
BANDERA COUNTY RIVER AUTHORITY
AND GROUNDWATER DISTRICT

*OCTOBER 28, 2017 FLASH FLOOD PUBLIC
INFORMATION MEETING*

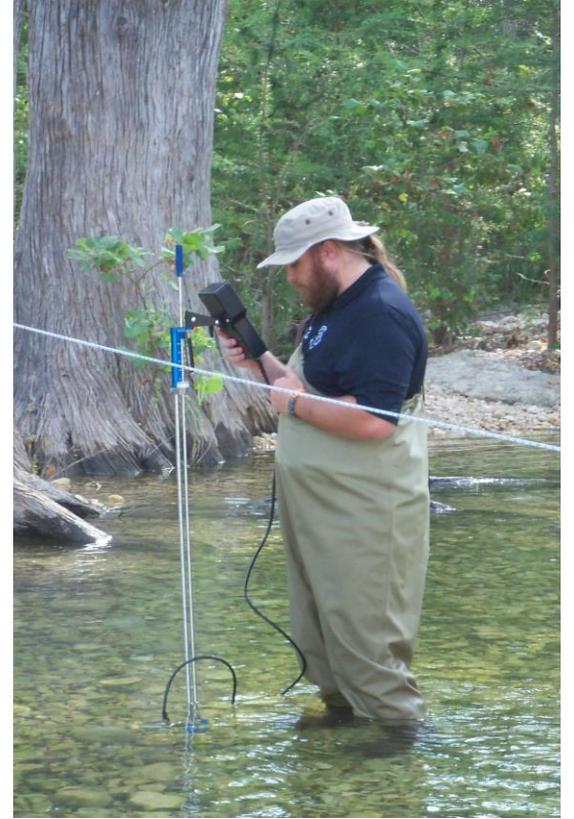
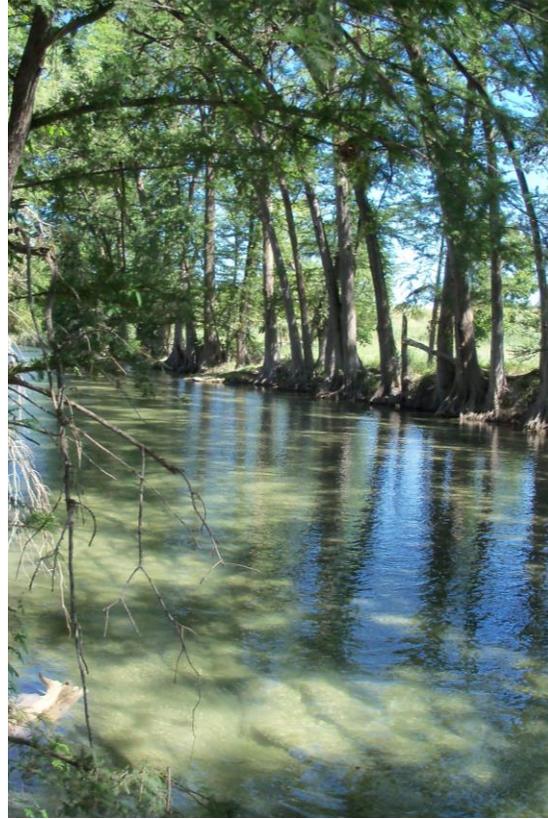
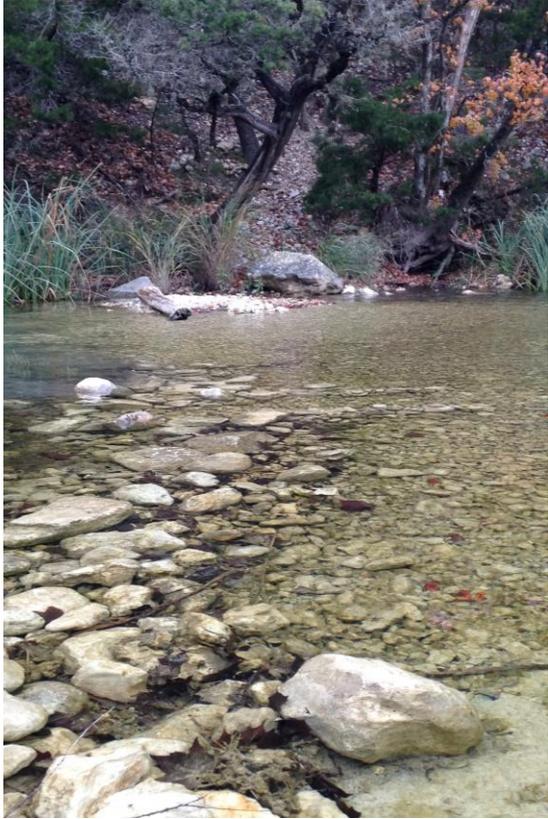


Mission statement

▶ The principal mission of the Bandera County River Authority and Groundwater District is to protect and preserve the County's water and natural resources for the citizens of Texas. The District is also tasked with maintaining local accountability of the County's water resources to help safeguard the property rights of the citizens of Bandera County.



PRESERVING AND PROTECTING THE AQUIFERS



PRESERVING AND PROTECTING THE HEADWATERS



2002, 2012, 2015, 2016 Flood Events

Update of Progress on TWDB Awarded Flood Protection Grant for Bandera County in Cooperation with USGS

Local Funding Partners

Bandera County

City of Bandera Economic Development Coop

Bandera County River Authority and Groundwater District

The following 15 slides are a USGS presentation on the scope of the flood project for Banderera County

