Discovery Report

Little Wabash Watershed, 05120114

Clay, Coles, Cumberland, Edwards, Effingham, Fayette, Gallatin, Jasper, Marion, Moultrie, Richland, Shelby, Wayne, and White Counties, Illinois

Report Number 01

04/2017

Project Area Community List

Community Name
Clay County
Village of Clay City
City of Flora
Village of Iola
Village of Louisville
Village of Sailor Springs
Coles County
City of Mattoon
Cumberland County
City of Neoga
Edwards County
City of Albion
Effingham County
City of Altamont
Village of Dieterich
Village of Edgewood
City of Effingham
Town of Mason
Village of Montrose*
Village of Shumway
Village of Teutopolis
Village of Watson
Fayette County
Village of Farina **

Community Name
Gallatin County
Village of New Haven
Jasper County
Village of Wheeler
Marion County
Moultrie County
Richland County
Village of Calhoun
Village of Noble
City of Olney
Village of Parkersburg
Shelby County
Town of Sigel
Wayne County
Village of Cisne
City of Fairfield
Village of Golden Gate
Village of Jeffersonville
Village of Mount Erie
White County
Village of Burnt Prairie
City of Carmi
Village of Crossville

*Dual County Community – Effingham, Cumberland
**Dual County Community – Fayette, Marion

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I. General Information

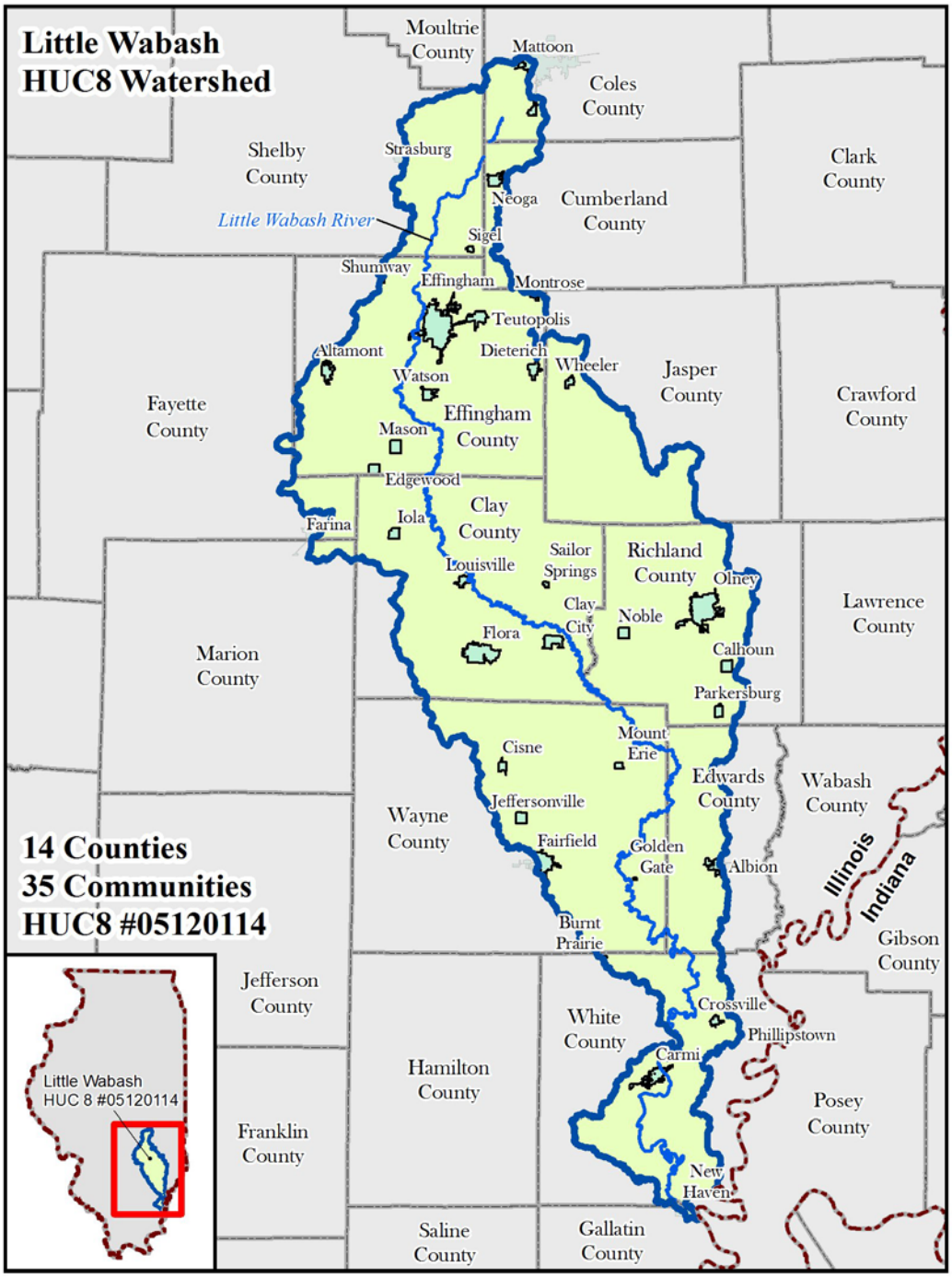


Figure 1. Little Wabash Watershed

The Little Wabash River is located in southeastern Illinois, flowing southward to the Wabash River. The river's headwaters are located in southwestern Coles County. From there, the Little Wabash flows approximately 237 miles south and east to its confluence with the Wabash River near New Haven, Illinois, a point approximately 13 miles upstream from the Ohio River (LIMNO-TECH, 2008).

