**USGS FIMI – Published References for Flood Inundation Mapping Projects**

**November 29, 2010**

**General Techniques**

Davidian, Jacob, 1984, Computation of water-surface profiles in open channels: U.S. Geological Survey Techniques of Water-Resources Investigations, book 3, chapter A15:

<http://pubs.usgs.gov/twri/twri3-a15/>

Topics: General step-backwater techniques

**USACE HEC-RAS manuals**

The following manuals are available from USACE and include topics:

* Theoretical basis for model
* Steady flow applications
* Unsteady flow applications
* Data requirements
* Modeling structures
* Use of HEC-GeoRAS

U.S. Army Corps of Engineers, Hydrologic Engineering Center, 2002, HEC-GeoRAS manual , accessed on October 6, 2010 at URL

<http://www.hec.usace.army.mil/software/hec-ras/documents/HEC-GeoRAS42_UsersManual.pdf>

U.S. Army Corps of Engineers, Hydrologic Engineering Center, 2002, HEC-RAS 4.1 applications guide

<http://www.hec.usace.army.mil/software/hec-ras/documents/HEC-RAS_4.1_Applications_Guide.pdf>

U.S. Army Corps of Engineers, Hydrologic Engineering Center, 2002, HEC-RAS hydraulic reference manual, version 3.1

<http://www.hec.usace.army.mil/software/hec-ras/documents/HEC-RAS_4.1_Reference_Manual.pdf>

U.S. Army Corps of Engineers, Hydrologic Engineering Center, 2002, HEC-RAS 4.1 user's manual

<http://www.hec.usace.army.mil/software/hec-ras/documents/HEC-RAS_4.1_Reference_Manual.pdf>

**USGS Inundation Map Libraries/Studies**

Bales, J.D., Wagner, C.R., Tighe, K.C., and Terziotti, Silvia, 2007, LiDAR-derived flood-inundation maps for real-time flood-mapping applications, Tar River basin, North Carolina: U.S. Geological Survey Scientific Investigations Report 2007–5032.

<http://pubs.usgs.gov/sir/2007/5032/>

Topics: LiDAR data sources, accuracy, conversion to DEMs; HEC-RAS modeling at non-tidal and tidal sites; inundation map development; inundation map uncertainty

Murphy, E.A., Straub, T.D., Soong, D.T., and Hamblen, C.S., 2007, Hydrologic, hydraulic, and flood analyses of the Blackberry Creek watershed, Kendall County, Illinois: U.S. Geological Survey Scientific Investigations Report 2007–5141:

<http://pubs.usgs.gov/sir/2007/5141/>

Topics: Hydrological Simulation Program–FORTRAN (HSPF), HEC-RAS modeling, 1 and 0.2 percent exeedence probability inundation map development

Soong, D.T., Straub, T.D., Murphy, E.A., Continuous hydrologic simulation and flood-frequency, hydraulic, and flood-hazard analysis of the Blackberry Creek watershed, Kane County, Illinois, U.S. Geological Survey Scientific Investigations Report 2005-5270.

<http://pubs.usgs.gov/sir/2005/5270/>

Topics: Hydrological Simulation Program–FORTRAN (HSPF), HEC-RAS modeling, 1 and 0.2 percent exceedence probability inundation map development

Studley, S.E. 2003, Estimated flood-inundation maps for Cowskin Creek in western Wichita, Kansas: U.S. Geological Survey Water-Resources Investigations Report 03-4074:

<http://ks.water.usgs.gov/pubs/abstracts/wrir.03-4074.html>

Topics: Steady-flow HEC-RAS modeling; inundation map development; Web delivery of real-time gage data and corresponding maps

Whitehead, M.T., and Ostheimer, C.J., 2009, Development of a flood-warning system and flood-inundation mapping for the Blanchard River in Findlay, Ohio: U.S. Geological Survey Scientific Investigations Report 2008–5234.

<http://pubs.usgs.gov/sir/2008/5234/pdf/sir2008-5234.pdf>

Topics: Steady-flow HEC-RAS modeling; inundation map development

**2D Modeling**

Aquaveo, Surface Water Modeling System (SMS), Finite Element Surface Water Modeling System (FESWMS), Flo2DH 2D model:

<http://www.xmswiki.com/xms/SMS:FESWMS>

Fulford, J.M., computational technique and performance of transient inundation model for rivers—2 dimensional (TRIM2RD): a depth-averaged two-dimensional flow model

<http://pubs.usgs.gov/of/2003/ofr03371/>

Topics: TrimR2D model

Jones. J.L., Fulford, J.M., and Voss, F.D., Near-real-time simulation and Internet-based delivery of forecast-flood inundation maps using two-dimensional hydraulic modeling--a pilot study for the Snoqualmie River, Washington, U.S. Geological Survey Water-Resources Investigations Report 02-4251.

