

Multi-Hazard Plan Mitigation Objectives Progress Report

August 27, 2012

Objective Description	Activities Completed
A. Prevention	
<p>Brushy Creek, Rocky Creek, Upper Reedy River & Gilder Creek Watershed Studies</p> <p><u>New Study</u></p> <p>Grove Creek Stormwater Master Plan</p>	<p>All studies were submitted to FEMA and have been incorporated into the new Flood Insurance Study for Greenville County. County residents were allowed to preview the new study in December 2011 and submit appeals during a 90 day appeal period that ended July 20, 2012.</p> <p>Currently, we are awaiting the Letter of Final Determination from FEMA that will indicate the effective date for the new study. The County will have six months to incorporate the new study into our Flood Damage Prevention Ordinance.</p> <p>In June 2012, the County initiated a Stormwater Master Plan study of the Grove Creek Watershed located southwest of the City of Greenville. A Letter of Map Revision will be prepared for this study upon completion so that the data can be incorporated into the FEMA Flood Insurance Rate Maps covering this area. Mitigation alternatives will be presented in the final report for areas determined to be at risk for significant flooding.</p>
Bridge/Culvert Replacements	<p>Bridge/Culvert replacements completed in 2012 include:</p> <p>New Circle Rd @ Reedy River Tributary Blacks Dr. @ Rocky Creek Greybridge Rd. @ Baker Creek Mountain Creek Church Rd @ Mountain Creek Trib. 1 Pennington Rd. @ Lake Robinson Tributary</p> <p>Additional bridges/culverts are targeted for replacement by Pubic Works. These replacements improve structural integrity of the crossing and reduce road overtopping potential during a flood event.</p>
County Severe Weather Manual	This objective has not been addressed and will be discussed during the next scheduled meeting.
B. Public Education and Awareness	
Flood Pool Elevations	The nine (9) Greenville County Soil and Water Conservation District impoundment easements are available for public review on GIS. The parcel viewer layer name is GCSWCD Impoundment Easement,

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	<p>located under Zoning/Special Assessment. Development within the easements is restricted and this information is reviewed during the building permit application process. The Floodplain Administrator maintains a database for these impoundments that includes flood and easement boundary elevation information.</p>
Enhance Hazards Education	<p>Flood Insurance Rate Maps (FIRM) and various flood related publications are located in the South Carolina Room of the County Library main branch. These materials are checked annually for CRS recertification. Additional information on the County's new Flood Insurance Study (FIS) will be supplied when finalized.</p> <p>Since September 2011, six (6) meetings with County citizens and various groups have been held where floodplain information was provided. This effort is ongoing as part of our Community Rating System (CRS) outreach program.</p> <p>Information on flood hazards, the Elevation Grant Program and flood insurance was sent to 90 homeowners living in "repetitive loss" flood hazard areas.</p> <p>A public meeting was held in December 2011 to roll out the draft flood insurance study for incorporated and unincorporated areas of the County. Information regarding the appeal period for the new Greenville County Flood Insurance Study (FIS) was submitted to the SC Society of Professional Engineers – Piedmont Branch; Greater Greenville Realtors Association; and, the SC Association of Professional Land Surveyors - Foothills Branch. Notifications of the appeal period were placed on the County website and local newspaper.</p> <p>Informational brochures on flooding, in both English and Spanish, were provided to the public in the Planning and Code Compliance Department. These brochures included information such as flood preparation, insurance, response to flooding and increased cost of compliance coverage.</p>
Realtor Flood Hazard Education	<p>Flood hazard information has been distributed to the Greater Greenville Realtors Association for inclusion on their website. The association was notified regarding the appeal period for the new FIS and provided with information required to access the draft FIS. The Floodplain Administrator routinely responds to individual realtor requests for information on floodplain</p>