Development of a Flood Warning Tool Set for Bandera County, Texas

U.S Geological Survey, South Texas Program Office



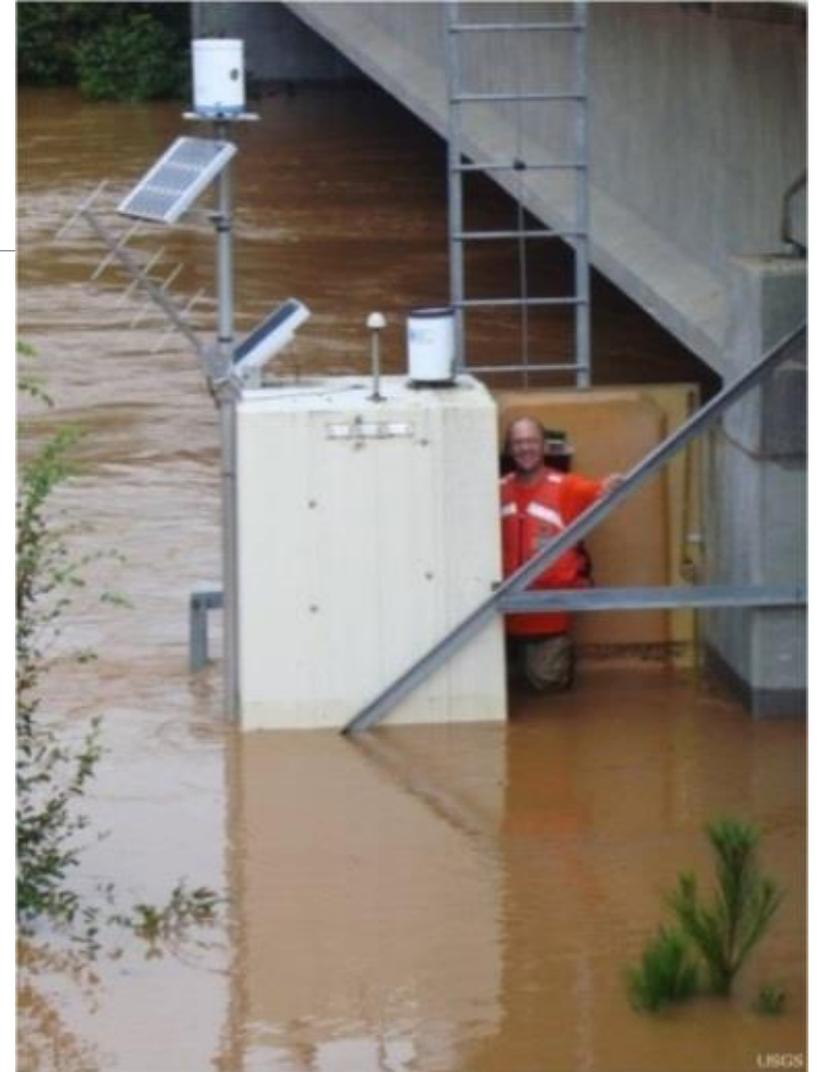
Outline

Introduction

Key elements of a FWS

Where can the USGS help

Questions



Introduction

What is a Flood Warning System?

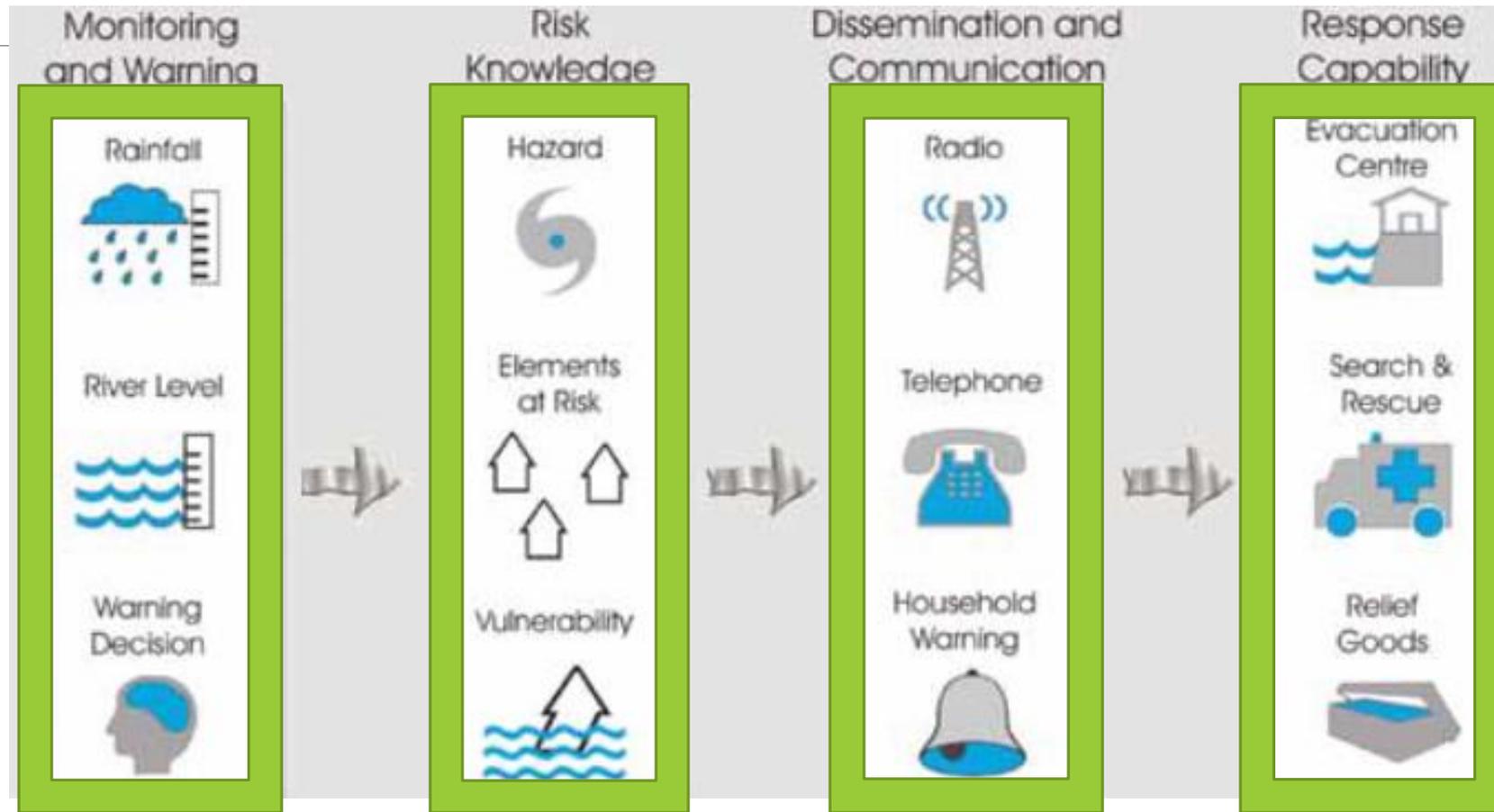
Subsystems used to monitor, predict and warn of a impending flood or flash flood.

What is a Flood Atlas?

