a. Public Emergency Notification system FirstCall (primary to public)

#### Overview (initiate and relay)

FirstCall provides an emergency telephone notification system. This is an extremely high-speed telephone communication service

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## Volusia County Communications, Notification & Warning System Standard Operating Guideline

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available for emergency notifications. The system is capable of delivering customized pre-recorded emergency messages directly to homes and businesses at the rate of up to 60,000 calls per hour. Access to this system is gained through contact with the County Warning Point (CWP) on a 24/7 basis.

### Application

This system is capable of emergency notifications to the Public and Responders across all hazards. It is also capable of targeting vulnerable populations and houses the special needs registry contact list.

### Testing

The system is maintained and operated by the CWP and used on average more than 10 times per month. The system is also tested by VCEMD at least annually.

## b. HAM Radio Communications

### Overview (secondary/initiate, receive and relay)

Volusia ARES radio operators may be used for communications between the CEOC and public shelters during activations. They may also be used as backup communications in the event of a complete communications infrastructure failure. Capabilities include local VHF/UHF, long-haul HF and digital communications services. Amateur Radio also serves as SkyWarn for Severe Weather Storm Spotters.

### Application

This system is applicable across all hazards.

### Testing

The Volusia County Amateur Radio Emergency Service (VolARES) group is responsible for maintaining and testing the system. They hold a weekly on-air voice and digital net test. This system is also tested during special events activations of the County EOC.

## c. National Warning System (NAWAS)

### Overview (primary) (initiate, receive and relay)

The National Warning System (NAWAS) is a 24-hour continuous private line telephone system used to convey warnings to Federal, State and local governments. A NAWAS telephone set is monitored 24/7 at the CWP. NAWAS is also monitored at the CEOC during standard business hours and 24 hours during full activation.

### Application

This system provides a notification method between the SWO and CWP. When the County EOC is activated for planned events NAWAS may be the means of notification to the SWO that the

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## Volusia County Communications, Notification & Warning System Standard Operating Guideline

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CEOC is activating. This system may also be used to notify the SWO of un-planned activations.

### Testing

This system is tested weekly and documented in the State Watch Office summary.

#### **d. EMnet Voice Manager and Message Manager**

##### Overview (primary) (initiate, receive and relay)

The Emergency Management Network Voice Manager (EMnet VM) and Message Manager (MM) constitute the SWO's primary backup communications system for voice and data communication to the counties and other state agency emergency management facilities. The EMnet MM receives weather bulletins from the local NWS office as well as other EAS bulletins. The EMnet VM provides voice communications between County Warning Points, the County EOCs, NWS Offices, and the State Watch Office.

##### Application

This system is applicable for communication with the SWO, County Emergency Management Offices, NWS Offices, and plugs in to the Integrated Public Alert and Warning System (IPAWS) and the Emergency Alert System (EAS).

##### Testing

Weekly tests are conducted and documented in the State Watch Office summary. VCEMD staff also conducts weekly line checks.

#### **e. Citizen Information Center Disaster Hotline**

##### Overview (primary) (receive and relay)

Volusia County's non-emergency Citizen Information Line is a one-stop information and assistance center that answers questions, coordinates complaints, handles designated requests for services and serves as a means for rumor control in Volusia County. During CEOC activations it is a 24/7 conduit for citizens to report non-emergency disaster related issues or receive important information prior to, during and following a disaster or major emergency. The CIC is located in the County EOC.

##### Application

This system is useful for receiving and passing non-911 type information to the public. TTY/TDD equipment is available to facilitate communication with the hearing impaired.

##### Testing

This is a daily use system. However, this phone line is open and re-routed to the County EOC during times of disaster.

#### **f. All Hazards NOAA Weather Radio (NWR)**

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## Volusia County Communications, Notification & Warning System Standard Operating Guideline

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### Overview (secondary for EM/initiate, receive and relay)

NWR broadcasts National Weather Service (NWS) warnings, watches, forecasts and other non-weather related hazard information 24 hours a day. During an emergency, NWS forecasters interrupt routine broadcasts and send a special tone activating local weather radios. Weather radios equipped with a special alarm tone feature sound an alert to give you immediate information about a life-threatening situation. NWR broadcasts warnings and post-event information for all types of hazards: weather (e.g., tornadoes, floods), natural (e.g., earthquakes, forest fires and volcanic activity), technological (e.g., chemical releases, oil spills, nuclear power plant emergencies, etc.), and national emergencies (e.g., terrorist attacks). Working with other Federal agencies and the Federal Communications Commission's (FCC) Emergency Alert System (EAS), NWR is an all-hazards radio network, making it the most comprehensive weather and emergency information available to the public. Life-threatening weather emergency messages are alerted on NWR. Many of those same weather-related emergency messages are also broadcast via the EAS.

Volusia County is served by KIH26 operating on 162.4 MHz and the County S.A.M.E. code is 012127.

### Application

This system is used to automatically inform and alert regarding high winds, severe weather, wildland/urban wildfire conditions, and other weather related events. Non-weather related hazard information can also be disseminated via the Weather Radios.

### Testing

Weekly tests are conducted by the National Weather Service and are coordinated with VCEMD. Volusia County Radio Services broadcasts the weekly tests over the County 800MHz radio system.

#### **g. National Emergency Alert System (EAS)**

### Overview (secondary for EM/initiate, receive and relay)

The Emergency Alert System (EAS) is a national public warning system that requires broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service (SDARS) providers and, direct broadcast satellite (DBS) service providers to provide the communications capability to the President to address the American public during a National emergency. The system also may be used by state and local authorities to deliver important emergency information such as AMBER alerts and weather information targeted to a specific area.

### Application

This system is applicable to all hazards. VCEM can request that emergency messages be disseminated via the EAS by notifying the

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## Volusia County Communications, Notification & Warning System Standard Operating Guideline

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SWO and the local Primary LP-1 Control Station, WPOZ-FM or the local NWS office.

### Testing

Testing of the EAS is the responsibility of the SWO and the Local Primary LP-1 Control Station. Monthly tests are conducted by the SWO and the Local Primary LP-1 Control Station. Digital television and cable providers, along with Sirius XM satellite radio, IBOC, DAB and digital radio broadcasters have been required to participate in the EAS since December 31, 2006. The last nationwide test was conducted November 9, 2011 2pm EST.

#### **h. Commercial Broadcast Media**

##### Overview (primary for EM/initiate, receive and relay)

Volusia County is served by several broadcast television stations representing all the major networks and a multitude of AM/FM radio stations. All stations maintain equipment capable of receiving alerts broadcast through the EAS system. Additionally, VCEM has an agreement with Brighthouse Cable to issue "cable override" messages as requested.

##### Application

Use of this system is applicable across all hazards to alert and warn the public of impending or occurring emergency events or to disseminate emergency information.

##### Testing

This is a daily use system.

#### **i. Integrated Public Alert and Warning System (IPAWS)**

##### Overview (secondary for EM/initiate, receive and relay)

Federal, state, territorial, tribal, and local alerting authorities may choose to use IPAWS and may also integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS gives public safety officials an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), the Commercial Mobile Alert System (CMAS), NOAA Weather Radio (NWR), and other public alerting systems from a single interface. This interface can be reached through EMnet orFirstCall.

##### Application

This system integrates many of the commonly used communication components including cell phones and television. The primary focus of this system is to allow federal officials to communicate over large geographical areas. However, local authorities could access this system to alert or warn residents of the County.

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## Volusia County Communications, Notification & Warning System Standard Operating Guideline

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### Testing

This system integrates multiple programs which are tested independent of each other.

#### j. Person-to-Person Contact

##### Overview (secondary/initiate, receive and relay)

Person-to-person or door-to-door contacts can be made with field personnel such as Firefighters and Law Enforcement Officers. Typically methods employed would be by use of PA systems on Fire Apparatus and/or Patrol Cars.

##### Application

This system is especially useful to notify neighborhoods and large groups of people in the events of high winds, hazardous materials incidents, flooding, wildland/urban wildfires, droughts and terrorism.

##### Testing

This is a daily use system.

#### k. SLERS (State Law Enforcement Radio System)

Overview (tertiary/initiate, receive, and relay) Florida's Statewide Law Enforcement Radio System (SLERS) is a single, unified radio network that meets the radio voice communications needs of state law enforcement officers and other participating agencies throughout the state. SLERS is a 800/700 (aircraft) MHz system consisting of 200 microwave sites, RF multi-sites, and RF simulcast sites. The SLERS all-digital radio network covers over 60,000 square miles (including 25 miles offshore) with 98% mobile coverage and portable coverage in selected areas. The VCEOC and the FDEM Regional Coordinators have these radios.