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	management issues, including floodplain verifications.
Pre-prepared Hazard Information Advertisements	<p>The Greenville County Office of Emergency Management has a new web page containing a wealth of information including an excellent section on potential natural hazards to County citizens. A link is provided to the County Emergency Operations Plan, a comprehensive emergency planning document.</p> <p>The telephone directory contains Severe Weather Planner information that includes Red Cross contact information. Natural hazards addressed include thunderstorms, tornados and flooding.</p> <p>The National Weather Service (NWS) and local TV stations have severe weather alerts and information on their websites. Television and radio stations offer NWS special broadcasts for severe weather. Greenville County is an established Storm Ready Community. The NWS website contains "Awareness Materials" under the Storm Ready website for the following natural hazards: thunderstorms, tornados, hurricanes, floods and winter weather.</p> <p>The County web page contains links to flood hazard information under the Floodplain Management tab of the Department of Planning and Code Compliance.</p>
Flood Signs	<p>Flood hazard warning signs are posted at strategic locations throughout the County. Also, we have 15 Turn Around Don't Drown signs available for use at flooded intersections when required. Public works will post these signs when barricading flooded roads.</p> <p>A partial list of roads flooded during previous flood events (1995 and 2004) includes:</p> <ul style="list-style-type: none"> - Hammett Road - Log Shoals Road - Dukeland Drive - N Chastain Drive - Del Norte Subdivision Roads - Batesville Road - Old Spartanburg Rd at Riverside High - East Georgia Road - Hopkins Road - Gibbs Shoals Road - Cedar Falls Road - Holland Ford Road - Woodville Road

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	<p>These areas will be monitored during potential flood events using rain/flood gage information, NWS announcements and/or field observation.</p>
Weather Station	<p>County has installed 10 rain gages in support of the NPDES permit monitoring program. These gages were placed in strategic locations across the County and provide continuous rainfall data. This data can be accessed online by the public as well as governmental agencies at "http://gcfieldnet.woolpert.com. The username and password is "public."</p> <p>Five (5) Davis Instruments weather stations have been installed at County facilities in Travelers Rest, Oneal, Oaklawn, Animal Care Services and County Square. These locations provide a good overview of weather condition over the entire County. Weather data from these stations will be useful for flood prediction, emergency management operations and routine public works operation. The stations can be accessed via the internet at www.weatherlink.com. Click on the WeatherLink Station Map and type in Greenville, SC to obtain the Greenville County station locations and data links. The County Floodplain Administrator has additional information on these stations if required.</p>
FIRM Updates	<p>The FEMA contractor is continuing preparation of the revised Flood Insurance Rate Maps for Greenville County. The 90 day statutory appeal period for the new Flood Insurance Study was completed from April 20 to July 20, 2012. One appeal was filed for a portion of Rocky Creek near the intersection of Highway 14 and Batesville Road. After FEMA issues the Letter of Final Determination we will initiate the process of incorporating the study into our Ordinance.</p>
Enhance GIS Database.	<p>The County GIS Department has included a layer for the nine (9) watershed district impoundment easements on the Internet Mapping System. This layer, along with our updated topographic information using Light Detection and Ranging (LIDAR) data and our 2012 aerial photography, has significantly improved our ability to locate new structures out of flood hazard areas. Also, this information is used to assist citizens in assessing their need for flood insurance and in making real estate purchase decisions.</p> <p>When finalized and adopted into our Ordinance, the new FIRM digital layer will be incorporated into the Internet Mapping System for public use.</p>

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C. Natural Resources Protection	
Stream Crossing Debris Removal	The County continues to remove downed trees on County owned properties in areas of special flood hazard. Also, County maintains drainage areas on our right of ways as required. Areas under and immediately adjacent to existing bridges and culverts are cleaned and reworked to accommodate replacement structures.
D. Emergency Services	
Early Warning System	The County Early Warning System is in development with a projected completion date of Spring 2013.
Gates at Flooded Intersections	The DMC has recommended deletion of this objective and use of temporary barricades as needed. Flood warning signs will be used along with the barricades.
Improve Radio Communications	Greenville E911 is currently considering a County-wide radio network available to County agencies.
Post-disaster Review Meetings	<p>During the June 2011 storm event, inspectors were deployed and debriefed at the end of each day. The Palmetto 800 radio system was used to send information back to the Codes Enforcement Emergency Operations Room. Data was uploaded to the EMD WebEOC as received. Codes and EMD personnel met after the event to generate a final report for FEMA.</p> <p>This process will be used as necessary for similar future events.</p>
Installation of River Gages	<p>River gages have been installed at four locations on the Reedy River and one location each on Brushy Creek and Gilder Creek. Data from these gages is available to the public and government agencies online at gcfieldnet.woolpert.com. The username and password for this site is "public".</p> <p>One additional stream gage is being installed on the Mountain Creek Church Road bridge over Mountain Creek Tributary 1. A Memorandum of Understanding between Greenville County and the National Weather Service (NWS) has been completed. The NWS will provide the gage equipment and County will install the support unit as well as procuring the telephone line for the gage. This unit should be functional by the end of September 2012.</p>

