American Water Resources Association
2010 SUMMER SPECIALTY CONFERENCE
GIS & Water Resources VI
March 29 – 31, 2010
Orlando, FL

Wednesday, March 31
10:30 AM – 12:00 Noon
SESSION 30: Flood Inundation III

Field Inspections and Reporting for Non-Federally Sponsored Flood Control Works (FCW) under the Rehabilitation and Inspection Program (RIP) - Jonathan Posner, CDM, Irvine, CA (co-authors: Kerry Casey, Jun Wang)

Under contract with the Corps of Engineers Los Angeles District, CDM performed field inspections and prepared reports for approximately 220 Non-Federally sponsored Flood Control Works (FCW) that fell under the Corps of Engineer□s Rehabilitation and Inspection Program (RIP). The work effort included a review of previous Initial Eligibility Inspection (IEI) reports and Continuing Eligibility Inspection (CEI) reports, as well as existing data related to each FCW from the Local Sponsor and/or the Corps of Engineers (COE). A unique requirement of the work included using GPS tagged digital photos of each FCW at multiple locations to accurately capture field inspection information that was easy to integrate within a GIS. Coupled with the use of a GPS enabled camera and capturing each FCW into a GIS environment, there was a tremendous amount of data management in order to adequately pre-plan and execute the work to meet a very tight schedule. All the data was managed and delivered in an SDSFIE (Spatial Data Standards for Facilities, Infrastructure, and Environment) compliant ArcGIS 9.3 geodatabase to comply with the Corp□s spatial data standards. This presentation will highlight the steps in executing the project, walk you through the challenges of performing the work, and pinpoint lessons learned.

Gunbarrel Fire Burned Area Emergency Response Assessment and Associated Flood Risk Reduction Project - Gregory Bevenger, Shoshone National Forest, Cody, WY

Abstract 2010 AWRA Spring Specialty Conference Geographic Information Systems (GIS) and Water Resources VI Orlando, Florida March 29-31, 2010 Gregory S. Bevenger Professional Hydrologist Shoshone National Forest 808 Meadowlane Avenue Cody, WY 82414 307.578.5163 (desk) or 307.250.5548 (cell) or 307.578.5112 (fax) gbevenger@fs.fed.us Gunbarrel Fire Burned Area Emergency Response Assessment and Associated Flood Risk Reduction Project The lightning-caused Gunbarrel Fire burned approximately 70000 acres within the Shoshone National Forest during the summer and fall of 2008. A burned area emergency response (BAER) assessment team utilized GIS to map soil burn severity, predict post-fire flood risk, and develop a flood-risk reduction project to protect numerous values at risk from potential flood damage. The assessment and implementation occurred over an extremely short timeframe, i.e., a few weeks versus a few months for a BAER project, in part due to time savings afforded by GIS capabilities. Pre- and post-fire satellite imagery was acquired and processed by the USDA Forest Service Remote Sensing Applications Center (RSAC) to develop an initial soil burn severity map. This map was field validated and adjusted by a Shoshone National Forest burn area emergency response assessment team that consisted of a hydrologist and soil scientist. Information from the final soil burn severity map was used to model post-fire flood risk. The modeling indicated the 25-year, 1-hour summer thunderstorm rainfall event could result in a seven to ten fold increase in flood flows, post-fire. Potential values at risk, such as the Buffalo Bill Cody Scenic Byway (Highway 14/16/20), guest lodges, recreation residences, and a private ranch, were assessed to determine if they were at risk from post-fire flooding. The assessment included rapid field survey of stream channel cross-section and associated routing of the flood event. From this, a determination was made that several of the potential values-at-risk were confirmed to be so. Subsequently, a flood risk reduction project was developed and implemented. The project involved clearing floatable woody debris from channels, educating individuals on NOAA-NWS flood warning systems, and cooperating with the Wyoming Department of Transportation on development of storm patrols.

The National Flood Hazard Layer (NFHL): Continually Updated Flood Hazard Data at Your Fingertips - Jeff Tornatore, Michael Baker Jr Inc, Alexandria, VA (co-author: Mike Domaratz)

On behalf of the Federal Emergency Management Agency (FEMA), Michael Baker Jr., Inc. designed, developed, and operated the National Flood Hazard Layer. The NFHL is a nationwide set of flood hazard GIS data from FEMA's Flood Map Modernization program. These data include modernized Digital Flood Insurance Rate Map (DFIRM) databases and subsequent changes from Letters of Map Revision (LOMRs). Data from DFIRM databases and LOMRs are published on their effective dates, resulting in integrated, continually maintained GIS data for flood hazards. A companion set of point locations for Letters of Map Amendment (LOMAs) and Letters of Map Revision based on Fill (LOMR Fs) complete the suite of mapped determinations of flood hazards made by FEMA. FEMA publishes the NFHL as state-formatted GIS data sets that are updated monthly. FEMA also publishes new data continually through a web-based mapping application, a web map service (WMS), and two applications that overlay maps from the WMS in the Google EarthTM mapping service. These data and services are available through FEMA's Map Service Center at http://msc.fema.gov. FEMA's customers are adopting these products rapidly; for example, demand for the WMS averaged 1.2 million image requests monthly in late 2008. The NFHL web services and products provide engineers, floodplain managers, and GIS specialists with a spectrum of flexible products that are "ready to use" in floodplain management, flood insurance, and infrastructure projects. For example, a community can add the WMS to their GIS and immediately have a quick look at how flood hazards overlay their critical infrastructure or development plans. Because FEMA updates the NFHL as it revises the flood hazard maps, the community automatically receives these updates with no additional effort. For GIS projects that already have flood hazard data, the NFHL provides flood hazard GIS data for watersheds, communities, or other areas that surround the project. By using the NFHL, decision makers quickly can take advantage of flood hazard maps engineered by more than 300 mapping partners and companies to gain insights that affect the outcome of the project.

3D Water Surface Elevation Generation Leveraging ESRI's Terrain Data Type - Stuart Geiger, Dewberry, Fairfax, VA (co-authors: Benjamin Pratt, Mat Mampara)

The majority of national efforts to understand flood risk have focused on the identification of the hazards. Determining the extent of the 1% annual chance floodplain has been the overarching goal of analyses conducted by the engineering community. While identifying the hazard as it relates to a particular frequency event to determine whether a particular structure is "in or out" is an important output, mitigating flood losses must factor the consequence or risk faced by a structure, community, or larger entities, in order to effectively prioritize where to direct scarce mitigation resources. To evaluate risk, the depth of flooding must be calculated and depicted in efficient data structures such as triangulated irregular networks. In addition, information regarding first floor elevations of structures exposed to the hazard is essential for more refined estimates of risk. For both of these tasks, the terrain feature data type introduced by ESRI in ArcGIS 9.2, can be leveraged to produce efficient and highly accurate estimates of depth and first floor elevations. Dewberry has developed a set of tools called GeoTerrain within its engineering and mapping system GeoFIRM that takes advantage of terrain data type capabilities, such as massive elevation data storage and rapid access and visualization. This presentation illustrates examples of how Dewberry's GeoTerrain produces depth triangulated irregular networks and estimated first floor elevations more efficiently in a variety of scenarios.