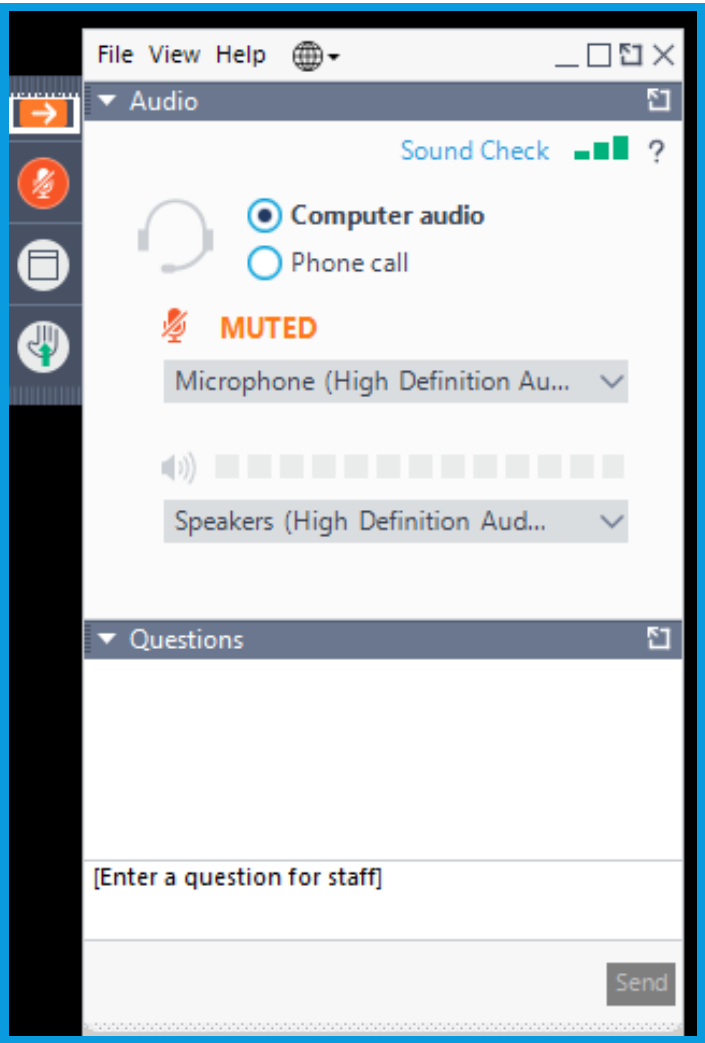
COOPERATING TECHNICAL PARTNER INFORMATION EXCHANGE

Flood Forecast Inundation Maps

September 26, 2017

Association of State Floodplain Managers

AUDIO AND WEB SETTINGS



Your Participation

Open and hide your control panel using the orange arrow button at top left corner

- Choose “Computer audio” to use computer speakers or headphones
- Choose “Phone call” to dial in using the information provided

*Submit questions and comments via the **Questions** panel*

WEBINAR LOGISTICS

- All lines will be automatically be muted.
- ***Use the Question window in your webinar control panel to submit your question or comment to the ASFPM Organizer.***
- Select questions will be read to the presenter and answered.
- Questions not asked during the webinar will be answered and made available in a follow-up email.

CONTINUING EDUCATION CREDIT LOGISTICS

- Certified Floodplain Managers are eligible for 1 Continuing Education Credit for participating in this webinar.
- You must register individually and indicate you are a CFM at time of registration.
- Eligibility for CEC is dependent on your participation in poll questions and time spent viewing the webinar, as determined by the webinar software.
- ***Attending this webinar in a group setting or only viewing the recording is NOT eligible for CEC.***

ASFPM MAPPING AND ENGINEERING STANDARDS COMMITTEE
COOPERATING TECHNICAL PARTNER SUB-COMMITTEE

Co-chairs:

- Thuy Patton, PE, CFM - Colorado Water Conservation Board
- Carey Johnson - Kentucky Department for Environmental Protection

Goals:

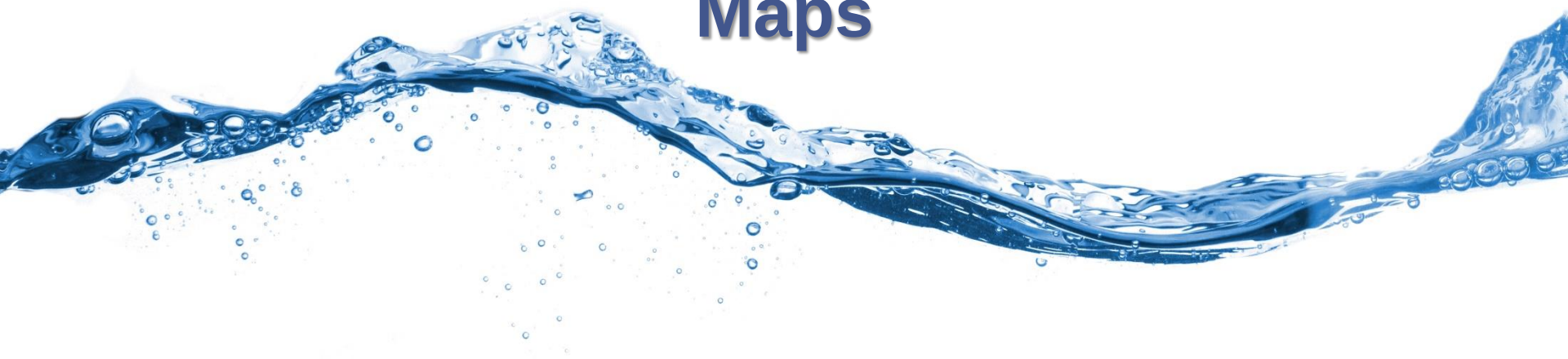
- ***Identify common concerns***
- ***Provide opportunities for information exchange***
- ***Identify training needs***
- ***Promote and document the value of CTPs***

AGENDA

- Introduction - Alan Lulloff
- ***Flood Forecast Inundation Maps***
  - **NWS Flood Forecast and Warnings** - Victor Hom
  - **NOAA NWS AHPS Webpages** - Victor Hom
  - **Flood Forecast Inundation Maps** - Victor Hom
  - **Wisconsin's Rock River** - Christopher Olds
  - **Project Workflow** - Christopher Olds
  - **Snapshots of the Rock River Flood Inundation Maps** - Christopher Olds
  - Questions/Discussion

CTP Information Exchange Webinar
September 26, 2017

Flood Forecast Inundation Maps



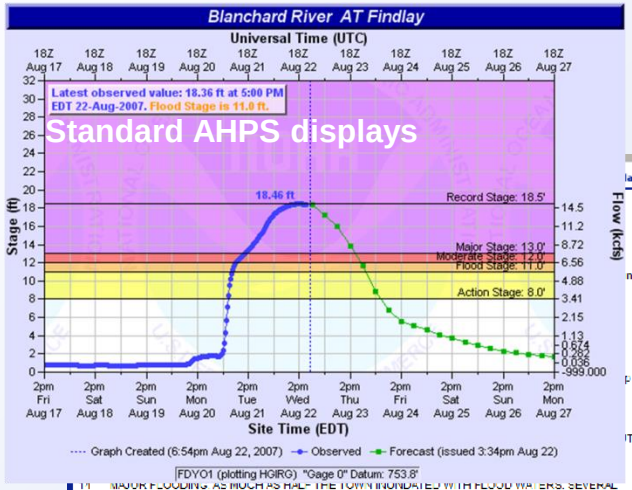
Alan Lulloff (ASFPM)
Victor Hom (NOAA NWS)
Chistopher Olds (Wisconsin DNR)

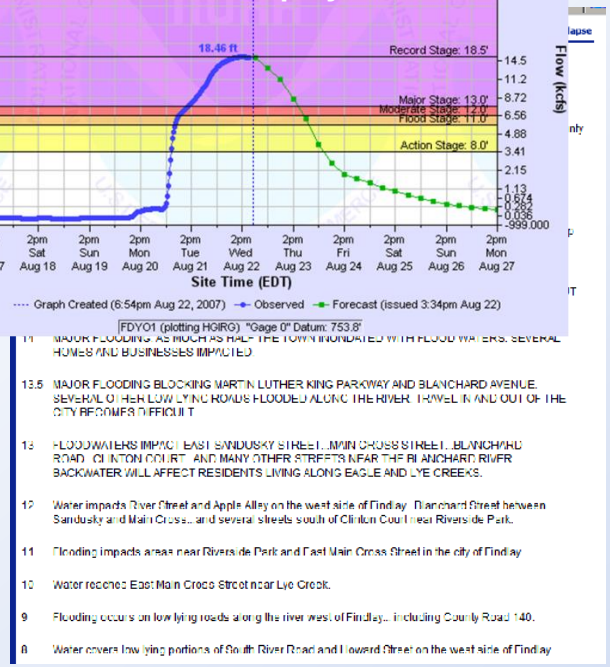
Objectives

- Flood Forecast Inundation Maps => IWRSS FIM Event Map
- NOAA Partnered Federal Guidelines for Flood Inundation Mapping
- The Components of an IWRSS FIM Event Map
- Role of FEMA Cooperating Technical Partners and the Federal Agencies
- Demonstration of the End Product

Flood Forecasts Inundation Maps

- Designed to be linked to the observations & forecasts at a gage
- Spatially representative of the river forecast
- Consistently scoped and Quality Controlled across the nation
- Available and supported by NWS staff 24x7





13.5 MAJOR FLOODING BLOCKING MARTIN LUTHER KING PARKWAY AND BLANCHARD AVENUE. SEVERAL OTHER LOW LYING ROADS FLOODED ALONG THE RIVER. TRAVEL IN AND OUT OF THE CITY BECOMES DIFFICULT.

13 FLOODWATERS IMPACT EAST SANDUSKY STREET, MAIN CROSS STREET, BLANCHARD ROAD, CLINTON COURT, AND MANY OTHER STREETS NEAR THE BLANCHARD RIVER. BACKWATER WILL AFFECT RESIDENTS LIVING ALONG EAGLE AND LYE CREEKS.

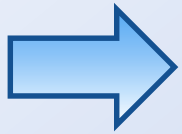
12 Water impacts River Street and Apple Alley on the west side of Findlay. Blanchard Street between Sandusky and Main Cross... and several streets south of Clinton Court near Riverside Park.

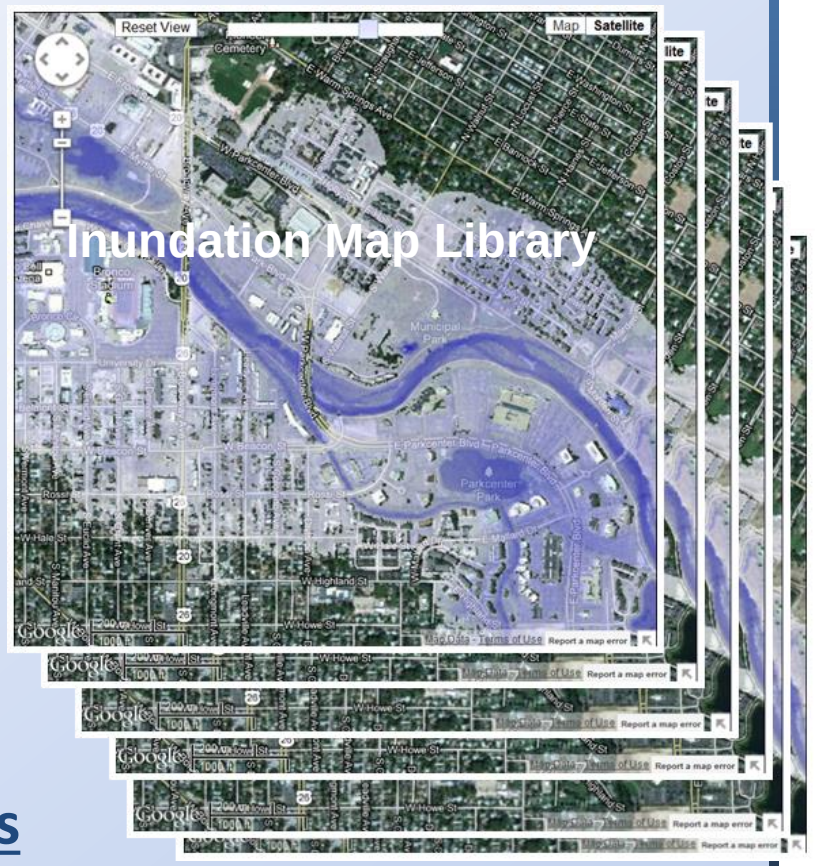
11 Flooding impacts areas near Riverside Park and East Main Cross Street in the city of Findlay.

10 Water reached East Main Cross Street near Lye Creek.

9 Flooding occurs on low lying roads along the river west of Findlay... including County Road 140.

8 Water covers low lying portions of South River Road and Howard Street on the west side of Findlay.

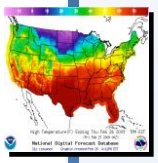


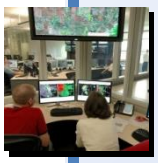


http://water.weather.gov/ahps

National Weather Service

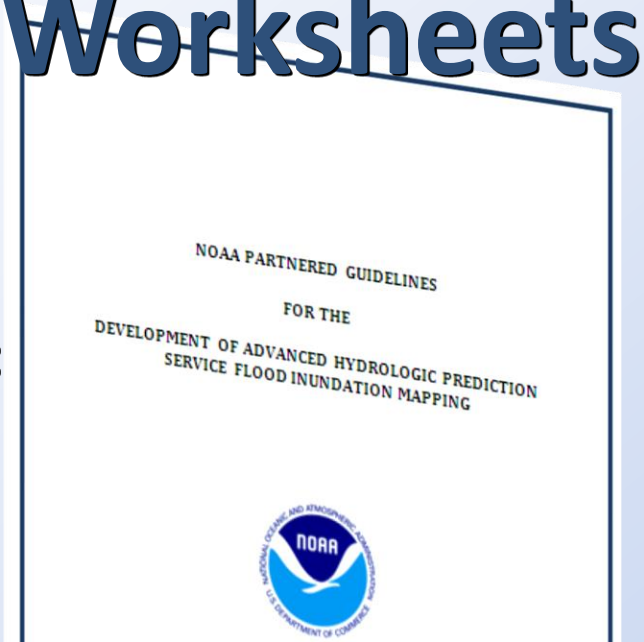
Protecting Lives and Property





NOAA Partnered FIM Guidelines & QC Worksheets

- **NOAA Partnered Guidelines**:
  - *Best Practices*
- **Project Development Template**:
  - *Standards*
  - *Project Framework*
  - *Roles*


NOAA PARTNERED GUIDELINES

FOR THE

DEVELOPMENT OF ADVANCED HYDROLOGIC PREDICTION SERVICE FLOOD INUNDATION MAPPING

NOAA

011

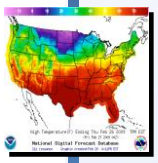
NWS Flood Inundation Mapping - Project Development Template Version 1.2

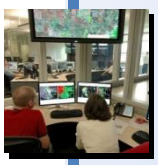
PROJECT INFORMATION

Project Name:	Wildcat Creek
River:	Wildcat Creek
NWS Site Description:	Wildcat Creek at Manhattan Scenic Drive
USGS Site Description:	WILDCAT C AT SCENIC DRIVE, MANHATTAN, KS
Gage County, State:	Riley County, Kansas, Hydrologic Unit 10270101
AHPS Gage NWSLID:	MWCK1
USGS Gage ID:	06879810
NWS WFO:	TOP
NWS RFC:	MBRFC
U\S Reach Length (mi):	3.5 (XS 71400.9) clip to boundaries
D\S Reach Length (mi):	6 (XS 12030) clip to boundaries
Map Display Scale:	1:2000 (z18)
FEMA FIS Date & Type:	FIS AND DFIRM 07/06/2010
EMA Elev @ (10, 2, 1, 0.2%)	10% = 1059.9 ft; 2% = 1062.9 ft; 1% = 1063.7 ft; 0.2 % = 1065.9 ft

	Stage (ft)	Elevation (ft) NAVD88
Highest inundation Stage:	31	1071.96
Major Flood Stage:	23	1063.96
Moderate Flood Stage:	17	1057.96
Flood Stage:	14	1054.96
Action Stage:	9	1049.96
Lowest inundation Stage:	12	1052.96
Gage 0 Datum:	0	1040.96
Mapping Interval (ft):	1	
NGVD29 to NAVD88 Offset Value (ft):	0.449	
Gage Latitude (DMS NAD83):	39°11'18.20"	
Gage Longitude (DMS NAD83):	96°38'33.20"	
List of Modeled Stages:	12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31	

http://water.weather.gov/ahps/inundation.php





National Weather Service

Protecting Lives and Property

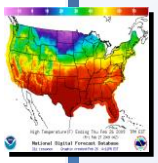
Geospatial Deliverables

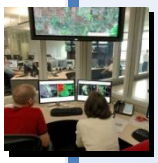
- **NOAA Partnered Guidelines**:
  - *Appendix D*
  - *Key attributes for the geospatial deliverables*
- **Project Development Template**:
  - *File Structure of the Zip File*
  - *List of .shp files for*
    - **depth_grids**
    - **polygons,**
    - **base_data,and**
    - **supplemental info**
  - *Documentation*

http://water.weather.gov/ahps/inundation.php

National Weather Service

Protecting Lives and Property





Integrated Water Resources Science and Services (IWRSS): Partners and Missions

USGS science for a changing world

Water Science: to collect and disseminate reliable, impartial, and timely information needed to understand the Nation's water resources in order to minimize loss of life and property from natural disasters

US Army Corps of Engineers

Water Management: to strengthen our Nation's security, energize the economy, and reduce risks from disasters

NOAA National Oceanic and Atmospheric Administration U.S. Department of Commerce

Water Prediction: to provide weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy

U.S. Department of Homeland Security FEMA

Response and Mitigation: to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against respond to, recover from and mitigate all hazards

IWRSS Partnership will expand over time

CUAHSI

U.S. Department of the Interior Bureau of Reclamation

NRCS

IWRSS Charter Teams

Initial teams 2011-2015

* Interoperability and Data Synchronization (IDS) Requirements and Design Teams
* Flood Inundation Mapping (FIM) Requirements and Design Teams
* Stakeholder Engagement to Demonstrate Integrated Water