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Develop Formal Agreements with Utility Providers	Greenville County has a Preferred Customer agreement with the electric utility provider to restore power to critical facilities first after a severe weather event.
Develop Inter-local Agreements	<p>This objective addresses agreements between municipalities and the NWS to share information on development or changes that may affect a downstream community. Currently, a statewide mutual aid agreement is in place.</p> <p>The County notifies NWS of homes that are removed from the floodplain under our acquisition program. The most recent list of homes acquired was submitted in August 2012</p> <p>The County and NWS have Memorandums of Understanding for sharing data from County rain/stream gages. Also, an MOU is in place for the Mountain Creek Church Road stream gage where the gage equipment was supplied by the NWS.</p>
Evaluation of Emergency Routes	This objective was designed to improve the ability of emergency services to access those in need. The County Engineer has reviewed ingress and egress routes with regard to critical facilities. A system of public works vehicles and equipment has been developed to accompany emergency response vehicles as necessary during disaster events or inclement weather.
Communications Protocol	<p>The Emergency Operations Center (WEB-EOC) has been revised and updated to enhance communications and cooperation during a natural hazards disaster response. Training on this system is ongoing. EMD is working on getting fire departments and municipalities trained to use WEB-EOC.</p> <p>Greenville County Council passed an Ordinance (No. 4295) to enact a Hazardous Substance User Fee that will be used by the Local Emergency Planning Committee (LEPC). Funds generated by this Ordinance will be used in part for long term planning and development of a county-wide notification system. Over two years of fees have been collected and will be used to procure the Early Warning System.</p>
Comprehensive Training Strategy	<p>This objective is designed to identify positions throughout the County related to natural hazard response and provide appropriate training.</p> <p>The County provides continuous employee training opportunities that enhance our ability to provide the</p>

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	<p>services required by our citizens and help to keep employees safe while on the job. The Health and Safety Coordinator conducts department audits in order to determine the types of training needed.</p> <p>One additional Codes Enforcement employee obtained certification as a floodplain manager (CFM) in 2012, bringing the total number of CFMs to nine (9). All senior staff positions and senior disaster assessment positions are CFMs.</p> <p>The National Weather Service offers offsite training for 911 operators.</p>
E. Property Protection	
Dwelling Elevation Grant Program	The County will provide up to \$7,500 to elevate homes that meet certain flooding criteria. In August 2012, information on this program was mailed to 90 homeowners located in areas where repetitive loss flood insurance claims have been filed. The program is ongoing.
Flood Mitigation Acquisition Program	<p>Since 2007 the County has implemented a program to acquire flood prone structures identified in the Brushy Creek and Upper Reedy River Watershed studies. To date, 111 structures have been acquired and removed from site. This represents over 51 acres of land returned to floodplain use in perpetuity. This program has helped the County reduce the number of repetitive loss structures from 42 to 22 and has improved safety from flood events for our citizens as well as emergency response personnel. We are attempting to acquire additional repetitive loss structures as we proceed with the program.</p> <p>We have initiated another watershed study in the Grove Creek Watershed. This study includes a risk assessment to determine if any structures in this watershed may have a high risk of flooding. If so, the acquisition and removal option will be evaluated for those structures.</p>
Critical Facility Review	County critical facilities (e.g., hospitals, fire depts., police depts., and schools) are identified in Appendix H of the Plan. The Volunteer Service Corp. has evaluated the adequacy of several disaster shelters in the County. This evaluation was performed to determine if these shelters were designed and constructed to withstand potential disasters.

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Relocate Fire Station(s)/EMS	The DMC determined this objective to be cost prohibitive and recommended its deletion.
F. Structural Projects	
Neighborhood Drainage Improvement Projects (NDIP)	<p>NDIP projects seek to upgrade roads and crossings to reduce localized flooding. The project list is maintained by the County Engineer and includes all known flooding problem areas.</p> <p>Locations of current and recently completed drainage projects include:</p> <ul style="list-style-type: none">Michaux DriveVine StreetDevenger Place/OvertonIvy TrailBennington WayPinckney StreetPinehurst StreetProvidence Square