<http://pubs.usgs.gov/wri/wri024251/>

Topics: dynamic flood modeling; TrimR2D 2D hydraulic model; inundation map production

Kelly, B.P., and Rydlund, P.H., Jr., 2006. Estimated Flood-Inundation Mapping for the Lower Blue River in Kansas City, Missouri, 2003–05: U.S. Geologic al Survey Scientific Investigations Report 2006–5089. <http://pubs.usgs.gov/sir/2006/5089/>

Topics: Flo2DH 2D Federal Highway Administration model, simulated velocity magnitude and direction maps, inundation map production

Kim, M.H., Morlock, S.E., Arihood, L.A., and Kiesler, J.L., Observed and forecasted flood-inundation mapping: a pilot study of an eleven-mile reach of the White River, Indianapolis, Indiana: IN PRESS

Topics: static map libraries, FaSTMECH 2D model, dynamic flood modeling, inundation map production, HAZUS-MH loss estimations

Musser, Jonathan W., and Dyar, Thomas R., 2007, Two-dimensional flood-inundation model of the Flint River at Albany, Georgia: Atlanta, Georgia, U.S. Geological Survey Scientific Investigations Report 2007-510.

<http://pubs.usgs.gov/sir/2007/5107/>

Topics: Finite-element surface-water modeling system for two-dimensional flow in the horizontal plane (FESWMS-2DH)

U.S. Geological Survey Geomorphology and Sediment Transport Laboratory, FaSTMECH 2D (now the iRIC model):

<http://wwwbrr.cr.usgs.gov/projects/GEOMORPH_Lab/2D-Download.php>

U.S. Geological Survey Geomorphology and Sediment Transport Laboratory, list of publications referencing FaSTMECH (note – these are not inundation related): <http://wwwbrr.cr.usgs.gov/projects/GEOMORPH_Lab/project-FaSTMECH.html>

U.S. Geological Survey Geomorphology and Sediment Transport Laboratory ,Multidimensional Surface-Water Modeling System: <http://wwwbrr.cr.usgs.gov/projects/GEOMORPH_Lab/project-MDSWMS.html>

**1D Unsteady Flow Modeling**

U.S. Geological Survey Water Resources Surface Water Software: Full Equations (FEQ) Model Web Resources, software and users' manuals:

<http://il.water.usgs.gov/proj/feq/>

Topics: USGS FEQ model for one-dimensional unsteady flow in open channels

**FEMA Model List**

Federal Emergency Management Agency, Nationally-accepted Hydraulic Models for National Flood Insurance Program:

<http://www.fema.gov/plan/prevent/fhm/en_hydra.shtm>

**Flood Documentation Reports**

* Ebner, A.D.; Sherwood, J.M.; Astifan, Brian; and Lombardy, Kirk, 2007, Flood of July 27–31, 2006, on the Grand River near Painesville, Ohio: U.S. Geological Survey Open-File Report 2007–1164, 17 p. <http://pubs.usgs.gov/of/2007/1164/pdf/ofr20071164.pdf>
* Ebner, A.D., Straub, D.E., and Lageman, J.D., 2008, Floods of August and September 2004 in eastern Ohio—FEMA Disaster Declaration 1556: U.S. Geological Survey Open-File Report 2008–1291, 104 p. <http://pubs.usgs.gov/of/2008/1291/pdf/ofr2008-1291_web.pdf>
* Ebner, A.D., Straub, D.E., and Lageman, J.D., 2008, Floods of December 2004 and January 2005 in Ohio—FEMA Disaster Declaration 1580: U.S. Geological Survey Open-File Report 2008–1289, 98 p. <http://pubs.usgs.gov/of/2008/1289/pdf/ofr2008-1289_web.pdf>
* Ebner, A.D., Straub, D.E., and Lageman, J.D., 2008, Floods of May and June 2004 in central and eastern Ohio—FEMA Disaster Declaration 1519: U.S. Geological Survey Open-File Report 2008–1290, 85 p. <http://pubs.usgs.gov/of/2008/1290/pdf/ofr2008-1290_web.pdf>
* Brooks, L.T., 2005, Flood of September 18-19, 2004 in the Upper Delaware River Basin, New York: U.S. Geological Survey Open-File Report 2005-1166, 123 p. <http://ny.water.usgs.gov/pubs/of/of051166/>
* Fitzpatrick, F.A., Peppler, M.C., Walker, J.F., Rose, W.J., Waschbusch, R.J., and Kennedy, J.L., 2008, Flood of June 2008, southern Wisconsin: U.S. Geological Survey Scienific Investigations Report 2008–5235.