The Little Wabash HUC 05120114 watershed study area, as shown in Figure 1, is approximately 515,000 acres (805 square miles) in size. The mainstem of the Little Wabash River, from its headwaters to the downstream end, is approximately 114 miles long. Major tributaries to the portion of the Little Wabash River located in the study area include: West Branch, Green Creek, Blue Point Creek, Second Creek, Big Creek North, Fulfer Creek, Salt Creek, Bishop Creek, Lucas Creek, Dismal Creek, Crooked Creek, Panther Creek, and Buck Creek (LIMNO-TECH, 2008).

Two tributaries to the Little Wabash River, Village Creek and Big Creek, located in the western portion of Edwards County are the primary sources of river flooding within that county. (Edwards County HMP, 2009). The combined flooding of the Little Wabash and the Wabash Rivers caused $0.5 million in damage to White County roads in 2009 (White County HMP, 2009).

The predominant land use in the watershed is agriculture with approximately 69 percent of the watershed covered by cropland. Grassland (pasture) constitutes 7 percent of the watershed area. The second largest expanse of land cover is forest, which covers approximately 19 percent of the watershed. Developed areas constitute only 3 percent of the watershed area (LIMNO-TECH, 2008).

Portions of the Little Wabash watershed lie within fourteen Illinois counties: Clay, Coles, Cumberland, Edwards, Effingham, Fayette, Gallatin, Jasper, Marion, Moultrie, Richland, Shelby, Wayne and White. The counties with the greatest land area within the watershed are Clay County (88 percent), Effingham County (85 percent), Richland County (69 percent), Edwards County (53 percent), Wayne County (51 percent), White County (40 percent) and Jasper County (32 percent). Effingham is the largest urbanized area entirely within the watershed with 12,384 residents. (Population Estimates, United States Census Bureau, May 11, 2016, http://www.census.gov/popest/)

II. Watershed Stakeholder Coordination

Discovery

The Discovery phase of this Federal Emergency Management Agency (FEMA) Risk Mapping, Assessment and Planning (MAP) project included an investigation of existing terrain, flood hazard data, and flood risk data; broad data mining for development of an initial Discovery map; and detailed data collection to refine the Discovery map, which was prepared by the Illinois State Water Survey (ISWS). Watershed coordination meetings were held with community, state, and federal officials to share information concerning the watershed and its stakeholders.

Approximately six weeks prior to the Discovery Meeting, the ISWS conducted a project team conference call with FEMA Region V staff and appropriate state officials. During the State/Federal project team call, ISWS staff provided an overview of the Risk MAP program and the Discovery process. Information concerning the Little Wabash River and its tributaries as well as current watershed projects and mitigation efforts was exchanged between ISWS staff and officials. Pre-Discovery materials are available in Appendix A.

Following this initial contact, ISWS staff updated the Illinois Department of Natural Resources (IDNR) contacts database using available websites. Approximately eight weeks prior to the meetings, ISWS sent e-mails, or mailed letters when no e-mail was available, to stakeholders providing a background of the Risk MAP program and an invitation to attend one of the two Discovery meetings. Access was made available to the stakeholders to the ISWS Little Wabash River watershed web-page, which contained the mapping data to be presented at the Discovery meetings. A second e-mail was sent two weeks prior to the meeting day, with an update on the data that had been uploaded to the web-page and reminding people to view their community data prior to the meeting of their choice. The Little Wabash River Watershed Discovery meetings were held on August 18, 2016. Additional information regarding these meetings is included in Section IV. The watershed stakeholder coordination materials are included in Appendix B.

III. Data Analysis

A list of the data collected, the deliverable or product in which the data are included, the source of the data, and any pertinent comments are provided in Table 1. Table 1 data can be used for flood risk products and additional information to benefit the project.

Table 1. Data Collection for Little Wabash Watershed

Data Types	Description	Source	Deliverable
Coordinated Needs Management Strategy (CNMS) Streams	Streams categorized by study validity	FEMA Region V Coordinated Needs Management Strategy Inventory	Geodatabase
Community, County, and State Boundaries	Location of community and county boundaries	U.S. Census 2015	Discovery Map; Geodatabase
Dams	Location of dams	U.S. Army Corps of Engineers (USACE) National Inventory of DAMS 1999 obtained from HAZUS Database	Discovery Map; Geodatabase
Effective DFIRM Panels	Panel scheme from Effective DFIRMs	FEMA Digital Flood Insurance Rate Maps (DFIRMS)	Floodplain Comparison
Embankments	Embankments shown on Effective FEMA FIRMs	Effective FEMA Flood Insurance Rate Maps (FIRMs)	Discovery Map; Geodatabase
FEMA Composite Risk Analysis	National Flood Risk Analysis HUC Risk Data	FEMA Region V	Discovery Map; Geodatabase
FEMA Public Assistance (PA) Grant Program	Locations of PA disbursements	FEMA Region V	Discovery Map; Geodatabase
HUC 8, 10, and 12 Watersheds	Watershed boundary (HUC8)	United States Geological Survey (USGS) National Hydrology Dataset	Discovery Map; Geodatabase
Letters of Map Change	Locations of Letters of Map Change	FEMA Mapping Information Platform Database	Discovery Map; Geodatabase
Levees	Location of levees considered for accreditation status by	FEMA Midterm Levee Inventory; USACE National Levee Database	Discovery Map; Geodatabase
Roads	Location of interstates and major highways	Illinois Department of Transportation, 2014	Discovery Map; Geodatabase
Special Flood Hazard Areas	Location of special flood hazard areas	FEMA FIRMs	Discovery Map; Geodatabase
Stream Centerlines	Stream centerlines	FEMA DFIRMs; USGS National Hydrography Dataset	Discovery Map; Geodatabase
Stream Flow Constrictions	Locations of ice jams and other stream flow	USACE Ice Jam Database	Discovery Map; Geodatabase
Stream Gages	Locations of stream gages operated by multiple agencies	USGS	Discovery Map; Geodatabase
Wetlands	Location and type of wetlands and deep water habitats	U.S. Fish and Wildlife Service National Wetlands Inventory	Discovery Map; Geodatabase

