

Flood Inundation Mapping

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USGS FIM Program



USGS and NWS Data Networks

USGS
science for a changing world

National Water Information System: Web Interface

MSL Water Resources

News updated March, 2012
Mar 22, 2012 11:30 EDT: A satellite that relays current conditions information is presently unavailable. This mainly affects western states and there is no present time estimate on when the issue will be resolved. More information will be posted as it becomes available.

USGS Current Water Data for the Nation

--- Predefined displays --- Green tabs by Select sites by number or name

Daily Streamflow Conditions



Explanation

- High
- > 90th percentile
- 75th - 90th percentile
- 25th - 75th percentile
- 10th - 25th percentile
- < 10th percentile
- Low
- not ranked

The colored dots on this map depict streamflow conditions as a percentile, which is computed from the period of record for the current day of the year. Only stations with at least 30 years of record are used. The gray circles indicate other stations that were not ranked in percentiles either because they have fewer than 30 years of record or because they report parameters other than streamflow. Some stations, for example, measure stage only.

Select a state from the map to access real-time data

Current data typically are recorded at 15- to 60-minute intervals, stored onsite, and then transmitted to USGS offices every 1 to 4 hours, depending on the data relay technique used. Recording and transmission times may be more frequent during critical events. Data from current sites are relayed to USGS offices via satellite, telephone, and/or radio telemetry and are available for viewing within minutes of arrival.

All real-time data are provisional and subject to revision.

Build Current Conditions Table	Show a custom current conditions summary table for one or more stations.
Build Time Series	Show custom graphs or tables for a series of recent data for one or more stations.

National Oceanic and Atmospheric Administration's National Weather Service

Home > River Observations

NOAA has issued its annual Spring Flood Outlook. Details...

Warnings & Forecasts Graphical Forecasts National Maps Radar Water Air Quality Satellite Climate

River Observations River Forecasts Precipitation River Downloads Other Information

18 Locations

Print this map Permissions

Click on the map or select one of the data views below:

- United States
- NWS Weather Forecast Offices
- NWS River Forecast Centers
- Water Resources Regions

4061 total gauges

Show all locations in flood (76)

- 8 Gauges: Major Flooding
- 17 Gauges: Moderate Flooding
- 95 Gauges: Minor Flooding
- 95 Gauges: Near Flood Stage
- 4516 Gauges: No Flooding
- 293 Gauges: Observations older than 24 hours
- 22 Gauges: Out of Service

Show all locations

5,001 map updates: 03/22/2012 at 04:04:55 pm EDT
03/22/2012 20:04:49 EDT

Hydrologic Resources

- River Forecast Centers
- About A-IPS
- Partners
- World FeedBack
- A-IPS RSS
- Automated Flood Warning Systems
- Hydro-meteorological Automated Data System
- Installation Mapping Locations

Additional Resources

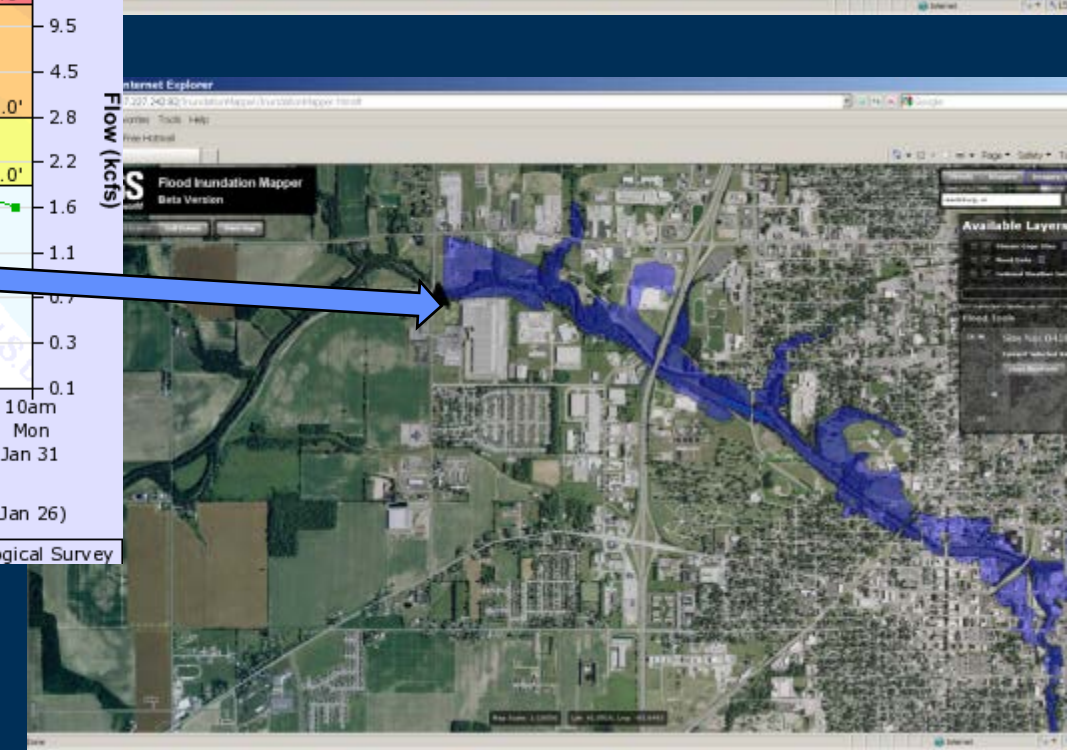
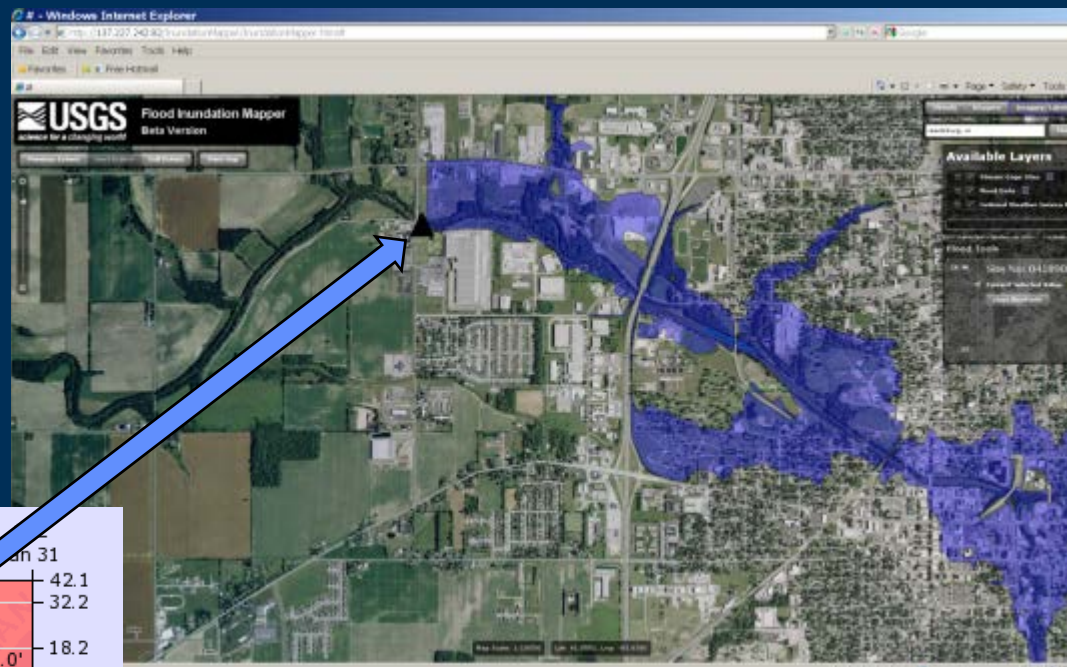
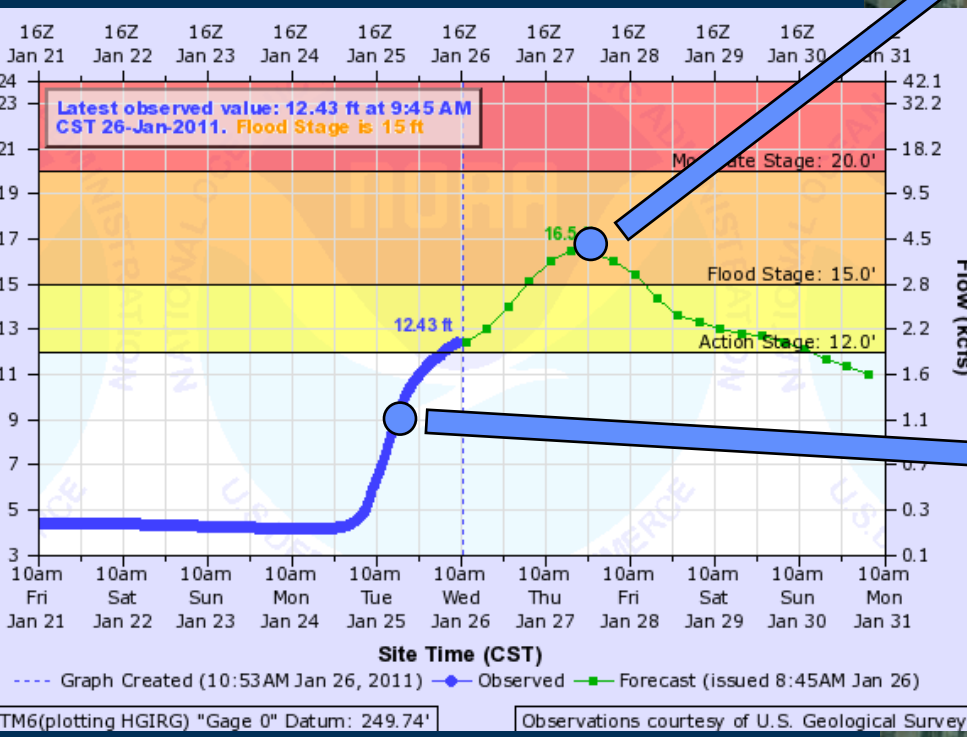
- National Significant River Flood Outlook
- U.S. Geological Survey Streamflow Information
- Stream Information
- NWS Precipitation and River Forecasting
- Water Resources Outlook
- Experimental Flood Prediction
- Guide to Hydrologic Information on the Web
- Princ FrequencyPUP