IWRSS FIM
Stakeholder Needs

Organizations & individuals involved in flood-fighting

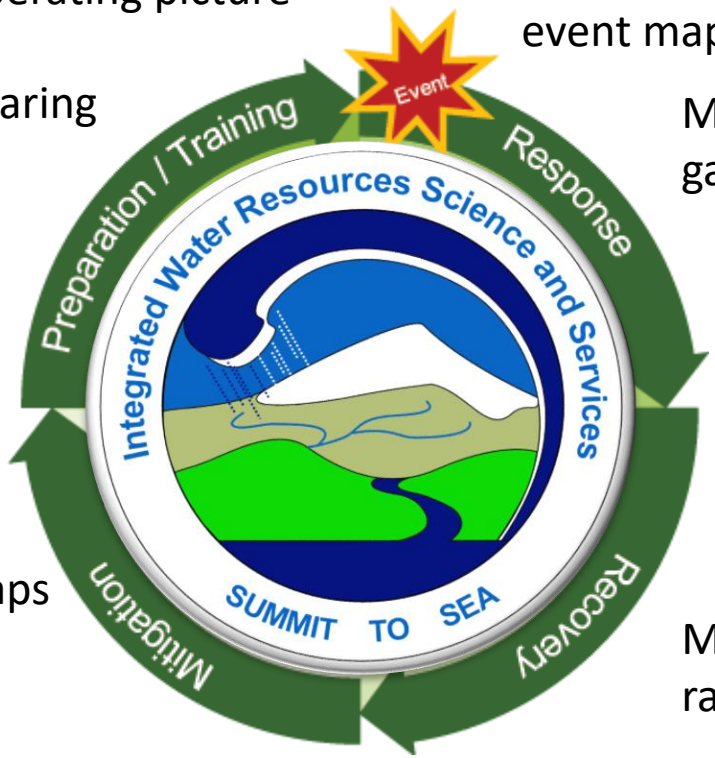
Common operating picture

Geospatial data sharing

Tools to calculate Socioeconomic impacts

Hydraulic model sharing

Historical event maps



A single, authoritative federal event map

Maps connected to stream gages & flood forecasts

Visualization of bridge & levee impacts

Visualization of map accuracy

Maps that cover a wide range of flooding events

IWRSS FIM Map Library Types

Map Library: collection of electronic maps developed based on the same source data, modeling parameters, and common methods for an intended purpose

- **Stream Reach Map:** *set of predetermined inundation boundary maps for a particular stream reach, aka static maps*
- **Emergency Action Plan Map:** *subset of the event-based maps, defined by a specified set of emergency planning scenarios*
- **Event Map:** *connected to a specified set of real or anticipated hydraulic and/or land feature boundary conditions; including dynamic or pseudo-dynamic maps*
- **Flood Documentation Map:** *shows the extent, and generally not depth, of peak flooding as a record of flood inundation at a specific location and based on flood observations for a given flood event.*

IWRSS FIM Event Map

- Event-based maps inform the user of the expected inundation based on current and/or forecasted hydrologic conditions for a selected location over a determined length of time covering the onset of flooding, flood crest and flood cessation
- Best available map for impact-based decision support

Sources for Event-Based FIM

- Crest based forecast map [Crest]
- Time Based forecast map [Time]
- **Stream-reach map [Crest or Time-based]**
- **Leveed Area map [Crest or Time-based]**
- **Historical event map [Crest]**
- Dam break EAP maps [Crest]

IWRSS FIM Event Map

Source: Stream Reach Map Library

- For most flood events, NWS will evaluate existing stream reach flood map libraries to identify the available map that most closely depicts the pending flood event and denote as the “pending event map”

IWRSS FIM Event Map

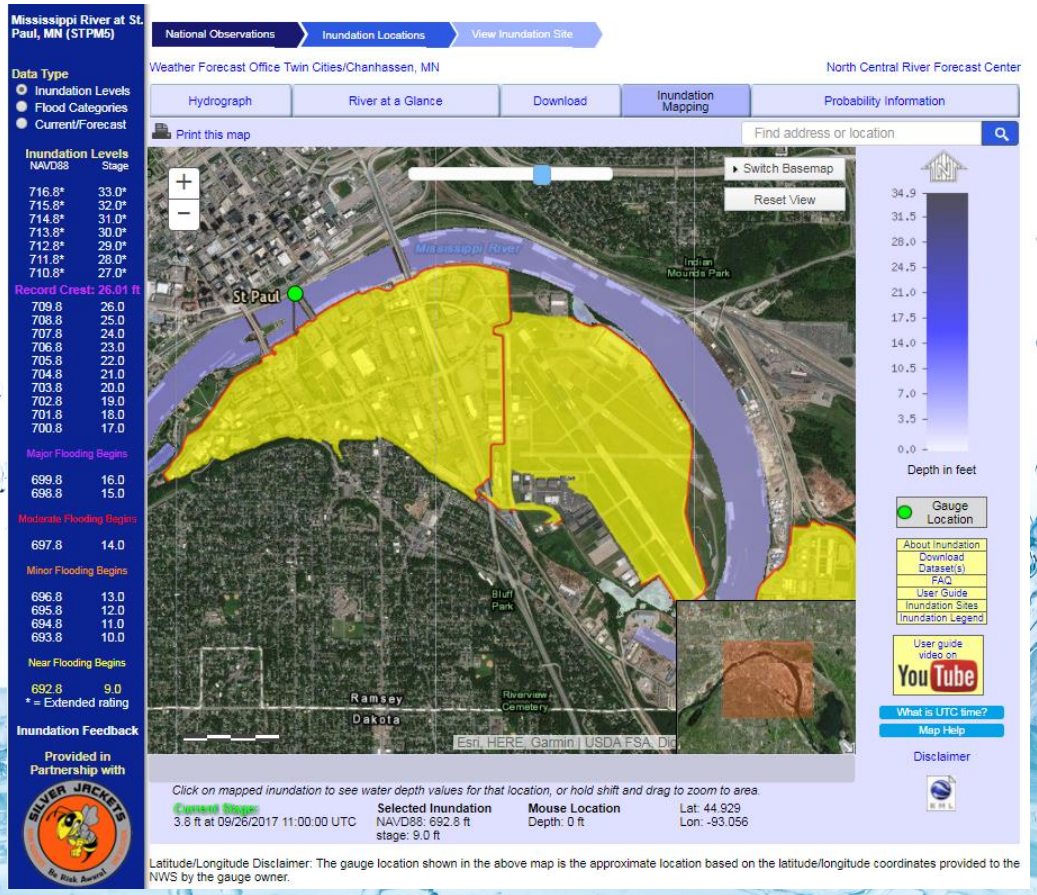
Source: Historical Flood Map Library

- For anticipated flood event in which the scenario is expected to equal a past event, NWS will evaluate historical flood documentation map libraries to identify the best available map that most closely depicts the pending flood event and denote as the "pending event map

IWRSS FIM Event Map

Source: Leveed Risk Area

- Area protected by levee



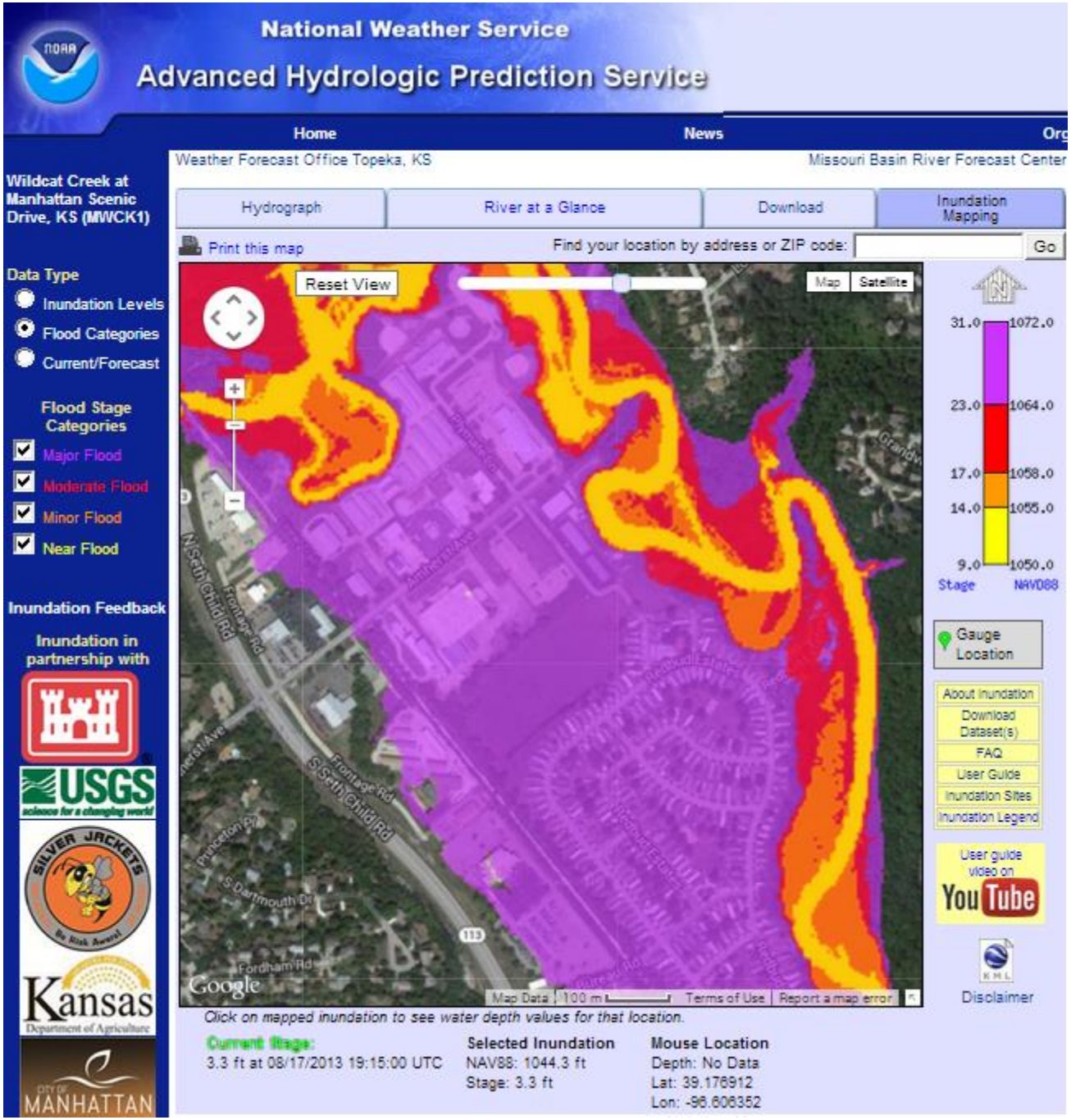
IWRSS FIM Event Map

http://water.weather.gov/ahps/inundation.php


National Weather Service
Advanced Hydrologic Prediction Service
Home
News
Weather Forecast Office Topeka, KS
Missouri Basin River Forecast Center
Wildcat Creek at Manhattan Scenic Drive, KS (MWCK1)
Hydrograph
River at a Glance
Download
Inundation Mapping
Print this map
Find your location by address or ZIP code:
Go
Data Type
Inundation Levels
Flood Categories
Current/Forecast
Reset View
Map
Satellite
Inundation Levels
NAVD88 Stage
1,072.0* 31.0*
1,071.0* 30.0*
1,070.0* 29.0*
1,069.0* 28.0*
1,068.0* 27.0*
1,067.0* 26.0*
1,066.0* 25.0*
1,065.0* 24.0*
1,064.0* 23.0*
Major Flooding Begins
1,063.0* 22.0*
1,062.0* 21.0*
1,061.0* 20.0*
1,060.0* 19.0*
1,059.0* 18.0*
1,058.0* 17.0*
Moderate Flooding Begins
1,057.0* 16.0*
1,056.0* 15.0*
1,055.0* 14.0*
Minor Flooding Begins
1,054.0* 13.0*
1,053.0* 12.0*
* = Extended rating
Inundation Feedback
Inundation in
38.2'
36.0'
32.0'
28.0'
24.0'
20.0'
16.0'
12.0'
8.0'
4.0'
0'
Water Depth in Feet
Gauge Location
About Inundation
Download Dataset(s)
FAQ
User Guide
Inundation Sites
Inundation Legend
User guide video on YouTube
Disclaimer
Amherst Ave
N Seth Child Rd
Frontage Rd
S Seth Child Rd
Redbud Estates
Princeton Pl
S Dartmouth Dr
Fordham Rd
Bureau Rd
Google
Map Data
100 m
Terms of Use
Report a map error
Click on mapped inundation to see water depth values for that location.
Current Stage:
3.3 ft at 08/17/2013 19:15:00 UTC
Selected Inundation
NAVD88: 1,058.0* ft
stage: 17.0* ft
Mouse Location
Depth: 0 ft
Lat: 39.179174
Lon: -96.598027


National Weather Service
Advanced Hydrologic Prediction Service
Home
News
Weather Forecast Office Topeka, KS
Missouri Basin River Forecast Center
Wildcat Creek at Manhattan Scenic Drive, KS (MWCK1)
Hydrograph
River at a Glance
Download
Inundation Mapping
Print this map
Find your location by address or ZIP code:
Go
Data Type
Inundation Levels
Flood Categories
Current/Forecast
Reset View
Map
Satellite
Inundation Levels
NAVD88 Stage
1,072.0* 31.0*
1,071.0* 30.0*
1,070.0* 29.0*
1,069.0* 28.0*
1,068.0* 27.0*
1,067.0* 26.0*
1,066.0* 25.0*
1,065.0* 24.0*
1,064.0* 23.0*
Major Flooding Begins
1,063.0* 22.0*
1,062.0* 21.0*
1,061.0* 20.0*
1,060.0* 19.0*
1,059.0* 18.0*
1,058.0* 17.0*
Moderate Flooding Begins
1,057.0* 16.0*
1,056.0* 15.0*
1,055.0* 14.0*
Minor Flooding Begins
1,054.0* 13.0*
1,053.0* 12.0*
* = Extended rating
Inundation Feedback
Inundation in
38.2'
36.0'
32.0'
28.0'
24.0'
20.0'
16.0'
12.0'
8.0'
4.0'
0'
Water Depth in Feet
Gauge Location
About Inundation
Download Dataset(s)
FAQ
User Guide
Inundation Sites
Inundation Legend
User guide video on YouTube
Disclaimer
N Seth Child Rd
Frontage Rd
Amherst Ave
Princeton Pl
S Dartmouth Dr
Fordham Rd
Bluebell Rd
Google
Map Data
100 m
Terms of Use
Report a map error
Click on mapped inundation to see water depth values for that location.
Current Stage:
3.3 ft at 08/17/2013 19:15:00 UTC
Selected Inundation
NAVD88: 1,066.0* ft
stage: 25.0* ft
Mouse Location
Depth: 0 ft
Lat: 39.181852
Lon: -96.598027


National Weather Service
Advanced Hydrologic Prediction Service
Home
News
Weather Forecast Office Topeka, KS
Missouri Basin River Forecast Center
Wildcat Creek at Manhattan Scenic Drive, KS (MWCK1)
Hydrograph
River at a Glance
Download
Inundation Mapping
Print this map
Find your location by address or ZIP code:
Go
Data Type
Inundation Levels
Flood Categories
Current/Forecast
Reset View
Map
Satellite
Marker Info:
Depth: 9.9 - 11.9 ft
Lat: 39.180854
Lon: -96.600130
Nearest geolocated address:
Redbud Estates
Manhattan, KS 66502, USA
Remove this marker.
Water Depth in Feet
38.2'
36.0'
32.0'
28.0'
24.0'
20.0'
16.0'
12.0'
8.0'
4.0'
0'
Gauge Location
About Inundation
Download Dataset(s)
FAQ
User Guide
Inundation Sites
Inundation Legend
User guide video on YouTube
Disclaimer
Inundation Levels
NAVD88 Stage
1,072.0* 31.0*
1,071.0* 30.0*
1,070.0* 29.0*
1,069.0* 28.0*
1,068.0* 27.0*
1,067.0* 26.0*
1,066.0* 25.0*
1,065.0* 24.0*
1,064.0* 23.0*
Major Flooding Begins
1,063.0* 22.0*
1,062.0* 21.0*
1,061.0* 20.0*
1,060.0* 19.0*
1,059.0* 18.0*
1,058.0* 17.0*
Moderate Flooding Begins
1,057.0* 16.0*
1,056.0* 15.0*
1,055.0* 14.0*
Minor Flooding Begins
1,054.0* 13.0*
1,053.0* 12.0*
* = Extended rating
Inundation Feedback
Inundation in
N Seth Child Rd
Frontage Rd
Princeton Pl
S Dartmouth Dr
Fordham Rd
113
Google
Map Data
100 m
Terms of Use
Report a map error
Click on mapped inundation to see water depth values for that location.
Current Stage:
3.3 ft at 08/17/2013 19:15:00 UTC
Selected Inundation
NAVD88: 1,072.0* ft
stage: 31.0* ft
Mouse Location
Depth: 0 ft
Lat: 39.176795
Lon: -96.605365


National Weather Service
Advanced Hydrologic Prediction Service
Home
News
Org
Weather Forecast Office Topeka, KS
Missouri Basin River Forecast Center
Wildcat Creek at Manhattan Scenic Drive, KS (MWCK1)
Hydrograph
River at a Glance
Download
Inundation Mapping
Print this map
Find your location by address or ZIP code:
Go
Data Type
Inundation Levels
Flood Categories
Current/Forecast
Flood Stage Categories
Major Flood
Moderate Flood
Minor Flood
Near Flood
Inundation Feedback
Inundation in partnership with
USGS
science for a changing world
SILVER JACKETS
Kansas
Department of Agriculture
CITY OF MANHATTAN
Reset View
Map
Satellite
31.0
1072.0
23.0
1064.0
17.0
1058.0
14.0
1055.0
9.0
1050.0
Stage
NAVD88
Gauge Location
About Inundation
Download Dataset(s)
FAQ
User Guide
Inundation Sites
Inundation Legend
User guide video on YouTube
KML
Disclaimer
N Seth Child Rd
Frontage Rd
Princeton Pl
S Dartmouth Dr
Fordham Rd
113
Google
Map Data
100 m
Terms of Use
Report a map error
Click on mapped inundation to see water depth values for that location.
Current Stage:
3.3 ft at 08/17/2013 19:15:00 UTC
Selected Inundation
NAVD88: 1044.3 ft
Stage: 3.3 ft
Mouse Location
Depth: No Data
Lat: 39.176912
Lon: -96.606352

Acknowledgement

- FEMA and Cooperating Technical Partners
  - Flood Inundation Maps (non-Regulatory Products)
  - National Flood Hazard Layers
- USGS and USACE
  - NSIP now known as the Federal Priority Streamgages
  - National Flood Risk Management Program - Silver Jackets *Many Agencies One Solution*
- NOAA Colleagues, State and Community Partners

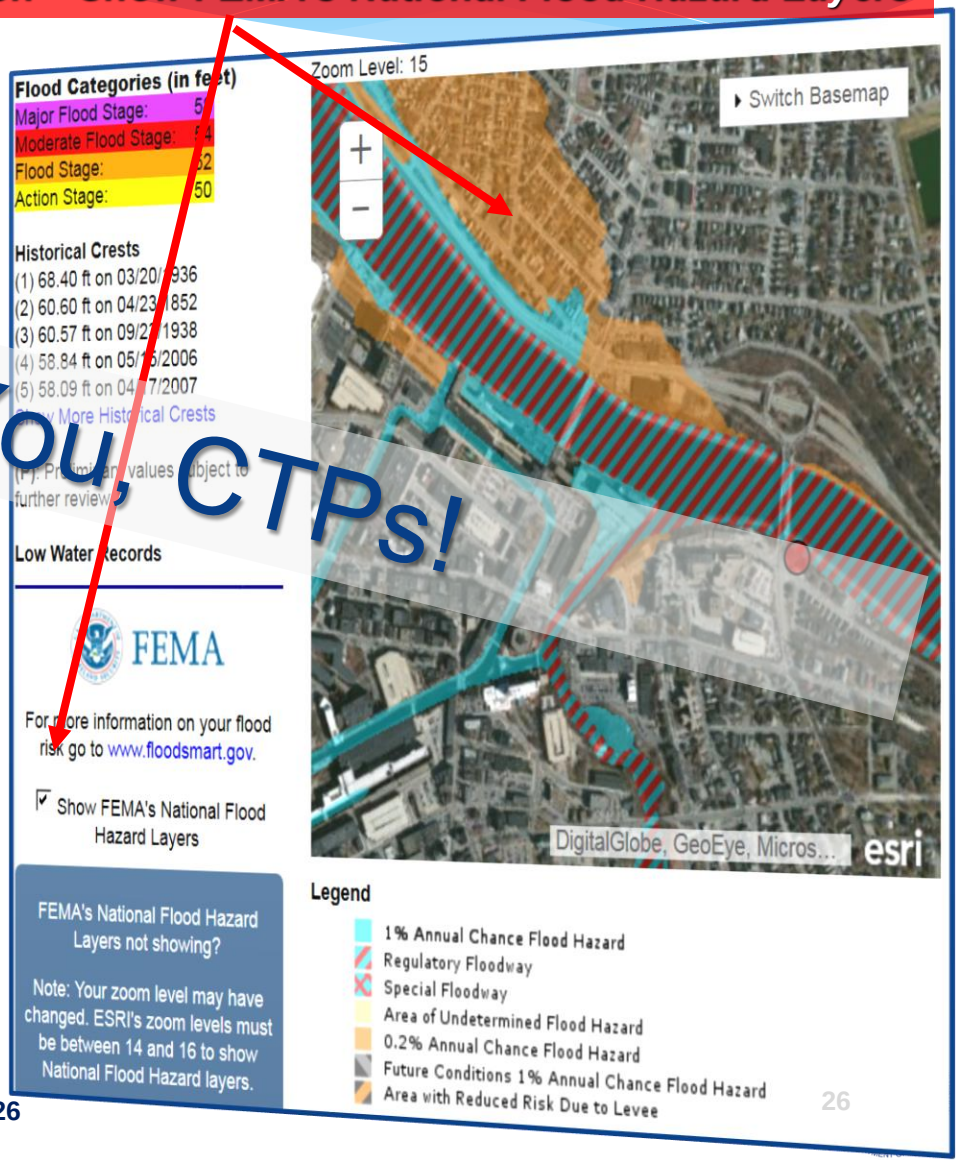
FEMA National Flood Hazard Layers within AHPS

- Enhance communication of flood risk
- Display FEMA's National Flood Hazard Layers at corresponding river locations
- Leverage capability to better identify flood impacts and refine flood warning categories
- Help to build a Weather-Ready Nation
- Empower users to Be Force of Nature by knowing their risk, taking action, and being an example in their community.

