

Appendix K: Summary of Plan Changes

SUMMARY OF REVISIONS TO THE *CHARLESTON REGIONAL HAZARD MITIGATION PLAN FOR 2003-2005*

The Charleston Regional Hazard Mitigation Program Committee met on January 29, 2003, April 30, 2003 and July 23, 2003 and made the following revisions to the *Charleston Regional Hazard Mitigation Plan* to update the plan for the 2003 – 2004 year:

- Preface:** Updated the “Overview of Community Rating System” to reflect grant programs for which an approved hazard mitigation plan is required.
- Executive Summary:** Revised the number of flood vulnerable building counts. Sections discussing the Disaster Mitigation Act of 2000 requirements for hazard mitigation planning added.
- Planning Process:** Revised this section to indicate changes to the committee membership and enhanced opportunities for public input into the planning process.
- Hazard Assessment:** Added a discussion of additional hazards required to be included in the plan for Disaster Mitigation Act of 2000 compliance. Updated flood, tornado, earthquake, wild fire, hazardous materials, terrorism, winter storms, drought, thunderstorms/lightning, and hail incidents in Charleston County for 2002 and 2003. Added sections discussing heat advisories, tsunamis, and dam failure.
- Problem Assessment:** Updated the number of vulnerable buildings to reflect new construction and annexations in the Charleston Region during 2002-2003. Added a new section discussing the vulnerability of buildings to dam failure. Added a new section discussing infrastructure vulnerability to dam failure. Updated known flood damages section regarding the number of repetitive flood properties in the Charleston Region. Added a discussion of the vulnerability of critical facilities to hurricane storm surge flooding. Revised the Economic Impact section to discuss economic effects of the September 11, 2001 terrorist attacks on the local economy. Updated the repetitive loss area list to reflect repetitive loss properties for 2002-2003. Updated the critical facility list to include category of hurricane at which flooding could occur on the lot on which the facility is located and additional critical facilities identified by local government entity representatives.

- Possible Activities:** Updated the list of drainage projects and studies to reflect the status of previously listed projects and to include new projects planned or under development.
- Action Plans:** Included new action plans for 2003-2005 and status reports for action plan items for 2002-2003.
- Appendices:** New maps of vulnerability to wildfire and earthquake added. Electronic link to hurricane storm surge map search engine added.
- References:** Added new bibliographic references for citations in the plan.

Summary of Updates to the Charleston Regional Hazard Mitigation Plan 2005-2006 Edition

Preface:

Community Rating System Discussion – added Class 5 as a class of Charleston Region participating communities.

II. Planning Process Description

- defined “participation” in planning process
- expanded discussion of public input
- added table regarding land use and development plans adopted by local governments and how these relate to the Charleston Regional Hazard Mitigation Plan
- updated list of members of the Charleston Regional Hazard Mitigation Project Committee
- updated adoption history of plan by local governments

III. Hazard Description

- expanded description of hurricanes/tropical storms to include 2004 hurricane season
- mentioned new Flood Insurance Rate Maps in flood section (11-17-04 effective date)
- mentioned (record breaking) 2004 tornado season
- updated earthquake section (2004)
- updated causes of wildfire to 2003 data
- mentioned Graniteville Chlorine leak, expanded description of Chlorine transport in Charleston Region – mentioned increase in meth lab. responses and effects on emergency response organizations
- updated terrorism section with security related events/grants obtained in '04
- expanded tsunami description to mention Indian Ocean tragedy, Canary Island theory, etc.
- **DISCUSSION SECTION:**
 - added '03 and '04 hurricanes and tropical storms (Claudette, TD7, Henri, Isabel, Alex, Bonnie, Charley, Gaston, Frances, Jeanne)
 - added '03 and '04 flood events
 - added '04 tornado events
 - added '03 and '04 earthquake events
 - added '03 and '04 wildfire events – added wildfire reports from Awendaw and St. John's Fire Departments
 - added '03, '04, and '05 hazardous material incidents (from Post and Courier archives)
 - added '03 and '04 responses to possible acts of terrorism/security details/anti-terrorism measures taken (small pox vaccinations, etc.)
 - added '03, '04, and '05 snow/winter storm events
 - added '03 drought information
 - added '03, '04, and '05 lightning/thunder storm events
 - added '03 and '04 hail events
 - added '04 non-severe wind event (NWS report)
 - expanded tsunami discussion to include wave events of 1713 and 1893
 - added discussion of Santee Cooper Pinopolis Dam strengthening
 - added summary table of hazard vulnerability per local government entity