Over 8,000 USGS Gages reporting current stream conditions in NWIS

Over 4,000 NWS Flood Forecast/Warning locations in AHPS



Flood Inundation Maps translate a hydrograph into operational maps that communicate risk and consequences



FIM becomes a tool for flood...



- Preparedness
 - “What-if” scenarios
- Response
 - Tied to gage & forecast data
- Recovery
 - Damage assessment

- Mitigation & planning
 - Flood risk analyses
- Environmental & ecological assessments



Environmental Aspects

- Ecological studies of floodplains
 - Such as frequency of inundation
- Riparian habitat
 - 7-day inundation areas
- Hazardous substance spills
 - Kalamazoo River Oil Spill



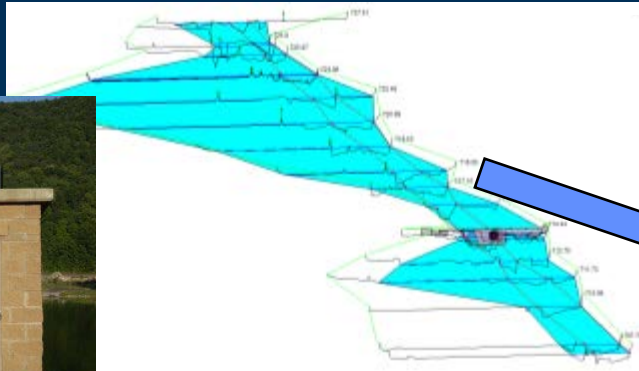
Creation of Flood Inundation Maps

1. Choose Stream Reach

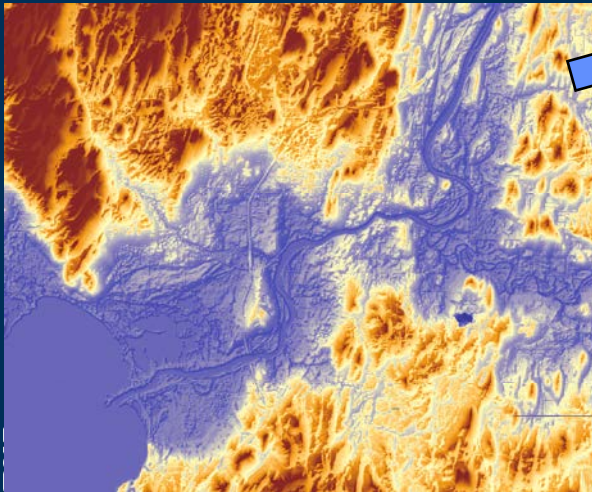
- Streamflow information
- Flood Forecast information
- Elevation data availability
 - Topography
 - Bathymetry
 - Structural surveys
- Flood Impact Locations
 - Critical infrastructure
 - Routes of egress
 - Populations