Status:

✓ *About 6200 river locations (as of August 2017) have this capability*

"click on" Show FEMA's National Flood Hazard Layers



Thank You, CTPs!

26

Questions

- Flood Forecast Inundation Maps => IWRSS FIM Event Map
- NOAA Partnered Federal Guidelines for Flood Inundation Mapping
- The Components of an IWRSS FIM Event Map
- Role of FEMA Cooperating Technical Partners and the Federal Agencies
- Demonstration of the End Product

For more info, see:
http://water.weather.gov/ahps2/inundation/about_google.php

Victor.Hom@noaa.gov

Extras

- Slides here after are for additional reference for viewers of this audience
- They provide

  more understanding of other types of IWRSS FIM Maps,

  more understanding of important metadata for IWRSS FIM

Source: Emergency Action Plan Map Library

- For most flood events, NWS will evaluate existing stream reach flood map libraries to identify the available map that most closely depicts the pending flood event and denote as the “pending event map

IWRSS FIM Event Map

Source: Dynamically Generated

- Event-based flood inundation maps generated to more accurately depict the extent, timing and depth of flooding or
- Estimate of the flood inundation for more complicated flooding events to account for extensive backwater flooding, flood routing, drawdown hydraulics, control structure degradation, hysteresis, tidal impacts and sediment transport.
- .

IWRSS FIM Event Map

Potential Real-time Production

- NWS River Forecast Center [CHPS-FEWS with HECRAS, DFLOWS, or Comparable Hydraulics and RASMAPPER/ARCGIS]
- NWS National Water Center [NWM and Mapping System (TBD)]
- .
- .

IWRSS FIM Event Map

Data Requirements

- Data Model Fields Used to Identify the Event Map (Table 4.2)
- Data Model Field Requirements for Loading Event Map Source Data into the System (Table 4.3).
- Data Model Field Values While Event Mapping is In Effect With Changes Underlined (Table 4.5).

IWRSS FIM Event Map

Feature Table	Model Name	Field Contents	Event Map Description
Library	UseRestrictionType	Unrestricted; FOUO-IWRSS; FOUO-Federal; FOUO	Must be populated to ensure appropriate data distribution, and that event map is visible to the appropriate audience. Public event maps must be populated as "unrestricted"
Library	Status	Re-review; archive; complete; draft; critical rapid deployment	Publication status must be set as either "complete" or "critical rapid deployment" for all event maps.
Inundation	InundationID	Agency Code|Library ID|Object ID{020}|Object Record ID{unique per each date/time stamped layer}	Identifies the Inundation ID that is related to FloodExtent OR LeveedAreaFloodExtent Layer OR FloodDepth OR LeveedAreaFloodDepth
Inundation	EventStartDate	The UTC date and time of the start of an actual flood event or date of a flood extent (actual or modeled). Null if extent does not represent an actual or forecast event.	Must be populated with a UTC date and time. Used as a toggle to assign a stream-reach map, historical map or EAP as an event map. The field can be set back to "null" at the end of the event.
Inundation	EventEndDate	The UTC date and time of the end of an actual flood event or date of a flood extent (actual or modeled). Null if extent does not represent an actual or forecast event.	Must be populated with a UTC date and time. Used as a toggle to assign a stream-reach map, historical map or EAP as an event map. The field can be set back to "null" at the end of the event.
Inundation	ForecastPublishDate	The UTC date and time of the published forecast used to generate the flood extent.	The system selects the most current map from this field.
Inundation	MapPurposeType	None, ForecastCrestMap, ForecastTimeMap, HistoricalFloodDocumentationMap, EmergencyPlanMap.	The purpose for map creation. The system interprets the map purpose, which triggers the display of key features.
ReferencePoint	ReferencePointStage	Stage value at the gage or interior levee reference point.	Used by the system to trigger the display of stream reach or leveed area layers.
ReferencePoint	ReferencePointElevation	Elevation value at the gage or interior levee reference point.	Used by the system to trigger the display of stream reach or leveed area layers.
ReferencePoint	ReferencePointDatum	Datum of the elevation value.	Used by the system to trigger the display of stream reach or leveed area layers.

IWRSS FIM Event Map – Table 4.2

Table 4.3. Data Model Field Requirements for Loading Event Map Source Data into the System

Data Model Fields			Event Map Source Types				
Feature Table	Model Name	Forecast Crest Map	Forecast Time Map	Stream Reach Map	Leveed Area Map	EAP Map	Historical Map
Library	UseRestrictionType	Required	Required	Required	Required	Required	Required
Library	Status	Required	Required	Required	Required	Required	Required
Inundation	InundationID	Required	Required	Required	Required	Required	Required
Inundation	EventStartDate	Required	NA	NA	NA	NA	NA
Inundation	EventEndDate	Required	NA	NA	NA	NA	NA
Inundation	ForecastPublishDate	Required	Required	NA	NA	NA	NA
Inundation	MapPurposeType	Required	Required	Required	Required	Required	Required
ReferencePoint	ReferencePointStage	NA	NA	Required	Required	NA	NA
ReferencePoint	ReferencePointElevation	NA	NA	Required	Required	NA	NA
ReferencePoint	ReferencePointDatum	NA	NA	Required	Required	NA	NA

Table 4.5 Data Model Field Values While Event Mapping Is In Effect With Changes Underlined

Feature Table	Model Name	Forecast Crest Map	Forecast Time Map	Stream Reach Map	Leveed Area Map	EAP Map	Historical Map
mLibrary	UseRestrictionType	unrestricted	unrestricted	unrestricted	unrestricted	unrestricted	unrestricted
mLibrary	Status	Critical Rapid Deployment	Critical Rapid Deployment	Complete	Complete	Complete	Complete
Library	LibraryID	Unique ID	Unique ID	Unique ID	Unique ID	Unique ID	Unique ID
Library	EventStartDate	UTC Date/Time	NA	UTC Date/Time *	UTC Date/Time *	UTC Date/Time	UTC Date/Time
Library	EventEndDate	UTC Date/Time	NA	UTC Date/Time *	UTC Date/Time *	UTC Date/Time	UTC Date/Time
Library	ForecastPublishDate	UTC Date/Time	UTC Date/Time	UTC Date/Time	UTC Date/Time	UTC Date/Time	UTC Date/Time
Library	MapPurposeType	Forecast Crest Map	Forecast Time Map	Forecast Crest Map OR Forecast Time Map	Forecast Crest Map OR Forecast Time Map	Forecast Crest Map	Forecast Crest Map
Reference Point	ReferencePointStage	NA	NA	Stage (ft)	Stage (ft)	NA	NA
Reference Point	ReferencePointElevation	NA	NA	Elevation (ft)	Elevation (ft)	NA	NA
Reference Point	ReferencePointDatum	NA	NA	Datum	Datum	NA	NA

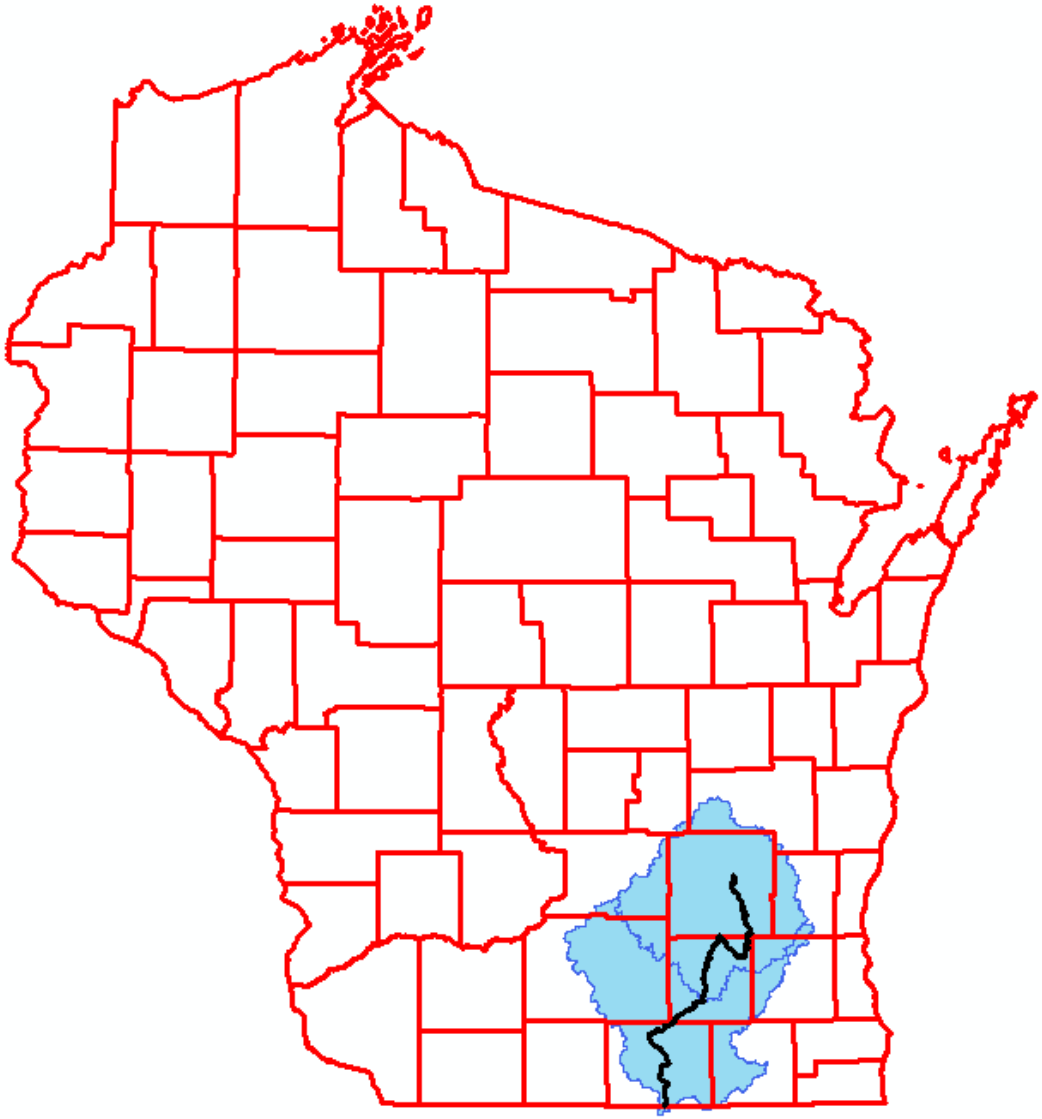
POLL QUESTION

ROCK RIVER FLOOD INUNDATION MAPPING PROJECT

September 26, 2017

Chris Olds
Floodplain Engineer
Wisconsin Department of Natural Resources

Rock River



Background

- WDNR, WEM, and USGS met December 2012 to discuss a pilot flood inundation mapping project in the state
- Due to the flood risk, LIDAR, flood modeling, and mitigation activities selected the Rock River
- Reached out to Dodge, Jefferson and Rock Counties in January 2013 to determine local interest
- Stakeholders meeting held in April 2013 in Jefferson

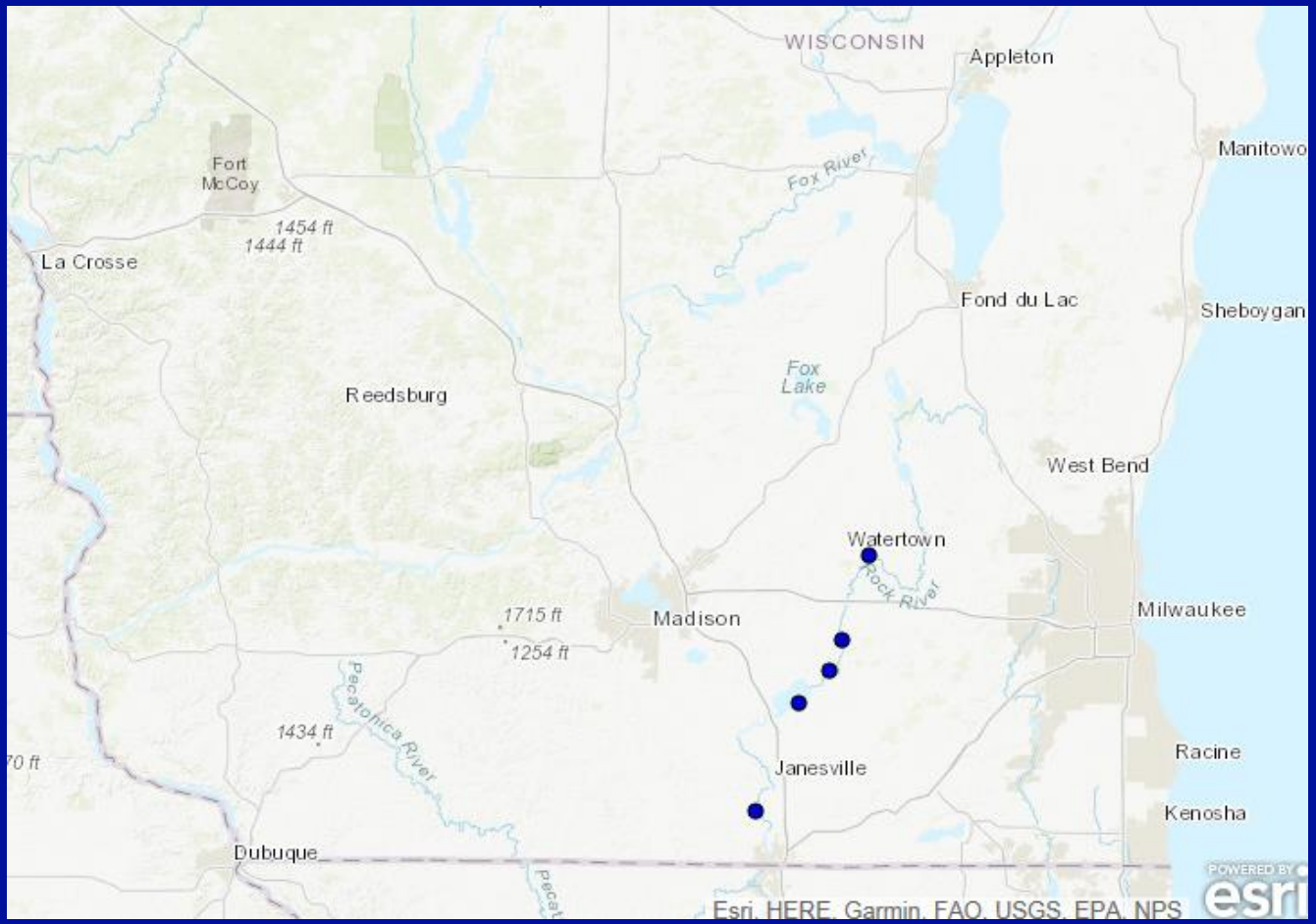
Partner Resources & Collaboration

- WEM:
  - State Hazard Mitigation Plan
  - State Team meetings
  - Training
  - Coordination among stakeholders
- NWS
  - MOU on Integrated Water Resources & Science Services (IWRSS)
  - Flood forecasts
  - Staff time and technical expertise
- FEMA
  - Rock River Watershed Modeling

Partner Resources & Collaboration

- USGS
  - MOU on IWRSS
  - 6 streamgages related to the mapping
  - Mapper development; and methods and program support
  - Flood Frequency Program
- DOA: LIDAR Data (CDBG Program)
- WDNR
  - RiskMAP Discovery Meetings
  - Rock River Watershed Modeling
- Local: Hazard mitigation plans and mitigation projects

Inundation Locations



Base Data

- Rock River hydraulic model created for FEMA's RiskMap project in the Rock River watershed

  - survey completed in spring of 2010
  - model effective in Dane on 9/17/14, Dodge 5/19/14, Jefferson 2/4/15, Rock 9/16/15