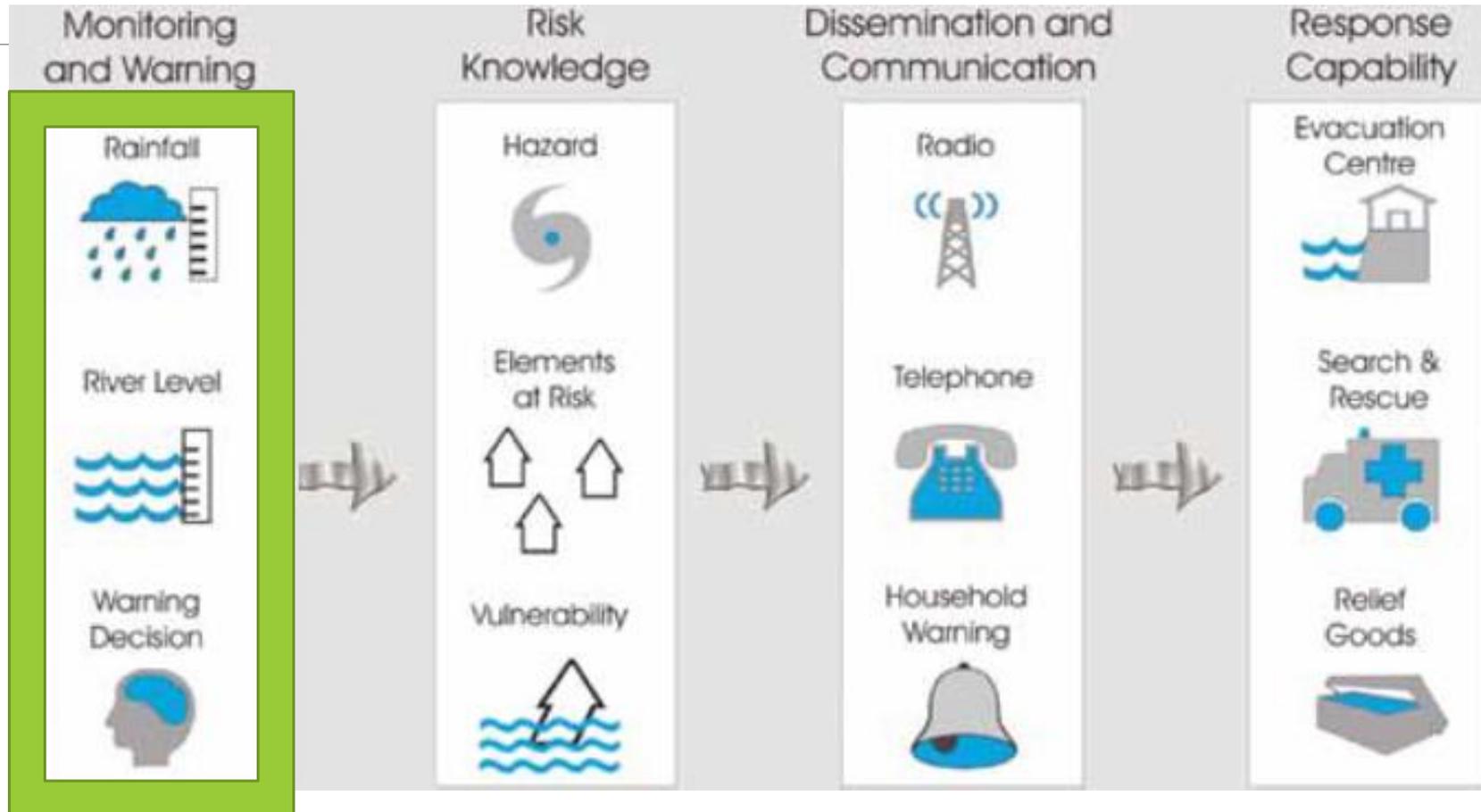
A series of sequential maps that help communicate where flooding may occur over a range of river levels.