i. Data that can be used for Flood Risk Products

USGS Gages

The project team identified USGS stream gages in the watershed. The locations of the Little Wabash River gages are shown on the Discovery map and are listed in Table 2.

Table 2. USGS Stream Gages

Gage Number	Station Name and Location	Years of Record (Peaks)
03378635	Little Wabash River near Effingham, IL	49
03379500	Little Wabash River Below Clay City, IL	101
03380000	Little Wabash River Near Golden Gate, IL	44
03381500	Little Wabash River at Carmi, IL	76

(USGS, 01/26/2016, http://waterdata.usgs.gov/nwis/rt)

Dams

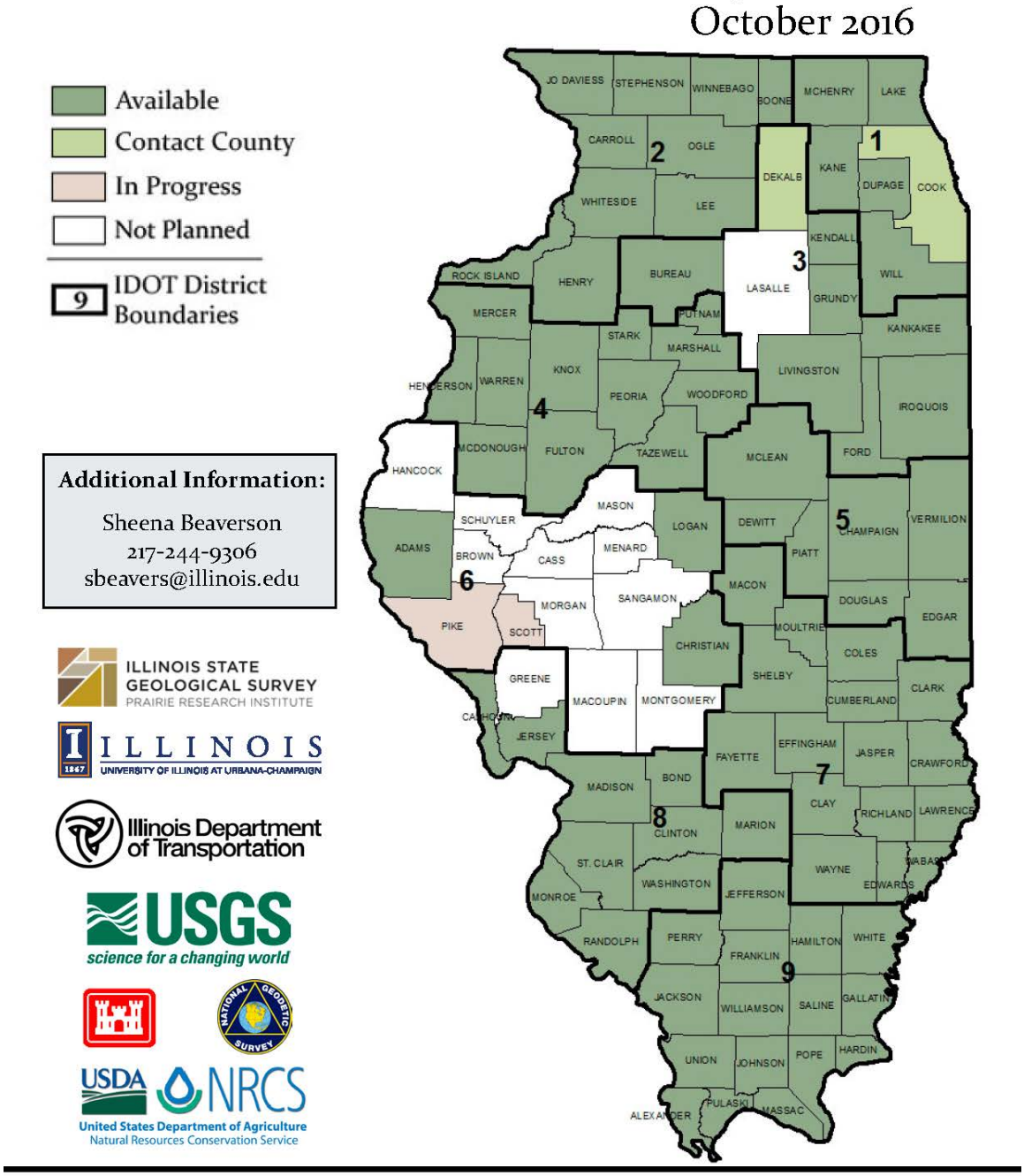
There are 46 dams listed in the USACE National Inventory of Dams as being located within the watershed, of which only 14 have Dam Inspection Reports.

Levees

No levees exist in the study area that provide the county with some degree of protection against flooding.