##### Application

This system can be used to communicate with the Florida Division of Emergency Management Regional Coordinators.

##### Testing

This is a daily use system and Volusia County Emergency Management will ensure it is tested at least annually.

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Emergency Operations Center (EOC) for two purposes. The first is to make all minor updates and track them for later incorporation into the next edition of the CEMP. The second is to have a copy of the most current CEMP available in the EOC for reference during activation of the plan. Major changes are promulgated via change notices distributed IAW the CEMP master distribution list.

## II. SITUATION

The Volusia County CEMP is intended to reflect the unique characteristics of the county and its municipalities before, during and after a disaster. This section of the CEMP summarizes information about the county that is relevant to developing, maintaining and implementing the plan.

### Overview of the Situation

Volusia County is a large, geographically diverse political subdivision of the State of Florida, and the CEMP must account for the county's characteristics. The land area of the county is in excess of 1,200 square miles. In this area, approximately 454,000 residents are generally clustered into two major areas of development - the coastal areas east of I-95 and along the US 17/92 and I-4 corridors in the west and southwest. Sixteen municipalities comprise approximately 75% of the total population and range in size from approximately 1,300 (Oak Hill) to 85,000 (Deltona), based on the 2010 estimates. Ten municipalities are clustered in the eastern area while six are grouped in the west and southwest. The number of jurisdictions and wide-range of capabilities are important considerations for the Volusia County CEMP. Providing first response emergency services within the 16 municipalities and the unincorporated and specialized areas (beach, airport) are 16 local law enforcement agencies, 14 fire/rescue/EMS agencies (including EVAC), and 16 public works agencies. In addition, Volusia County has several large venues where residents and visitors gather throughout the year, including the Daytona International Speedway and the north and south beach areas that cross six jurisdictions. These sites are the focal points of several special events activities attracting international attention that increase the in-county populations by 50-75% at several times throughout the year.

### A. Hazards Analysis

1. Volusia County is vulnerable to a wide range of natural, technological and societal hazards. The most prominent hazards that threaten the County and municipalities are hail, hurricanes and tropical storms, lightning, severe winter storms, thunderstorms, tornados, coastal erosion, drought,

flood, storm surge, sinkholes, tsunamis, and wildfires. Man-made and technological hazards include cyber attack, agroterrorism, terrorism, HAZMAT (man caused and terrorism), civil disturbance, coastal oil spill, and mass migration. Wildfires destroyed 163,000+ acres during the summer of 1998. Hurricane Dora impacted the coastal areas in 1964, while inland Volusia County was impacted by Hurricane Donna in 1960. The entire County was affected by hurricanes Charley, Frances, Ivan, and Jeanne in 2004.

2. The assessment of the vulnerability of the community to these hazards is an integral part of the development and maintenance of the Volusia Prepares hazard mitigation planning process. Volusia Prepares is a multi-jurisdictional, public-private partnership to develop and implement a strategy to decrease the vulnerability of the community to the impacts of future disasters. Volusia Prepares was initiated in 1999 with the issuance of a detailed strategy that included a comprehensive hazards analysis and vulnerability assessment. The mitigation planning effort has been continuing since that time, and has recently been supplemented by additional efforts under federal local mitigation planning programs.
3. A detailed hazard assessment process was originally conducted by the Volusia Prepares planning participants in 1999, and updated in 2010; the following table indicates those hazards considered common or having the potential to affect the County:

|                 | <i>Weather</i>            | <i>Health</i>                               | <i>Ecological</i> | <i>Economic</i>   |
|-----------------|---------------------------|---|-------------------|-------------------|
| Natural         | Hail                      | Pandemic                                    | Tsunami           | Civil disturbance |
|                 | Hurricane/Tropical Storms | Agroterrorism                               | Sinkhole          |                   |
|                 | Lightning                 |   | Wildfire          |                   |
|                 | Severe Winter Storm       |   | Coastal Erosion   |                   |
|                 | Thunderstorm              |   | Drought           |                   |
|                 | Tornado                   |   | Flood             |                   |
|                 |                           |   | Storm Surge       |                   |
|                 |                           |   |                   |                   |
| Techno-logical  |                           | HazMat Incidents (man caused and terrorism) | Coastal Oil Spill | Cyber attack      |
|                 |                           |   |                   |                   |
|                 |                           |   |                   |                   |
| Socie-tal/Civil |                           |   |                   | Civil disturbance |
|                 |                           |   |                   | Mass Migration    |

|  |  |  |  |           |
|--|--|--|--|-----------|
|  |  |  |  | Terrorism |
|  |  |  |  |           |
|  |  |  |  |           |

4. The Volusia Prepares FEMA approved Local Mitigation Strategy, *Volusia Prepares*, issued in 1999, and updated in 2010, contains an extensive analysis of the potential impact of various types of hazards on the property within the county, with a particular emphasis on the predicted property damage that would result from hurricanes. Continuing mitigation planning efforts by the county routinely update and refine the hazards identification and risk assessment process.
  
5. Weather-related disasters are a major concern to Volusia County. The county also has a high percentage of its land lying within the 100-year flood plain. Over the last few years Volusia County has experienced flooding problems caused by both annual increases in the water table and the recent El Niño phenomenon. The winter storm of 1993 (the "Storm of the Century") caused an estimated \$15 million in crop damage, and over \$2.5 million damage to public and private property in Volusia. Tornadoes in May of 1994 caused \$6.7 million in private property damage. Tropical Storm Gordon in November 1994 caused over \$3.8 million in public damage and over \$9.3 million in private property damage. 1995 and 1996 brought damage from hurricane Erin, and evacuation and activation costs for Fran and Bertha. Tornadoes and other El Niño related events since July 1997 have caused over \$21 million in individual damage to residents and business. 165 residences were destroyed, 344 received major damage, and 413 suffered minor damage. 8 businesses were damaged. The total cost for the response, clean-up and damage to public facilities is not included in this figure. Additional information regarding the costs and impacts of disaster events is routinely gathered as a part of the Volusia County mitigation planning program. A summary of EOC activations by disaster is located [here](#).

**B. Geographic Information**

**1. Geographic area:**

**a. Area**

Volusia County is located on the Atlantic coast in the north-central portion of the Florida coastline. The county is bordered on the south by Brevard and Sem-

inole Counties, on the west by Marion, Seminole and Lake Counties, the north by Putnam and Flagler Counties, and on the east by the Atlantic Ocean. There are 832,000 acres (1,062 square miles of land and 238 square miles of water) located within the borders of Volusia County, including 47 miles of ocean beaches.

**b. Topography**

The topography of the county is generally flat, with little variation in elevation.

**c. Land Use**

Land use patterns are influenced by the waterways and road system. As with most of the Central Florida Area, more areas are being developed for residential and commercial uses. All county jurisdictions have adopted comprehensive land plans, zoning, and building codes.

**d. Water Area**

There are 238 square miles of water located within the borders of Volusia County, including 47 miles of ocean beaches.

**e. Drainage Patterns**

Volusia County has three primary rivers running north parallel to the east and west boundaries. The Halifax River is approximately 27 miles long and parallels the Atlantic Ocean running the length of the county ending in Ponce Inlet. The Tomoka River and Spruce Creek empty into the Halifax River. The Indian River (a part of the Inter-Coastal Waterway) starts at Ponce Inlet, then parallels the Atlantic Ocean and flows south 21 miles through the county continuing into Brevard County at its southern point. The St. Johns River flows south to north along the entire length of the county's western boundary. The St. Johns runs 60 miles through Puzzle Lake, Harney Lake, Lake Monroe and Lake George before continuing out of the county.

**f. Environmentally Sensitive Areas**

Volusia County has 48 miles of coastline enveloping 1,090 acres. Coastal marshland covers 39,488 acres while inland swamps cover 135,808 acres. The coastal areas, beaches and inland swamps are considered to be environmentally sensitive areas. Volusia County has been divided into six geographic areas by the Water Quality Management Program of the Volusia Council of Governments. These are the Tomoka Basin, which remains largely in a natural state, with little urbanization. The Mosquito Lagoon Basin (North Indian River), in which land use is dominated by agricultural and forested lands, with approximately 20% of the area urbanized. The Spruce Creek/Turnbull Bay Basin is only slightly urbanized, with most of the land cover being forest or wetland. The Middle St. Johns River Basin contains a portion of the Interstate 4 corridor, although only 5% of the land in this basin is urbanized, with the remainder being forested and in agriculture. Finally, the Central Recharge Area, in the center of the county, has two major transportation corridors (Interstate 4 and U.S. 92), although most of the land use is forest, wetlands or rangelands. Developed lands account for only 3% of the basin.