IV. Problem Assessment

-VULNERABLE BUILDINGS SECTION

- *added frequency/severity table assessing hazard vulnerability of Region & discussion*
- *added table of “vulnerability score” of Region to hazards & discussion*
- *added discussion of HAZUS-MH Category 4 hurricane making landfall at northern tip of IOP & damage estimates*
- *added \$ estimate of mobile homes in region potentially vulnerable to tornados*
- *added discussion of HAZUS-MH 7.7 magnitude earthquake simulation & damage estimates*
- *added \$ estimate of buildings vulnerable to wildfire damages (Francis Marion Forest)*
- *added \$ estimates of buildings vulnerable to dam failure (Pinopolis and Santee dam Systems)*

-INFRASTRUCTURE VULNERABILITY SECTION

- *added discussion of SCE&G utility undergrounding program*
- *added discussion of HAZUS-MH 7.7 magnitude earthquake simulation & damage estimates*
- *added discussion that loss of transportation infrastructure due to earthquake would make it difficult, if not impossible, for emergency organizations to respond - mentioned CERT program as mechanism to assist.*

-EMERGENCY WARNING NEEDS SECTION

- *added discussion of emergency warning systems used in Chas. Co. (door-to-door, reverse 9-1-1, PAWN, etc.)*
- *added discussion of functions fire, police, and EMS pre-, during-, and post-event*

-CRITICAL FACILITIES SECTION

- *added discussion of critical facility retrofits/construction in Region and planned critical facility construction within next 5 years*
- *updated critical facility list with new facilities*

-NATURAL AND BENEFICIAL FUNCTIONF OF FLOODPLAINS SECTION

- *added discussion of local events/programs with a focus on preserving natural resources*

-DEVELOPMENT AND POPULATION TRENDS SECTION

- *added table with estimated population trends per local government (2004-2024)*
- *added discussion of local historic building preservation activities*
- *added table with anticipated future development trends per local government*

-ECONOMIC IMPACT SECTION

- *added discussion of Charleston-area economy '03, '04 and '05*
- *updated tourism section with '03,'04 reports (hotels, attractions, etc.)*
- *updated trade section with '03,'04 reports (port TEU's, etc.)*
- *updated manufacturing section (effect of Iraq war/port security changes)*
- *updated transportation section (airport, attempts to stave off air force base closure through BRAC, etc.)*

- updated government section (effect of Iraq war, BRAC, etc.)
- updated finance/insurance section ('04 hurricane effects, etc.)

V. Goals

- added paragraph relating goals to hazards identified in vulnerability assessments, etc.

VI. Possible Activities

- added paragraph explaining that prioritization factors (except for repetitive flood loss) apply to all hazards, etc.
- updated activities to include Firewise community program and electronic bulletin board as possible activities
- updated Attachment VI-C (drainage projects/studies)

VII. Adopting Resolution/Action Plans

- Replaced action plans and/or status reports with 2005-2006 editions (Charleston County and multiple other signatories)

VIII. Appendices

- Appendix F: added earthquake location maps for '03 and '04 and HAZUS-MH 7.7 earthquake simulation maps
- Appendix H: added list of participants in Charleston Regional Hazard Mitigation Project Committee meetings and Project Impact committees
- Appendix I: added HAZUS-MH Category 4 hurricane "At Least Moderate" Damages Map

IX. References

- updated section with new references '04 and '05

Summary of Changes Made to the *Charleston Regional Hazard Mitigation Plan* for 2006-2007 Edition

II. Planning Process Description

- updated committee membership to reflect personnel/member organization changes

III. Hazard Assessment

- updated hurricane discussion to include assistance provided to/lessons learned from 2005 hurricanes (Katrina, *etal.*)
- updated tornado discussion regarding increased tornadic activity, etc.
- updated earthquake discussion regarding major earthquakes (Pakistan) & local earthquake-related activities
- updated fire discussion regarding Firewise and other State wildfire-related activities
- updated hazardous materials discussion regarding law enforcement activities for methamphetamine labs
- updated terrorism discussion regarding WMD drills, port security drills/enhancements, legislative activities, military projects in area, etc.
- updated drought/heat wave section with statistics on drought months in S.C., heat waves in '05, global warming, etc.
- updated tsunami discussion with information on tsunami studies, Atlantic Ocean monitoring enhancements, etc.
- added hazard event activities through 4-06

IV. Problem Assessment

- added discussion of state modeling of damages today if Hurricane Hugo struck again
- added discussion of wildfire risk due to fuel loads in forested areas
- added discussion of undergrounding utility activities in infrastructure vulnerability section
- added discussion of effects of water main break in earthquake infrastructure vulnerability section
- added discussion of enhanced hazard-event resistance ratings of area bridges
- added discussion of Graniteville accident in hazardous materials infrastructure vulnerability section
- added section on winter storm utility line vulnerability
- added discussion of planned/completed new hospital, increased number of nursing homes, and area enhancements in emergency medical services in critical facility section
- added information on the Charleston Disaster Animal Response Team in the critical facilities section
- added discussion of the Greenbelt Advisory Board and the Comprehensive Greenbelt Plan to the Natural and Beneficial Functions of Floodplains section
- added section on environmental protection activities aimed at youth/children
- added discussion on wetland protection activities and land preservation activities
- updated population estimates in development/population trends section
- added discussion of ½ cent sales tax efforts towards roads and the Comprehensive Transportation Plan and CARTA
- updated information on historic preservation activities in the region
- added a section on preservation activities towards the Francis Marion National Forest
- added section on local efforts to preserve environmentally sensitive island areas