Key Elements of a FWS

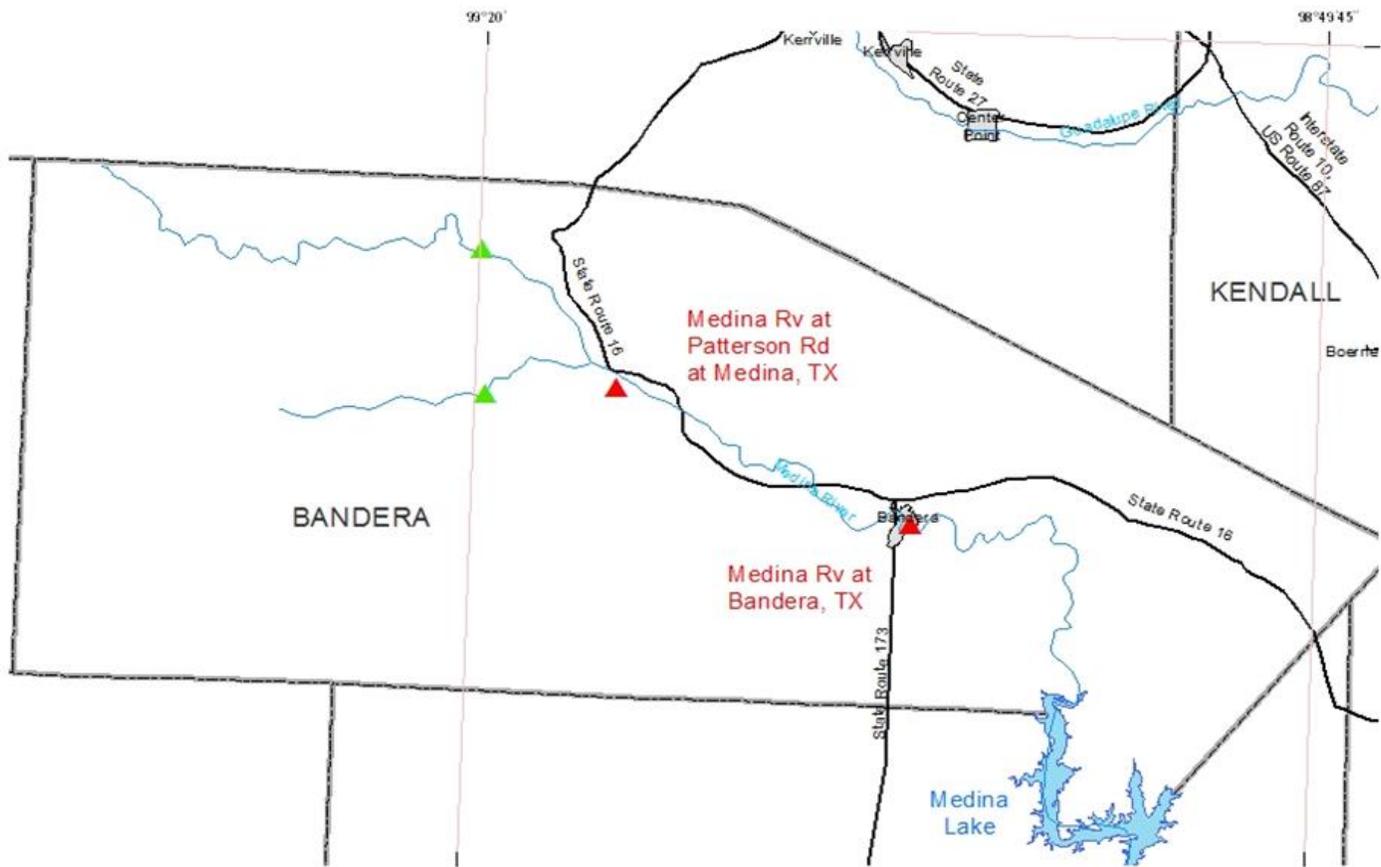


Where Can The USGS Help?



Installation of additional stage-only gages

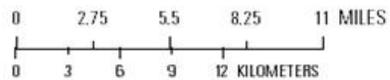




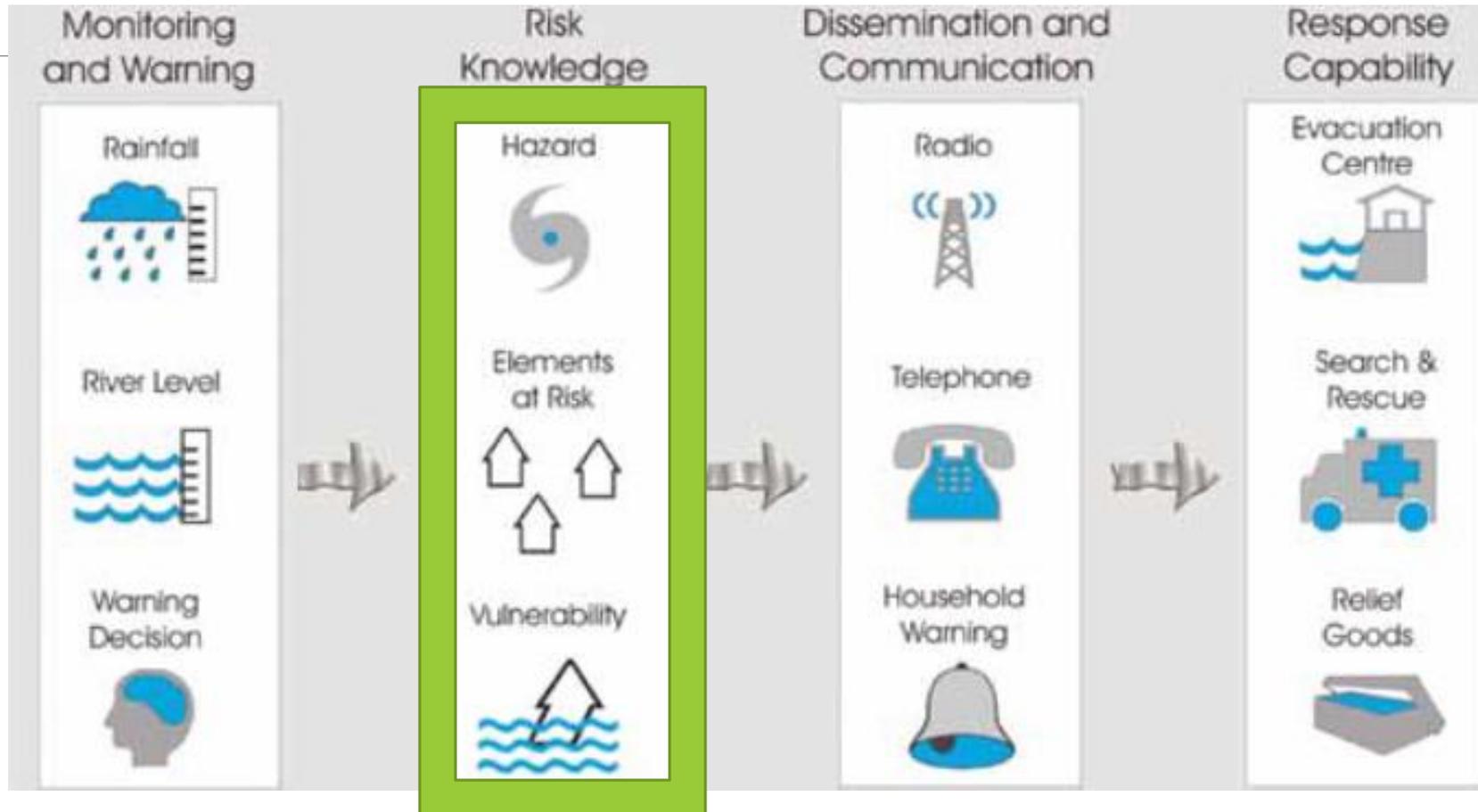
Install Two Additional Stage-Only Gages

EXPLANATION

-  Lakes
-  City Limits
-  Rivers
-  Proposed Additional Gaging Stations
-  USGS Gaging Stations



Where Can The USGS Help?



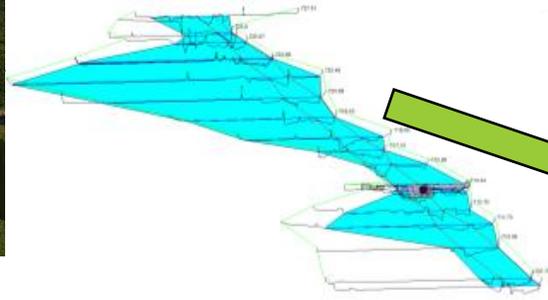
Creation of Flood Inundation Maps and Flood Atlas.