**g. Flood Prone Areas**

Flood Prone Areas in Volusia County are identified as those areas within the 100-year floodplain, and other areas subject to repetitive flooding along the rivers and lakes. In addition, flooding occasionally occurs in localized areas as a result of inadequate drainage. See LMS for further information.

**2. Geographic Hazard Areas-**

The geographic areas of the county that are expected to suffer the impact of the hazards are identified within the [Vulnerability Maps](#)

**C. Demographic Information**

**1. Population Characteristics:**

**a. Total Population**



C10

STATE OF FLORIDA  
**DIVISION OF EMERGENCY MANAGEMENT**

RICK SCOTT  
Governor

BRYAN W. KOON  
Director

July 24, 2012

Mr. Charlie Craig, Director  
Volusia County Department of Emergency Management  
49 Keyton Avenue  
Daytona Beach, FL 32124

**CERTIFIED MAIL – RETURN RECEIPT REQUESTED**

Dear Director Craig:

In accordance with the provisions of Rule Chapter 27P-6, Florida Administrative Code (FAC), the Florida Division of Emergency Management (FDEM) has completed its review of the Volusia County Comprehensive Emergency Management Plan (CEMP). The review team has determined that your plan meets the CEMP compliance criteria. We hope that the comments and discussions the review team had with you and your staff during the review will assist you in future planning efforts and enhance the update of your CEMP.

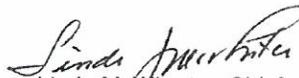
**The approved plan must now be adopted by resolution by the Board of County Commissioners within 60 days in accordance with Rule 27P-6.006(10) FAC. You must forward a copy of the adoption resolution and an electronic copy of the adopted plan to FDEM to complete compliance. Failure to adopt the plan by resolution within 60 days will result in a letter of non-compliance unless an adoption extension is requested in accordance with Rule 27P-6.006(10) FAC.**

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Mr. Charlie Craig  
July, 24, 2012  
Page Two

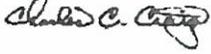
If you have any questions or need additional information regarding the plan's approval, please contact your review team leader, Rachel Sparling, at (850) 413-9927 or by email: [rachel.sparling@em.myflorida.com](mailto:rachel.sparling@em.myflorida.com).

Sincerely,

  
Linda McWhorter, Chief  
Bureau of Preparedness

LM/br/rs

cc: Frank T. Bruno Jr., Chairperson of BOCC, Volusia County  
Jim Roberts, DEM – Regional Coordinator Team Leader  
Shawn Collins, DEM – Regional Coordinator  
Tim Kitchens, RPC Representative  
Leo Lachat, DEM – Recovery  
Miles Anderson, DEM – Mitigation  
Rachel Sparling, DEM – CEMP Program Coordinator

|  |  |   |   |          |
|--|--|---|---|----------|
| Date: 09/06/2012   |  | <b>AGENDA ITEM</b>  |   | Item: 30 |
| <input type="checkbox"/> Ordinance   | <input checked="" type="checkbox"/> Resolution | <input type="checkbox"/> Budget Resolution  | <input type="checkbox"/> Other  |          |
| Department: Public Protection  |  |   |   |          |
| Division: Emergency Management   |  |   |   |          |
| Subject: Resolution adopting comprehensive emergency management plan.  |  |   |   |          |
| George Recktenwald<br>Interim Director Public Protection<br>  |  | Legal<br>Daniel D. Eckert<br>County Attorney Director<br>Legal Department<br> | County Manager's Office<br>Rhonda Orr<br>Deputy Director Director<br>Financial and<br>Administrative Services |          |
| Charles Craig<br>Director Emergency Management<br>  |  | Approved as to Form<br>and Legality   |   |          |
| Council Action:  |  |   |   |          |
| Modification:  |  |   |   |          |
| Account Number(s): NA  |  |   |   |          |
| Total Item Budget: NA  |  |   |   |          |
| Staff Contact(s):  |  | Phone:  | Ext.  |          |
| George Recktenwald   |  | 386 740 5120  | 12904   |          |
| Charles C. Craig   |  | 386 254 1500  | 11505   |          |
| <b>Summary/Highlights:</b><br>The Florida Division of Emergency Management has approved the county comprehensive emergency management plan submitted to it for quadrennial compliance review. The plan is continually revised to reflect changes such as population, growth, organizational and resource development, technology, protocols, and procedural and operational methodologies.<br><br>The plan must be adopted by resolution, if it meets council approval. It is available in interactive DVD format for review in the county manager's office. Plan distribution will be made to all jurisdictions and lead emergency support function agencies upon adoption. |  |   |   |          |
| Recommended Motion: Approval.  |  |   |   |          |

**RESOLUTION NO. 2012-116**

**RESOLUTION OF THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA,  
ADOPTING THE VOLUSIA COUNTY COMPREHENSIVE EMERGENCY MANAGEMENT  
PLAN.**

**WHEREAS**, Section 252.38 (1) (a), Florida Statutes, assigns to the governing body of each county the responsibility to establish and maintain an emergency management agency and develop a county emergency management plan and program that serves the county; and

**WHEREAS**, THE County Emergency Management Division is required to develop and submit to the county council for adoption a County Comprehensive Emergency Management Plan (CEMP) that is coordinated and consistent with the provisions of the State CEMP; and

**WHEREAS**, Rule, Chapter 27P-2.002 requires the State Division of Emergency Management to formally review and approve the County CEMP at a minimum of every four years as meeting the criteria for such plans established in Rule, Chapter 27P-6.006; and

**WHEREAS**, the State Division of Emergency Management reviewed and has provided Volusia County notice that on July 24, 2012 the Volusia CEMP meets compliance criteria; and

**WHEREAS**, section 46-151 of the County of Volusia Code provides for adoption of the Volusia County CEMP and incorporation of said plan therein; and

**WHEREAS**, the Volusia County CEMP, now meeting state plan criteria, must be adopted by resolution.

**NOW, THEREFORE, BE IT RESOLVED BY THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA, IN AN OPEN MEETING DULY ASSEMBLED IN THE VOLUSIA COUNTY ADMINISTRATIVE CENTER, IN THE CITY OF DELAND, THIS 6<sup>TH</sup> DAY OF SEPTEMBER, A.D. 2012 AS FOLLOWS:**

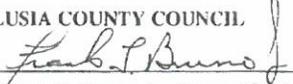
**SECTION I:** The Volusia County CEMP, dated July 24, 2012 is hereby adopted.

**SECTION II:** The Volusia County CEMP may be updated and revised by the County Emergency Management Division at any time between quadrennial reviews of the State Division of Emergency Management to reflect any changes that may occur in the County, and to maintain coordination and consistency with the State CEMP.

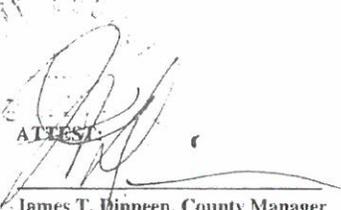
**SECTION III:** This resolution shall become effective immediately upon its adoption.

**DONE AND ORDERED IN OPEN MEETING.**

**VOLUSIA COUNTY COUNCIL**

By:   
Frank T. Bruno, Jr., County Chair

**ATTEST:**

  
James T. Dinneen, County Manager

## INTRODUCTION

A. **Mission.** Coordinate and facilitate resources to minimize the impacts of flood incidents on people, property, the environment and the economy of Volusia County.

B. **Purpose.** To establish responsibilities for agencies and organizations within Volusia County and document responsibilities of Volusia County Emergency Management in regard to preparation for, response to, recovery from and mitigating the effects of flood incidents within the County.

C. **Scope.** The County of Volusia Flood Response Plan is incorporated in the Volusia County Comprehensive Emergency Management Plan. This plan addresses flooding incidents, as described in each of the anticipated Flood Event Scenarios, and provides the foundation for:

1. The establishment of an organization and responsibilities for efficient and effective use of government, private-sector and volunteer resources if a flood incident occurs within Volusia County.
2. An outline of other participants' responsibilities in emergency management activities within Volusia County is described in the Basic Plan of the VCEMP.