- added section on development-related issues/debates throughout the region
- updated information on S.C. Economic development activities
- updated the tourism, shipping port, manufacturing sector, utility sector, transportation, construction, government, and insurance/finance/real estate sector discussions regarding economic development activity

V. Goals

No updates made to this section

VI. Possible Activities

Updated the drainage projects list in Attachment VI-C

VII. Adopting Resolutions/Action Plans/Status Reports

Replaced action plans and status reports with 2006-2007 editions (Charleston County and multiple other signatories)

VIII. Appendices

Updated earthquake occurrence maps for Charleston Region

IX. References

Updated references.

Summary of Changes Made to the *Charleston Regional Hazard Mitigation Plan* for 2007-2008 Edition

Preface

- added overview of Community Action for a Renewed Environment (CARE) program

I. Executive Summary

- added discussion of plan questionnaire distributed 2006-2007

X. Planning Process Description

- added discussion of plan questionnaire distributed 2006-2007
- updated committee membership to reflect personnel/member organization changes

XI. Hazard Assessment

- Added discussion of hazard event priorities per 2006-2007 questionnaire
- updated hurricane discussion regarding beach erosion, insurance company issues post-Katrina, 2006 hurricane season, 2007 hurricane season expectations, etc.
- updated flood discussion regarding West Nile cases in birds during 2006
- changed ranking of fire hazard from number 5 to number 3
- updated tornado discussion regarding increased tornadic activity, changed ranking of tornado hazard from number 3 to number 4
- updated earthquake discussion regarding research on earthquake hazards and changed ranking of earthquake hazard from number 4 to number 5
- updated hazardous materials discussion regarding Graniteville train wreck and federal security measures for rail, and updated discussion of methamphetamine lab seizures
- updated terrorism discussion regarding training exercises, foiled international terrorism attempt, seaport security enhancements, federal laws/grant awards, South Carolina and local efforts, and a discussion of school violence and efforts to curtail it.
- relocated rip current discussion to hazard number 8 and added discussion of forecasting tools and rip current frequency.
- relocated drought/heat wave section to number 9 hazard, updated section with climatological reports regarding drought, global warming, research on global warming, effects of rising sea levels/temperatures, efforts to curtail greenhouse emissions, State/local efforts to address global warming, etc.
- relocated avian (bird) flu/other pandemic discussion to hazard number 10, added introduction on other pandemics, updated section with South Carolina preparations for bird flu, etc.
- relocated dam failure to hazard number 11.
- relocated tsunami hazard to number 12 and updated discussion with information on offshore fault line and Atlantic tsunami possibility, and tsunami that occurred elsewhere during 2006-2007
- relocated winter weather discussion to Avalanches/Winter weather section to meet Disaster Mitigation Act discussion requirements, numbered section as 13, and updated discussion (Charleston County area not subject to avalanches, but does get winter weather.)
- added new section number 14 with discussion of geologic land subsidence to meet Disaster Mitigation Act discussion requirements (Charleston County area subject to sink holes in filled land areas but not definitional geologic land subsidence).

- added new section with discussion of expansive soils to meet Disaster Mitigation Act discussion requirements (Charleston County area does not have expansive soils).
- added hazard event activities from 4-06 to 5-07
 - i. Tropical Storms – 2 events
 - ii. Floods – 2 events
 - iii. Tornadoes – 10 events
 - iv. Earthquakes – Charleston earthquake sensor not working during time of this update
 - v. Hazardous materials – 17 events
 - vi. Terrorism/school incidents of violence – 18 events
 - vii. Rip currents - 4 events (3 deaths)
 - viii. Drought – declared in 2007
 - ix. Snowstorms/winter storms – 2 record events
 - x. Thunderstorms – 12 events (1 lightning death)
 - xi. Hail – 7 events
 - xii. Heat advisories – 2 events
 - xiii. Vermin-induced power outage (school) – 1 event
- added rip currents, avian flu, tsunami, severe storms/winter storms/freezing columns to table of hazards per jurisdiction (Table III-3)
- added College of Charleston and Dorchester County to table of hazards per jurisdiction (Table III-3)