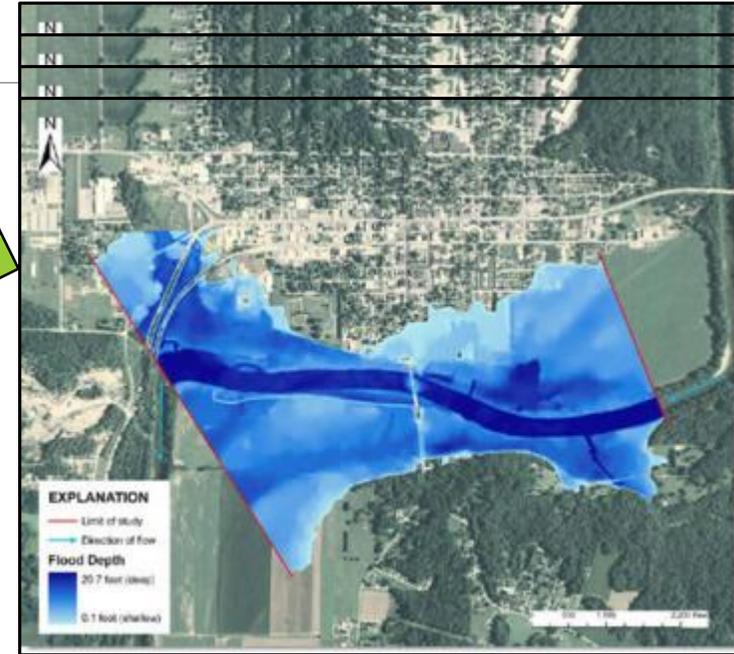
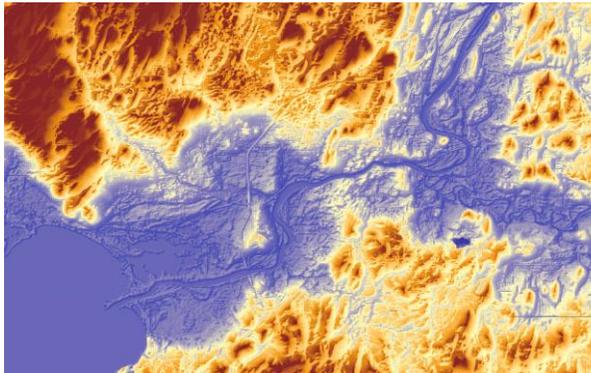
Creation of Flood Inundation Maps



Hydraulic Modeling



Geospatial Processing

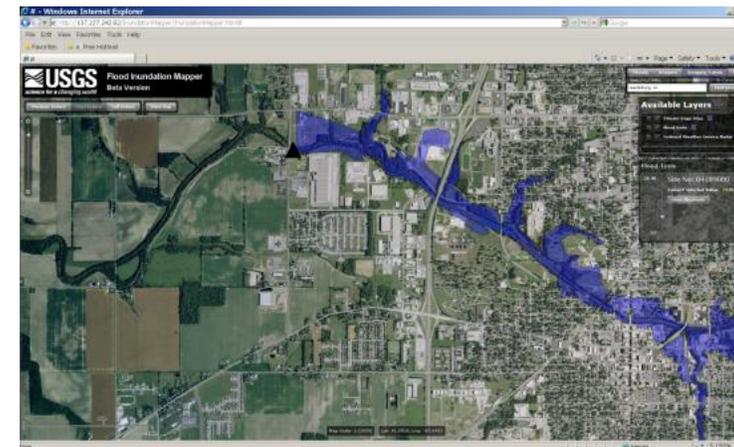
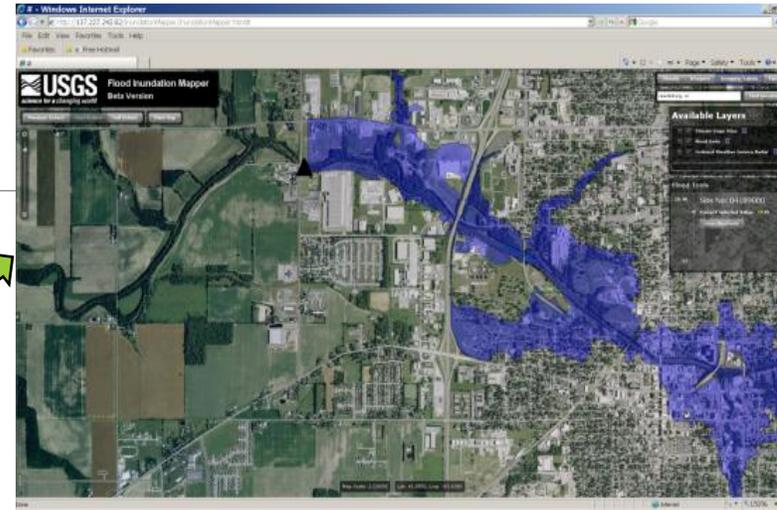
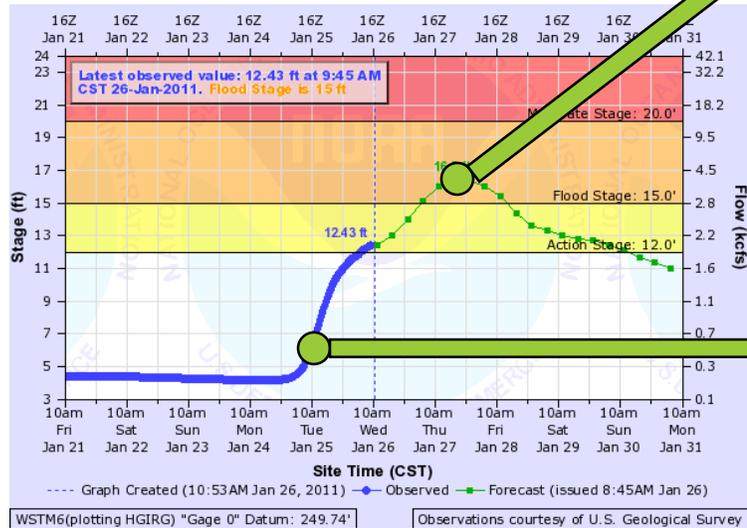


Series of sequential maps showing probable areas of flooding (Flood Atlas)



Develop Flood Atlas

Flood Inundation Maps translate a hydrograph, at different stages, into operational maps that communicate risk and consequences



Flood Atlas

A Flood Atlas becomes a tool for flood...

