

Boulder Creek and Boulder Slough Floodplain Mapping Study Boulder, Colorado

Client: Ms. Christie Coleman
City of Boulder Public Works Department
Utilities Division
1739 Broadway
Boulder, CO 80306
(303) 441-4077



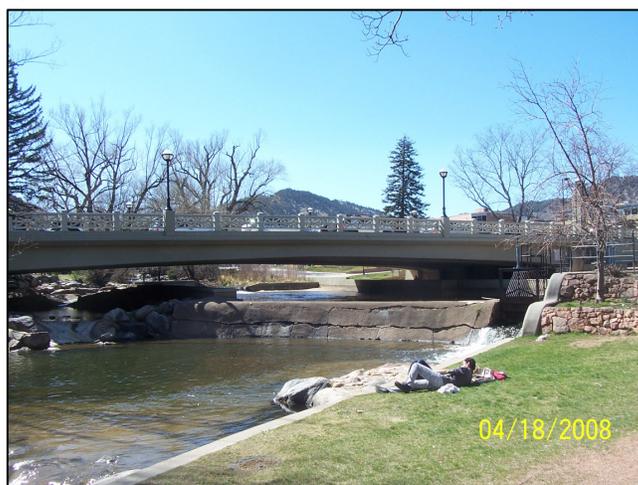
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The primary purpose of this study was to define various flood hazards for Boulder Creek over a 7-mile reach through the City of Boulder and a portion of unincorporated Boulder County, including nearly 6 miles of 25 distributary flow paths along adjacent drainage corridors and city streets. Also, the 100-year floodplain was defined for a 1.7-mile reach of Boulder Slough along its entire length between Boulder Creek and Goose Creek within the City of Boulder. This project included the following specific tasks:

- (a) **field reconnaissance efforts** to identify potential surveying requirements, characterize channel and overbank conditions and roughness coefficients, and to visually evaluate 30 bridges along Boulder Creek and distributary flow paths, and 23 bridges/culverts along Boulder Slough, including several irrigation diversion structures and other hydraulic structures;
- (b) **field surveying** of 30 bridges along Boulder Creek and distributary flow paths, and 23 bridges/culverts along Boulder Slough, including several irrigation diversion structures, numerous other hydraulic structures and channel cross sections, the 1,800-foot long pipe system along Boulder Slough, and topographic surveys of numerous sites throughout the Boulder Creek and Boulder Slough floodplains;
- (c) **hydrologic evaluation and modeling for the Boulder Creek watershed** to review the original U.S. Army Corps of Engineers' Storm Water Management Models (SWMM) and supporting documentation, along with utilizing the various USACE SWMM models to recreate the 100-year hydrologic model on which the effective Boulder Creek hydraulic model is based;
- (d) development of **six hydraulic (HEC-RAS) models for Boulder Creek and one HEC-RAS model for Boulder Slough** through the use of HEC-GeoRAS in conjunction with a LIDAR-based TIN supplemented with large volumes of field survey data;
- (e) hydraulic modeling for Boulder Creek included the **10-, 25-, 50-, 100- and 500-year events, the City-defined conveyance zone (1/2-foot rise floodway), and high hazard zone (Product 4 Corridor)**, utilizing numerous junctions and lateral weirs to define 18 distributary flow paths for a total modeling reach length of 12.4 miles;
- (f) **flood hazard mapping along Boulder Creek** of the 10-, 25-, 50-, 100- and 500-year floodplains, the conveyance zone and high hazard zone, mapping of the 100-year floodplain along Boulder Slough, and the preparation of the digital flood hazard work maps using HEC-GeoRAS, and ACE's automated mapping tools;
- (g) **two-dimensional modeling (using FLO-2D)** of a 3-mile reach of Boulder Creek and the adjacent floodplain through downtown Boulder to verify the results of the one-dimension analyses;
- (h) development of the graphical flood profiles, tables, and text providing detailed documentation of the study for incorporation into the Boulder County Flood Insurance Study (**FIS**);
- (i) development of an **ActionScript-based computer program/tool** for defining the High Hazard Zone for the City of Boulder, including an instructional video and detailed user information;
- (j) preparation of floodplain and floodway information in **DFIRM** format for inclusion in the **Boulder County DFIRM**, as well as the preparation of reports, information, **documentation, and the GIS database** required for the **Technical Support Data Notebook (TSDN)**; and
- (k) supporting the City of Boulder through the **public education and review process**.

Key Personnel:

- **Greg Koch, P.E.**
- **Jason Albert, P.E.**
- **Jamis Darrow, P.E.**
- **Aaron Hansen, P.E.**
- **Brian Van Zanten, P.E.**



Boulder Creek at Broadway

All work completed for this study was conducted in accordance with the requirements identified in the Map Modernization Guidelines and Specifications for Flood Hazard Mapping Partners [FEMA, April 2003].