- Terrain data from each county

  -Dane 2009, Dodge 2006, Jefferson 2012, Rock 2011

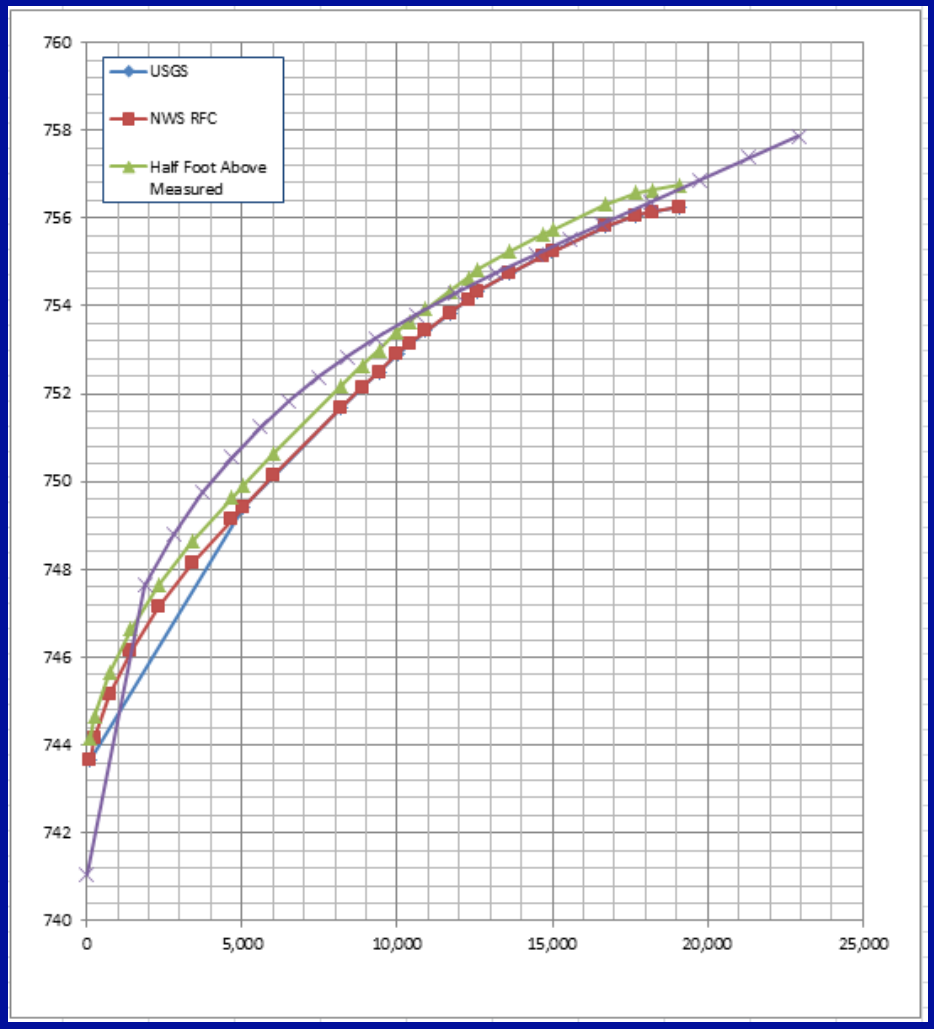
Calibration of Model

- Jefferson, Fort Atkinson and Lake Koshkonong gages will use the new model for basis of an updated rating curve
- Afton and Watertown locations in the model had to be adjusted so the model matched existing rating curves within 0.5’

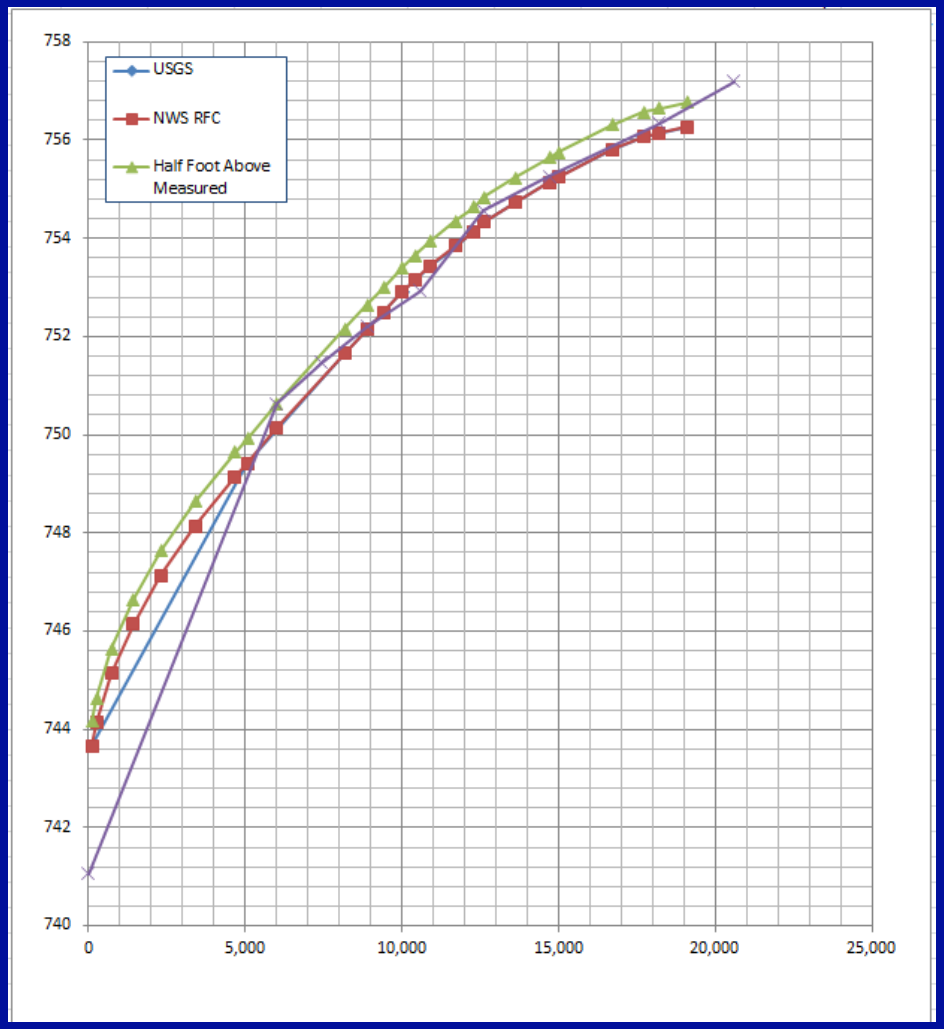
Rating Curve Calibration

WISCONSIN DEPT. OF NATURAL RESOURCES

Before



After



Workflow

NWS Flood Inundation Mapping - Project Development Template — Version 1.2

PROJECT INFORMATION

Project Name:	Afton
River:	AF
NWS Site Description:	Rock River at Afton
USGS Site Description:	USGS 05430500 ROCK RIVER AT AFTON, WI
Gage County, State:	Rock County, Wisconsin Hydrologic Unit Code 07090001
AHPS Gage NWSLID:	AFTW3
USGS Gage ID:	05430500
NWS WFO:	MKX
NWS RFC:	NCRFC
U\S Reach Length (mi):	22
D\S Reach Length (mi):	13.5
Map Display Scale:	1:3,048 ~z=17
FEMA FIS Date & Type:	RiskMap Study (from RAS Model)
FEMA Elev @ (10, 2, 1, 0.2%)	10yr = 753.26; 50yr = 755.19; 100-yr = 755.86; 500-yr=757.86
HEC RAS	XS 171.413

	Stage (ft)	Elevation (ft) NAVD88
Highest inundation Stage:	15	757.14
Major Flood Stage:	12.2	754.34
Moderate Flood Stage:	11.1	753.24
Flood Stage:	9	751.14
Action Stage:	8	750.14
Lowest inundation Stage:	8	750.14
Gage 0 Datum:	0	742.14
Mapping Interval (ft):	~1.0	
NGVD29 to NAVD88 Offset Value (ft):	-0.213	(NAVD88 - NGVD29)
Gage Latitude (DMS NAD83):	42°36'49"	
Gage Longitude (DMS NAD83):	89°04'18"	
List of Modeled Stages:	8, 9, 10, 11.1, 12.2, 13, 14, 15	

PROJECT TEAM - CONTACTS, ROLES AND RESPONSIBILTIES

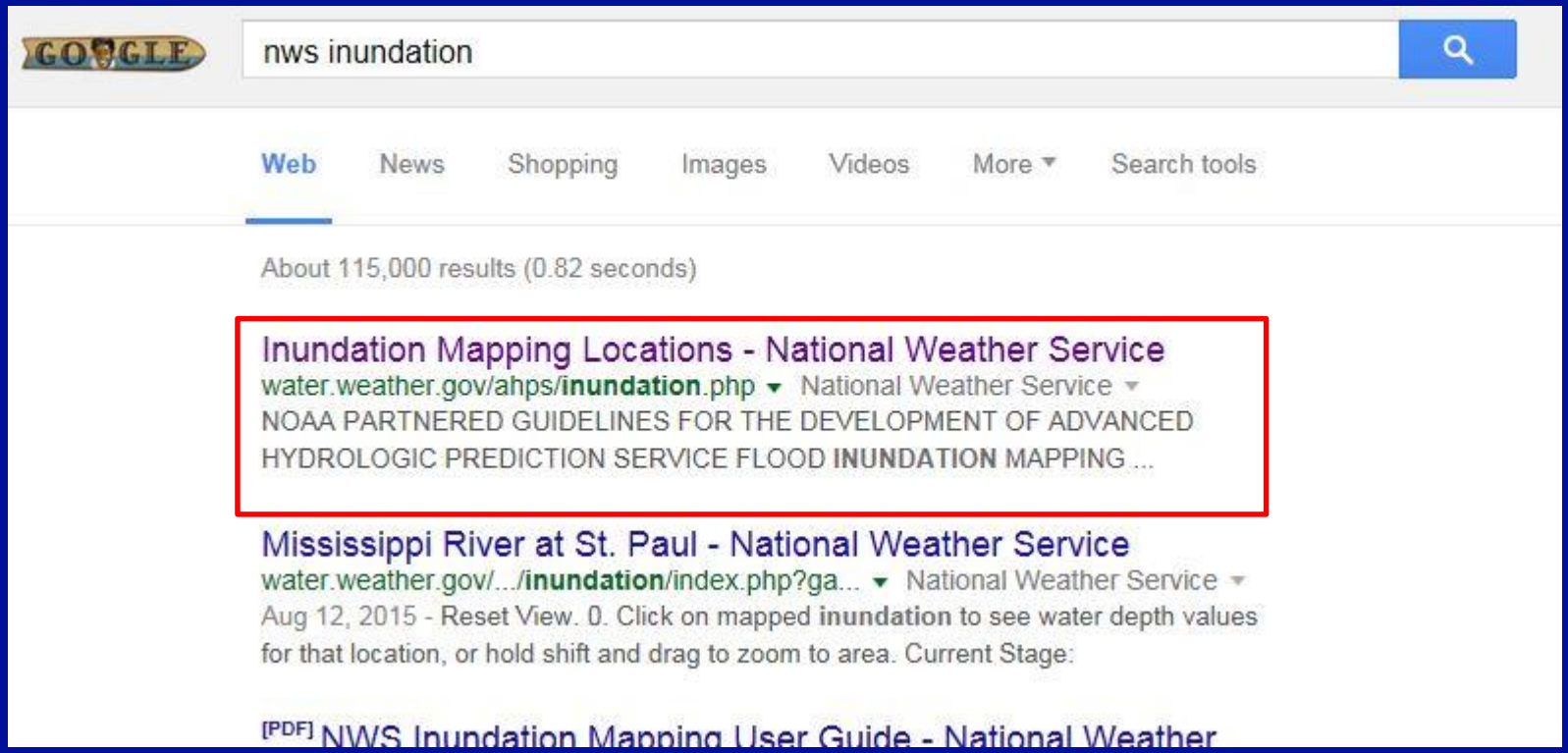
Organization	Project Role	Name	E-mail	Phone	Responsibilities	Co
NWS	Coordinator	Kris Lander	kris.lander@noaa.gov	816-268-3124	Overall coordination of the project. Responsible for project management, guiding partners and completing AHPS implementation.	X
	HPM	Brian Hahn	Brian.Hahn@noaa.gov	262-965-2074	NWS forecast services and serves as primary contact with local stakeholders.	
	QC Team	TBD			Conducts QAQC review of Hydraulic Analyses and GIS data in Phase 2A & 2B.	
	RFC Hydrologist	Mark Ziemer	Mark.Ziemer@noaa.gov	952-361-6650	Support for rating curve evaluation and develops RFC forecast services.	
	FIM Prog Manager	Victor Hom	Victor.Hom@noaa.gov	301-713-00006x173	Approves and advises on non-standard project approaches.	
NWS AHPS Web Team	AHPS Web Team	Tim MacCallmant	Timothy.McCalmant@noaa.gov	702-800-0588	Implements GIS deliverables into AHPS Web Team interface in Phase 3.	
Technical Partner	Partner Coordinator	Chris Olds Meg Galloway	christopher.olds@wisconsin.gov meg.galloway@wisconsin.gov	608-266-5606 ?	Overall coordination of the technical team. Responsible for Phase 2A & 2B deliverables.	
	Hydraulic Modeler	Marc Budsberg	marc.budsberg@wi.gov	?	Develops and calibrates hydraulic model and associated documentation.	
	GIS Analyst	Colleen Hermans	colleen.hermans@wi.gov	(608) 264-8988	Develops GIS data deliverables in Phase 2A. Provides GIS support to the project.	
USGS	Water Science Center	Rob Waschbusch	rwaschb@usgs.gov	608-821-3868	Provides hydrologic data support as required.	
Local	Local Stakeholder	Shena Kohler-Rock Co. Emergency Manager Mike Payne-City of Janesville Engineer Greg Boysen-Public Works Director-City of Beloit	kohler@co.rock.wi.us paynem@ci.janesville.wi.us boyseng@ci.beloit.wi.us	608-758-8440 608-364-2929	Central point of contact for local interests. Provides input on product decisions. Coordinates and collects input from other local stakeholders.	

PHASE 1 - PROJECT SCOPING AND PLANNING

Status	Task	Explanation	Actions	Guidance	Comments	Co
NWS Internal Pre-Scoping and Pre-Proposal Writing Activities						
Completed	Site-Suitability Evaluation	NWS will evaluate the suitability of the proposed site for AHPS static flood inundation mapping. Areas of program consideration include: value to the NWS AHPS program, and the value to local communities and evaluation of project funding sources. Areas of technical consideration include: stability of the operational rating curve (locations with ratings that shift frequently or significantly cannot be considered), hydrologic complexity, hydraulic complexity, flood history, time since most recent flood or other factors that may warrant static flood inundation mapping inappropriate for implementation.	NWS Coordinator and HPM will evaluate the value to the NWS AHPS program, the value to local communities and evaluation of project funding sources. NWS Coordinator will document the flood crest history on the [Flood Impacts] page. The RFC hydrologist will evaluate the rating curve and determine stable the rating curve is stable. NWS Coordinator, HPM and RFC will evaluate the hydrologic complexity, hydraulic complexity and other factors that may warrant flood inundation mapping in appropriate for implementation. The NWS Coordinator	N/A	Existing forecat point is suitable for AHPS FIM	R

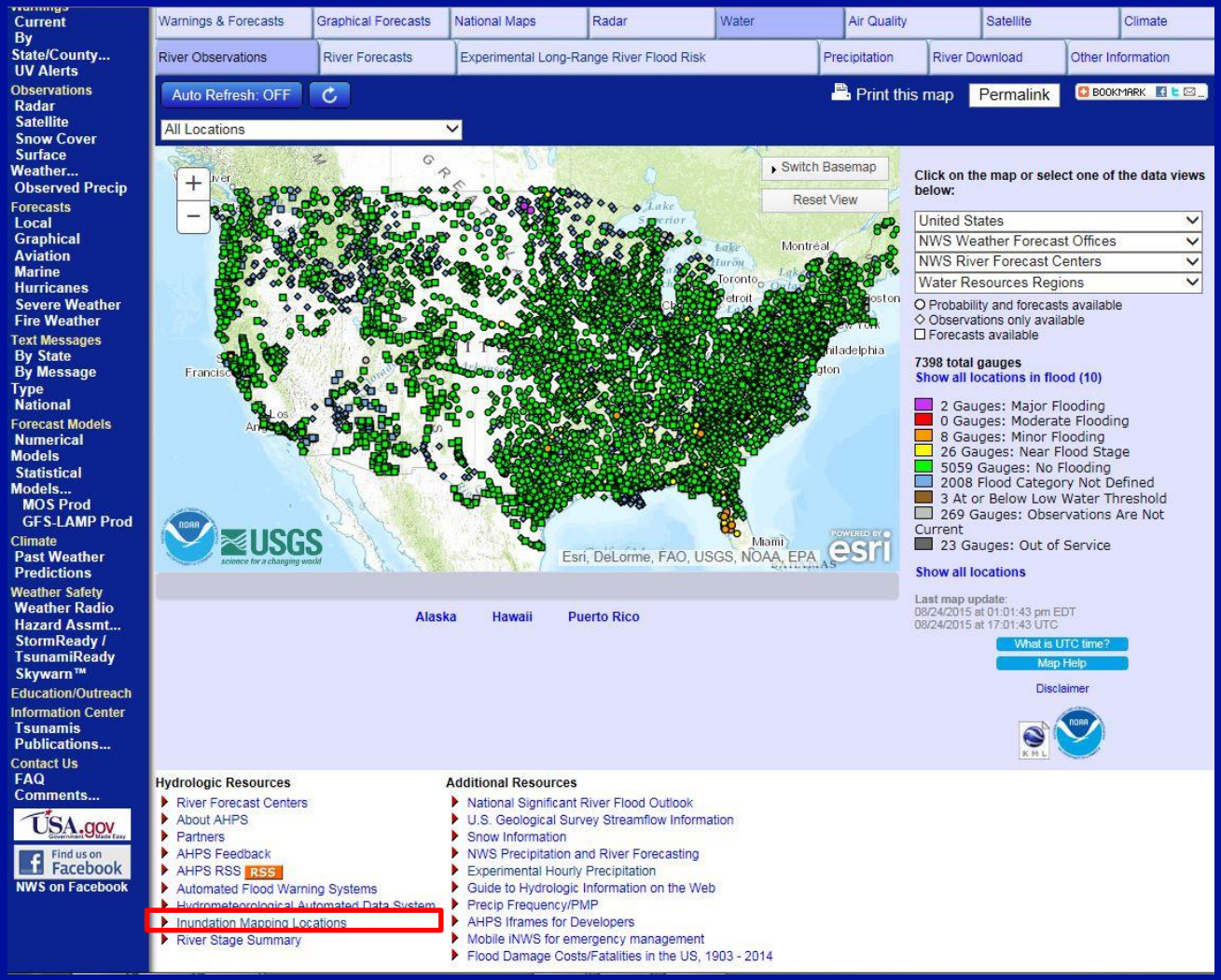
Web Location

Search “nws inundation”