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

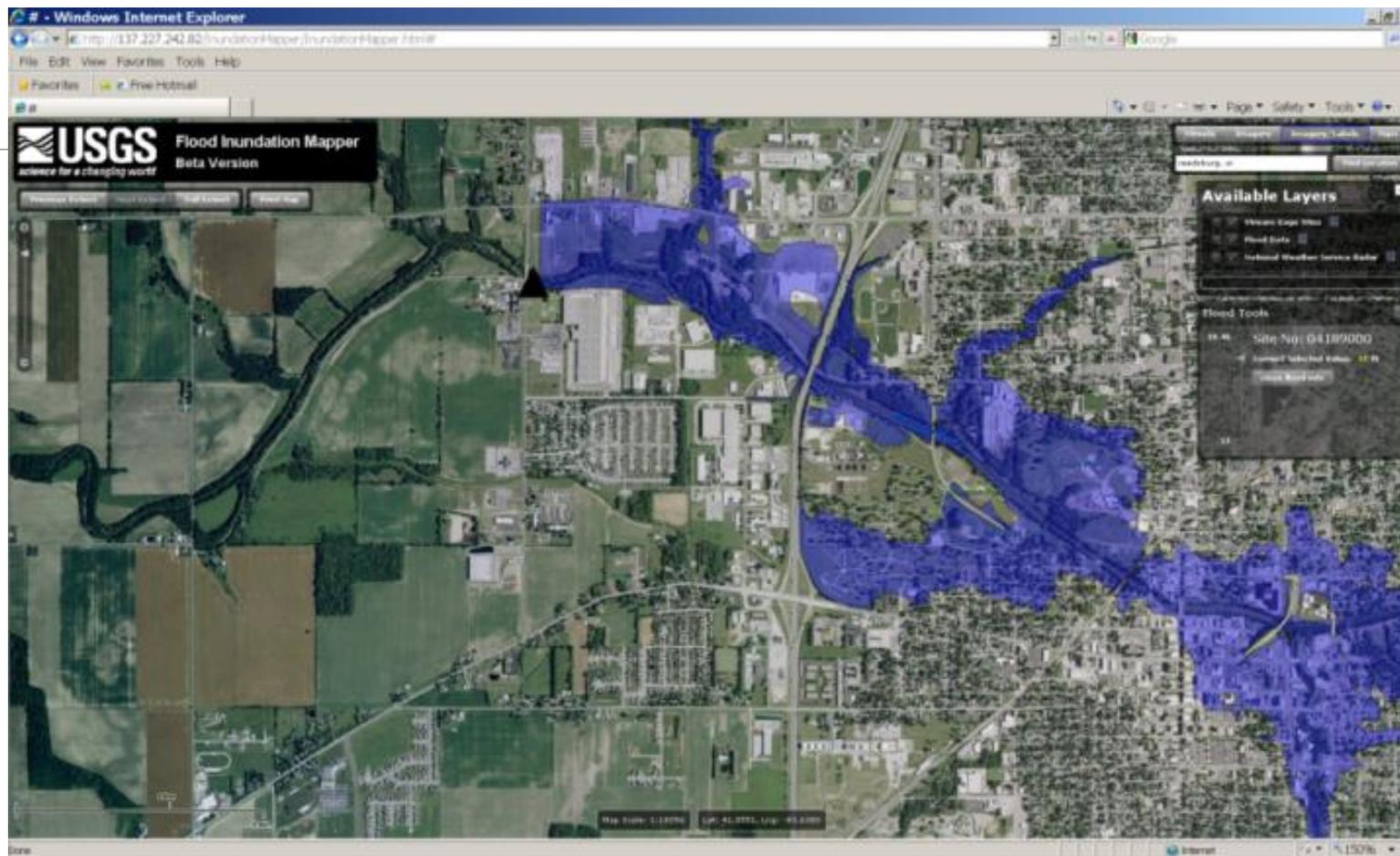
Medina Lake - 2002



Photo Courtesy of Jerry Sides



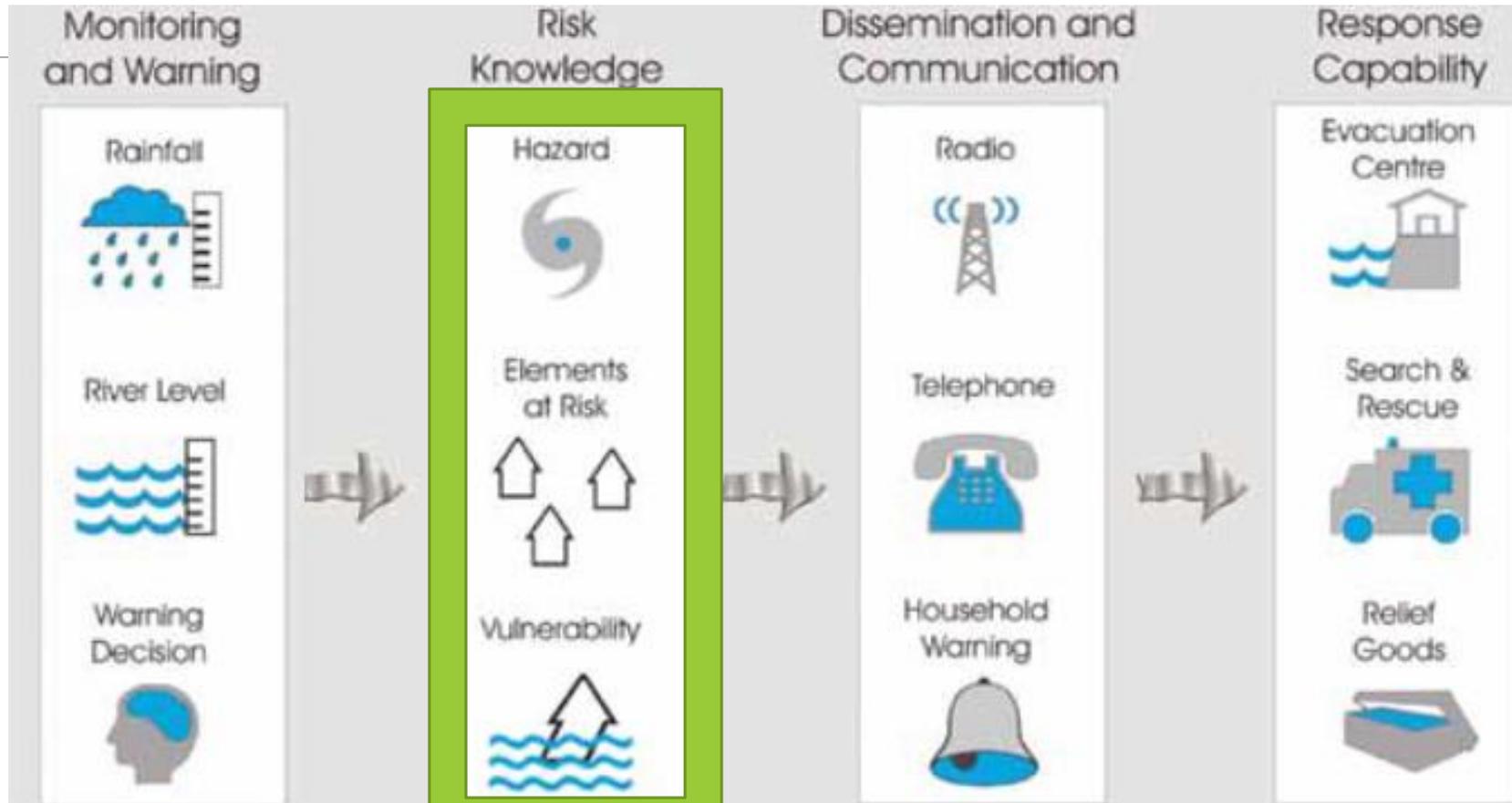
FIM Web Mapping Application



<http://wim.usgs.gov/FIMI/>



Where Can The USGS Help?