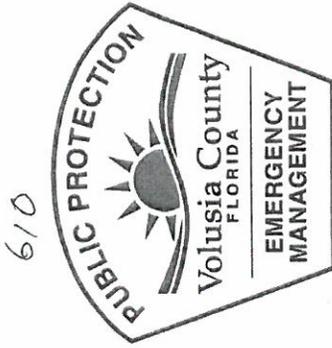
D. **Organization.** The Public Works Director of Volusia County functions as Incident Coordinator for all local agencies in regard to flood events within unincorporated Volusia County.

E. **Plan update/revision.** As a part of the CEMP, this and all plans and annexes are living documents; once formally adopted by the Volusia County Council, Volusia County Emergency Management has the authority to modify/update any and all plans/annexes as conditions warrant. Any plan or annex updated will reflect the current revision date; however, the formal adoption date governs to formal adoption cycle. Every five years the plan, as a part of the Volusia County Comprehensive Emergency Management Plan, will be formally adopted by the Volusia County Council per Florida Division of Emergency Management and Florida Statute requirements. Other jurisdictions in Volusia County may formally adopt this plan and supporting documentation to meet Community Rating System Activity 610 requirements.

## II. POLICIES

A. **Authority.** This plan was developed, promulgated, and is maintained pursuant to the following local, state, and federal agreements, statutes, and regulations:

1. The National Response Framework, January 2008
2. Volusia County Flood Response Plan, 2014
3. The Volusia County CEMP, 2011
4. F.S. 252, 2011



PRSR1 STD  
U S POSTAGE  
PAID  
Blountstown, FL  
PERMIT NO. 65

### COUNTY OF VOLUSIA EMERGENCY MANAGEMENT

*This information is being provided to you because your property is in or near an area subject to flooding.*

### CONTACT AND INFORMATION NUMBERS

Volusia County  
Emergency Management  
(386) 254-1500

Volusia County  
Citizen Information Center  
1-866-345-0345 (toll free)

Volusia County Building  
& Zoning Department  
(386) 626-6591

### GENERAL FLOOD & EMERGENCY INFORMATION

Volusia County  
[www.volusia.org/emergency](http://www.volusia.org/emergency)  
FEMA  
[www.fema.gov](http://www.fema.gov)

National Weather Service  
[www.srh.noaa.gov/mb](http://www.srh.noaa.gov/mb)

### RADIO & TV STATIONS

AM/FM Radio  
WVNB 1150 AM, WKRO 93.1 FM, WHOG 95.7 FM  
WVVB 103.3 FM, WLOV 98.5 FM, JOSE 98.1 FM

Television  
WESH Ch. 2, WKMG Ch. 6, WFTV Ch. 9  
WCFN News Ch. 13, WOFL Ch. 35, WDSB Ch. 15  
UNIVISION Ch. 26, TELEFUTURA Ch. 43

### FLOODING IN VOLUSIA COUNTY

In Volusia County, the primary threat of flooding results from the "pending" of water during heavy storms, and, potentially, storm surge from hurricanes. Some flooding can result from overflow of small ditches and streams during significant storm events, especially when the ocean and river tides are running higher than normal. Since the County is relatively flat, however, storm water sometimes simply overwhelms street drainage and storm outfall devices. Leaves and other debris can clog storm drains, causing water to back up into lower-lying areas. Residents are encouraged not to blow yard waste (i.e. grass clippings, leaves, and small branches) into the street to prevent clogging of the storm water grates and other similar devices.

There are many areas throughout the County that have recurring flooding problems. The natural low point running the entire length of the peninsula side of the County is especially subject to the "ponding" effect. Many storm water catch basins are located in this area, but are often overwhelmed, causing minor flooding. On rare occasions, flood waters may invade the lower-lying homes in those areas. Other areas of the County subject to localized flooding include the inhabited areas adjacent to the St Johns River; Maytown Road area; Tomoka Estates; the Samsula area; and the Plantation Pines development, depending on the amount of rainfall and levels in streams and tributaries of the Halifax, Tomoka, and St. John's rivers, and neighborhood storm water retention ponds.

Know your flood hazard – you are receiving this brochure because your property is in an area that has either flooded in the past, or is near a property that has experienced one or more floods. To find out what flood zone you are in, call your local Building and Zoning Department for a flood zone determination.

**DRAINAGE SYSTEM MAINTENANCE**  
A community can lose a portion of its drainage system carrying or storage capacity due to dumping, debris, soil erosion, sedimentation and overgrowth of vegetation. When this happens, flooding occurs more frequently and reaches higher elevations, subjecting otherwise protected properties to unnecessary risk of damage. Keep grass clippings, tree limbs, and other debris out of storm water drainage systems to prevent clogging and loss of storm water storage and treatment capacity. Remember, "The home you flood may be your own." If you experience or are aware of any localized drainage problems, including illegal stream dumping, please call the Public Works Department at 386-822-6422. Chapter 106, Sec 106-41 of the Volusia County Code of Ordinances prohibits the disposal of any solid waste in any stream, ditch, river, pond, or creek.



### FLOOD SAFETY MEASURES

Protective measures can be taken to ensure the safety of life and property before, during and after a flood:

#### BEFORE A FLOOD

- Avoid building in a floodplain.
- Construct barriers (levees, beams, floodwalls) to stop flood-water from entering your home.
- Seal walls with waterproofing compounds to avoid seepage.
- If a flood is likely in your area, listen to the radio or television for information.
- Know the difference between a flood watch and a flood warning. A watch means flooding is possible. A warning means flooding is occurring or will occur soon.
- Designate a place where your family can rendezvous after an evacuation order is lifted in case you get separated.

#### WHEN A FLOOD IS IMMINENT

- Place sand bags to reduce erosion and scouring.
- Elevate furniture and electronic equipment above flood protection levels.
- Create roadway openings in non-habitable areas such as garage doors.
- Be prepared! Pack a bag with important items in case you need to evacuate. Don't forget to include needed medications.
- If advised to evacuate your home, do so immediately.
- If there is any possibility of a flash flood, move immediately to higher ground.
- If possible, bring in outdoor furniture and move essential items to an upper floor.
- Turn off utilities at the main switches or valves if instructed to do so. Disconnect electrical appliances.

#### DURING A FLOOD

- Do not walk through moving water. As little as 6 inches (15 centimeters) of moving water can make you fall.
- If you have to walk in water, wherever possible, walk where the water is not moving. Use a stick to check the firmness of the ground in front of you. Wear rubber boots. Be aware that snakes and other creatures will be displaced from their regular habitat.
- Do not drive into flooded areas. If floodwaters rise around your car, abandon the car and move to higher ground if you can do so safely. "Turn around, don't drown!" More people drown in their car than anywhere else.
- Do not touch electrical equipment if you are wet or standing in water.

#### AFTER A FLOOD

- Listen for news reports to learn whether your water supply is safe to drink.
- Avoid floodwaters: water may be contaminated by oil, gasoline, or raw sewage. Water may also be electrically charged from underground or downed power lines.
- Avoid moving water.
- Be aware of areas where floodwaters have receded. Roads may have weakened and could collapse under the weight of a car.
- Stay away from downed power lines, and report them to your power company.
- Return home only when you are told it is safe.

Volusia County  
FLORIDA  
3825 Tiger Bay Road,  
Suite 102  
Daytona Beach, FL 32124

the building must meet the same construction requirements as a new building. Substantially damaged buildings must also be brought up to the same standards (e.g., a residence damaged so that the cost of repairs equals or exceeds 50% of the building's value before it was damaged must be elevated at least one foot above the base flood elevation). The assessed value of the structure, as listed by the Volusia County Property Appraiser's Office, shall be determined before the improvement is started. If the structure has been damaged and is being re-stored, a determination would be made of what the assessed value was before the damage or destruction occurred.

**FUNDING SOURCES FOR REPETITIVE LOSS PROPERTIES**

Repetitive Loss properties represent only one percent of all flood insurance policies, yet historically they account for one-third of the claim payments. Mitigation of flood risk to these repetitive loss properties reduces the overall costs to the National Flood Insurance Program (NFIP) as well as to individual homeowners. The Federal Emergency Management Agency (FEMA) has several grants and an extra flood insurance program available to help repetitive loss property owners reduce exposure to flood damage.