Topographic and Imagery Data

As part of the Illinois Height Modernization effort, the Illinois Department of Transportation (IDOT) has funded LiDAR data acquisition for Illinois counties scheduled by IDOT district. LiDAR projects in all Little Wabash watershed counties have been completed with data meeting FEMA standards. Figure 2 displays the LiDAR status for Illinois as of October 2016.



For Access to LiDAR Data, Please Google:
Illinois Height Modernization (ILHMP): LiDAR Data

(*Illinois Geospatial Data Clearinghouse*, 10/31/2016, http://clearinghouse.isgs.illinois.edu/data/elevation/illinois-height-modernization-ilhmp-lidar-data)

Figure 2. LiDAR Status for Illinois

Essential Facilities

Essential facilities are the facilities that can impact the delivery of vital services, cause greater damages to other sectors of a community, or put special populations at risk. They include schools, fire departments, police departments, emergency operations centers, and care facilities. The assessment of the flood risk posed to essential facilities within the watershed is an important aspect of Hazard Mitigation Plans (HMPs). Six of the fourteen counties that lie all or in part within the watershed have HMPs. None of the plans list essential facilities located within the 1 percent-annual-chance floodplain. The exact number of essential facilities considered at-risk is not always quantifiable due to the limited detail presented in the HMPs and is unknown in those counties and communities that have not prepared an HMP.

Effingham is the larges city in the watershed. An analysis of the City of Effingham has identified six essential facilities that are located within the special flood hazard area (SFHA), as shown on the City of Effingham FIRM, effective date 7/18/1985. Essential facilities include police, fire, medical, and school facilities, as well as emergency operation centers. The six essential facilites identified are located in the northwestern portion of the city and are all medical care facilites. These include clinics, surgical centers, and nursing homes. Special care needs to be taken with these facilities as they can house vunerable populations that need greater assistance if the facility were to be evacuated due to flooding. Essential facilities within or near the 1-percent-annual -chance floodplain are listed below.

- Facilities located within the SFHA
    - All Care Orthopedic Center
    - Bonutti Clinic
    - Effingham Ambulatory Surgery Center
    - Effingham Community Medical Center
    - Effingham Rehabilitation (Nursing Home)
    - Lakeland Rehabilitation & Health Care Center (Nursing Home)
- Facilities not within but in close proximity to the SFHA
    - Effingham Medical Center
    - Evergreen Nursing & Rehab Center (Nursing Home)
    - Marion Eye Center & Surgery Center
    - St Anthony's Memorial Hospital

A map of the identified facilities is included as Figure 3.

Data Sources:

- Essential Facilities
    - Google Maps
    - Google Streetview
- SFHA
    - FEMA City of Effingham FIRM, Effective Date 7/18/1985
- Stream Centerlines

FEMA Comprehensive Data Management

Figure 3. Essential facilities located within or near the 1-percent-annual-chance floodplain in the City of Effingham

ii. Other Data and Information

National Flood Insurance Program (NFIP) Data

In 1968, Congress created the NFIP to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding. These efforts help mitigate the effects of flooding on new and improved structures. Overall, the program reduces the socio-economic impact of disasters by promoting the purchase and retention of general risk insurance, but also of flood insurance, specifically. Within the Little Wabash watershed there are eight counties and fourteen communities that participate in the NFIP. Table 3 lists the Little Wabash communities and counties that participate in the NFIP.

Table 3. NFIP Participation Status

Community Name	Participating	Community Name	Participating
Clay County	No	**Gallatin County**	Yes
Clay City , Village of	Yes	New Haven, Village of	Yes
Flora, City of	Yes	**Jasper County**	Yes
Lola, Village of	No	Wheeler, Village of	No
Louisville, Village of	No	**Marion County**	No
Sailor Springs, Village of	No	**Moultrie County**	Yes
Coles County	Yes	**Richland County**	Yes
Mattoon, City of	Yes	Calhoun, Village of	No
Cumberland County	Yes	Noble, Village of	No
Neoga, City of	Yes	Olney, City of	Yes
Edwards County	Yes	Parkersburg, Village of	No
Albion, City of	No	**Shelby County**	No
Effingham County	No	Sigel, Town of	No
Altamont, City of	Yes	**Wayne County**	No
Dieterich, Village of	Yes	Cisne, Village of	No
Edgewood, Village of	No	Fairfield, City of	Yes
Effingham, City of	Yes	Golden Gate, Village of	No
Mason, Town of	No	Jeffersonville, Village of	No
Montrose, Village of	Yes	Mount Erie, Village of	No
Shumway, Village of	No	**White County**	Yes
Teutopolis, Village of	Yes	Burnt Prairie, Village of	No
Watson, Village of	No	Carmi, City of	Yes
Fayette County	No	Crossville, Village of	Yes
Farina, Village of	No		

(FEMA, *Community Status Book Report*, 1/21/2016, http://www.fema.gov/cis/IL.html)

Table 4 lists the Little Wabash communities and counties that have residences with flood insurance policies and their total coverage and premiums. The number of claims and the total dollars paid between 1978 and April 2016 is also provided. None of the counties lie entirely within the Little Wabash watershed. The county flood insurance information includes all of the county land area and the numbers may include residences that are not within the Little Wabash watershed area. These finding were based on tabular information provided by FEMA's Community Information System (CIS).