Web Location

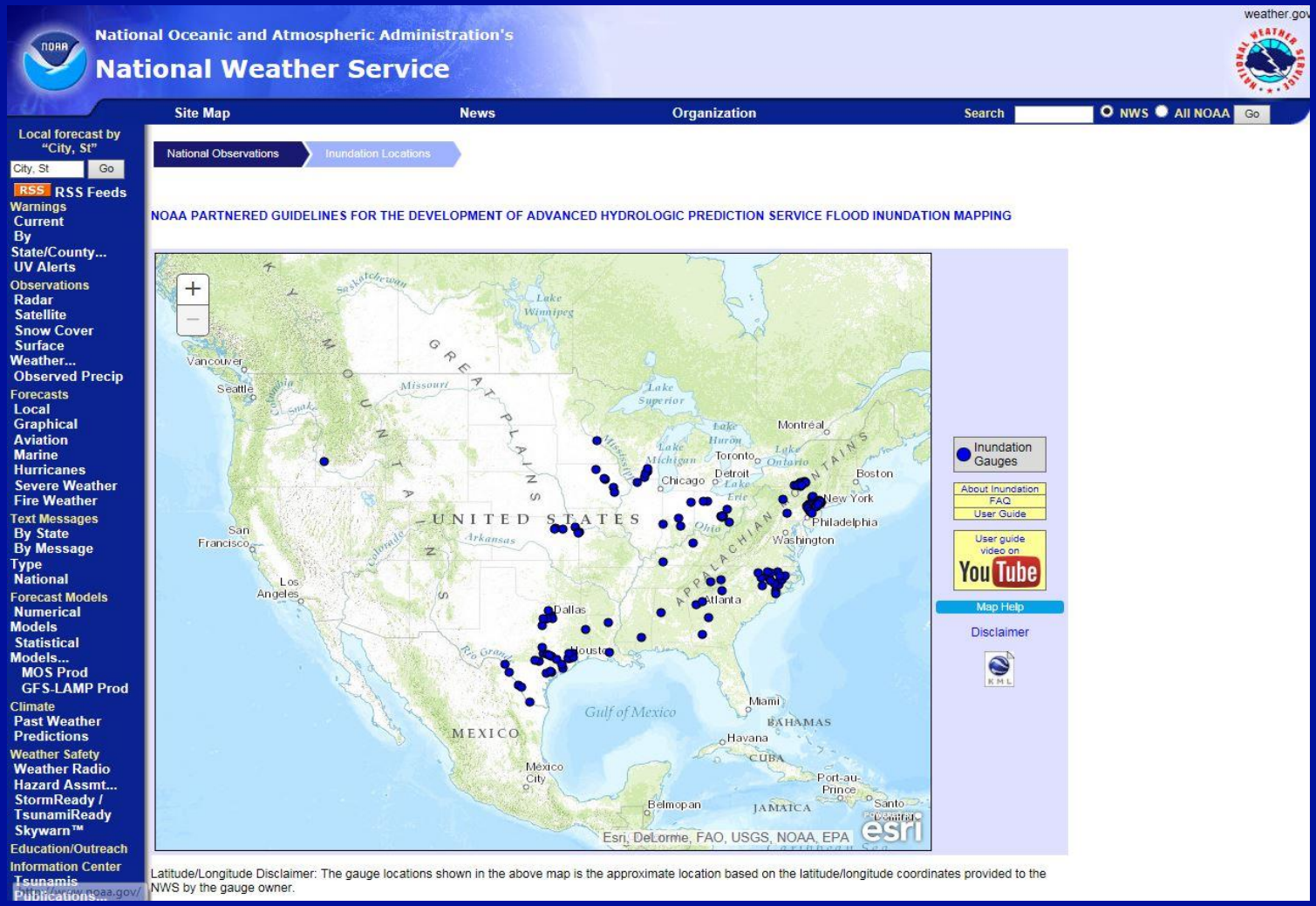
Within the NWS site



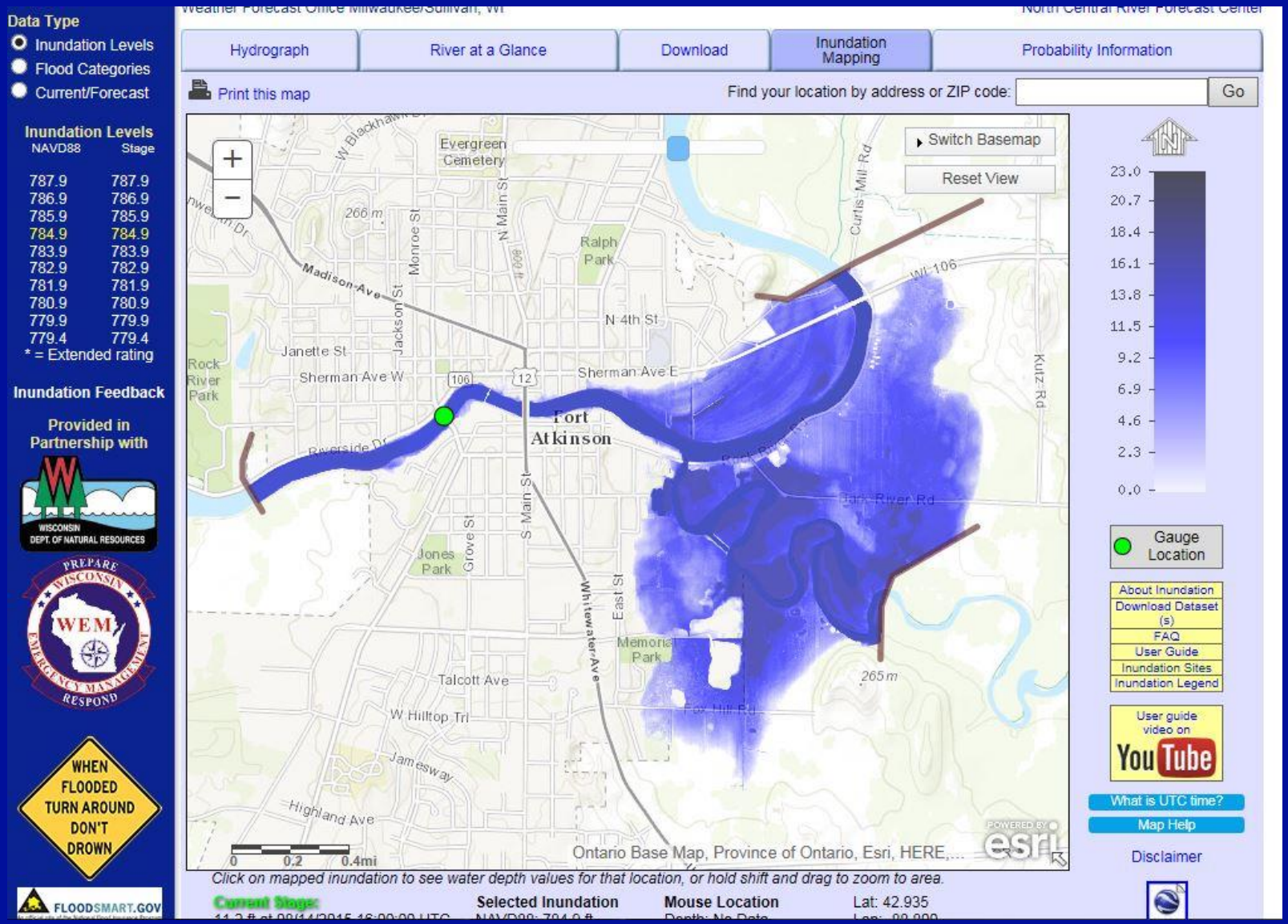
Web location

WISCONSIN DEPT. OF NATURAL RESOURCES

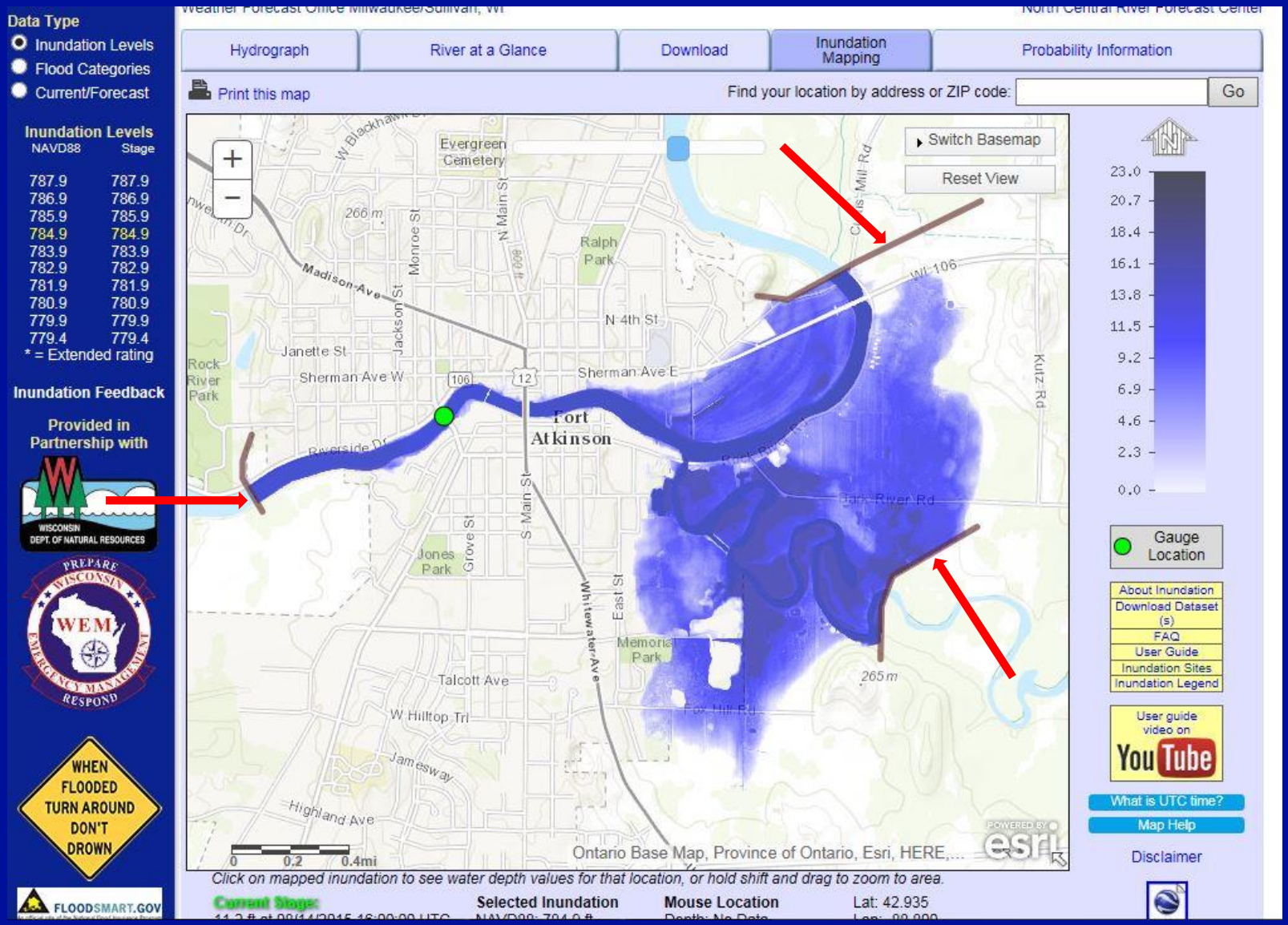
http://water.weather.gov/ahps/inundation.php