- Hazard Mitigation Grant Program (HMGP) – a grant made available after a Presidential disaster declaration [www.fema.gov/government/grant/hmfp/index.shtml](http://www.fema.gov/government/grant/hmfp/index.shtml)
  - Flood Mitigation Assistance (FMA) - a grant that the County can apply for each year ([www.fema.gov/government/grant/fma/index.shtml](http://www.fema.gov/government/grant/fma/index.shtml))
  - Pre-Disaster Mitigation (PDM) - a nationally competitive grant that the County can apply for each year ([www.fema.gov/government/grant/pdm/index.shtml](http://www.fema.gov/government/grant/pdm/index.shtml))
  - Severe Repetitive Loss (SRL) - a grant that is reserved for "Severe" repetitive loss properties, i.e., those with their flood insurance policies administered by FEMA's Special Direct Facility rather than a private insurance company ([www.fema.gov/government/grant/srl/index.shtml](http://www.fema.gov/government/grant/srl/index.shtml))
  - Increased Cost of Compliance (ICC) - an extra flood insurance claim payment that can be provided if an insured building was flooded and then declared substantially damaged by the local permit office. ([www.fema.gov/library/viewRecord.do?d=3010](http://www.fema.gov/library/viewRecord.do?d=3010))
- Most of the FEMA grants provide 75% of the cost of a project. The owner is expected to fund the other 25%. ICC pays up to \$30,000 of the cost of bringing the damaged building up to the local ordinance flood protection standards.

**What you can do:**

- Check the websites and read up on the details of the funding programs that are appropriate for your situation. For example, if Florida has not been declared a Federal disaster area for some time, look at the grants that have annual application procedures, not HMGP.
- Keep your flood insurance policy in force. All grants and ICC only fund properties that currently have a flood insurance policy.

systems are important habitats for a variety of fish, reptiles, vegetation, and tundraing wildlife. These systems provide feeding and breeding grounds for these species.

The importance of maintaining natural floodplains is not a difficult idea to understand. However, humans have always been attracted to floodplains because of their many sustaining attributes. Human development and industrialization take a toll on the natural functions of the floodplains. Development in the floodplains causes decreases in water quality, loss of wildlife habitats, and an increase in severity and frequency of flood losses. Understanding the importance of maintaining the natural functions of floodplains can lead to better floodplain management approaches that will better protect the natural and beneficial functions of floodplains.

**HURRICANE PREPAREDNESS**

Hurricanes are strong storms that can be life-threatening as well as cause serious property-threatening hazards such as flooding, storm surge, high winds and tornadoes. Preparation is the best protection against the dangers of a hurricane. Know the difference between the threat levels and plan accordingly.

**HURRICANE WATCH**

Hurricane conditions are a threat within 48 hours. Review your hurricane plans. Get ready to act if a warning is issued, and stay informed. Don't forget your pets.

**HURRICANE WARNING**

- Hurricane conditions are expected within 36 hours. Complete your storm preparations and leave the area if directed to do so by authorities.
- Listen to a NOAA Weather Radio for critical information from the National Weather Service (NWS).
- Check your disaster supplies. Replace or restock as needed.
- Bring in anything that can be picked up by the wind (bicycles, lawn furniture).
- Close your windows, doors and hurricane shutters. If you do not have hurricane shutters, close and board up all windows and doors with plywood.
- Turn your refrigerator and freezer to the coldest setting. Keep them closed as much as possible so that food will last longer if the power goes out.
- Turn off propane tank.
- Unplug small appliances.
- Fill your car's gas tank.
- Create a hurricane evacuation plan with members of your household. Planning and practicing your evacuation plan minimizes confusion and fear during the event.
- Find out about your community's hurricane response plan. Plan routes to local shelters, register family members with special medical needs and make plans for your pets to be cared for.
- Obey evacuation orders. Avoid flooded roads and washed out bridges.

**SUBSTANTIAL IMPROVEMENT REQUIREMENTS**

The County of Volusia requires that if the cost of reconstruction, rehabilitation, addition or other improvements to a building equals or exceeds 50% of the building's assessed tax value,

along every river and coastal areas. Flood waters can carry nutrient-rich sediments which contribute to a fertile environment for vegetation. Floodplains are beneficial for wildlife by creating a variety of habitats for fish and other animals. In addition, floodplains are important because of storage and conveyance, protection of water quality, and recharge of groundwater.

Floodplains provide cultural, educational, recreational, and scenic values to humans. The earliest Native Americans settled in and around floodplains, as they provided a wealth of food and provided the easiest means of travel. Consequently floodplains include many archaeological and historical sites. Floodplains also serve as a nature study center for scientific research. Due to the scenic value that they provide, floodplains are ideal locations for parks and campgrounds. Water-oriented sports and recreational activities such as boating, swimming, hiking, and camping are all dependent on floodplain areas. Wildlife resources in floodplains can be managed for observation, and recreational hunting and fishing. Natural floodplains are valuable in providing the "wilderness experience" that is an important part of Floridian culture.

Marshes, near-shore ocean bottoms, beaches, bays, coastal dune lakes, tidal flats, and estuaries are all components that make up the coastal floodplain of Volusia County. Coastal beaches, dunes, banks, and tidal flats all play roles in protecting the land from destructive coastal storms, such as hurricanes. In coastal systems, aside from major storm events where waves may overrun large areas, inundation follows a largely predictable tidal cycle. Coastal floodplains are recognized for their importance to estuarine and marine fisheries. Estuarine wetlands are important for breeding, nursery, and feeding grounds for marine fisheries and coastal floodplains are important to waterfowl and other wildlife. Shallow coastal areas such as estuaries, tidal flats and rivers, and beaches are significant for shellfish, reptiles, and other fin-fish. The water quality in these areas is affected by changes in sediments, salinity, nutrients, oxygen, temperature, and the addition of various pollutants. Rivers, creeks, and lakes that have an unimpeded connection to the sea provide breeding and feeding grounds for a variety of coastal marine life. Do not pick sea oats or tamper with sea turtle nests – it's illegal and carries a significant fine

Riverine systems such as the Indian, Halifax, and Tomoka Rivers vary in steepness, width, flow, sediment deposition, and erosion. These riverine floodplains typically flood during the tropical storm events, but are subject to periodic flooding due to excessive rainfall. The flooding brings erosion and deposition of soils and can determine considerably the shape of the floodplain, the depth and composition of soils, the type and density of vegetation, the presence and extent of wetlands, richness and diversity of wildlife, and the depth of groundwater. The major flood component of a riverine system is the flood way. Flood ways are defined as that area of the watercourse that is necessary to carry the base flood without increasing the water surface elevation more than one foot. Development is heavily regulated in flood way areas. Riverine

**PROPERTY PROTECTION MEASURES**  
Flood causes more property damage in the United States than any other type of natural disaster. While recent construction practices and regulations have made new homes less prone to flooding, many existing structures remain susceptible. Several effective ways include relocation of a building to a site not subject to flooding, construction of floodwalls or berms to keep water away from the property, or retrofitting structures to make them floodproof. Retrofitting is a different approach in that the property itself remains subject to flooding while the building is modified to prevent or minimize flooding of habitable space, and can be accomplished by elevation of the structure above flood protection levels, construction of barriers (floodwalls, berms), and/or dry flood proofing (permits entry and passage of flood waters).

**FLOOD INSURANCE**

For most people, their home and its contents represent their greatest investment. Property losses due to flooding are not covered under most homeowners' insurance policies; however, flood insurance can be obtained through the National Flood Insurance Program (NFIP). NFIP was established by Congress in 1968, enabling property owners to buy flood insurance at reasonable rates in participating communities. In return, those communities carry out flood management measures designed to protect life and property during future flooding. The Federal Emergency Management Agency (FEMA), through its Federal Insurance Administration, administers the NFIP. The County of Volusia has participated in the NFIP since 1973. To find out more about flood insurance, contact an insurance agent. Since there is usually a thirty (30) day waiting period before a flood insurance policy takes effect, do not wait until a storm threatens before securing flood insurance.

**DEVELOPMENT PERMIT REQUIREMENTS**

Any development in a floodplain requires a building permit according to Chapter 72, Section 72-746 of the Volusia County Land Development Code. To obtain a flood zone determination or to discuss any related inquiries, please call the Building Department at 386-626-6591. The Volusia County Building Department may be able to provide a FEMA elevation certificate for structures built after 1991 and located inside special flood hazard areas. For more information, or if you suspect illegal floodplain development is occurring, please call the Building Department, 386-626-6591.