Table 4. NFIP Policy and Claims Report Data

CID	Community	Number Policies	Total Coverage	Total Premium	Total Claims Since 1978	Total Paid Since 1978
170681	Carmi, City of	29	$4,831,100	$18,576	44	$3,486,580
170042	Clay City, Village of	12	$485,000	$7,637	1	$0
170986	Coles County*	27	$4,822,400	$17,601	6	$171, 835
WZ170682	Crossville, Village of	11	$808,900	$8,443	1	$11,815
170987	Cumberland County*	2	$560,000	$718	5	$17,807
170937	Edwards County*	0	$0	$0	1	$0
170229	Effingham, City of	10	$2,512,400	$8,266	1	$0
170680	Fairfield, City of	31	$2,371,800	$24,409	9	$66,455
170043	Flora, City of	9	$1,955,000	$6,856	2	$21,569
170900	Gallatin County*	23	$3,240,700	$16, 606	21	$580,543
170990	Jasper County*	5	$493,100	$2,643	1	$0
170053	Mattoon, City of**	63	$7,063,406	$59,815	27	$112,918
170998	Moultrie County*	3	$700,000	$1,008	0	$0
170768	Neoga, City of	3	$267,400	$3,513	0	$0
170246	New Haven, Village of	14	$916,100	$9,775	11	$220,129
170581	Olney, City of	7	$1,522,200	$4,021	0	$0
170906	White County*	32	$3,443,200	$22,735	23	$774,022

*Unincorporated areas
**Community is not entirely within the watershed.
(FEMA Community Information Service (CIS), February 3, 2017)

Geospatial NFIP Claims Analyses

A secondary GIS analysis was also performed on NFIP claims data. The analysis was based on a separate NFIP claims dataset, provided by FEMA. This data was provided in a tabular format and includes the payment amount for closed claims, date of loss, and the location by street address between the period of March 1978 and July 2013. The claims were geocoded by the street address and presentable in a spatial GIS layer. It should be noted that any differences between the CIS NFIP claims information and spatial NFIP claims is outside the scope of this project.

Within the 35-year time frame, 78 claims were identified within the Little Wabash HUC 8 watershed, 13 of the claims were closed without payment, and there were 65 closed claims receiving payments totaling $792,655, an average of $12,194 per claim. A table of the closed claim totals by county and the 2016 municipalities can be seen within Table 5.

Table 5. NFIP Claims

County	Municipality	Claims	Claim Payment
White County	City of Carmi	53	$651,247.00
White County	Village of Crossville	2	$11,815.00
Effingham County	City of Effingham	1	$0.00
Wayne County	City of Fairfield	7	$56,595.00
Coles County	City of Mattoon	1	$2,888.00
Cumberland County	City of Neoga	1	$5,726.00
Jasper County	City of Newton	1	$3,499.00
Richland County	Village of Calhoun	11	$60,885.00
Clay County	Village of Clay City	1	$0.00

This NFIP claims dataset was also analyzed by correlation with the effective floodplains. The floodplains used in these analyses were derived from the National Flood Hazard Layer (NFHL), and for counties without digital data, floodplains were digitized based on historical paper FIRMs. These analyses indicated that 41 percent of the claims fell within the 1-percent-annual-chance floodplain, 7 percent of the claims fell within the 0.2-percent-annual-chance floodplain, and 51 percent of NFIP claims were identified outside of the effective floodplains. These results along with the sum of claims per hazard area are shown in Table 6**.**

Table 6. Correlation between Effective Floodplains and NFIP Claims

Effective Floodplains	Claims	Claim Payment
1 Percent Annual Chance Floodplain	32	$455,720.00
0.2 Percent Annual Chance Floodplain	6	$77,345.00
Unshaded Zone X	40	$259,590.00

Hazard Mitigation Plans

Hazard Mitigation Plans (HMPs) are prepared for counties and communities to help reduce long-term risk to life and property from natural hazards. The plans include comprehensive mitigation strategies intended to promote flood-resilient communities. The project team reviewed the mitigation strategies in available HMPs to determine which, if any, were relevant for the Discovery process. The HMPs that are available for review can be found on the Illinois Emergency Management Agency's (IEMA) website at http://www.illinois.gov/iema/Mitigation/Pages/Planning.aspx. Table 7 lists the HMPs, their status, and their availability for review.

Table 7. HMPs: Status and Availability

County	HMP	Hazus	Issue Date	Expiration Date	Available for Review
Clay	No	N/A	N/A	N/A	N/A
Coles	Update in Progress	No	01/15/2010	01/15/2015	Yes
Cumberland	In Progress	N/A	06/15/2010	06/15/2015	N/A
Edwards	Update in Progress	Yes	07/13/2009	07/13/2014	Yes
Effingham	No	N/A	N/A	N/A	N/A
Fayette	No	N/A	N/A	N/A	N/A
Gallatin	Update in Progress	Yes	01/15/2010	01/15/2015	Yes
Jasper	Yes	Yes	05/22/2012	05/22/2017	Yes
Marion	No	N/A	N/A	N/A	N/A
Moultrie	In Progress	N/A	N/A	N/A	N/A
Richland	Yes	Yes	01/31/2013	01/31/2018	Yes
Shelby	In Progress	N/A	N/A	N/A	N/A
Wayne	In Progress	N/A	N/A	N/A	N/A
White	Update in Progress	Yes	01/15/2010	01/15/2015	Yes

(IEMA, 01/26/2016, http://www.illinois.gov/iema/Mitigation/Pages/Planning.aspx)

Table 8 provides a summary of flood related mitigation concepts listed in the available plans.