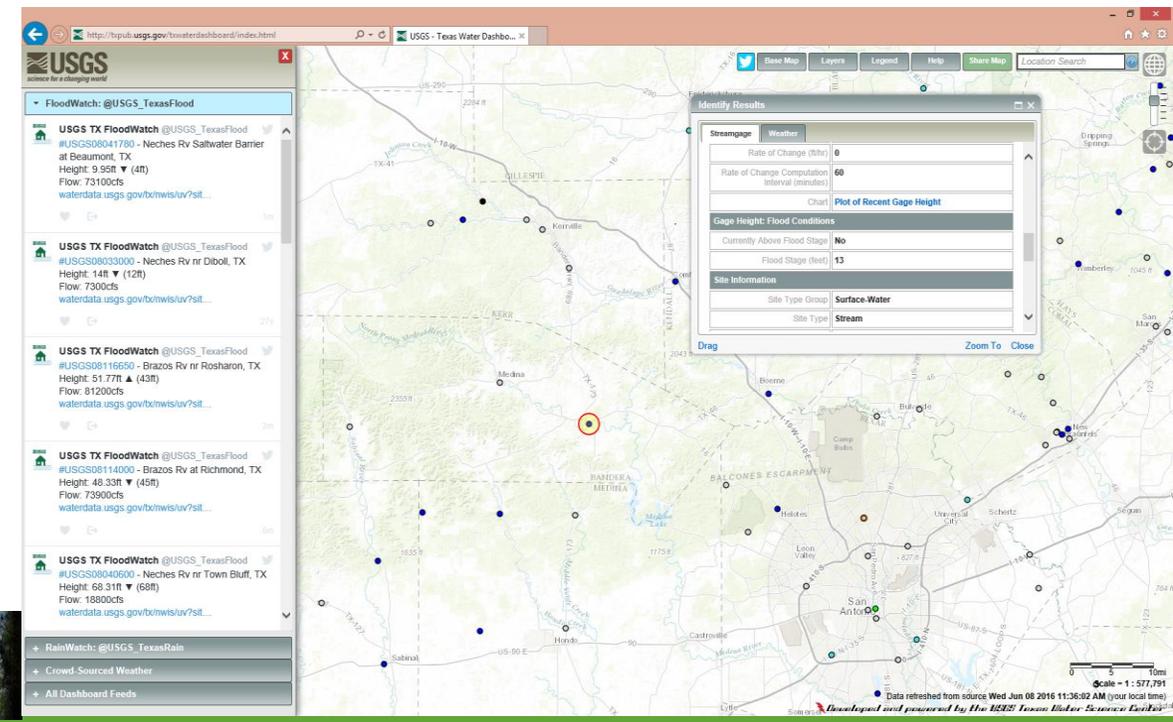
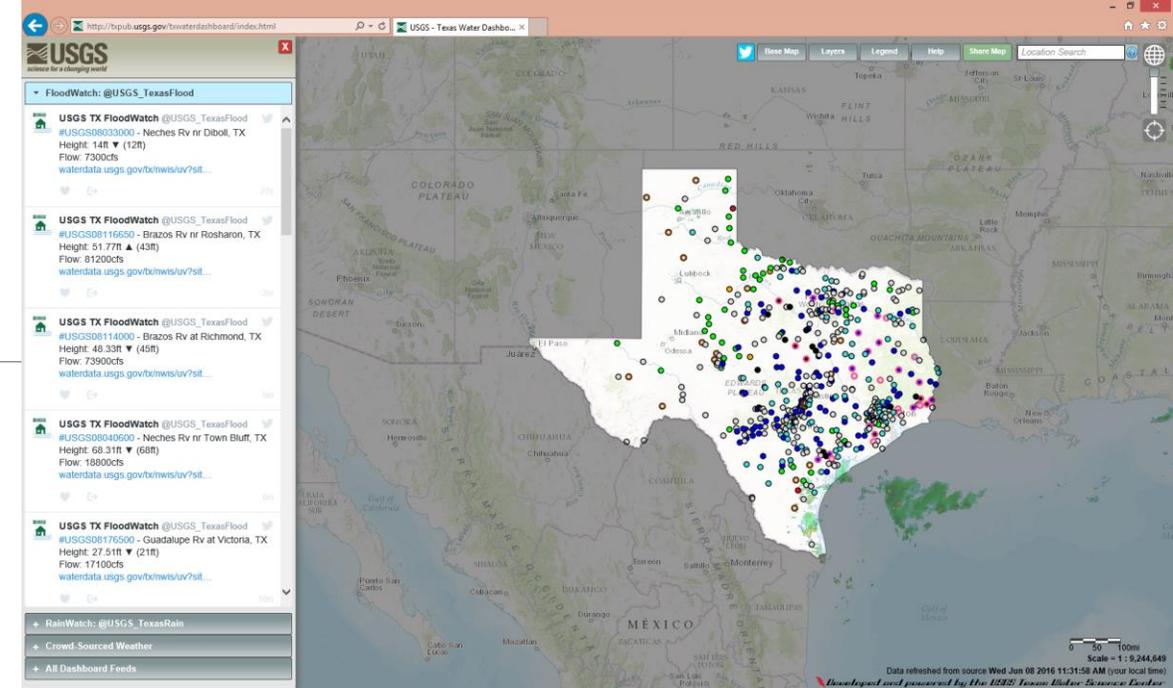
Development of Decision Support System



Decision Support System

- A mapping application interface that provides a basin-wide common perspective for water resource managers
- DSS will incorporate data from:
 - National Weather Service
 - USGS
 - After Action Reports (AAR)
- Similar to a Texas Water Dashboard