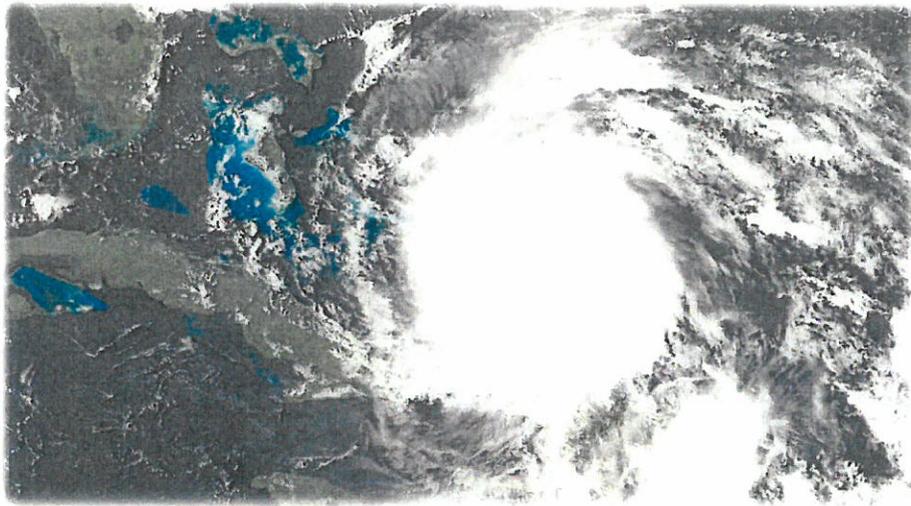
**NATURAL AND BENEFICIAL FUNCTIONS OF THE FLOODPLAIN**

Flood plains are areas adjacent to rivers, ponds, lakes, and oceans that are periodically flooded at different points in time. Floodplains are hydrologically important, environmentally sensitive, and ecologically productive areas that perform many natural functions. They contain both cultural and natural resources that are of great value to society. Flooding occurs naturally

County EOC activation is provided below in the following three levels:

- i. Level III, Monitoring Activation. Routine county-wide monitoring. At this level, the County's full-time Emergency Management Division staff provide necessary information to the respective state and local agencies regarding hazard materials incidents, adverse weather warnings, wildfires, road closures, plane crashes, or other critical events.
  - ii. Level II, Partial Activation. A limited activation of core ESF personnel, Citizens Information Center (CIC) personnel and as needed, municipality and support personnel to more closely monitor a developing situation and make initial plans to provide any necessary assistance.
  - iii. Level I, Full Scale Activation. All county ESF representatives, CIC personnel, municipality representatives and support staff report in shifts to the County EOC for 24 hour disaster response/recovery activities. All members of the Policy Group and the Municipal Coordination Group should be notified and prepared to meet as needed.
- (4) Upon notification of the lead agency of an ESF to activate, the lead agency is responsible for notification of the necessary support agencies for that ESF and for requesting, as indicated, mobilization of their staff and resources.
- (5) Mobilization will be to the County's EOC facility, located at 3825 Tiger Bay Road, Daytona Beach. Once staffed, the County EOC will serve as the single point of coordination and direction for the county's emergency response and disaster recovery operations. An alternate EOC is available and it is located in Historic Court House, second floor, adjacent to the Thomas C. Kelly Administration Center located at 123 West Indiana Ave., DeLand, Florida. Procedures and diagrams for operations at both the primary and alternate County EPC's are provided in the Volusia County Emergency

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## 2014 Florida Hurricane Exercise: Hurricane Jones

### After Action Report / Improvement Plan

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May 21 and 22, 2014

The After-Action Report/Improvement Plan (AAR/IP) aligns exercise objectives with preparedness doctrine to include the National Preparedness Goal and related frameworks and guidance. Exercise information required for preparedness reporting and trend analysis is included.

## EXERCISE OVERVIEW

|                   |  |
|-------------------|--|
| Exercise Name     | 2014 Florida Hurricane Exercise<br><b>Hurricane Jones</b>  |
| Exercise Dates    | May 19-23, 2014. Volusia County "Play Dates" May 21 & 22 2014  |
| Scope             | This exercise is a Discussion Based (Workshop) planned for 1300-1515 on each of the "play" days. The site was the Volusia County Emergency Operations Center located at 3825 Tiger Bay Road, Daytona Beach, Florida, 32124. Exercise play is focused on discussion with some limited Operational Components, such as actually sending Notification and Warning to community partners SITREPs to the State EOC.   |
| Mission Area(s)   | Prevention, Protection (preparedness) , Mitigation, Response, and/or Recovery  |
| Core Capabilities | <ol style="list-style-type: none"> <li>1. Operational Coordination</li> <li>2. Public Information and Warning, including the County flood threat recognition system.</li> <li>3. Community Resilience (Structural Damage Assessment/</li> <li>4. Economic and Community Recovery</li> </ol>  |
| Objectives        | <ol style="list-style-type: none"> <li>1. Exercise and Evaluate all municipal and Emergency Support Functions for EOC duty capabilities</li> <li>2. <b>Exercise and Evaluate public information and warning dissemination capability, including the county's Flood Warning &amp; Response plan and Flood Threat Recognition Plan.</b></li> <li>3. Exercise and Evaluate the community's ability to conduct timely structural damage assessment</li> <li>4. Exercise and Evaluate the community's ability to begin economic and community recovery</li> </ol> |
| Threat or Hazard  | For the exercise, the primary hazard was a Category One Hurricane exiting Florida through Volusia County. Hazards caused by the Hurricane include localized flooding, structural damage, creation of debris fields and power outages.  |
| Scenario          | The Scenario began with a storm entering south Florida and headed generally north, but away from Volusia County. The storm took a turn to the right (east) bringing the Cat 1 Hurricane through Volusia County's most heavily populated area.  |

|                                    |  |
|------------------------------------|--|
| <b>Sponsor</b>                     | No State Homeland Security Grant funds, nor any other “grant” money was utilized in financing this exercise.   |
| <b>Participating Organizations</b> | All Emergency Support Functions were staffed by their Lead Agencies. Most cities participated and many ancillary organizations had representation along with various members of the Volusia – Flagler Public Information Network, COAD, Volusia Prepares Business and three of the colleges and universities within Volusia County. A complete list is depicted in Annex B of this document. |
| <b>Point of Contact</b>            | James Judge, Exercise Director<br>3825 Tiger Bay Road<br>Daytona Beach, Florida 32124<br>386.254.1500<br>Laurence LaHue, Exercise Design Team Lead and Exercise Controller<br>3825 Tiger Bay Road<br>Daytona Beach, Florida 32124<br>386.254.1500  |

## ANALYSIS OF CORE CAPABILITIES

Aligning exercise objectives and core capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned core capabilities, and performance ratings for each core capability as observed during the exercise and determined by the evaluation team.

| Objective  | Core Capability                | Performed without Challenges (P) | Performed with Some Challenges (S) | Performed with Major Challenges (M) | Unable to be Performed (U) |
|--|--------------------------------|----------------------------------|------------------------------------|-------------------------------------|----------------------------|
| #1<br>Exercise and Evaluate all municipal and Emergency Support Functions for EOC Duty Capabilities  | Operational Coordination       |                                  | S                                  |                                     |                            |
| #2<br>Exercise and Evaluate Public Warning and Information Dissemination Capabilities including Flood Warning & Response/Flood Threat Recognition  | Public Information and Warning | P                                |                                    |                                     |                            |
| #3<br>Exercise and Evaluate the Communities ability to demonstrate Community Resilience by performing damage assessment  | Community Resilience           |                                  | S                                  |                                     |                            |
| #4<br>Exercise and Evaluate the Communities ability to begin Economic and Community Recovery   | Community Resilience           |                                  | S                                  |                                     |                            |
| <p><b>Ratings Definitions:</b></p> <ul style="list-style-type: none"> <li>Performed without Challenges (P): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.</li> <li>Performed with Some Challenges (S): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other</li> </ul> |                                |                                  |                                    |                                     |                            |

| Objective  | Core Capability | Performed without Challenges (P) | Performed with Some Challenges (S) | Performed with Major Challenges (M) | Unable to be Performed (U) |
|--|-----------------|----------------------------------|------------------------------------|-------------------------------------|----------------------------|
| <p>activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.</p> <ul style="list-style-type: none"> <li>• Performed with Major Challenges (M): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s), but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.</li> <li>• Unable to be Performed (U): The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s).</li> </ul> |                 |                                  |                                    |                                     |                            |

**Table 1. Summary of Core Capability Performance**

The following sections provide an overview of the performance related to each exercise objective and associated core capability, highlighting strengths and areas for improvement.