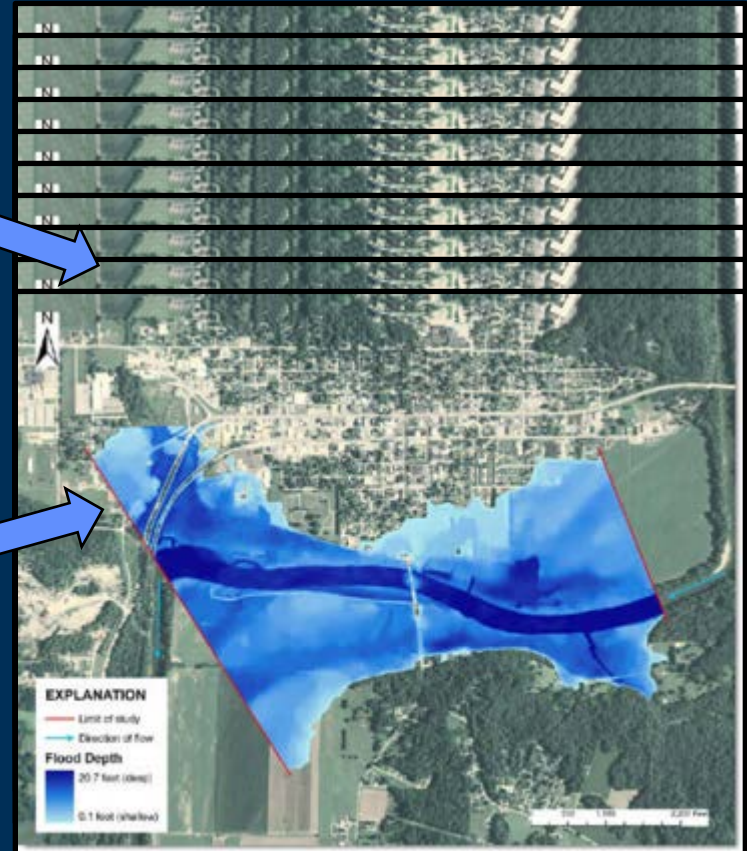
Creation of Flood Inundation Maps



2. Hydraulic Modeling
3. Geospatial Processing



High Quality Elevation Model

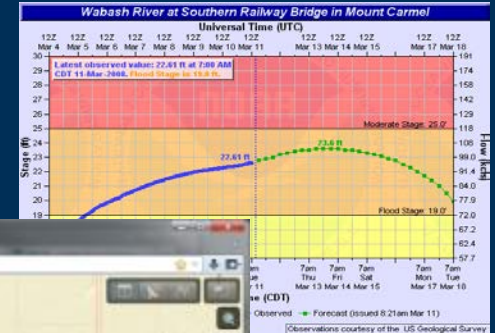
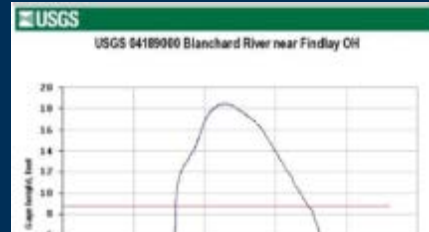


Series of sequential maps showing probable areas of flooding

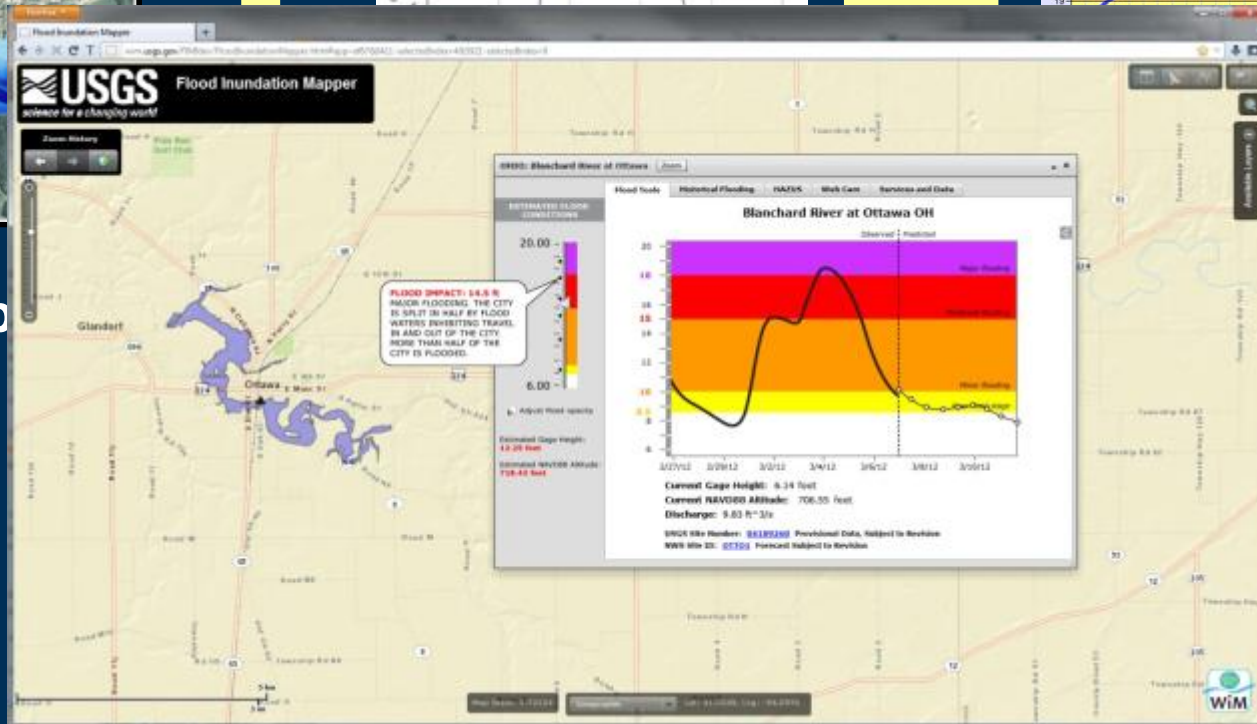
FIM Mapper – more than just maps



Flood Lib

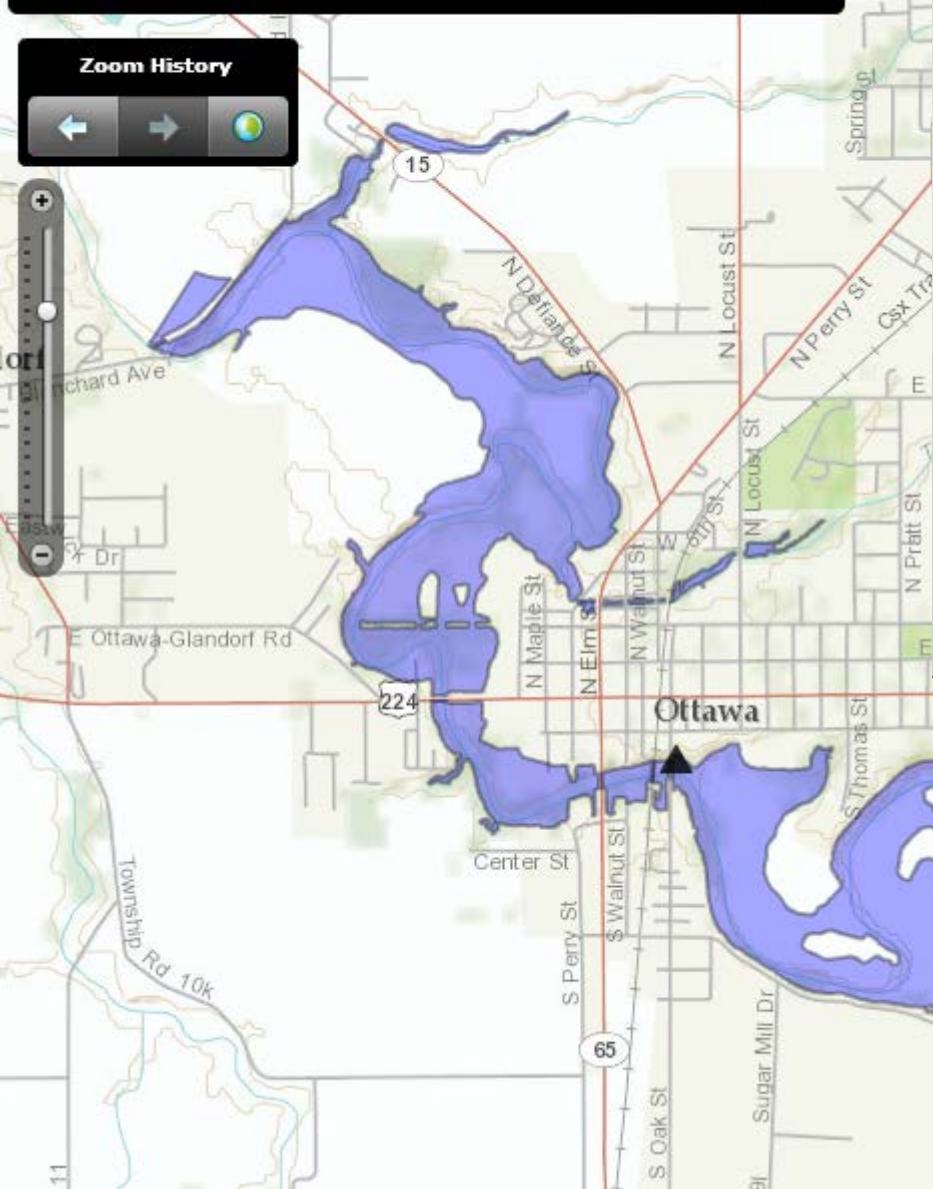
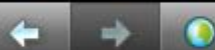