XII. Problem Assessment

- added discussion of 2006-2007 questionnaire
- revised vulnerability assessment table (IV-1) to reflect new hazards added (rip currents, avian flu, geologic land subsidence (n/a), avalanche (n/a), and expansive soils (n/a) for Disaster Mitigation Act or from questionnaire, and reordered hazards per questionnaire results.
- added 2005 Risk Assessment table per SC EMD's Vulnerability Assessment for Charleston County and discussion
- added 2005 Risk Assessment table per SC EMD's Vulnerability Assessment for Dorchester County and discussion
- added discussion of infrastructure vulnerability per 2006-2007 questionnaire
- added discussion of potential loss of internet in earthquake infrastructure vulnerability section
- added new section on vulnerability of critical facilities per 2006-2007 questionnaire
- updated the shipping port and utility sector discussions regarding economic development activity

XIII. Goals

- revised goals to reflect priorities per 2006-2007 questionnaire

XIV. Possible Activities

- revised project prioritization factors per 2006-2007 questionnaire
- revised prioritization factors for each type of activity (preventive activities, property protection, emergency services, natural and beneficial functions of floodplains, structural projects, and public information) per 2006-2007 questionnaire
- Updated the drainage projects list in Attachment VI-C

XV. Adopting Resolutions/Action Plans/Status Reports

- Replaced action plans and/or status reports with 2007-2008 editions (Charleston County and multiple other signatories)

XVI. Appendices

- revised Appendix E to reflect Historical Hurricane Tracks for Charleston County
- added Appendix J – Geologic Map of Charleston Quadrangle

XVII. References

- Updated references.

Summary of Changes Made to the *Charleston Regional Hazard Mitigation Plan* for 2008-2009 Edition

II. Planning Process Description

- a. Updated Professional Planner section to reflect personnel changes
- b. Updated committee membership to reflect personnel/member organization changes

III. Hazard Assessment

- a. Updated hurricane/tropical storm section with discussion of severe beach erosion that occurred during 2007-2008
- b. Updated flood discussion regarding causes of flooding on the Peninsula and regarding West Nile prevention initiatives and new weather service volunteer network
- c. Updated fire discussion with 2007 wildfire statistics, drought hazard increasing wildfire threat, legislative efforts regarding fire protection, and efforts of local fire departments on public education
- d. Updated tornado discussion regarding increased tornadic activity during 2008
- e. Updated earthquake discussion regarding increases in earthquake activity world-wide, research on earthquakes, and local earthquake preparedness initiatives
- f. Updated hazardous materials discussion regarding effects of the Graniteville train wreck, other hazardous materials transportation and transfer accidents, and updated discussion of methamphetamine lab seizures
- g. Updated terrorism discussion local initiatives to reduce school violence and enhance communication channels regarding emergencies at local universities and State efforts aimed at reducing gang violence.
- h. Updated rip current discussion regarding National Oceanic and Atmospheric Association (NOAA) rip current public education and monitoring activities.
- i. Updated drought/heat wave section regarding initiatives to address severe drought
- j. Updated avian (bird) flu/other pandemic discussion regarding world-wide reports of avian flu and State and local preparedness for pandemics or disease outbreaks
- k. Updated dam failure section regarding Santee Cooper warning system tests
- l. Updated tsunami hazard discussion regarding additional research on tsunami and TsunamiReady activities
- m. Added hazard event activities from 5-07 to 6-08
 - i. Tropical Storms – 1 event
 - ii. Floods – 9 events
 - iii. Tornadoes –6 events
 - iv. Wildfires – 2 events
 - v. Earthquakes – 3 events
 - vi. Hazardous materials –20 events
 - vii. Terrorism/school incidents of violence –20 events
 - viii. Rip currents - 5 events (2 deaths)
 - ix. Drought – severe drought declared in 2007-2008
 - x. Snowstorms/winter storms – 1 event
 - xi. Thunderstorms – 12 events
 - xii. Hail – 10 events
 - xiii. Heat advisories – 2 events
 - xiv. Non-severe wind - 1 event

IV. Problem Assessment

- a. Updated hazardous materials section to reflect methamphetamine lab seizures through march, 2008 (building and infrastructure vulnerability sections)
- b. Updated discussion of repetitive flood loss properties, number of flood claims and flood insurance payments with 2007 data
- c. Updated Natural and Beneficial Function of Floodplains section to reflect local efforts at preserving water quality through stormwater management activities, including stormwater master planning

VI. Possible Activities

- a. Added stormwater master planning to the list of activities being undertaken in the Region
- b. Updated the drainage projects list in Attachment VI-C

VII. Adopting Resolutions/Action Plans/Status Reports

- a. Replaced action plans and/or status reports with 2008-2009 editions (Charleston County and multiple other signatories)

VIII. Appendices

- a. Appendix F: Added graphics of 2007 earthquake locations
- b. Appendix H: Updated Project Impact committee membership lists

IX. References

- a. Updated references.