Objective 1 – To Exercise and Evaluate all Municipal and Emergency Support Functions for EOC Capabilities

The strengths and areas for improvement for each core capability aligned to this objective are described in this section.

## Core Capability 1 Operational Coordination

### Strengths

The partial capability level can be attributed to the following strengths:

**Strength 1:** Emergency Support Function Lead Agencies have stable leadership who exhibit commitment to their positions.

**Strength 2:** The representatives of the majority of ESFs have years of experience and are familiar with the technology used in the Operations Room, its policies and procedures as well as knowledge of the other ESF personnel and their functions.

**Strength 3:** Operational Coordination is greatly enhanced by the existence of a new Emergency Operations Center and the Operations Room with the latest technology and adequate space for the various activities that take place within it.

### Areas for Improvement

The following areas require improvement to achieve the full capability level:

**Area for Improvement 1:** Staff turnover among the majority of municipalities has brought about untrained and inexperienced representation at their respective desks.

**Reference:** There is no specific legal basis for requiring qualified, trained and experienced personnel be assigned to the EOC. It is a matter of Volusia County Policy that we request municipal representatives have the skills and training necessary to represent their jurisdiction.

**Analysis:** Turnover is the result of government downsizing over the last several years and the effect of the Florida DROP system on personnel stability. Volusia County Emergency Management should offer more frequent training specific to how we operate, offer the FEMA G775 course at least once annually, and offer discuss based exercises for new EOC representatives to hone their skills

**Area for Improvement 2:** Table Mounted Microphones proved to be difficult to use, thus were not used by most people.

**Reference:** Volusia County EOC Operations Manual

**Analysis:** The microphones are located at one end of each table group and cannot be passed from one person to another during briefings. While they have a long and flexible “neck” most people find their location and configuration difficult to use and thus present their briefing without benefit of the audio system. Frequently they cannot be heard by people at the other end of the Ops Room. Each table would be better served by one portable “hand-held” microphone.

## Core Capability 2 Public Information and Warning, Including Flood Warning & Response/Flood Threat Recognition

### Strengths

The fully capable level can be attributed to the following strengths:

**Strength 1:** Multiple systems have been brought into service over the years to create a multi-layer approach to Public Information and Warning, particularly flood warning.

**Strength 2:** A robust multi-jurisdictional public information network of experienced public information officers exists: The Volusia-Flagler Public Information Network (VFPIN)

**Strength 3:** The Manager’s Advisory Group serves as a leveling field for decisions, such as the release of Information and Warning, so all aspects of the county government, the cities within Volusia County, the multiplicity of social service organizations, and businesses have a common voice when issuing warnings to the public

**Strength 4:** The staff of Volusia County Community Information and Emergency Management is composed of competent, experienced, and generally long term employees with a knowledge of the community, information and all-hazard warning dissemination resources.

### Areas for Improvement

The following areas require improvement to achieve the full capability level:

**Area for Improvement 1:** Volusia County has limited ability to communicate with the hearing and sight impaired.

**Reference:** Volusia CEMP, ESF 14 Annex

**Analysis:** A serious effort needs to be made to identify methods of communicating with these groups and locating the technology and funding to make the communications possible. One solution would be to form task force to include members from the hearing and sight impaired community to look for solutions.

**Area for Improvement 2:** Volusia County has limited ability to communicate with the people living in isolation from common communications technology.

**Reference:** Volusia CEMP, ESF 14 Annex

**Analysis:** There is no exact count of these people, but in communicating with organizations such as the Council on Aging, it can be ascertained that there are people who live without much interaction with others. These people often lack access to media resources. An Intern Project could be established to determine the size of this population and identify possible methods of serving it.

### **Core Capability 3 Community Resilience - Structural Damage Assessment**

#### **Strengths**

The exercise examined the ability of the Property Appraiser to initiate the Structural Damage Assessment component of recovery at a fully capable level which can be attributed to the strengths below. It should be noted that there were weaknesses on the part of the municipalities which is also identified below.

**Strength 1:** The Volusia County Property Appraiser's Office has developed a software product to simplify the process: IDAM

**Strength 2:** The Property Appraiser working with Volusia County Emergency Management affords opportunities for representatives of the cities to be training in IDAM.

**Strength 3:** Municipalities within Volusia County are experienced with disasters due to the number of Presidentially Declared Disasters that have occurred in Volusia County over the last 20 years.

#### **Areas for Improvement**

The following areas require improvement to achieve the full capability level:

**Area for Improvement 1:** Broaden the community understanding of IDAM.

**Reference:** Volusia CEMP, ESF 19 Annex

**Analysis:** While the County staff and in particular the Property Appraiser's Office is knowledgeable about the IDAM program, many cities and other organizations that could use lack and understanding of its potential for them. Recommend that the Property Appraiser's Office provide workshops to all community partners.

## Core Capability 4 Economic and Community Recovery

### Strengths

Volusia County Emergency Management in cooperation with multiple private sector organizations has created a Business Operations Center. Further private sector support comes from the Chambers of Commerce, Hotel and Lodging Association, Volusia Manufacturers Association.

**Strength 1:** During the exercise the person staffing the ESF 18 desk notified the BOC to remain on standby for activation during the Preparedness Phase of the exercise. The ESF 18 staffer person and called for its activation as the exercise entered Recovery, which is what the CEMP calls for.

**Strength 2:** The Business Operations Center has the commitment of the Career Source which is its host organization.

**Strength 3:** The Daytona Regional Chamber was committed to staffing the ESF 18 desk throughout the exercise.

### Areas for Improvement

The following areas require improvement to achieve the full capability level:

**Area for Improvement 1:** Some city representatives were serving in the position for the first time. Many did not know about Points of Distribution, Disaster Recovery Centers, and the ESF system.

**Reference:** Volusia CEMP, Recovery Annex; Volusia County Staging Plan

**Analysis:** Due to the downsizing of government and the impact of the DROP program on staffing, many cities are unable to provide a consistent representation in the county EOC. The county needs to provide training, such as G-775.

**Area for Improvement 2:** The Recovery Committee did not participate in the exercise.

**Reference:** Volusia CEMP, Recovery Annex

**Analysis:** Each year the Volusia County EOC partners participate in the Hurricane Exercise, while the Recovery Committee does not. Should an incident take place requiring the activation of the EOC and the Recovery Committee, this could be a single point of failure. The R.C. should participate in the exercise as any other entity involved in a disaster.

## APPENDIX A: IMPROVEMENT PLAN

This IP has been developed specifically for Volusia County Division of Emergency Management as a result of Hurricane Jones, the State of Florida 2014 Annual Hurricane Exercise which was conducted on May 21 and 22, 2014 in the Volusia County Emergency Operations Center.

| Core Capability             | Issue/Area for Improvement  | Corrective Action   | Capability Element  | Primary Responsible Organization | Organization POC                | Start Date       | Completion Date    |
|-----------------------------|---|---|---|----------------------------------|---------------------------------|------------------|--------------------|
| 1. Operational Coordination | 1. Staff turnover among the majority of municipalities leads to unqualified and / or untrained and experienced representation at their respective desks | Develop orientation for new EOC staff. Once developed this training will be offered at least once a year prior to Hurricane Season and more often as necessary<br>Conduct G775 training Offered as needed, not less than once a year<br>Conduct G-191 Training Offered as need, not less than once a year | Organizational Coordination (Training)                              | VCEM                             | R. Moore                        | 6/4/14           | 9/4/14             |
|                             | 2. Table Mounted Microphones proved to be difficult to use, thus were not used by most  | Acquire handheld microphones that can be passed from person to person for each desk grouping<br>When used for training or activation, require people to use the   | Organizational Coordination (Training)<br>Operational Communication | VCEM<br>VCEM                     | A.R. Williams<br>A. R. Williams | 6/4/14<br>6/4/14 | 8/4/14<br>01/01/15 |

<sup>1</sup> Capability Elements are: Planning, Organization, Equipment, Training, or Exercise.