Flood
cast





Zoom History



OHIO: Blanchard River at Ottawa

Zoom

Flood Tools

Historical Flooding

HAZUS

Web Cam

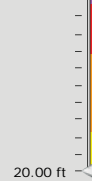
Services and Data

Blanchard River at Ottawa OH

Observed Predicted

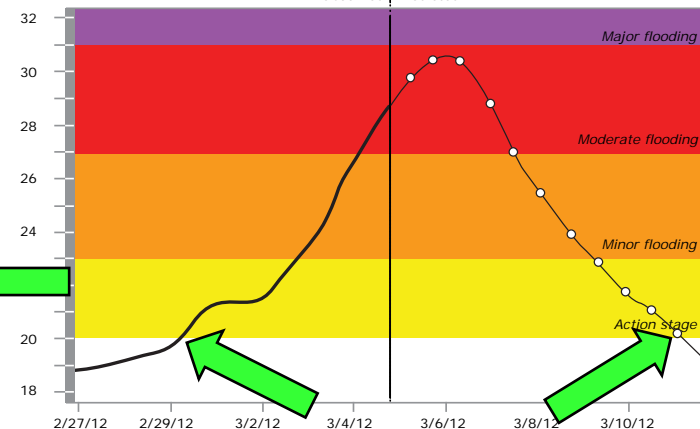
ESTIMATED FLOOD
CONDITIONS

31.40 ft



Selected Gage Height:
20.00 feet

Selected MVD88 Altitude:
718.43 feet



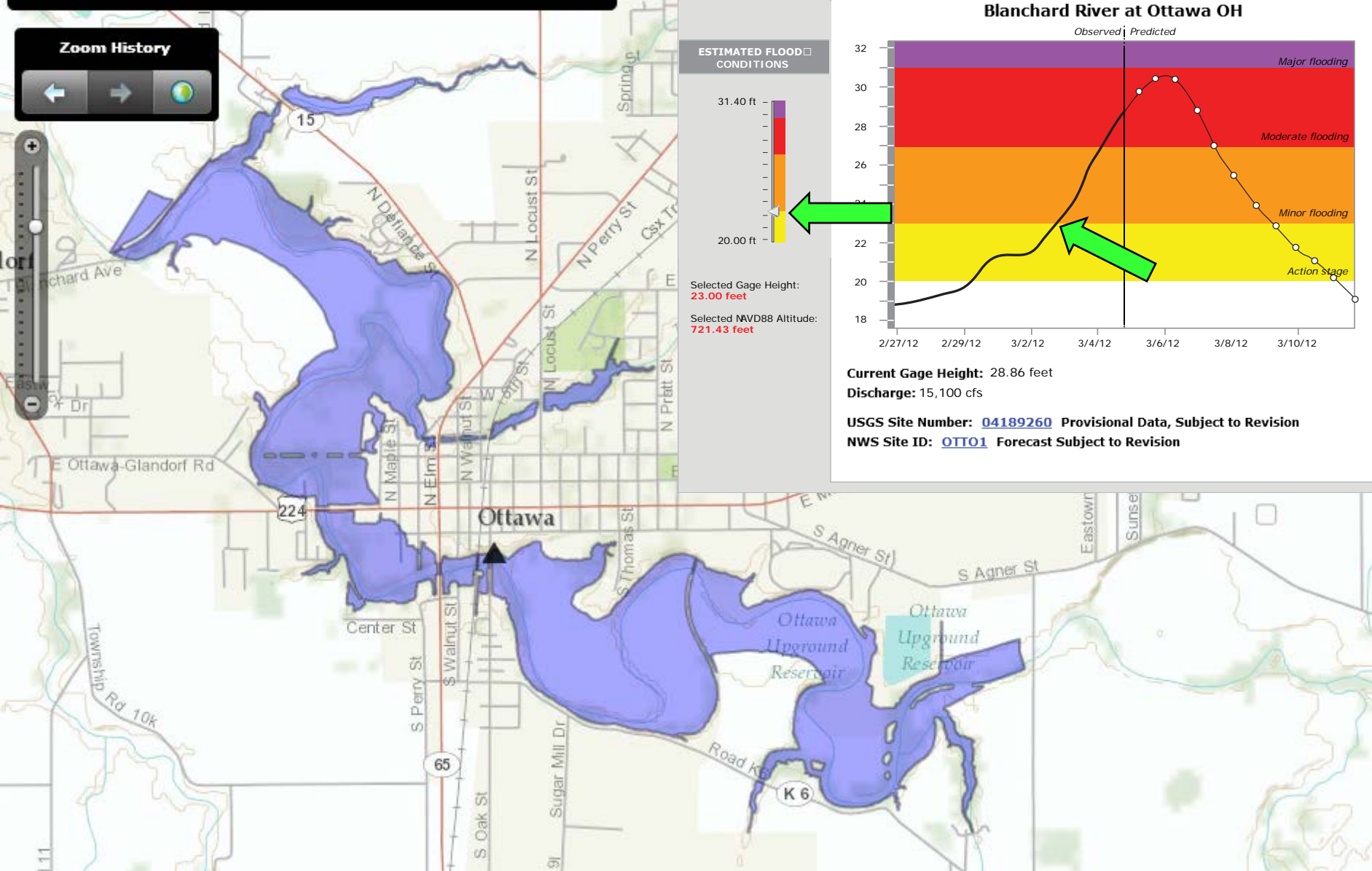
Current Gage Height: 28.86 feet

Discharge: 15,100 cfs

USGS Site Number: [04189260](#) Provisional Data, Subject to Revision

NWS Site ID: [OTTO1](#) Forecast Subject to Revision

Zoom History



OHIO: Blanchard River at Ottawa

Zoom

Flood Tools

Historical Flooding

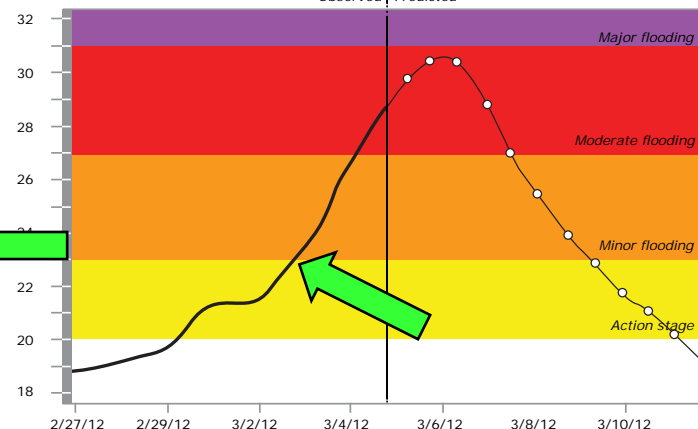
HAZUS

Web Cam

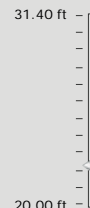
Services and Data

Blanchard River at Ottawa OH

Observed Predicted



ESTIMATED FLOOD CONDITIONS



Selected Gage Height:

23.00 feet

Selected MVD88 Altitude:

721.43 feet

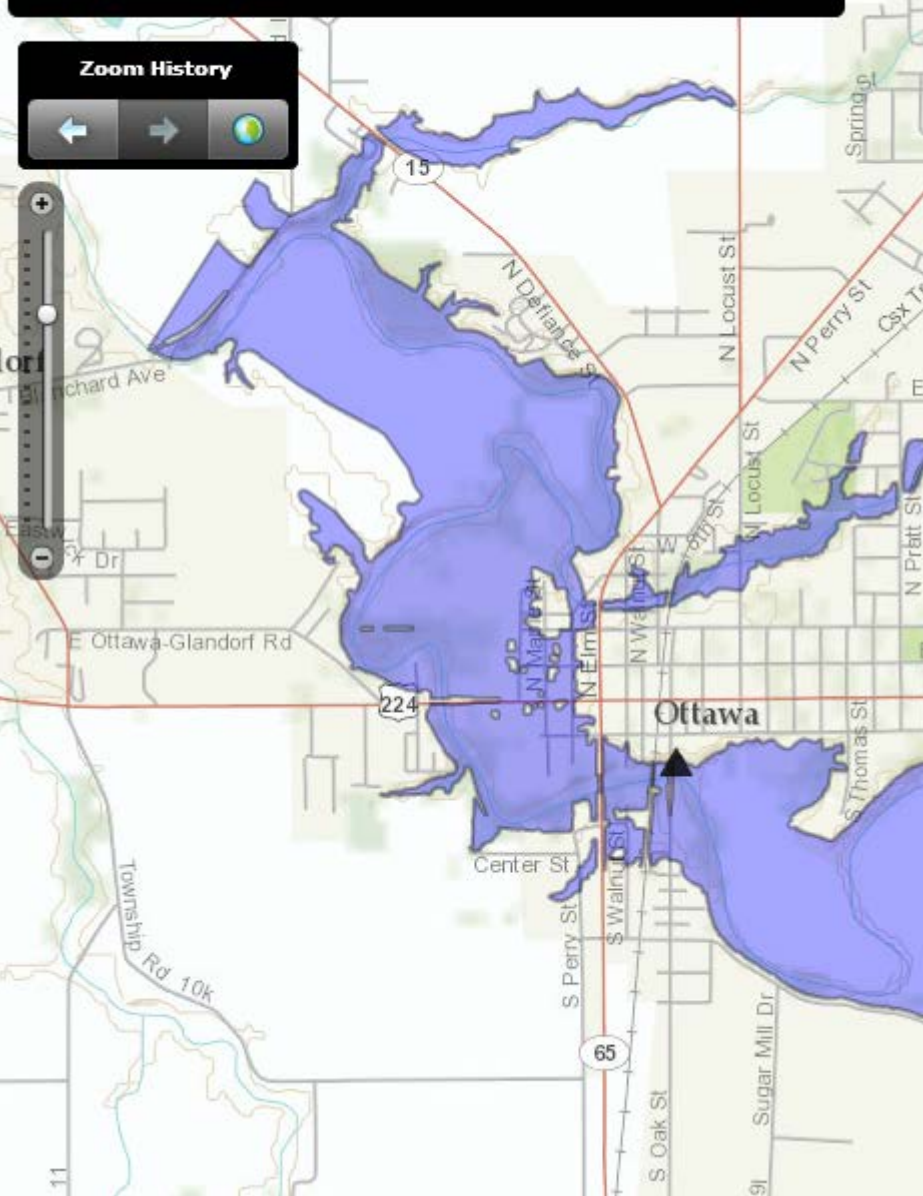
Current Gage Height: 28.86 feet

Discharge: 15,100 cfs

USGS Site Number: [04189260](#) Provisional Data, Subject to Revision

NWS Site ID: [OTTO1](#) Forecast Subject to Revision

Zoom History



OHIO: Blanchard River at Ottawa

Zoom

Flood Tools

Historical Flooding

HAZUS

Web Cam

Services and Data

Blanchard River at Ottawa OH

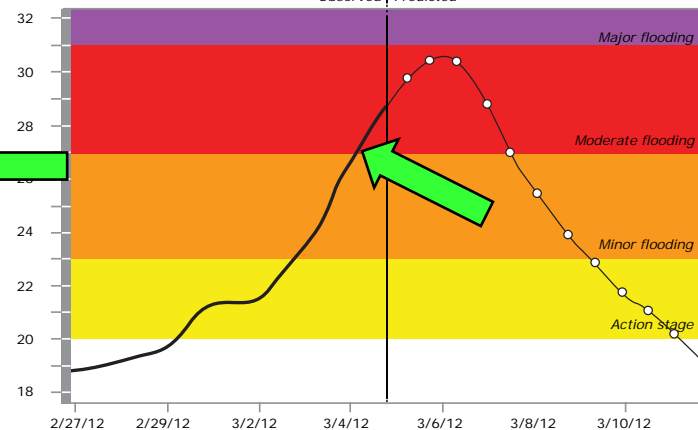
Observed | Predicted

ESTIMATED FLOOD CONDITIONS



Selected Gage Height:
27.00 feet

Selected NAVD88 Altitude:
725.43 feet



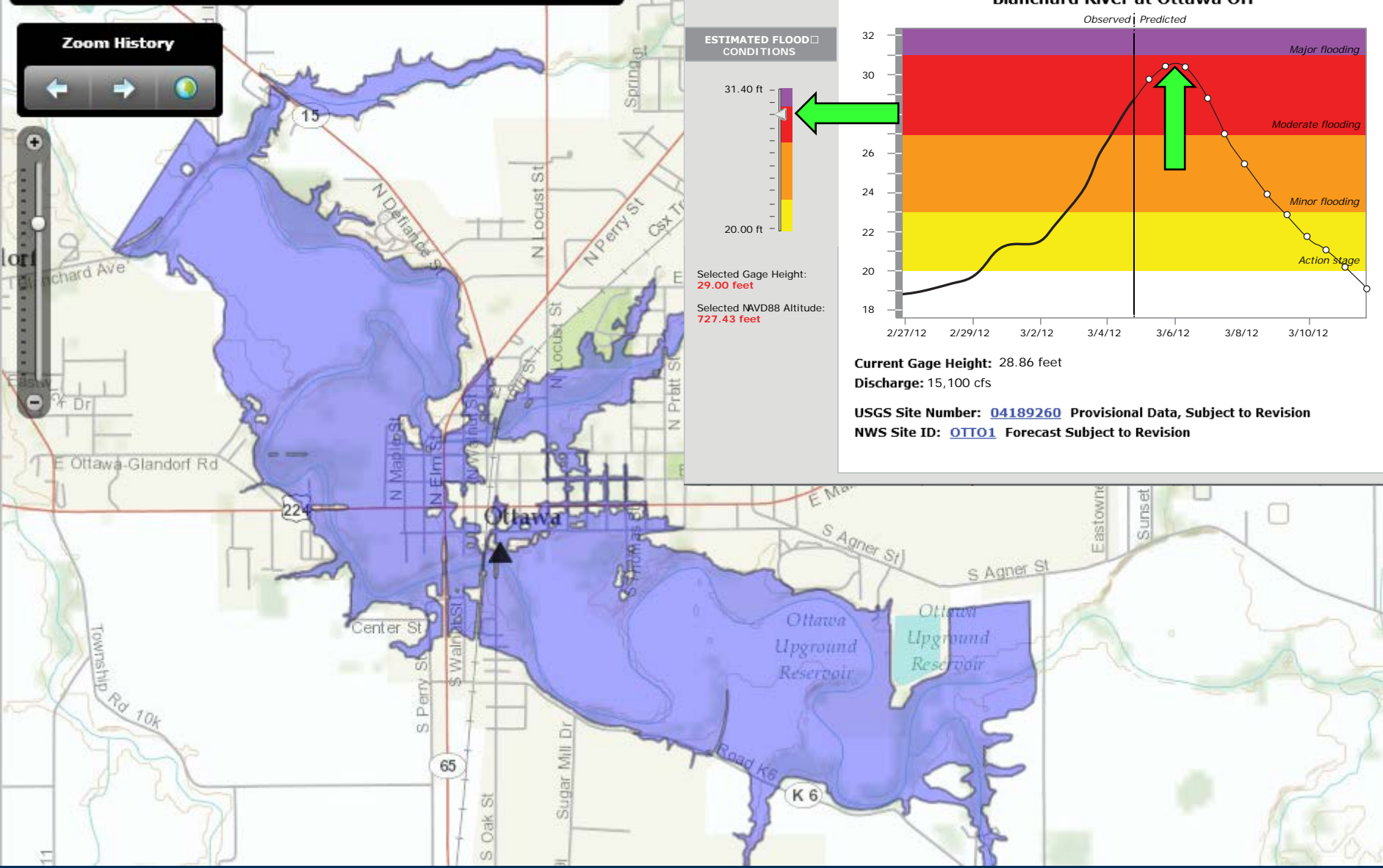
Current Gage Height: 28.86 feet

Discharge: 15,100 cfs

USGS Site Number: [04189260](#) **Provisional Data, Subject to Revision**

NWS Site ID: [OTTO1](#) **Forecast Subject to Revision**

Zoom History



OHIO: Blanchard River at Ottawa

Zoom

Flood Tools

Historical Flooding

HAZUS

Web Cam

Services and Data

Blanchard River at Ottawa OH

Observed Predicted

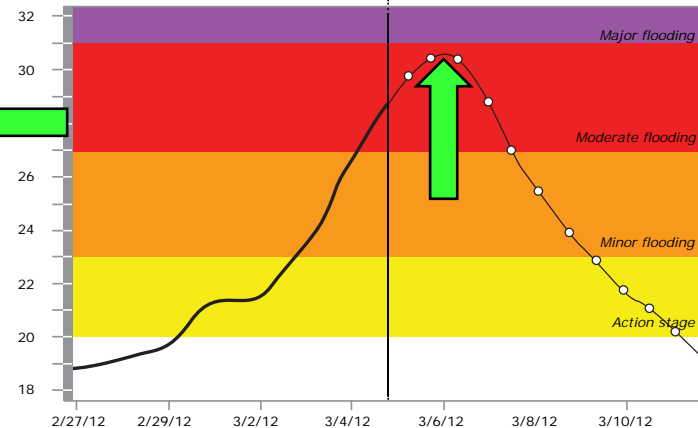
ESTIMATED FLOOD CONDITIONS

31.40 ft

20.00 ft

Selected Gage Height:
29.00 feet

Selected MVD88 Altitude:
727.43 feet



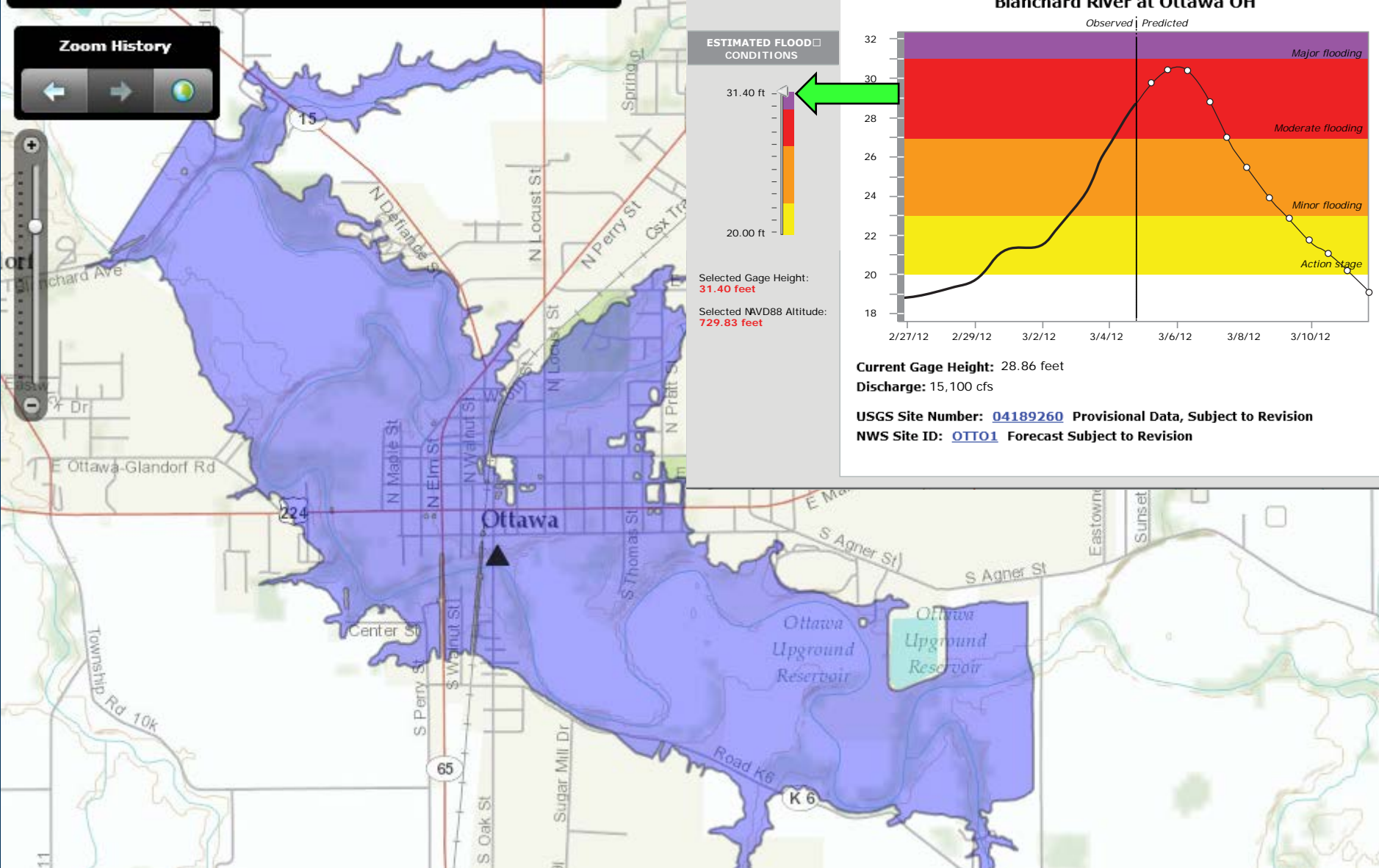
Current Gage Height: 28.86 feet

Discharge: 15,100 cfs

USGS Site Number: [04189260](#) **Provisional Data, Subject to Revision**

NWS Site ID: [OTTO1](#) **Forecast Subject to Revision**

Zoom History



OHIO: Blanchard River at Ottawa

Zoom

Flood Tools

Historical Flooding

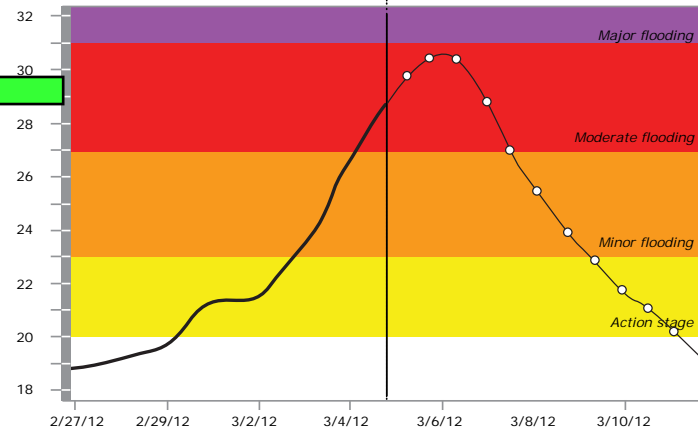