Table 8. Countywide Hazard Mitigation Plan Review
Summary of Projects to Identify or Reduce Flood Risk

County	Action	Potential Funding Source
Coles	Calculate and map the floodplain for the municipalities and the entire county.	IEMA and FEMA
	Buy outs – no specifics	IEMA
	Develop capacity figures for residential drainage ditches or creeks that are not located within the identified floodplain but are prone to flooding/flash flooding	Federal Planning funds and local general funds
	Regional retention ponds to reduce flooding in Mattoon	Federal mitigation funds and local general funds
Edwards	Create new or revised existing plans and maps related to hazards affecting the county to support compliance with the NFIP, evaluate dams, investigate potential structure relocation, water supply security	FEMA
Gallatin	Create new or revised existing plans/maps related to hazards affecting the county	County, IEMA
	Lessen the impacts of hazards to new and existing infrastructure: purchase permanent signage or flood gates for flood-prone areas; amend ordinances to improve stormwater drainage and management; harden water treatment plant stations and waste stations against the threat of floods	FEMA and local
	Implement a plan for voluntary buyouts of residences in flood-prone areas.	FEMA and local
	Implement a plan for maintenance and improvements for the Old Shawneetown levee	Local, state, federal
	Elevate flood-prone roads	Local, state, federal
Jasper	Purchase new road signage for high-water marks and road closure	Local, state, federal
	Update or elevate township roads, and improve or replace bridges and culverts	Federal and local
	Acquire repeatedly flooded properties/structures	Federal
	Inventory structures in floodplain or other low lying areas prone to flooding	Local
	Update flood map	FEMA
	Participate in the Community Rating System (CRS)	Local
	Purchase an airboat for flood evaluation and rescue	Federal and local
	Create educational system for NFIP building codes, enforcement, and restrictions	Local
	Expand relationships between levee district and Army Corps of Engineers	Local

Table 8. Countywide Hazard Mitigation Plan Review
Summary of Projects to Identify or Reduce Flood Risk (continued)

County	Action	Potential Funding Source
Richland	Support compliance with the NFIP; increase public awareness	FEMA and local
	Lessen the impacts of hazards to new and existing infrastructure: elevated roads flooded by the Fox River	State and federal
	Create new or revise existing plans/maps for the community; improve and enforce floodplain ordinances	Federal, state and local
	Elevated roads flooded by the Fox River	State and federal
White	Develop levee and pump system to prevent Little Wabash flooding in Carmi	TBD
	Institute buy-out program for residences with high flooding potential in Mill Shoals	TBD

CNMS and NFIP Mapping Study Needs

To maintain the validity of flood hazard data over time, FEMA assesses its inventory of FIRMs and flood risk studies and determines whether conditions on the ground are still adequately represented on the FIRM panels for that area. When the information on the FIRM does not adequately represent actual conditions, it is considered a "flood hazard mapping need" and a new or updated FEMA flood hazard study for the area may be warranted. FEMA uses GIS technology and develops policies, requirements, and procedures to coordinate the management of flood hazard mapping needs in a comprehensive approach, referred to as the Coordinated Needs Management Strategy (CNMS). Through CNMS, FEMA identifies and tracks the lifecycle of mapping needs of the FEMA flood hazard mapping program, known as the Risk MAP program (FEMA Coordinated Needs Management Strategy, 01/26/2016, https://www.fema.gov/ coordinated-needs-management-strategy).

CNMS contains data for stream reaches to support existing and proposed flood mapping activities. The ISWS and Illinois Department of Natural Resources, Office of Water Resource (IDNR-OWR) applied geospatial technologies to coordinate the management of mapping needs within the Little Wabash watershed. Update and analyses of the CNMS data for the Little Wabash watershed is complete.

Analyzed studies are identified in Illinois as "valid," "unknown" and "unverified." At the initiation of this project CNMS shows that of the 969 recorded total miles in the watershed, only 2 miles are identified as valid; there are 967 miles that are either unknown or unverified, with 875 of those miles still part of the paper map inventory. A comparison of the effective Zone A and Automated Engineering study shows that all SFHA in the Little Wabash River watershed failed to reach threshold limits and are categorized as unverified. Zone A stream miles that lie within modernized counties are coded as unknown and require assessment along with those in the un-modernized counties coded as unverified (to be studied) or unknown (to be assessed).

Community Rating System (CRS)

There are no communities in the Little Wabash watershed that participate in CRS (FEMA, Community Information System, 01/22/2016, https://portal.fema.gov/famsVuWeb/home).

Floodplain Management/Community Assistance Visits (CAVs)

As the state coordinating agency for the NFIP, the IDNR-OWR conducts Community Assistance Visits (CAVs) as part of their floodplain management programs. A CAV typically consists of a tour of the floodplain to assess any recent construction activities, a review of the local permitting process, and evaluation of the local floodplain ordinance. A meeting with the local floodplain official is held to discuss the NFIP, the local permitting process, any recent flood events, training opportunities, and any program deficiencies. In some situations a Community Assistance Call (CAC) is implemented to discuss the needed information. Table 9 lists the communities in the watershed that have had either a CAV or CAC carried out from January 1, 2000 to April 1, 2016.

Table 9. Recent CAVs/CACs

Community	CAV	CAC
City of Flora	N/A	09/18/2000
Cumberland County	N/A	08/27/2009
Edwards County	09/18/2000	09/18/2000
City of Effingham	09/03/2009	N/A
Gallatin County	06/11//2004	N/A
Moultrie County	N/A	08/29/2009
City of Olney	N/A	09/18/2000
White County	04/04/2006	12/09/2014
City of Carmi	04/06/2006	12/09/2014

(CIS, 04/01/2016)

Regulatory Mapping

As part of FEMA's Map Modernization program, ISWS has updated several of the countywide FIRMs throughout the state of Illinois. While these maps are in a digital format, they do not necessarily reflect newer hydrologic or hydraulic study information and therefore may not be the most accurate representation of flood risk within the watershed. Within the Little Wabash watershed, four counties have been updated with effective DFIRMs and the remaining nine counties were not funded for modernization. Table 10 lists the map modernization status of the Little Wabash watershed counties.