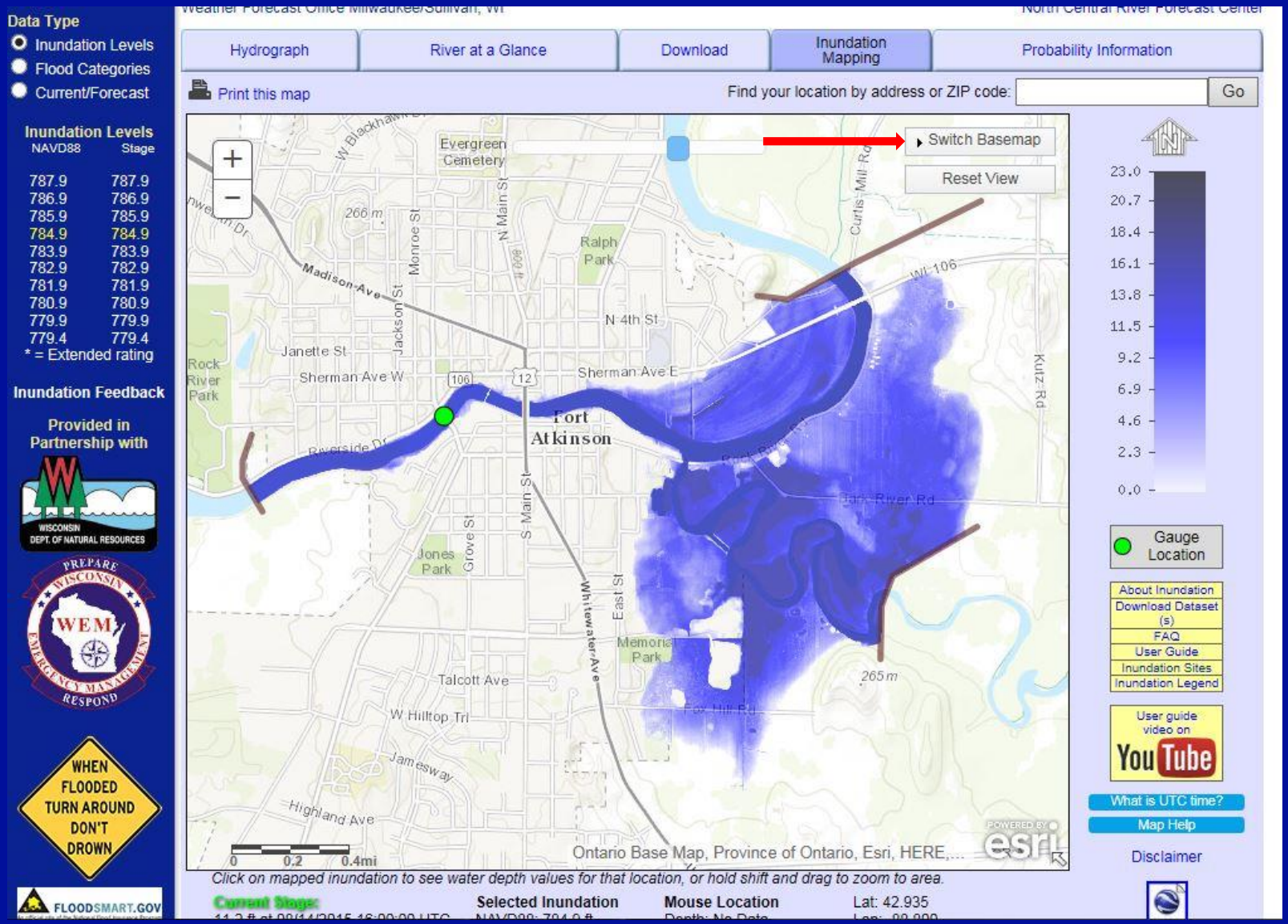
Individual Site Example



Individual Site Example

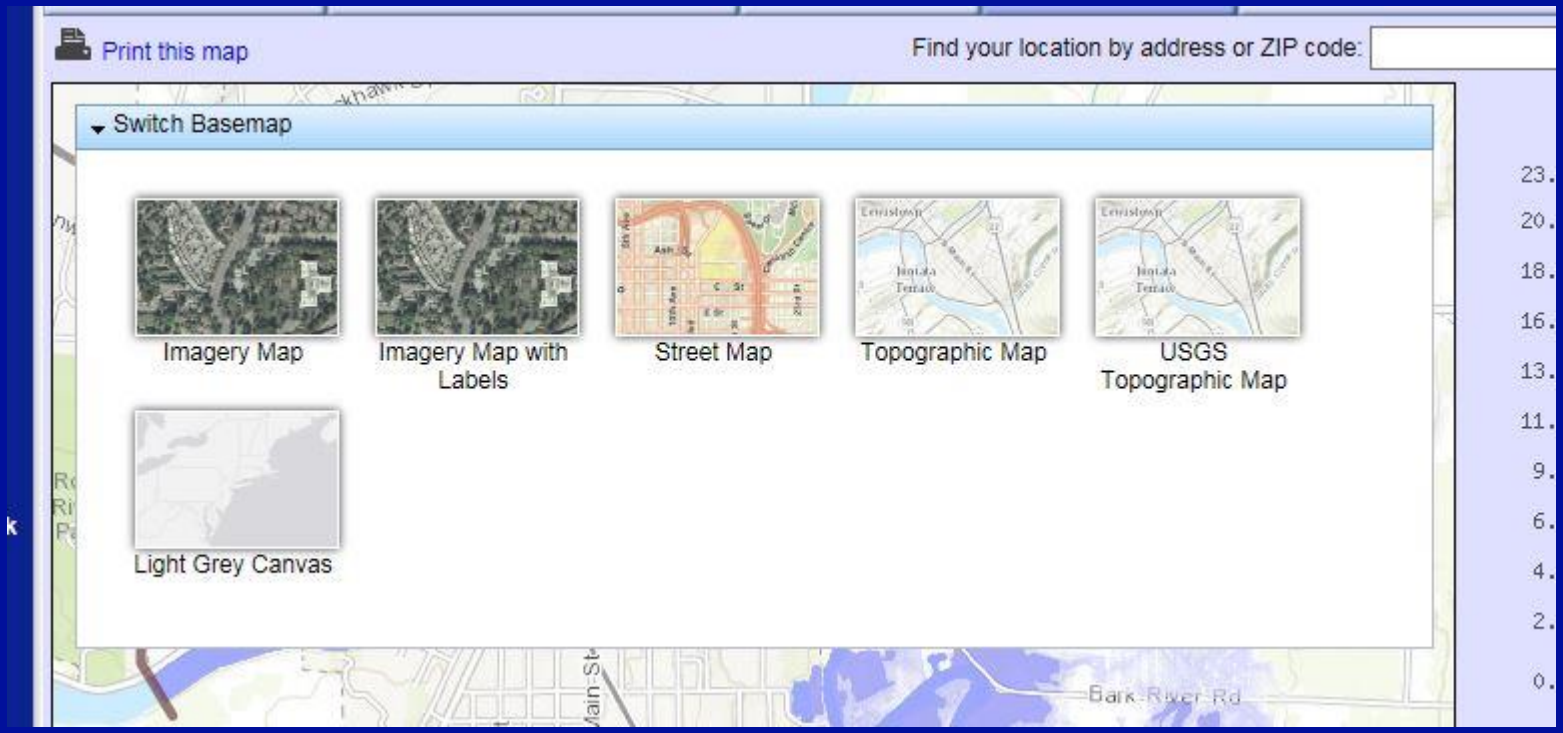


Individual Site Example



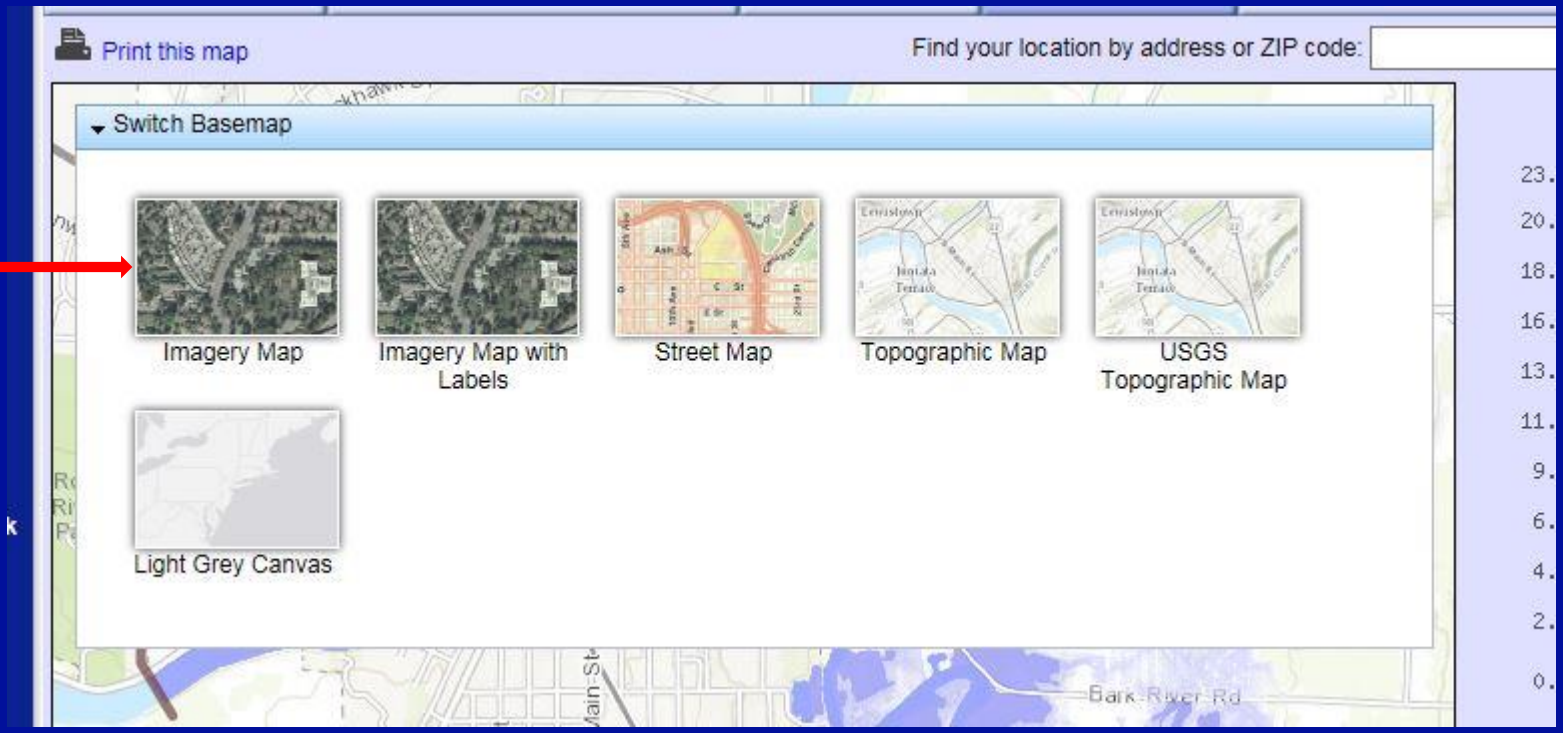
Individual Site Example

Basemap choices

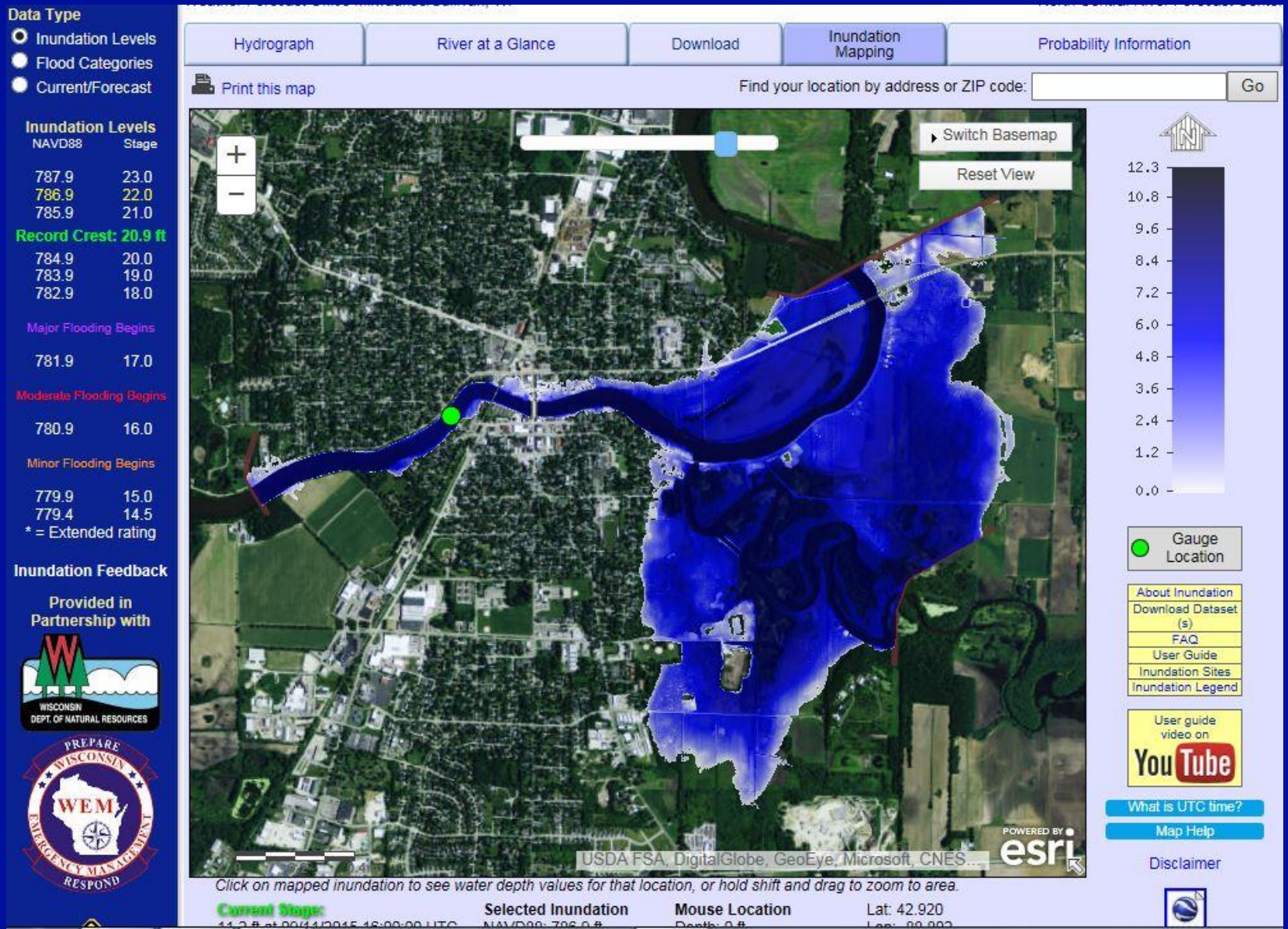


Individual Site Example

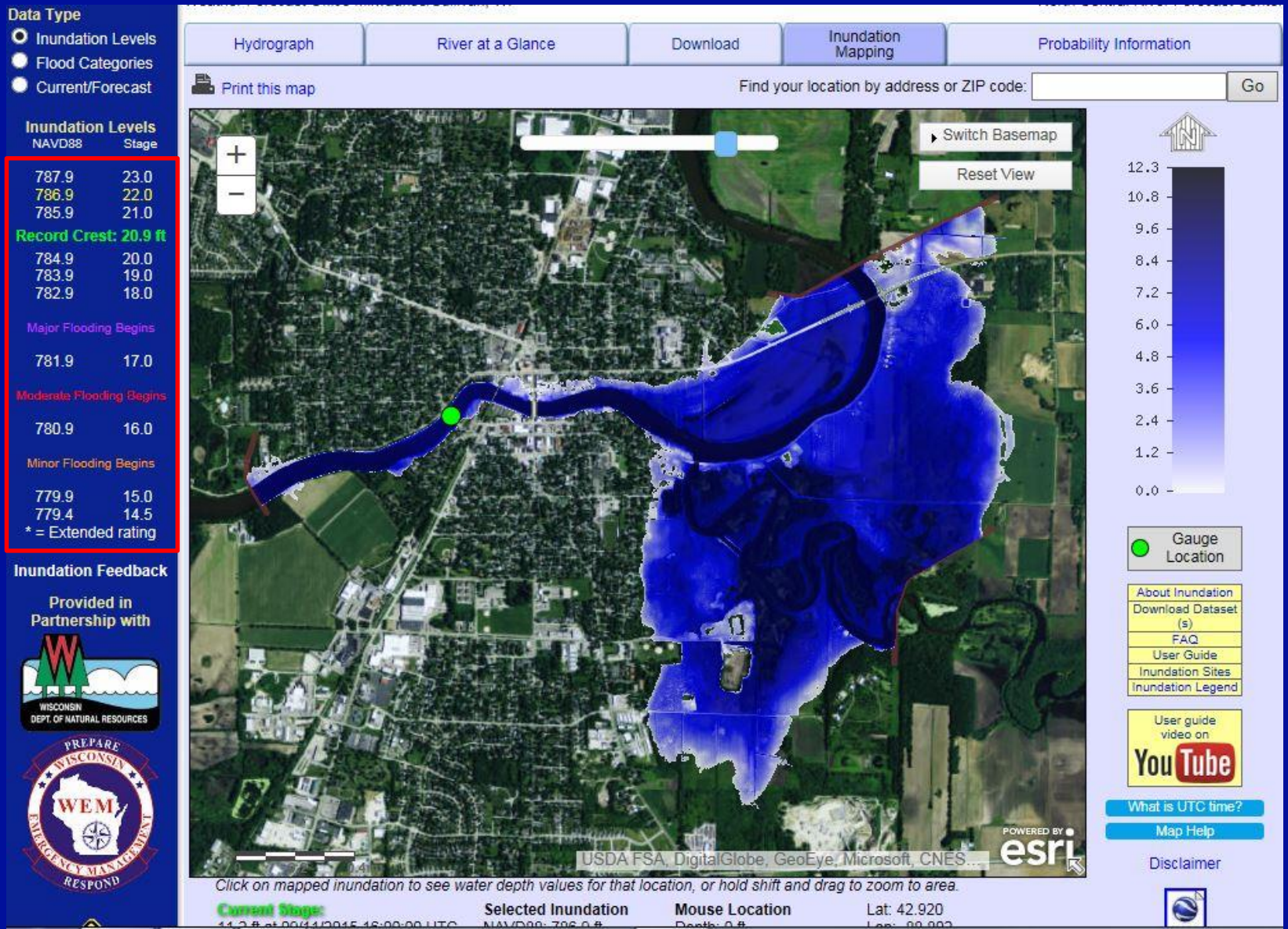
Basemap choices



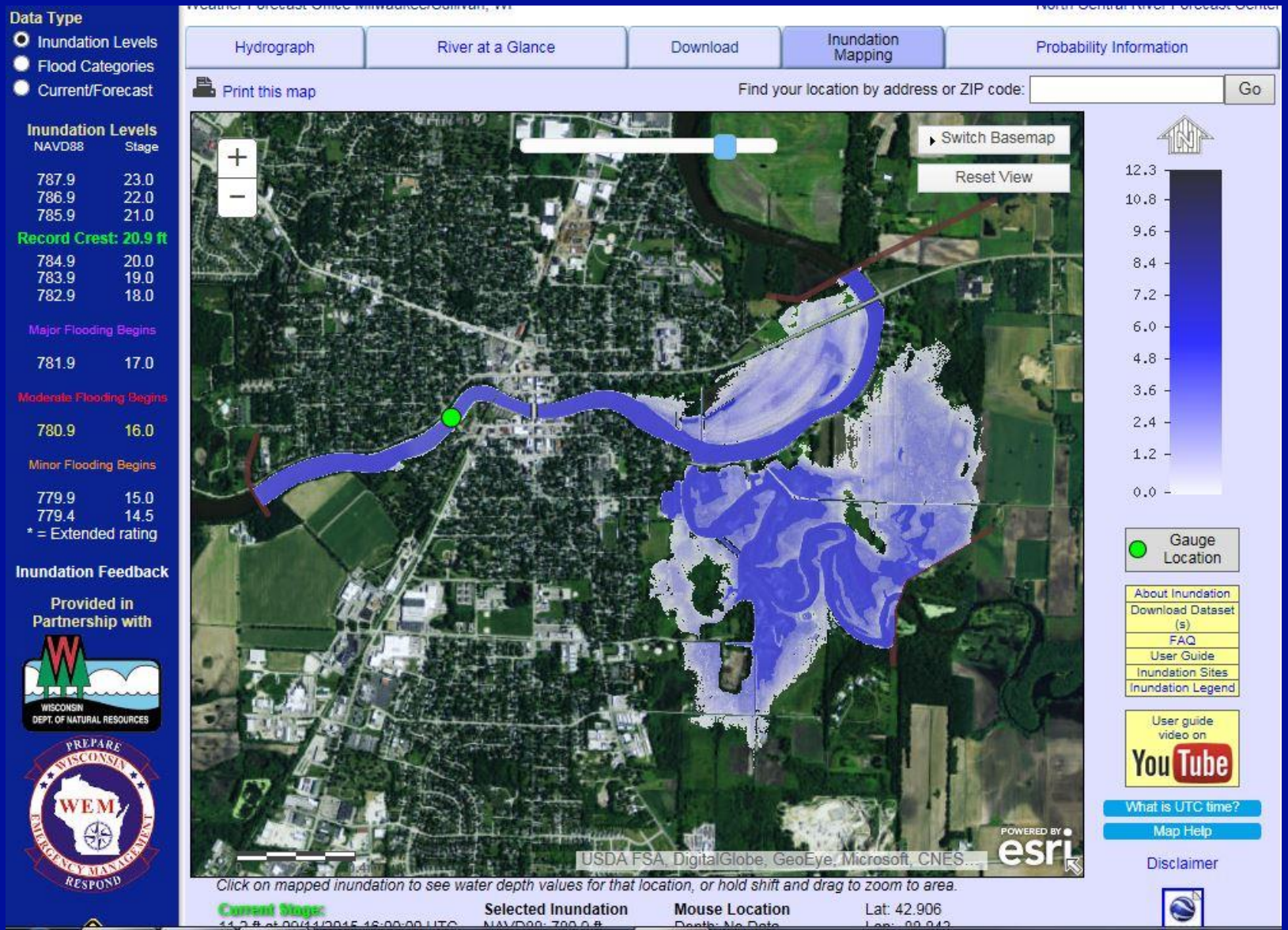
Individual Site Example



Individual Site Example

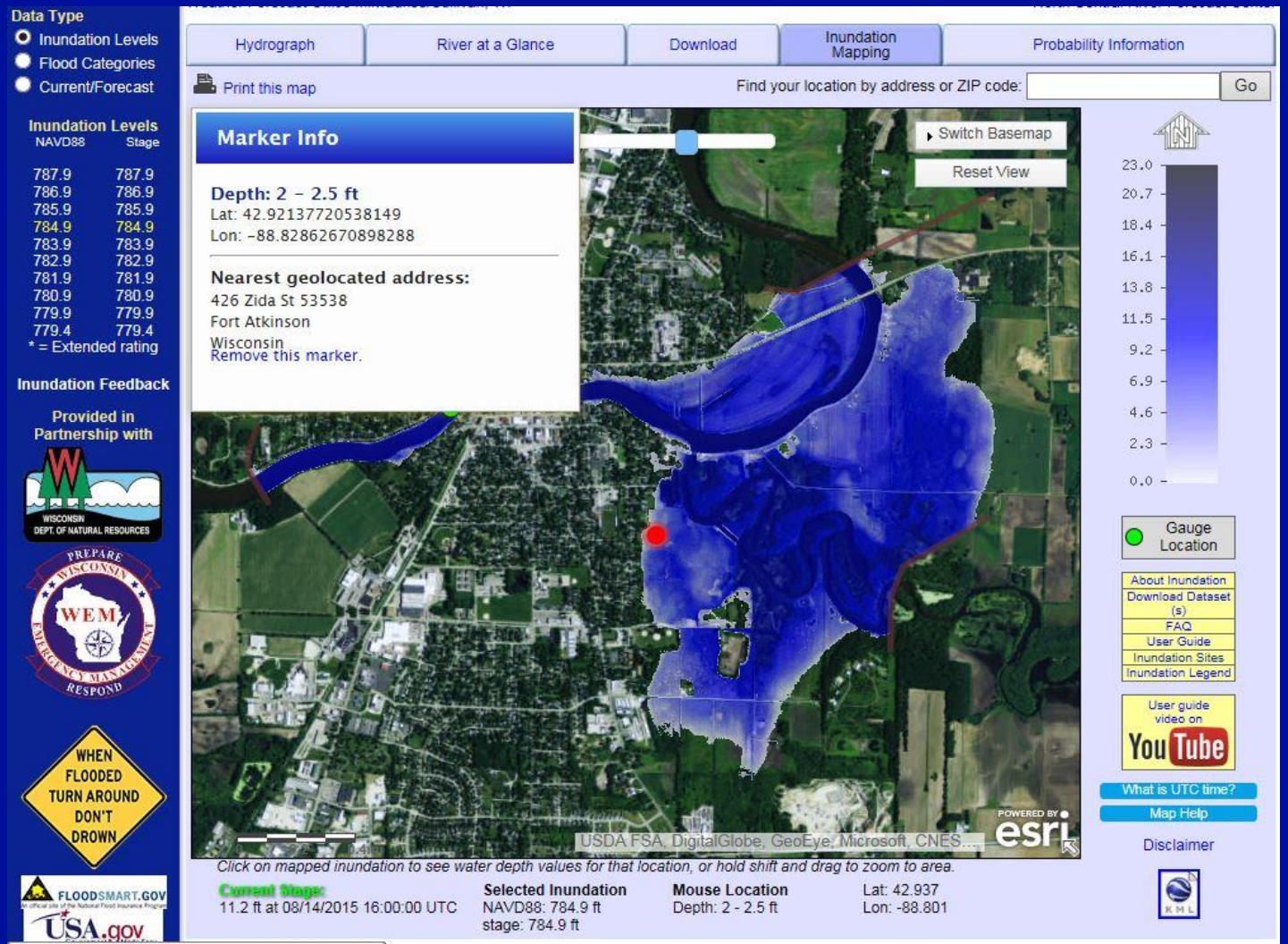


Individual Site Example



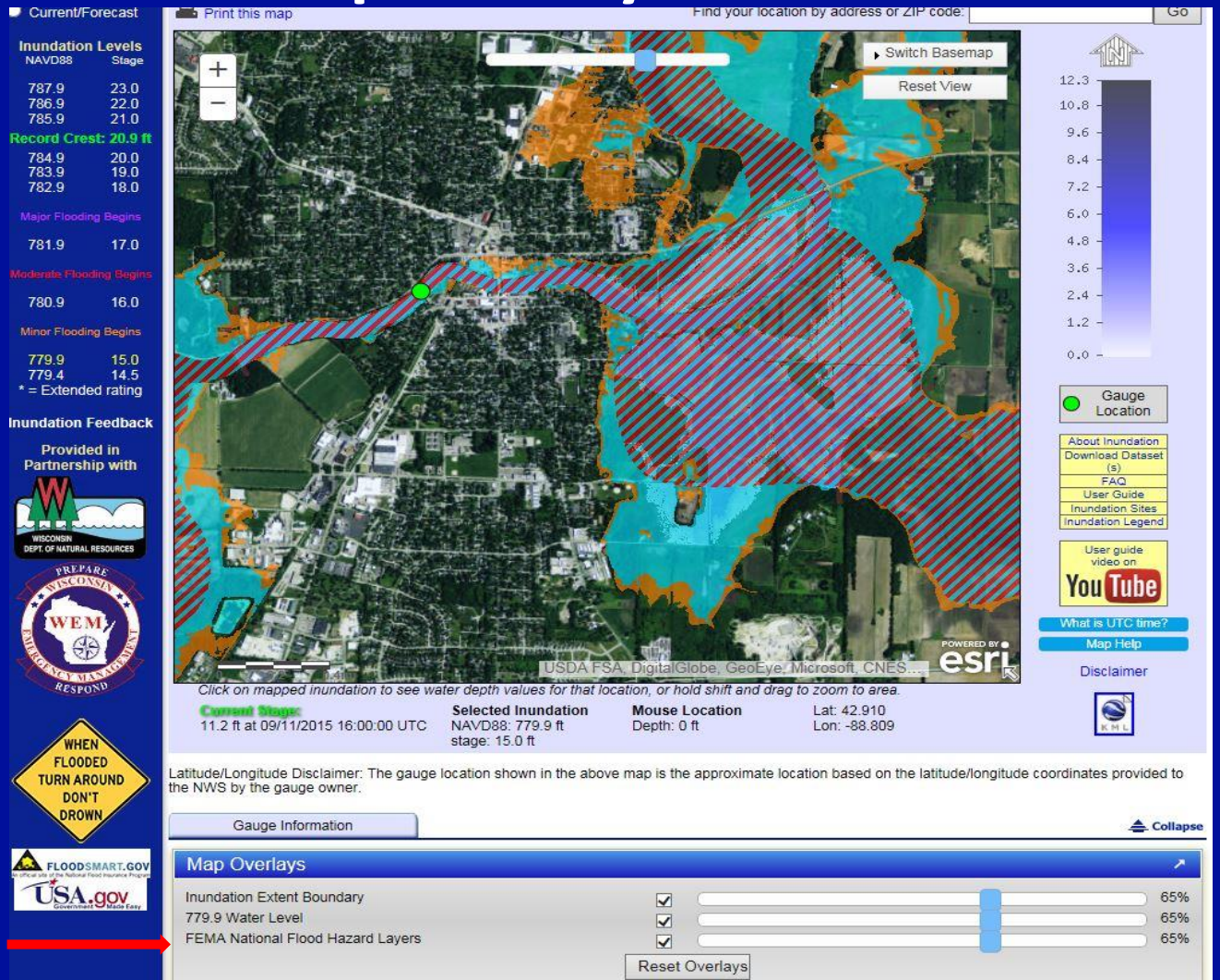
Individual Site Example

Depth of flooding



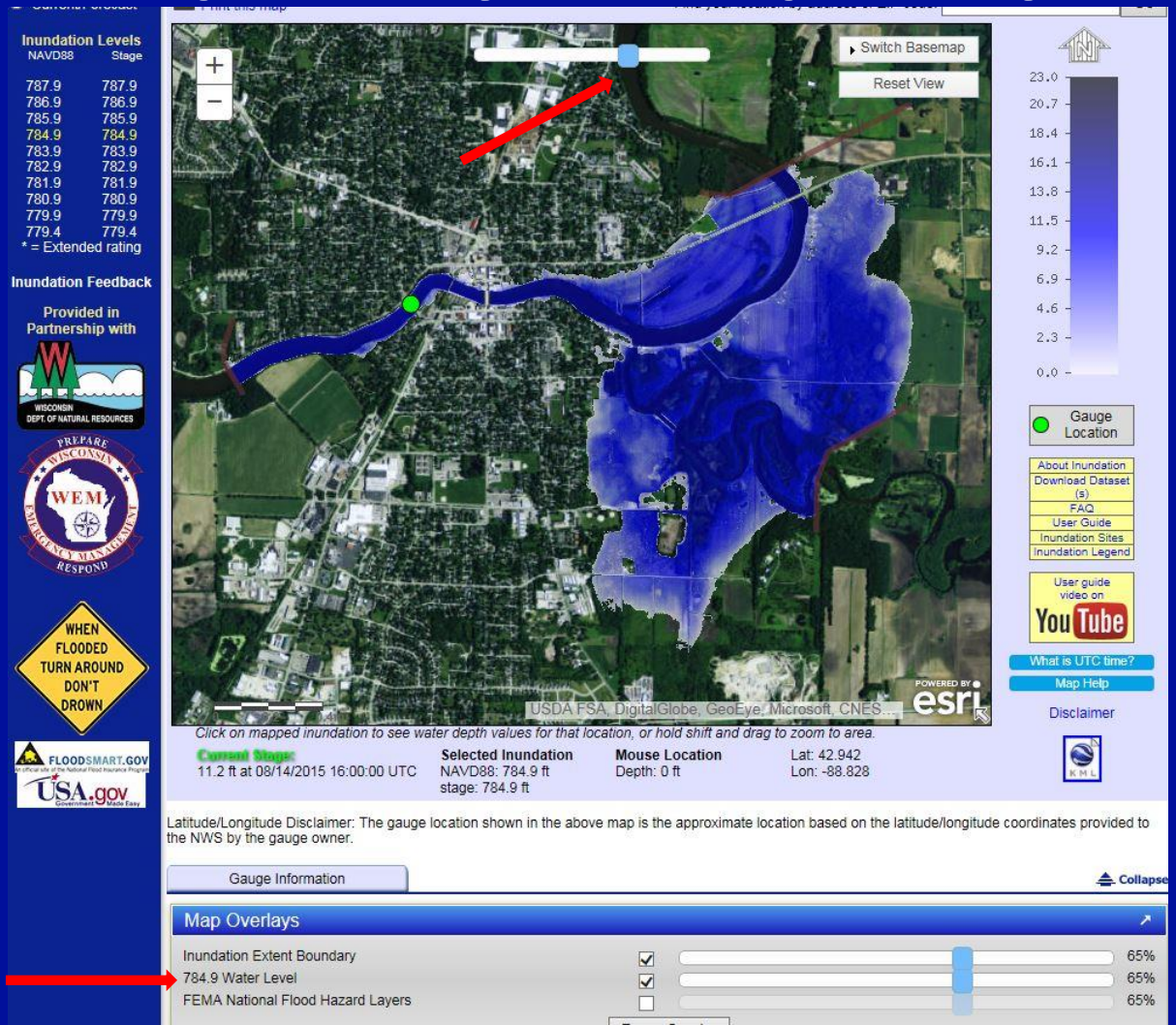
Individual Site Example

Map overlays - NFHL