HAZUS

Web Cam

Services and Data

Blanchard River at Ottawa OH

Observed | Predicted



ESTIMATED FLOOD CONDITIONS

31.40 ft

20.00 ft

Selected Gage Height:
31.40 feet

Selected MVD88 Altitude:
729.83 feet

Current Gage Height: 28.86 feet

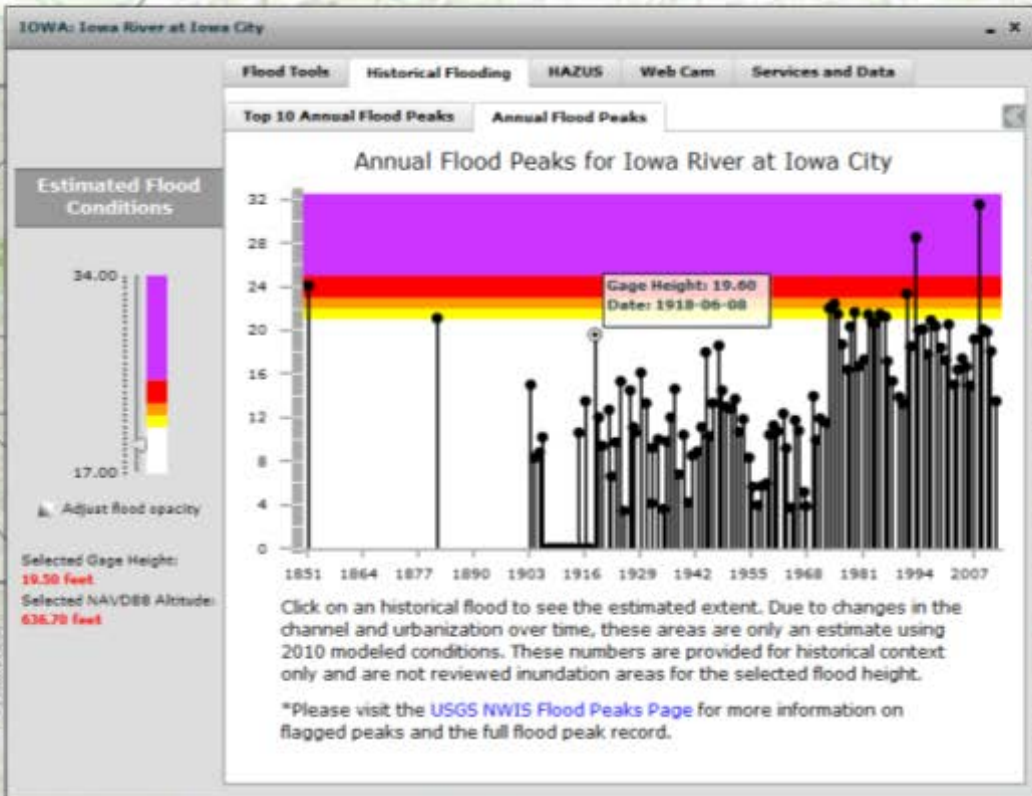
Discharge: 15,100 cfs

USGS Site Number: [04189260](#) Provisional Data, Subject to Revision

NWS Site ID: [OTTO1](#) Forecast Subject to Revision

USGS Flood Inundation Mapper

Zoom History

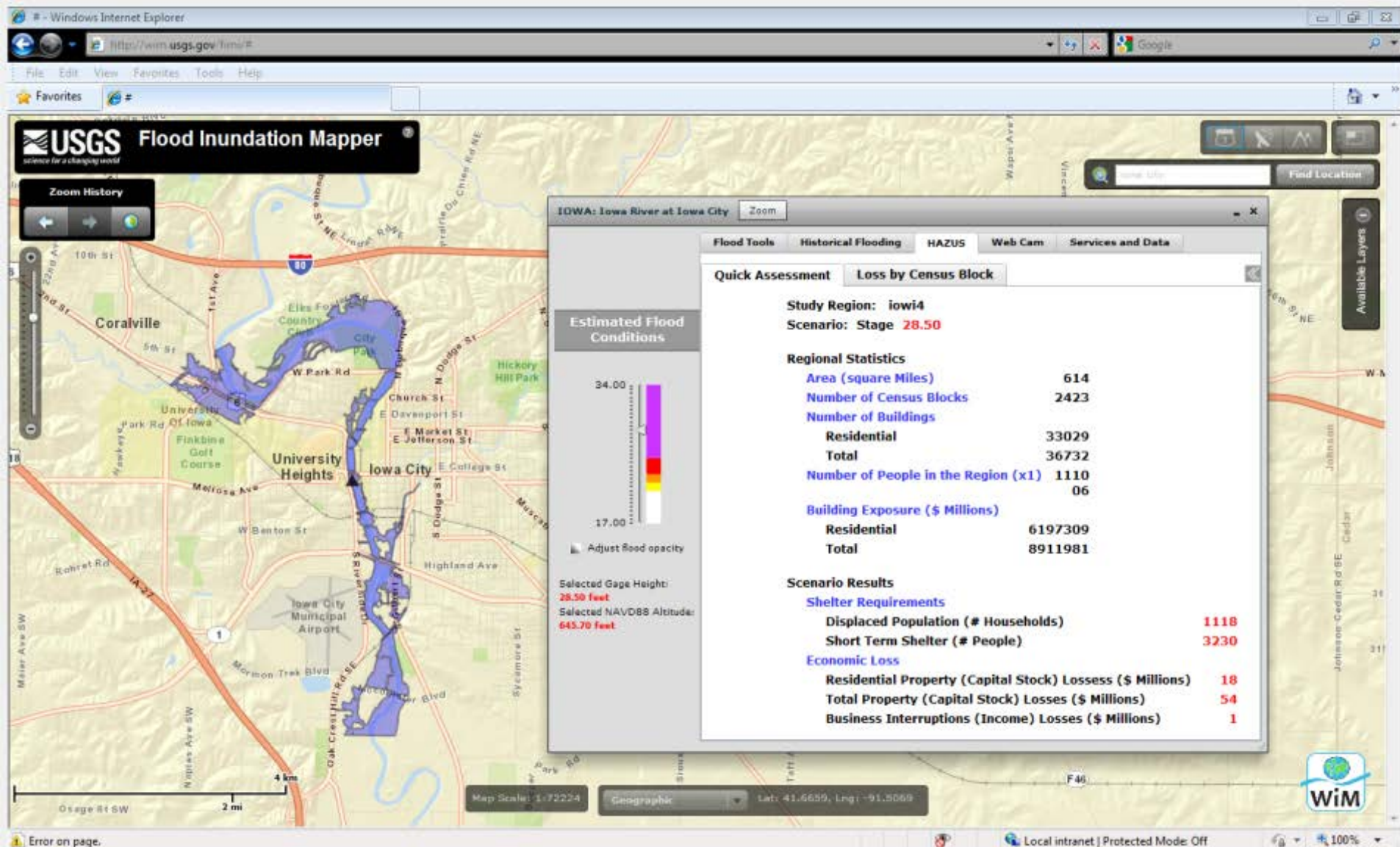


Map Scale: 1:72224

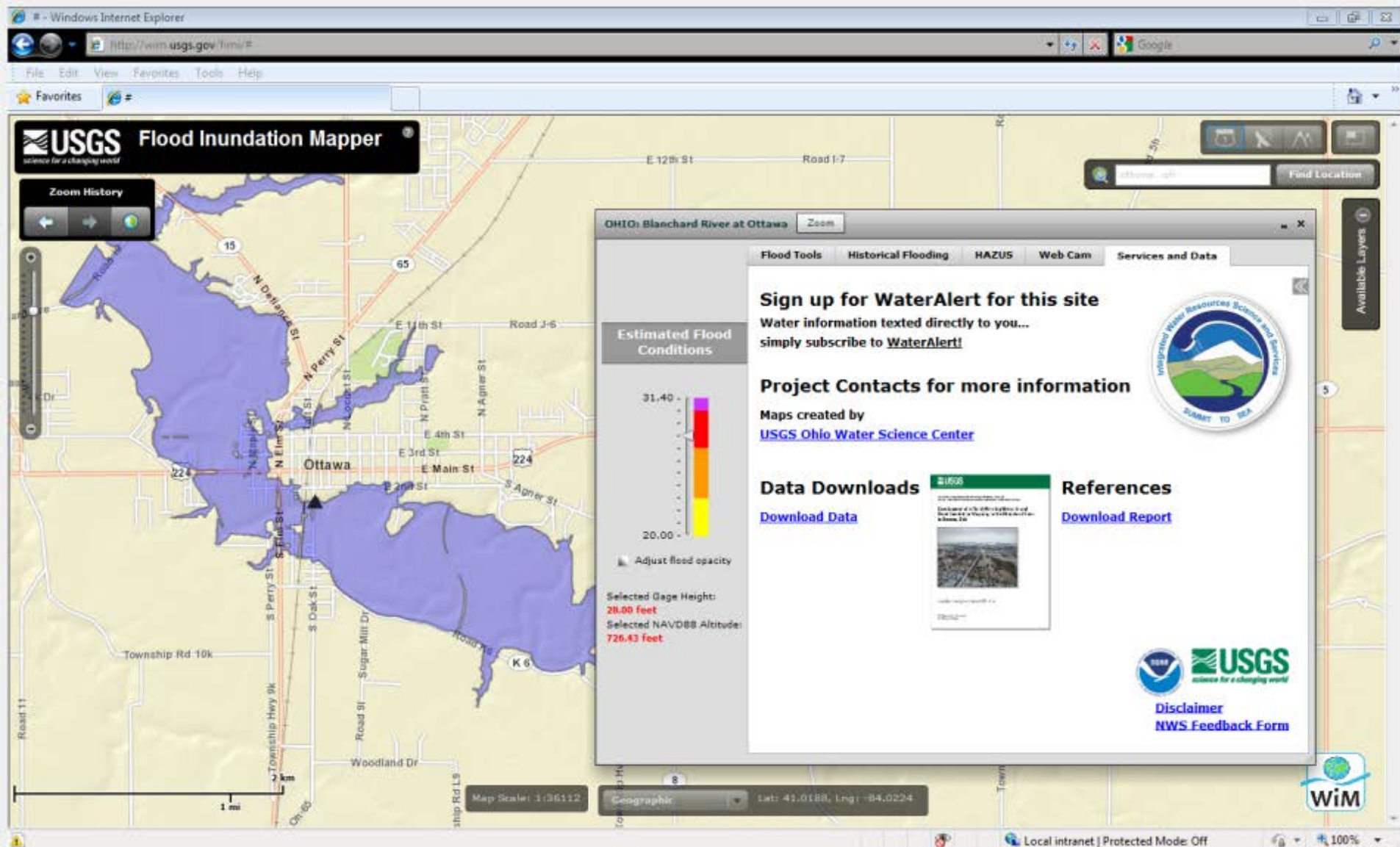
Geographic

Lat: 41.6685, Long: -91.3817

National Weather Service | MET/NASA, DeLorme, NAVTEQ, USGS, Esri, EPA, USDA, TomT...









Flood Inundation Mapper

Zoom History



Water Depth: 8 - 9.5 ft



Program website

- Information Sheet
 - Two page pdf summary
- Mapper Link
 - Mapper Info Sheet
- Toolbox



USGS Flood Inundation - Windows Internet Explorer

http://water.usgs.gov/own/flood_inundation/

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U.S. Geological Survey Flood Inundation Mapping Science

The USGS Flood Inundation Mapping Program focuses its efforts at state and local levels to help communities understand flood risks and make cost-effective mitigation decisions. We partner with local communities to assist in the development and validation of flood inundation map libraries. Communities use these maps to help protect lives and property.