|   |  |  |                                |                    |                          |         |          |
|---|--|--|--------------------------------|--------------------|--------------------------|---------|----------|
| 2. Public Information and Warning                     | people.  | existing audio system  | Public Information and Warning | VCEM               | R. Moore w/ Intern staff | 6/04/14 | 6/4/15   |
|   | Volusia county has limited ability to communicate with the sight and hearing impaired  | Develop a list of appropriate agencies and their POC<br>Research existing methods of communicating with these groups |                                |                    |                          |         |          |
| 3 Community Resilience - Structural Damage Assessment | Volusia County has limited ability to communicate with the people living in isolation from common communications technology. | Identify the isolated groups and identify alternative methods of communicating with them.                            | Economic Recovery              | Property Appraiser | Morgan Gilreath          | 6/04/14 | 12/31/14 |
|   | Broaden the community understanding of IDAM  | Develop and deliver training programs at a time and place convenient to the cities                                   |                                |                    |                          |         |          |
| 4. Economic and Community Recovery                    | Some city representatives were serving in the position for the first time. Many did not know about Points of Distribution,   | Develop an orientation for new members of the EOC team and conduct re-occurring G-775 and G191 training              | Operational Coordination       | VCEM               | R. Moore                 | 6/04/14 | 12/31/14 |

**After-Action Report/  
Improvement Plan (AAR/IP)** **Hurricane Jones  
2014 Hurricane Exercise**

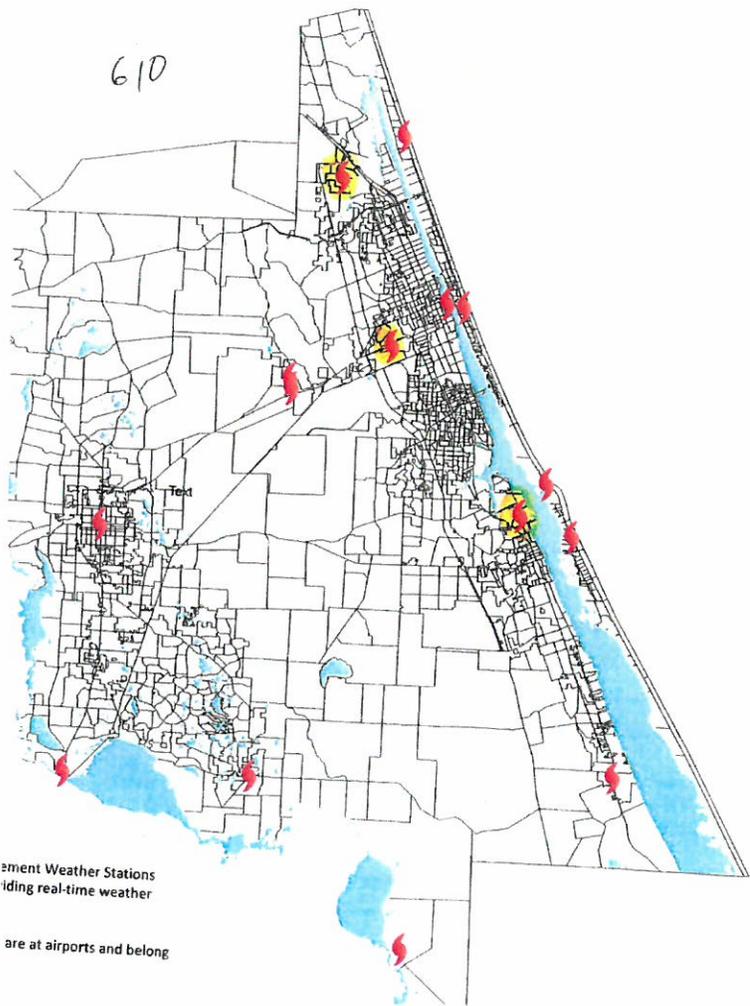
|  |   |  |                          |      |           |         |          |
|--|---|--|--------------------------|------|-----------|---------|----------|
|  | Disaster Recovery Centers, and the ESF system.              |  |                          |      |           |         |          |
|  | The Recovery Committee did not participate in the exercise. | Identify the Recovery Committee Leadership and encourage them to attend training and exercises | Operational Coordination | VCEM | Pat White | 6/04/14 | 12/31/14 |

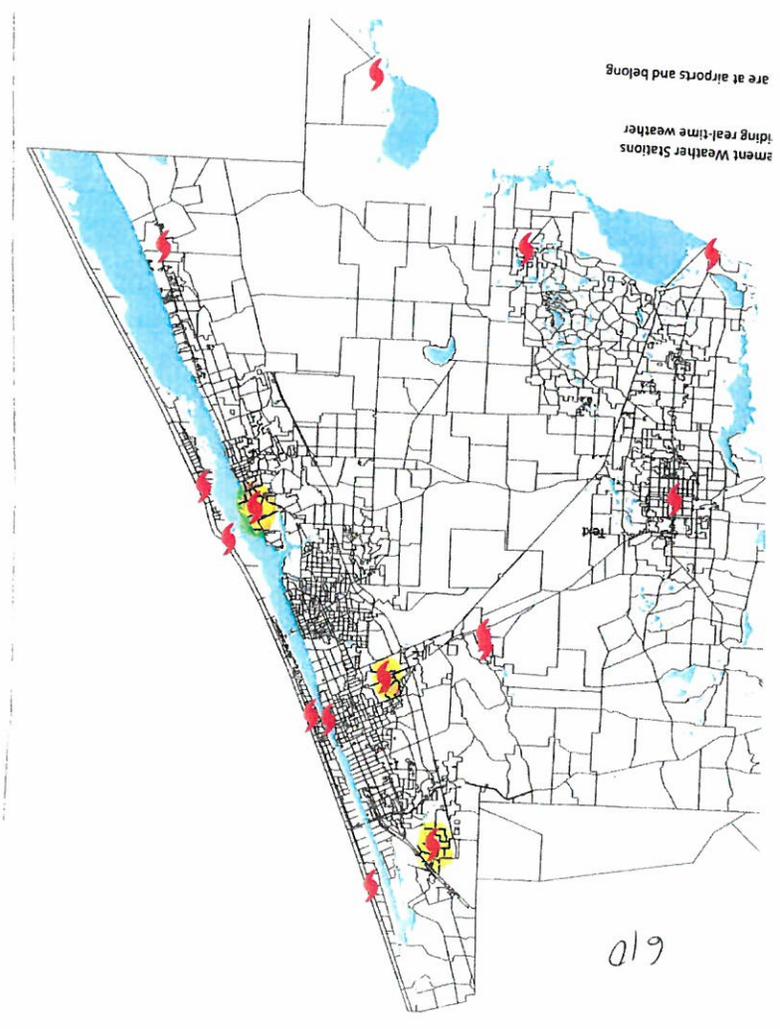
## APPENDIX B: EXERCISE PARTICIPANTS

| Participating Organizations   |                        |
|---|------------------------|
| <b>Federal:</b>   |                        |
| United States Coast Guard, Station Ponce Inlet; Army National Guard |                        |
| <b>State</b>  |                        |
| Florida Army National Guard   |                        |
| <b>Volusia County ESF's</b>   |                        |
| ESF 1   | Transportation         |
| ESF 2   | Communications         |
| ESF 3   | Public Works           |
| ESF 4   | Fire & Rescue          |
| ESF 5   | Information & Planning |
| ESF 6   | Mass Care              |
| ESF 7   | Resource Support       |
| ESF 8   | Health & Medical       |
| ESF 9   | Search & Rescue        |
| ESF 10  | HazMat                 |
| ESF 11  | Food & Water           |
| ESF 12  | Energy                 |
| ESF 13  | Military               |
| ESF 14  | PIO                    |
| ESF 15  | Volunteers & Donations |
| ESF 16  | Law Enforcement        |
| ESF 17  | Animal Protection      |
| ESF 18  | Chamber of Commerce    |
| ESF 19  | Damage Assessment      |
| ESF 20  | PSN                    |
| <b>Volusia County Cities</b>  |                        |
| Daytona Beach   |                        |
| Daytona Beach Shores  |                        |
| DeBary  |                        |
| DeLand  |                        |
| Deltona   |                        |
| Edgewater   |                        |
| Holly Hill  |                        |
| Lake Helen  |                        |
| New Smyrna Beach  |                        |
| Ormond Beach  |                        |

|   |
|---|
| Orange City<br>Pierson<br>Ponce Inlet<br>Port Orange<br>South Daytona   |
| <b>Additional Organizations</b>   |
| Volusia COAD<br>Volusia County Beach Services<br>Volusia County Economic Development (Daytona Beach International Airport)<br>Volusia (Seminole) Medical Examiner<br>Volusia Flagler Public Information Network (VFPIN)<br>Duke Energy<br>Florida Power and Light (FPL)<br>Embry Riddle Aeronautical University Interns<br>Embry Riddle Aeronautical University Emergency Management<br>Bethune Cookman University Emergency Management<br>Daytona State College Emergency Management |

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Weather Stations providing real-time weather data are at airports and belonging to the city

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