Table 10. Map Modernization Activity

County	Status	Effective Date
Clay County	Not Modernized	N/A
Cumberland County	Effective	02/04/2011
Edwards County	Not Modernized	N/A
Effingham County	Not Modernized	N/A
Fayette County	Not Modernized	N/A
Gallatin County	Effective	12/02/2011
Jasper County	Not Modernized	N/A
Marion County	Effective	11/16/2011
Moultrie County	Effective	07/18/2011
Richland County	Not Modernized	N/A
Shelby County	Not Modernized	N/A
Wayne County	Not Modernized	N/A
White County	Effective	02/16/2012

Automated Engineering Mapping

A Large Scale Automated Engineering analysis and report was completed by ISWS for the Lower Wabash watershed. The report, *Automated Engineering Little Wabash River Watershed HUC 05120114, including portions of Clay, Coles, Cumberland, Edwards, Effingham, Fayette, Gallatin, Jasper, Marion, Moultrie, Richland, Shelby, Wayne, and White Counties, Illinois*, dated September 12, 2016, was submitted to FEMA as part of project work in MAS13-03. The automated engineering analysis included a hydrologic and hydraulic analysis of approximately 1,100 stream miles, all within effective Zone A flood zones, to validate the accuracy of the effective Zone A boundaries for CNMS and to establish the first step of future scalable hydrology and hydraulic studies. Note that use of GIS to identify streams resulted in a greater number of stream miles than recorded in CNMS, which was based on decades-old paper maps and lower resolution NHD stream lines.

The automated engineering study was developed using an automated StreamStats procedure to generate peak flows for the 50%, 20%, 10%, 4%, 2%, 1%, 0.2%, 1%+, and 1%-annual-chance flow events. Flows were run through a HEC-RAS one-dimensional steady state model to develop floodplains for each annual chance flood event. A validation procedure was performed with the automated engineering output to determine the validity of effective Zone A studies in CNMS. **A comparison of the effective Zone A and Automated Engineering study show that all SFHA areas in the Little Wabash River watershed failed to reach threshold limits and are categorized as unverified.** The Automated Engineering output can be used in future work to develop regulatory and non-regulatory products, perform outreach and Discovery work, and provide stakeholders with information for planning and developmental purposes.

Detailed results and a list of flood-prone areas that warrant additional analysis appear in the aforementioned 2016 ISWS report.

IV. Discovery Meeting

The Little Wabash Discovery meetings were held at the following places, dates, and times:

Thursday, August 18, 2016 9:30 AM - noon
Effingham City Council Chambers
City Hall
201 East Jefferson Avenue
Effingham, IL 62401

Thursday, August 18, 2016 2:30 PM – 5:30 PM
Frontier Community College
2 Frontier Drive
Fairfield, IL 62837-2601

Each Discovery meeting was approximately two and one half hours long and consisted of a presentation overviewing the Risk MAP goals and objectives. FEMA flood map terminology, the NFIP and the CRS were discussed. The need for each county within the watershed to create and keep current a Natural Hazard Mitigation Plan was explained, with emphasis on providing mitigation plans for all natural hazards that are known to occur within this watershed. The meeting materials are available in Appendix C.

A break-out session followed in which Discovery maps were available for review at five stations at the Effingham meeting and three stations at the Fairfield meeting. Each station was staffed by ISWS personnel. FEMA and IDNR-OWR staff were also available for questions. After reviewing the maps and clarifying any questions, stakeholders provided comments about the maps and known flooding issues by completing comment forms that included their contact information. Names and ownership information for embankments, levees and dams as well as possible recommendations for mitigation projects for local flood risk areas were also requested on the comment forms. The meeting summary, attendance, and mitigation action forms are available in Appendix D. The Discovery Maps and Floodplain Comparison Workmaps are available in Appendix E.

As part of the ongoing outreach process, meeting participants received pre-meeting and post-meeting surveys to assess Risk MAP knowledge gained as a result of the Discovery meeting and to determine topics for which they would like to receive further information. The meetings generated interest in the NFIP and, in particular, the CRS program as well as interest in mitigation planning. Out of 100 survey responses, 41 respondents would like more information on the NFIP and CRS, 33 respondents would like more information on funding opportunities for Hazard Mitigation Plans, and 41 respondents would like more information about Risk MAP. The survey results and summary are available in Appendix F.

Following the meetings, the data collected were reviewed and analyzed. The mitigation actions were entered into FEMA's online Mitigation Action Tracker and an Areas of Mitigation Interest (AoMI) database was developed from information provided by the community officials.

Areas of concern and interest within the Little Wabash watershed that could be addressed with Risk MAP projects include the following:

Floodplain Studies
With input from community stakeholders, IDNR and ISWS have developed a plan for new or updated studies.

The goal of the floodplain mapping program is to have a high quality, model-based floodplain mapped for all streams that drain greater than one square mile. Updated flood studies have not been completed for any stream in this watershed for approximately 30 years. The effective floodplains are nearly all Zone A and have no identifiable technical basis. Communities within the watershed do not have base flood elevations established for floodplain management. In particular, representatives from the communities of Effingham, Fairfield, Carmi, Teutopolis and Mattoon expressed concern about inadequate flood hazard identification in and around their communities. Furthermore, the USACE National Inventory of Dams lists 46 dams within the watershed; only 14 have dam inspection reports, which are also about 30 years old.