<http://wi.water.usgs.gov/surface-water/flood2008/index.html>

* Fowler, K.K., Kim, M.H., Menke, C.D., and Arvin, D.V., 2010, Flood of September 2008 in Northwestern Indiana: U.S. Geological Survey Open File Report 2010–1098. <http://pubs.usgs.gov/of/2010/1098/>
* Jackson, K.S. and Vivian, S.A., Flood of March 1997 in southern Ohio, Water-Resources Investigations Report 97-4149. <http://oh.water.usgs.gov/reports/Flood/flood.rpt.html>
* Koltun, G.F., Floods of June 28-29, 1998 in Ohio, Water-Resources Investigations Report, 99-4192. <http://oh.water.usgs.gov/reports/wrir/wrir.99-4192.pdf>
* Mastin, M.C., Gendaszek, A.S., and Barnas, C.R., 2010, Magnitude and extent of flooding at selected river reaches in western Washington, January 2009: U.S. Geological Survey Scientific Investigations Report 2010–5177, 34 p. <http://pubs.usgs.gov/sir/2010/5177/pdf/sir20105177.pdf>
* Morlock, S.E., Menke, C.D., Arvin, D.V., and Kim, M.H., 2008, Flood of June 7–9, 2008, in central and southern Indiana: U.S. Geological Survey Open File Report 2008–1322, 15 p., 3 app. <http://pubs.usgs.gov/of/2008/1322/pdf/ofr2008-1322.pdf>
* Sherwood, J.M., Ebner, A.E., Koltun, G.F., and Astifan, B.M., 2007, Flood of June 22–24, 2006, in north-central Ohio, with emphasis on the Cuyahoga River near Independence: U.S. Geological Survey Scientific Investigations Report 2007–5161, 18 p. <http://pubs.usgs.gov/sir/2007/5161/pdf/sir2007-5161_web.pdf>
* Straub, D.E., Ebner, A.D., and Astifan, B.M., 2009, Floods of August 21–24, 2007, in northwestern and north-central Ohio: U.S. Geological Survey Open-File Report 2009–1094, 76 p. <http://pubs.usgs.gov/of/2009/1094/pdf/ofr20091094_main_text.pdf>
* Suro, T.P., and Firda, G.D., 2007, Flood of April 2-3, 2005, Esopus Creek Basin, New York: U.S. Geological Survey Open File Report 2007-1036, 85 p. <http://pubs.usgs.gov/of/2007/1036/OFR2007-1036.pdf>
* Suro, T.P., Firda, G.D. and Szabo, C.O. 2009, Flood of June 26–29, 2006, Mohawk, Delaware, and Susquehanna River Basins, New York: U.S. Geological Survey Open-File Report 2009–1063, 354p. <http://pubs.usgs.gov/ofr/2009/1063>

**USGS Training Courses**

SW1004 Basic Hydraulic Principles

<http://training.usgs.gov/ntc/courses/Course_Info/course_catalog.cfm?db_course_id=207>

SW 1536 Using StoRM within MD\_SWMS

<http://training.usgs.gov/ntc/courses/Course_Info/course_catalog.cfm?db_course_id=284>

SW1537 Using FastMech within MD\_SWMS

<http://training.usgs.gov/ntc/courses/Course_Info/course_catalog.cfm?db_course_id=285>

SW2009A Part I - Surface-Water Hydraulic Analysis - Indirect Measurement of Open Channel Flow

<http://training.usgs.gov/ntc/courses/Course_Info/course_catalog.cfm?db_course_id=30>

SW2009B Part II - Surface-Water Hydraulic Analysis - Indirect Measurement of Flows Through Structures

<http://training.usgs.gov/ntc/courses/Course_Info/course_catalog.cfm?db_course_id=236>

Geographic Information Systems Courses

<http://training.usgs.gov/ntc/courses/Course_Info/course_catalog.cfm?db_subject_id=20>

**Model Comparison and Accuracy**

Bales, J., 2008, Uncertainty issues in flood inundation mapping: Proceedings of the 4th International Symposium on Flood Defence: Managing Flood Risk, Reliability and Vulnerability. Toronto, Ontario, Canada, May 6-8, p. 106-1 to 106-7.

Cook, A., and Merwade, V., 2009, Effect of topographic data, geometric configuration and modeling approach on flood inundation mapping, Journal of Hydrology, v. 377, no. 1-2, p. 131-142.

Jain, S., Saraf, A., Goswami, A., Ahmad T., 2006, Flood inundation mapping using NOAA AVHRR data, Water Resources Management, v. 20, no. 6, p. 949-959.

Merwade, V., Olivera, F., Arabi, M., Edleman, S., 2008, Uncertainty in flood inundation mapping: current issues and future directions: Journal of Hydrologic Engineering, v. 13, no. 7, p. 608-620.

Tayefi, V., Lane, S.N., Hardy, R.J., Yu, D., 2007, A comparison of one- and two dimensional approaches to modeling flood inundation over complex upland floodplains: Hydrological Processes. V. 21 p, 3190-3202.

U.S. Army Corps of Engineers, 1986, Accuracy of computed water resources profiles, Research Document RD-26, 210 p. <http://www.hec.usace.army.mil/publications/ResearchDocuments/RD-26.pdf>