The USGS works with the National Weather Service, the U.S. Army Corps of Engineers, and the Federal Emergency Management Agency to connect communities with available federal resources thereby ensuring the quality and consistency of flood inundation maps across the country.

USGS Flood Inundation Mapping Science Focus Areas

The USGS is working in the following focus areas for flood inundation mapping science:

- † [Flood documentation studies](#)
- † [Static flood-inundation map libraries](#)
- † [Real-time dynamic flood inundation mapping](#)

What is a flood inundation map library?

A flood inundation map library contains a series of sequential maps that help communicate where flooding may occur over a range of river levels. The library can be connected to real-time and forecasted river levels at USGS streamgages to help communities identify immediate risks during a flood.

Learn more about the FIM program with our information sheet!

Inundation maps can be used for:

- † Preparedness - "What-if" scenarios
- † Timely Response - tied to real-time gage and forecast information
- † Recovery - damage assessment
- † Mitigation and Planning - flood risk analyses
- † Environmental and Ecological Assessments - wetlands identification, hazardous spill cleanup

Example hydrograph of a flood:

High flood stage inundation map:

Low flood stage inundation map:

Inundation maps translate flood data into operational maps that communicate risk and the consequences of current and forecasted flooding.

FIM Mapper

The [USGS Flood Inundation Mapper](#) combines the flood inundation map libraries with real-time USGS river-level data and National Weather Service flood forecasts into a powerful tool that helps communicate when and where it may flood and allows for better tools to inform local responses that can protect lives and property.

Learn more about how to use the Mapper with [this information sheet!](#)

FIM Toolbox

The [FIM toolbox](#) is designed to provide USGS personnel and their partners with a comprehensive series of resources that have been developed for the Flood Inundation Mapping Initiative.

Resources include FIM program development tools, flood documentation study tools, flood inundation mapping library tools, information on dynamic flood mapping and FIM links to HAZUS-MH and Integrated Water Resources Science and Services (IWRSS). This toolbox will be updated as new resources become available.

To view PDF files, the latest version of [Adobe Reader](#) (free of charge) or similar software is needed.

USGS Home Water Climate Change Core Science Ecosystems Energy&Env. Health Hazards

Accessibility FOIA Privacy Policies and Notices

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

USA.gov

Local intranet | Protected Mode: Off

100%

Questions



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http://water.usgs.gov/osw/flood_inundation/



Wisconsin Internet Mapping