There is lack of current and verified flood hazard data throughout this watershed. Zone AE or at least model-based Zone A studies are needed in these communities. The automated engineering performed should be upgraded to model-based Zone A. Table 11 is a summary listing the stream miles in the environs of communities (urban) that should be considered for Zone AE studies. The total miles including those which have never been studies as well as totals for Effingham and Clay Counties are given in Table 11. Effingham County and Clay County are primarily located within the Little Wabash watershed. Neither county has a digital countywide FIRM, provided in Table 11 are the number of stream miles within Effingham and Clay counties that are not within the Little Wabash watershed and would require study for DFIRM updates.

Table 11. Urban and Rural Stream Miles

Zone A Stream Miles within One Mile of Communities with SFHA	
Watershed total Stream Miles	133
Effingham County	47
Clay County	21

Total Miles for Little Wabash	
Watershed total Stream Miles	1034
Effingham County	197
Clay County	254

Zone A Stream Miles outside of Little Wabash	
Effingham County	28
Clay County	10

The proposed plan for data development is summarized in Table 12. It is recommended that: a hydrologic study of the watershed include a peak flow analyses (Bulletin 17C) for all gages to determine design flows for the main stem; and USGS regression equation results adjusted as needed for urbanized areas to support detailed studies and base level hydraulic studies as follows: 1) all streams within communities have studies conducted that would support Zone AE floodplain delineation; 2) a study of the main stem of the Little Wabash be conducted that includes bridge data and any significant constrictions or other hydraulic features; 3) base level study of rural streams using high resolution LiDAR and engineering oversight. A detailed listing of streams sorted by county, zone, and proposed study level is provided in a spread sheet in Appendix G. Specific locations where the FOA analyses illuminated particularly poor hazard identification in the watershed are documented in Appendix H, where a map and short caption describe the situation.

Table 12. Recommend Data Development

County	*Existing*				*Data Development*					
	Zone A	**Zone AE**	**Mapped total**	**Unmapped**	**Little Wabash Main Stem Zone A (enhanced)**	**Little Wabash Main Stem Zone AE**	**Valid Zone AE**	**Estimated Detailed study miles (environs of communities) ****	**Model based Zone A**	**Community for Zone AE study**
Clay	243.92	3.5	247.42	6.08	54.88	3.5	0	15	180.12	Iola, Sattor Springs, Louisville, Flora, Clay City*
Coles	4.82	0	4.82	0	3.42	0	0	0	1.4	
Cumberland	3.85	0	3.85	1.66	0	0	0	3.85	1.66	Neoga*
Edwards	50.23	0	50.23	0.23	15.29	0	0	0	35.17	
Effingham	194.77	0	194.77	2.26	35.78	0	0	30	131.25	Effingham, Teutopolis, Beecher City, Altamont, Watson*
Fayette	2.78	0	2.78	2.28	0	0	0	0	5.06	
Gallatin	0	3.4	3.4	0	0	0	0	0	0	
Jasper	61.19	0	61.19	1.89	0	0	0	3	60.08	Wheeler*
Richland	177.67	0	177.67	0	7.47	0	0	10	160.2	Olney*
Shelby	22.65	0	22.65	6.97	14.54	0	0	0	15.08	
Wayne	137.98	0	137.98	10.35	45.09	0	0	30	73.24	Fairfield*
White	32.44	63.69	96.13	2.54	0	56.18	7.51	25.49	9.49	Carmi, Crossville*
Watershed total	**932.3**	**70.59**	**1002.89**	**34.26**	**176.47**	**59.68**	**7.51**	**117.34**	**672.75**	**1033.75**
				1033.75						
	corr.	67.19***								

Notes:

* = estimated miles

** does not include all streams in one mile radius

***Gallatin & White share common reach length of Little Wabash, 3.4 miles

i. Mitigation Projects

At the Discovery meetings, community stakeholders identified several locations in which mitigation projects could reduce the impacts of flooding. Topics of mitigation interest included levees, roads that frequently flood, significant riverine erosion, at-risk essential facilities, streamflow constriction, and recent and/or future development. The following mitigation projects were identified. There were also a number of study requests for improved hazard identification to determine the status of both existing structures and areas of development.

Table 13. Mitigation Projects

Community	Subject(s)	Project	Status	Comment Number
Illinois				
Effingham, City of	Buy outs	2 houses and 1 business Stream of interest: Salt Creek Location: W. Kentucky Ave\ N, Keller Dr.	Not started	9
Fairfield, City of	Possible buy outs or other infrastructure repair	Name: Lakeside Park Owner: Fairfield Park District The City of Fairfield is subject to increased flooding due to a breached dam. IDNR is completing a flood survey that can be used to update flood mapping. Dam was breached in 2007 (Comment on map: Breached in 2007 as a class III hazard).	IDNR/OWR investigating	33

V. References

Edgar County Emergency Service and Disaster Agency, The Polis Center, and Southern Illinois University. (2014). *Multi-Hazard Mitigation Plan Edgar County, Illinois*. IL:SIU.

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Limno-Tech (Firm), United States, & Tetra Tech, Inc. (2008). *Little Wabash River I Watershed TMDL Report*. Springfield, Ill.: Illinois Environmental Protection Agency, Bureau of Water. http://www.epa.state.il.us/water/tmdl/report/little-wabash/little-wabash.pdf