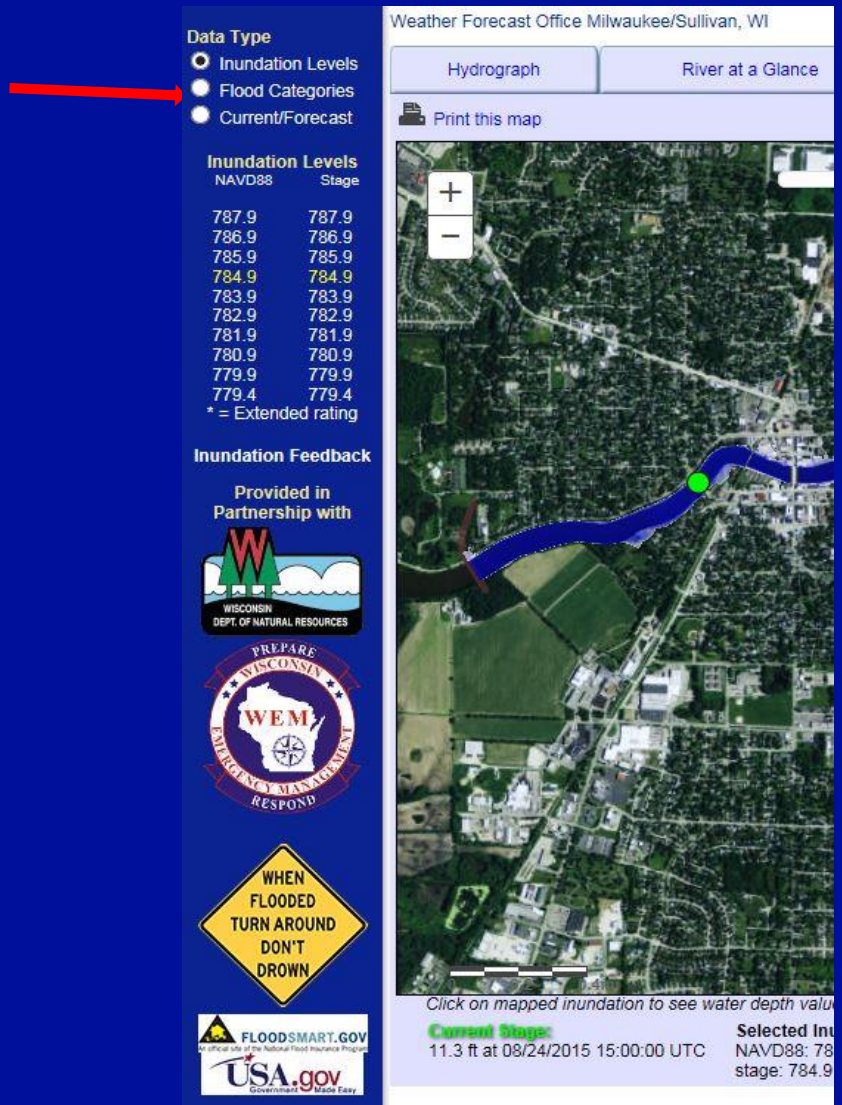
Individual Site Example

Map overlays - transparency



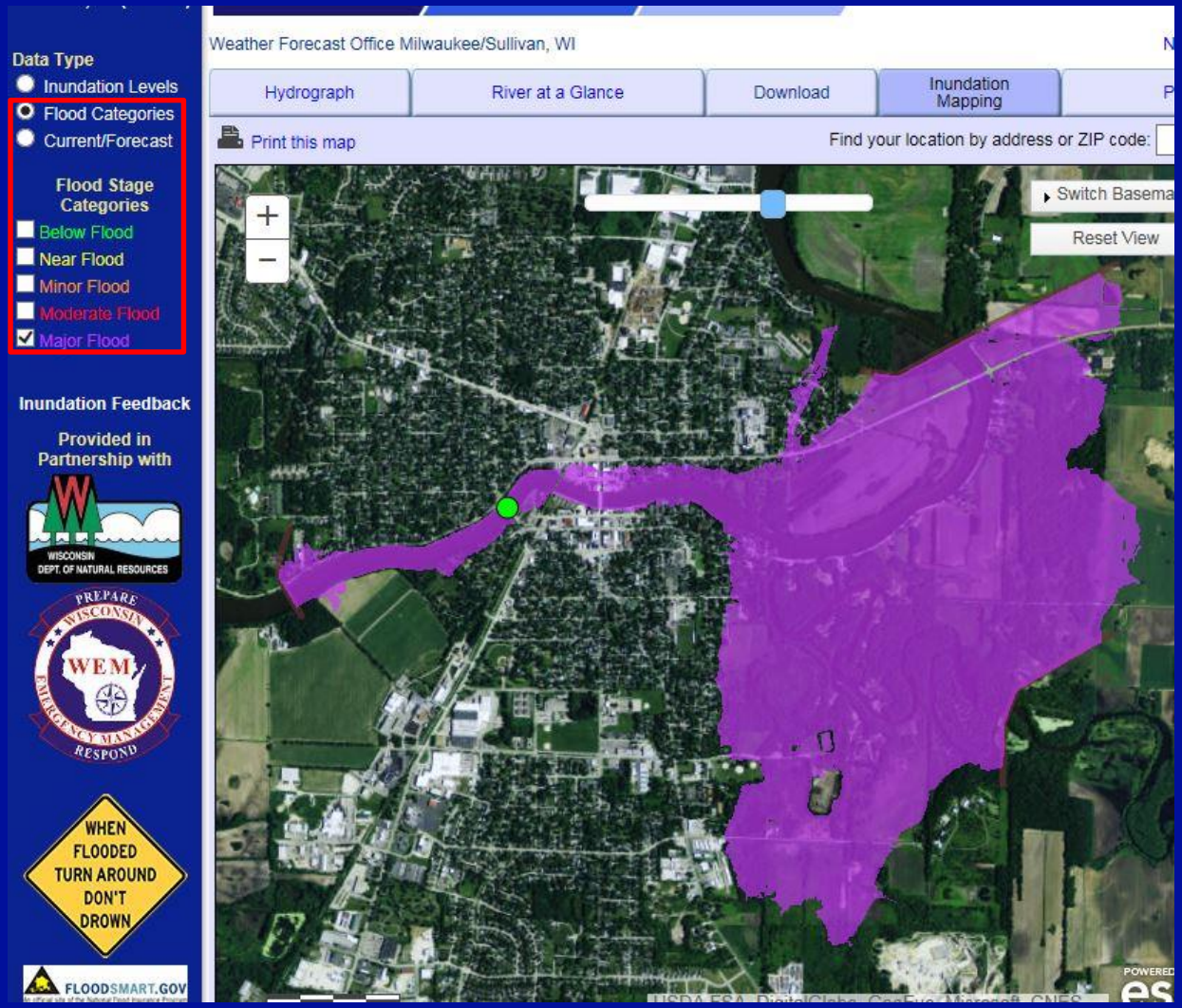
Individual Site Example

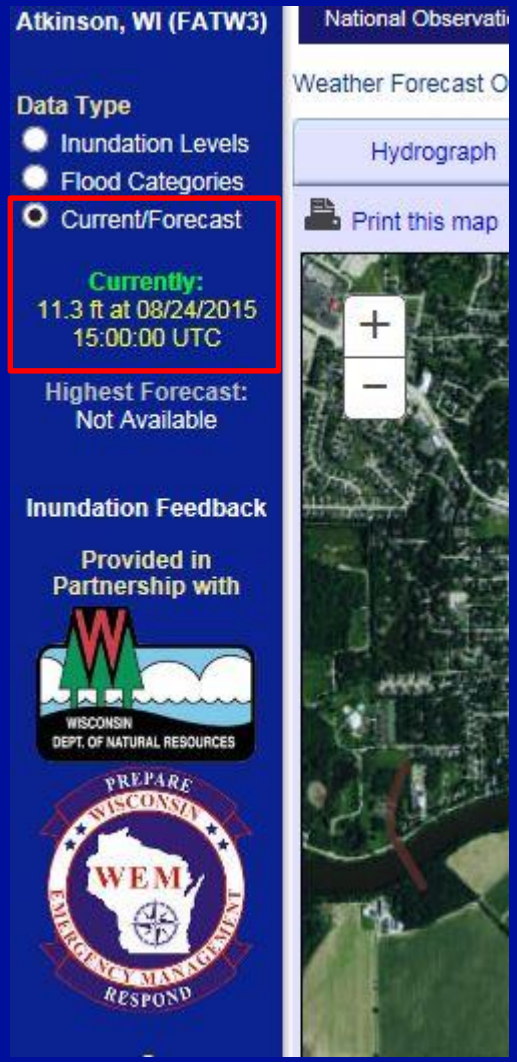
Other flood data



Individual Site Example

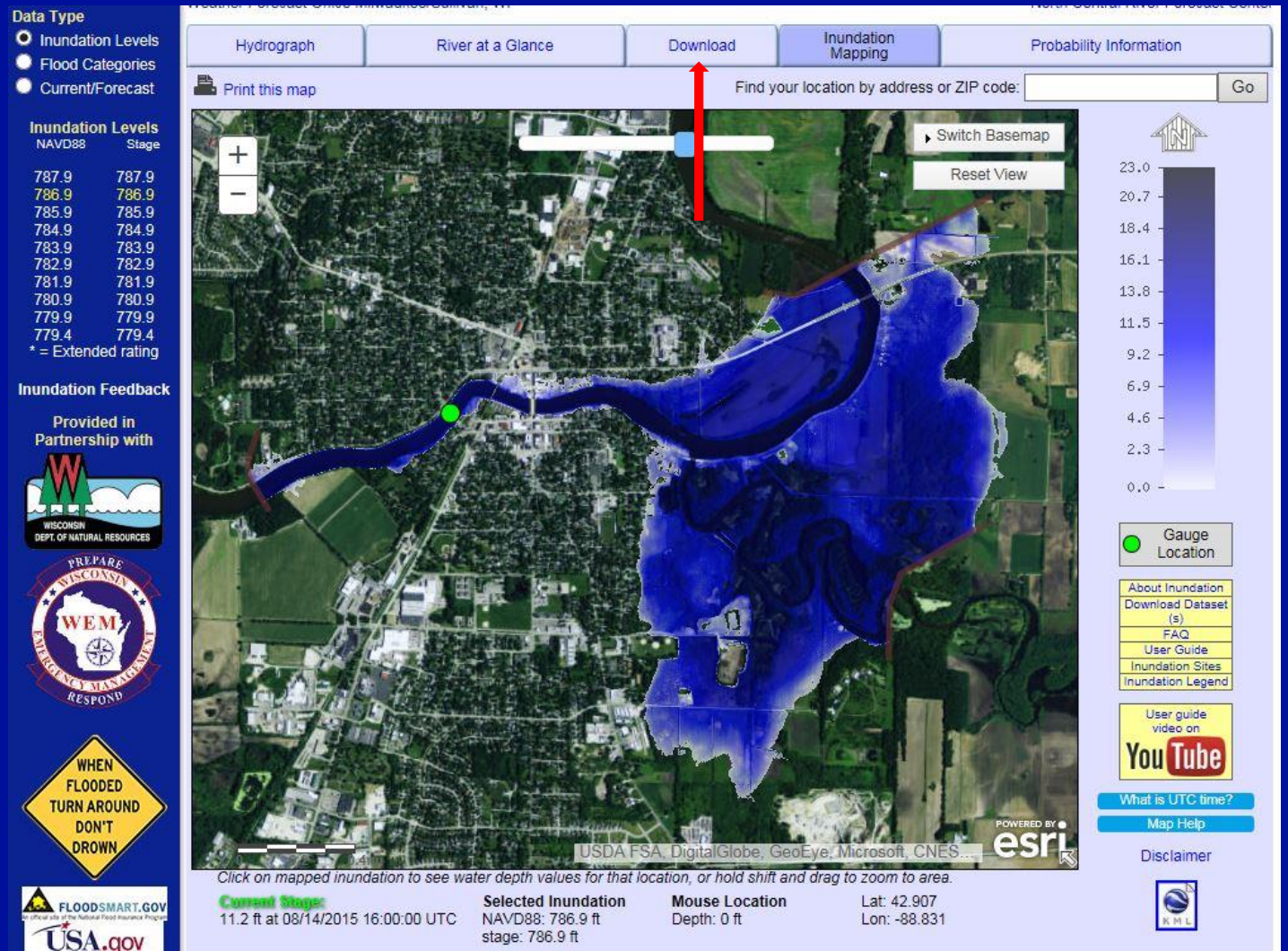
Other flood data





Individual Site Example

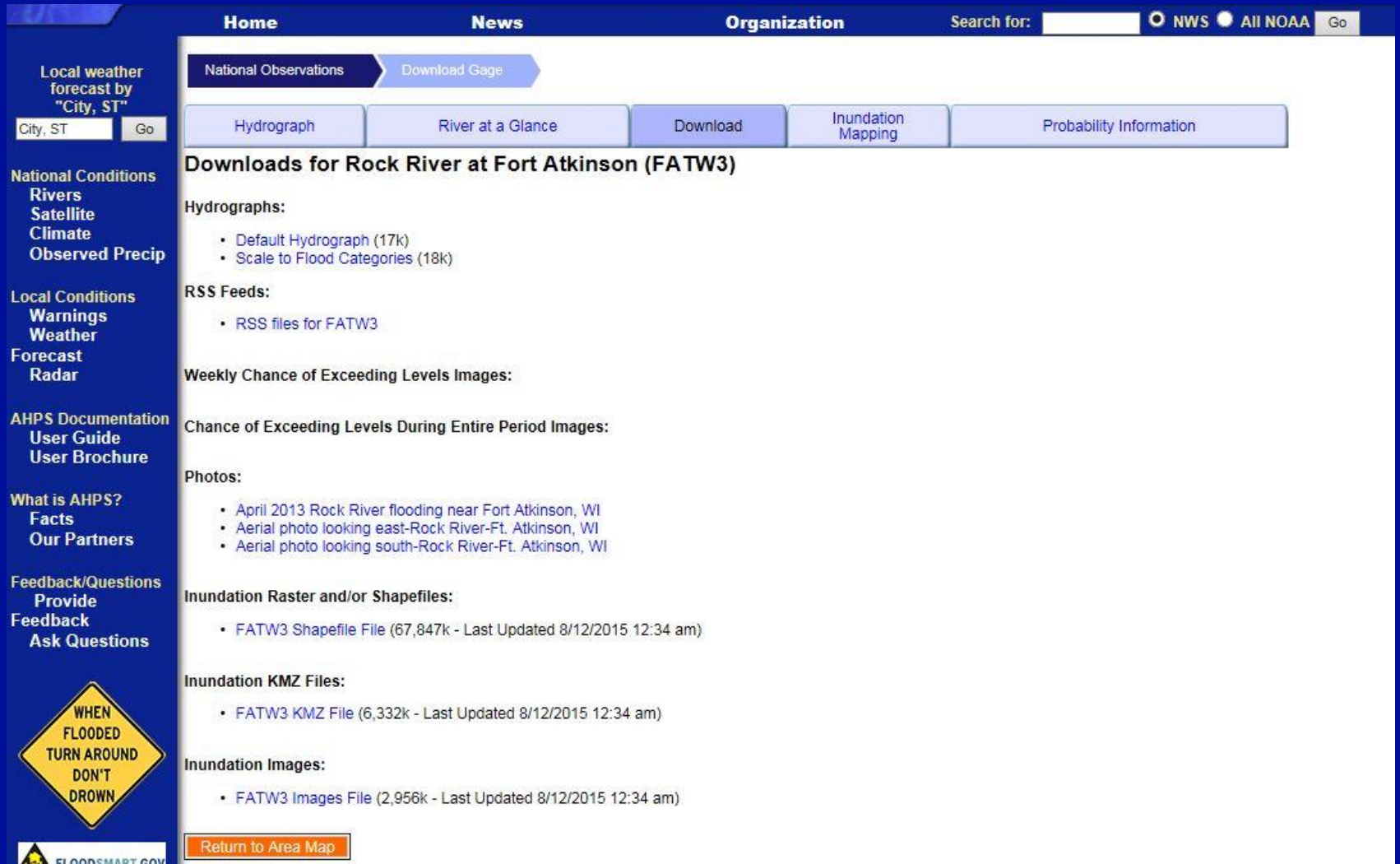
Download data



Individual Site Example

WISCONSIN DEPT. OF NATURAL RESOURCES

Download data



2008 comparison

USGS
science for a changing world

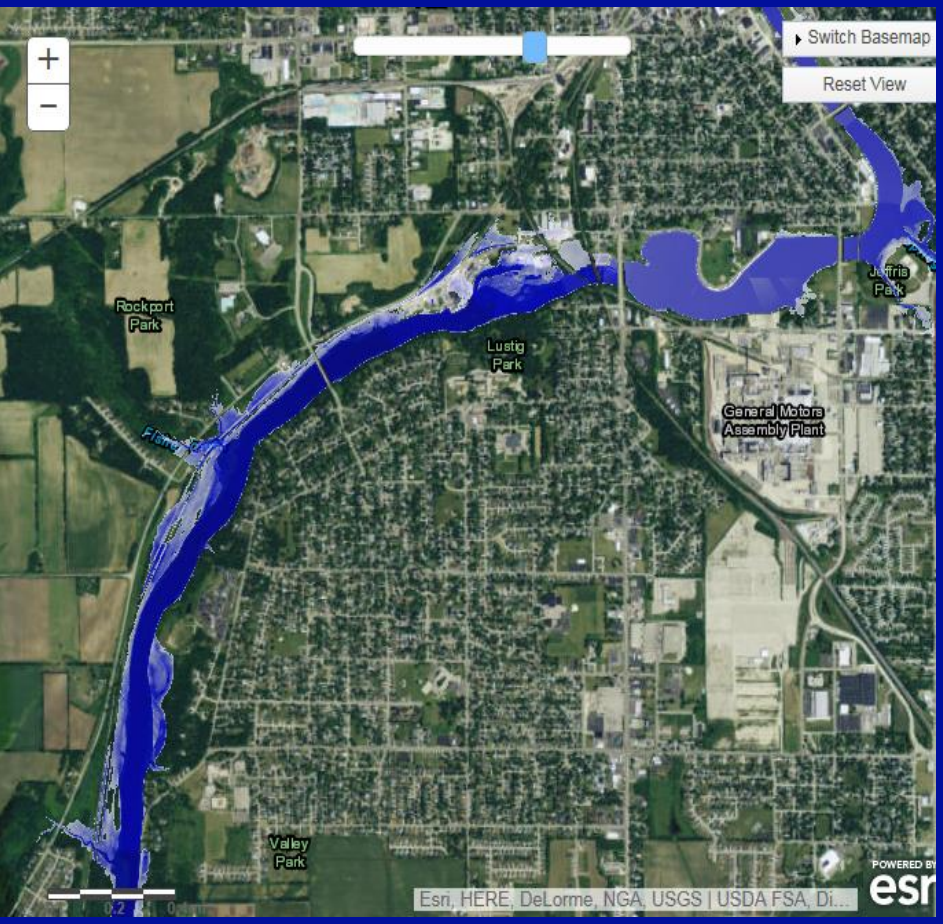
Prepared in cooperation with the Federal Emergency Management Agency

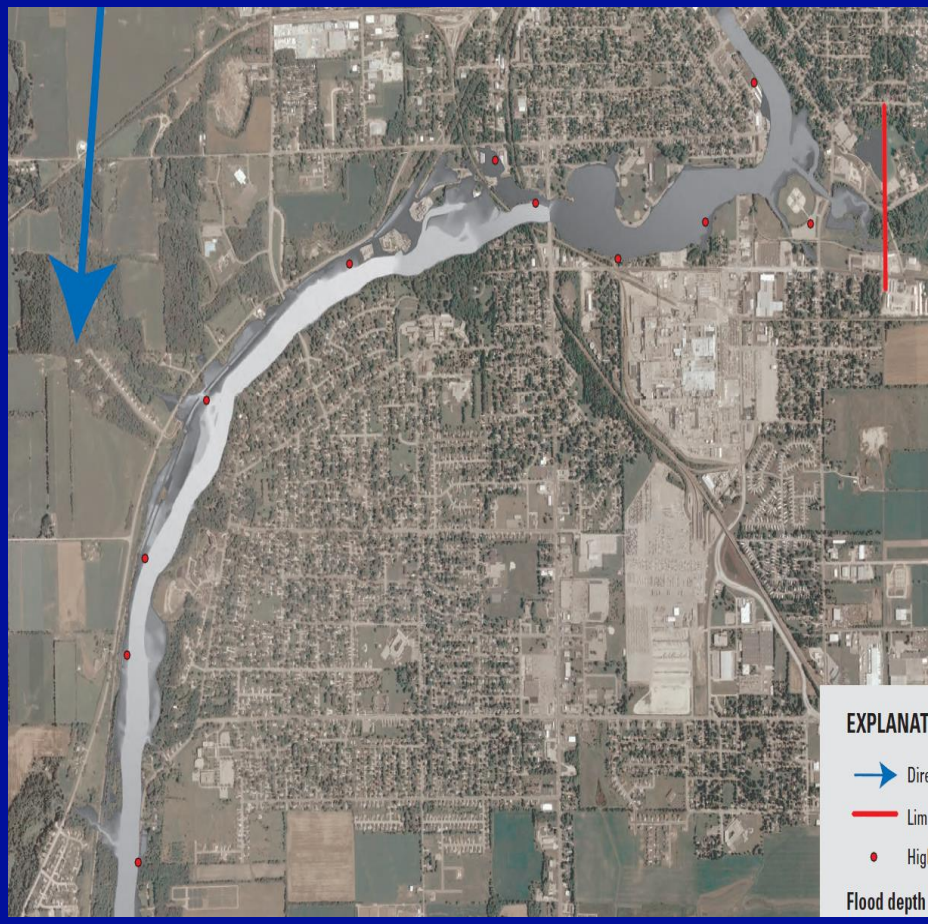
Flood of June 2008 in Southern Wisconsin

Scientific Investigations Report 2008–5235

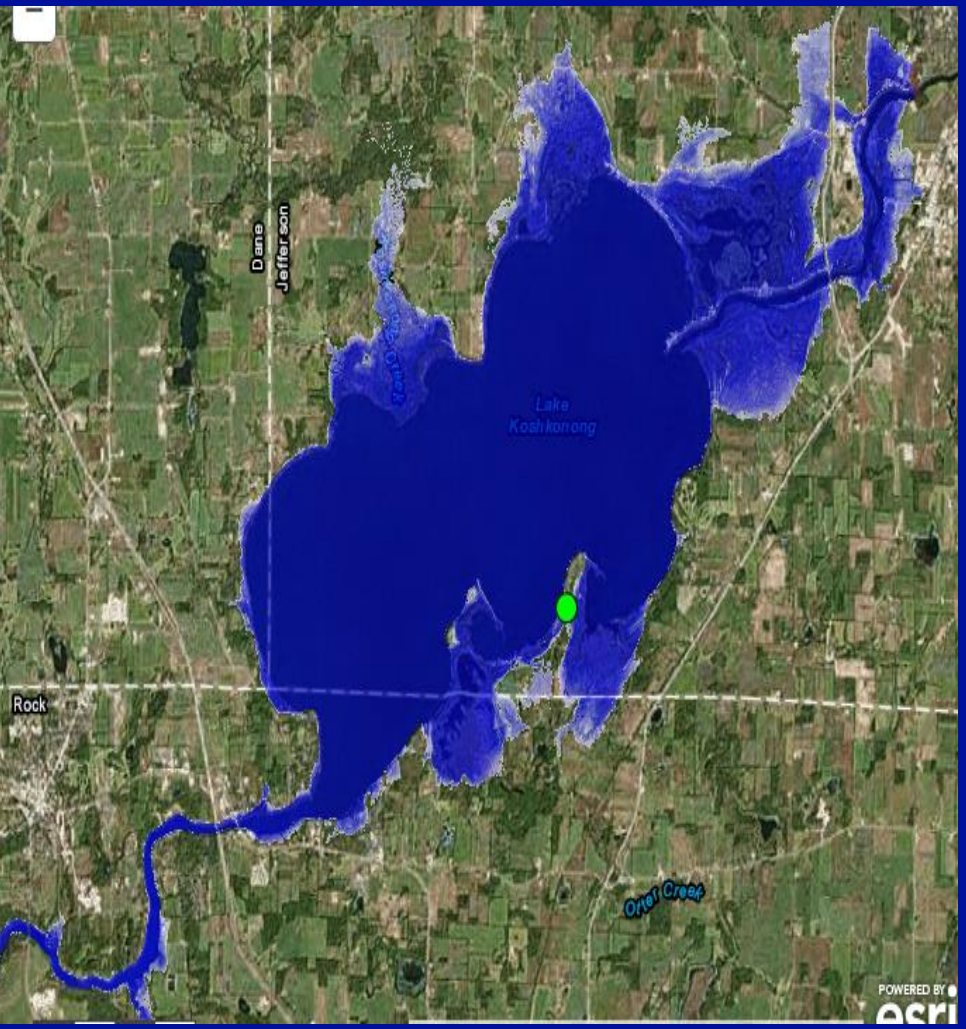
U.S. Department of the Interior
U.S. Geological Survey

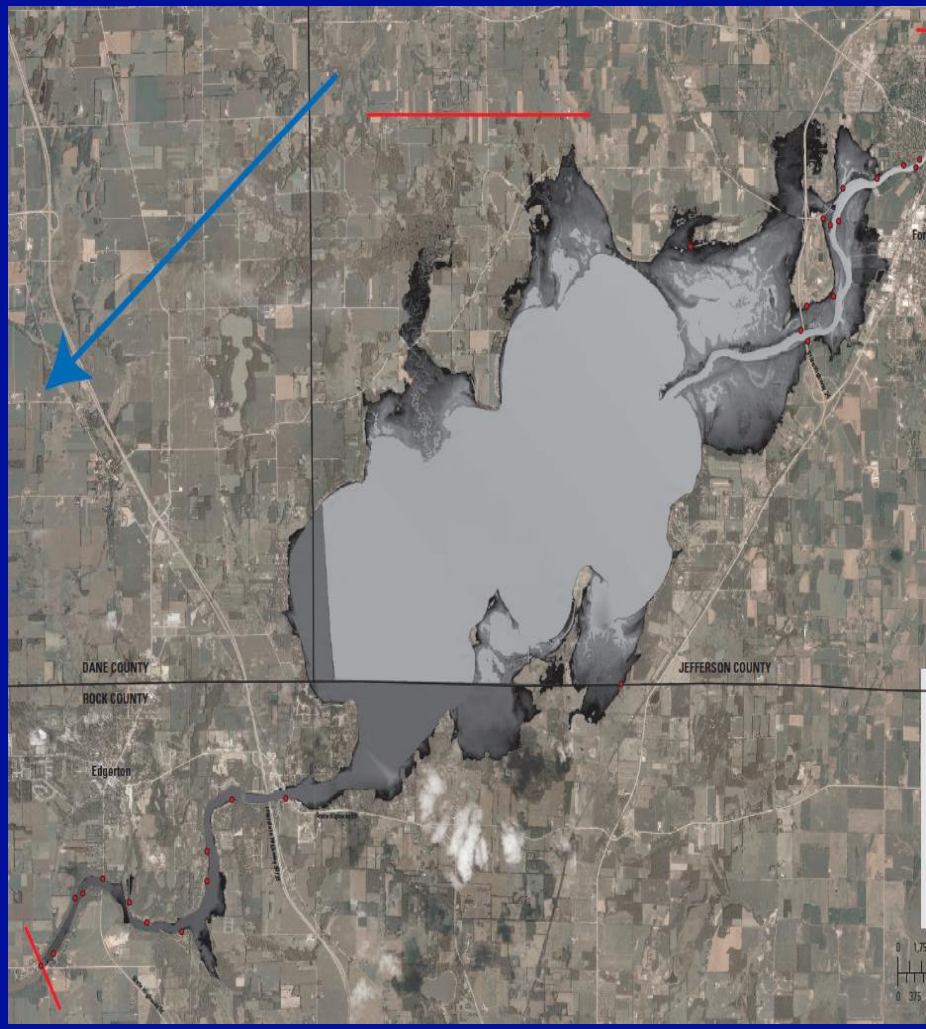
2008 comparison





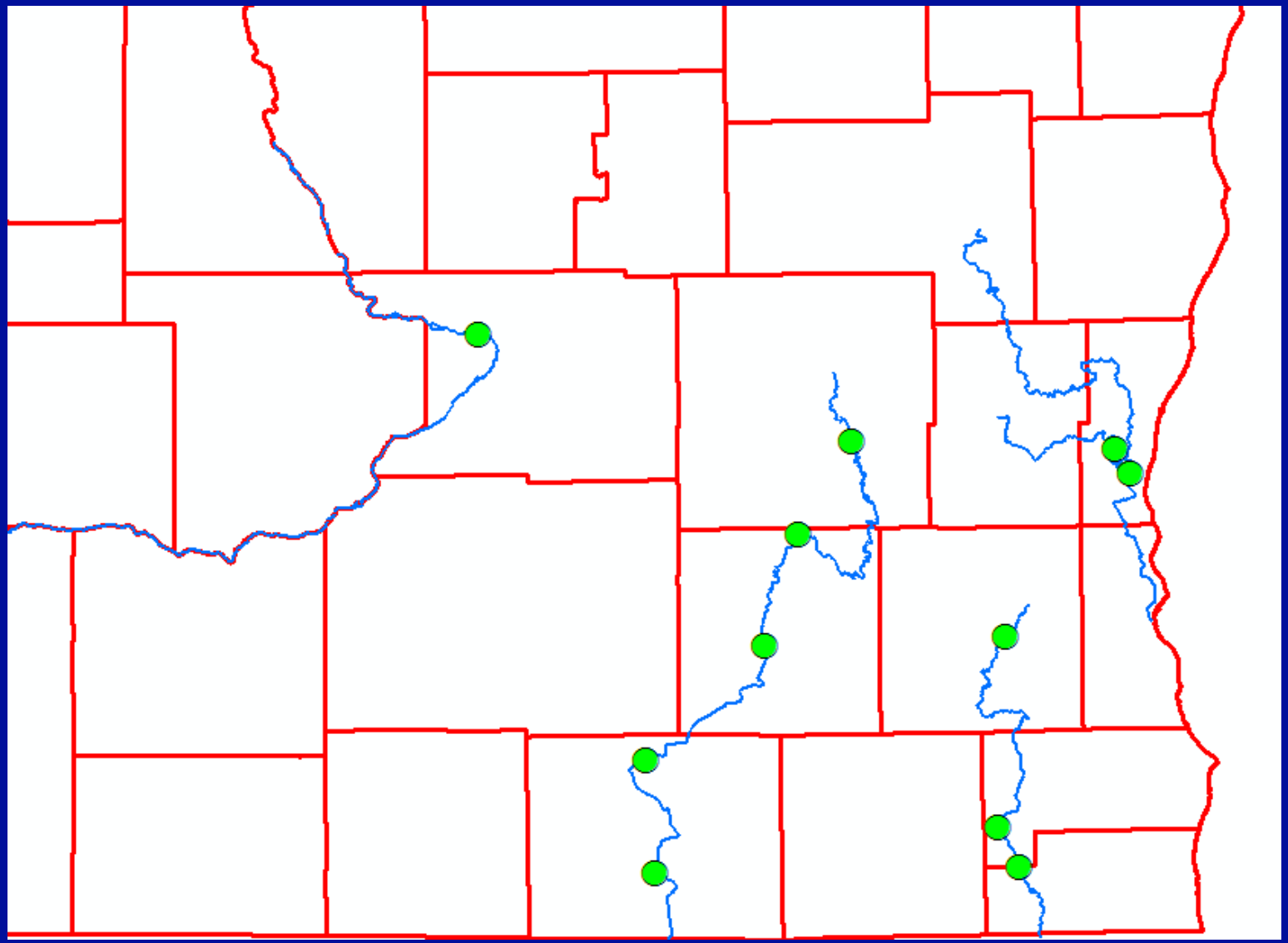
2008 comparison





2008 comparison

Future Inundation Sites



POLL QUESTION

CLOSING COMMENTS

- To suggest future CTP web meeting topics, please contact Alan Lulloff at *alan@floods.org* or type a suggested topic into the Questions panel today
- CFM CECs through ASFPM will be automatically applied. If you *require* a Certificate of Attendance, please contact *gisjason@floods.org*
- Follow-up email with link to slides and recording will be sent in about a week

Thank You for Joining Us!