<http://txpub.usgs.gov/txwaterdashboard/index.html>



Summary

- Key Elements of a FWS
- Where Can the USGS Help
 - General Approach
 - Installation of Additional Gages
 - Create Hydrologic Atlas
 - FIM Web Mapping Application
 - Decision Support System (DSS)

Upper Medina River near Bandera, Tx. -2002



Photo Courtesy of Jerry Sides



Medina River at Bandera City Park, Bandera, Texas

End of USGS presentation slides

South Texas Program Office
210-691-9219

Photo courtesy of Larry B. Thomas



Flood Project Updates & Additional Resources

*OCTOBER 28, 2017 FLASH FLOOD PUBLIC
INFORMATION MEETING*

West Prong Medina River @ Carpenter Creek



- *Installed and Operational as of September 2017*
- USGS site # 08178871

https://nwis.waterdata.usgs.gov/nwis/uv/?site_no=08178871

North Prong Medina River @Brewington Crossing

*Expected Installation start by
end of November 2017*

Website Access- <http://www.bcragd.org/river-gages/>

[About](#) ▾ [Groundwater](#) ▾ [Surface Water](#) ▾ [Medina Lake](#) [Environmental Services](#) ▾ [Flood Management](#) ▾ [Education](#) ▾ [Transparency](#)

Rainfall & River Gauges

[Home](#)

Rainfall & River Gauges

Click on the links to the following locations in Bandera County to access real-time data:

[Weather Station at Bandera County River Authority Office](#)

[USGS Medina River Gauge at Medina Rv in Bandera, TX](#)

[USGS Medina River Gauge above English Crossing](#)

[Rain Gauge at Hwy 187 \(North of Lost Maples\)](#)

[USGS Sabinal River Gauge](#)

[USGS Medina River Gauge at Patterson Ave. \(Moffett Park\) in Medina, TX](#)

[USGS Gauge at Medina Lake, Texas](#)

[USGS West Prong Medina River at Carpenter Road Crossing](#)

For a view of state-wide river gauge data, click below:

[TWDB TexasFLOOD](#)



Weather Station @ BCRA GD

440 FM 3240
Bandera, TX

Weather Station online viewing



MED_ET1_BCRAGD Office WS

Latest Conditions

Smart Sensors

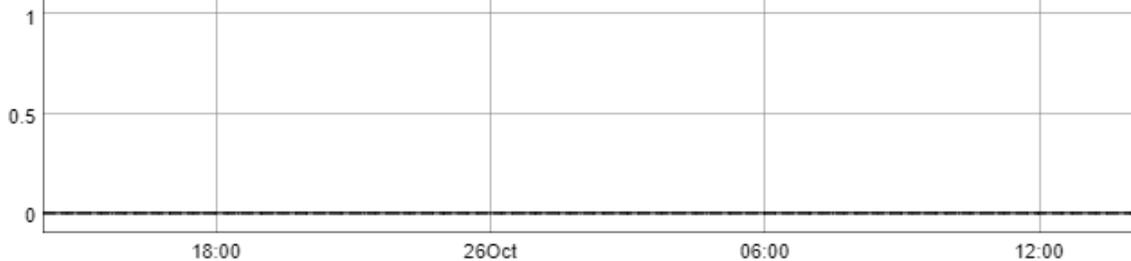
- Rain: 0.00 in
- Temperature: 82.75 °F
- RH: 34.90 %
- Dew Point: 52.27 °F
- Pressure: 28.480 inHg
- Wind Speed: 6.8 mph
- Gust Speed: 19.6 mph
- Wind Direction: SSW 201 °
- Solar Radiation: 0.721 KW/m²
- Water Content (Shallow): 0.2683 m³/m³
- Water Content (Deep): 0.3240 m³/m³
- Battery: 4.418 V

Activity Log

Graphs

Past Day Past Week Past Month

Rain in Past Day: 0.00 in



Rain: in
10425048-1
Hourly Totals



Temperature: °F
10419949-1



Medina River
@ Patterson
Ave Medina, TX
(Moffett Park)

Online Stream Gage Example from 2012 flood event: Medina River @ Patterson Ave Medina, TX (Moffett Park)

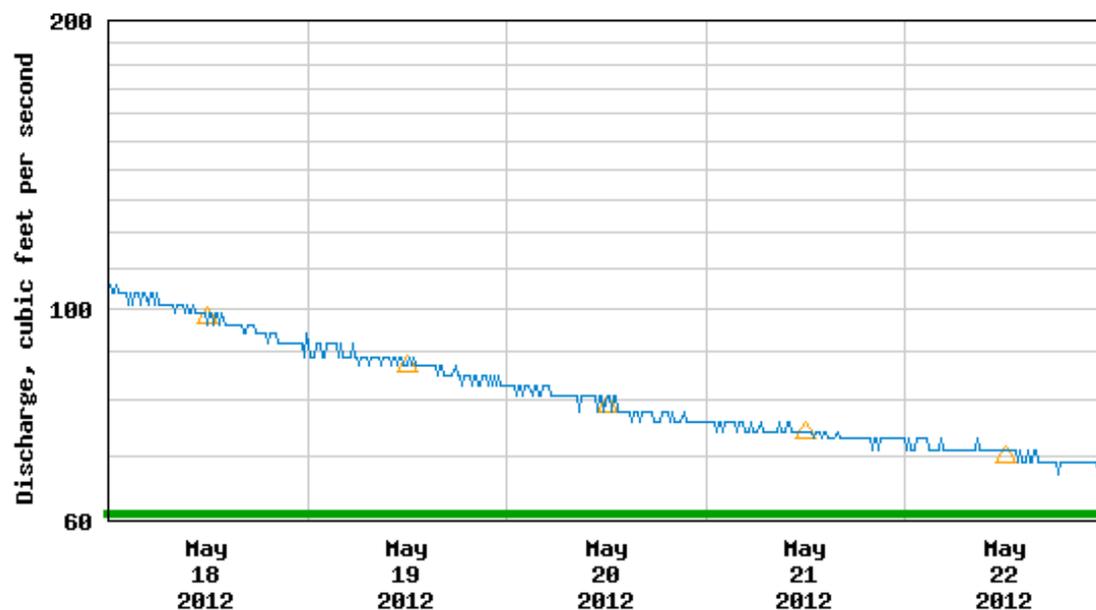
Discharge, cubic feet per second

Most recent instantaneous value: 72.5 10-27-2017 11:15 CDT

Gage height, feet

Most recent instantaneous value: 4.47 10-27-2017 11:15 CDT

USGS 0817887350 Medina Rv at Patterson Rd at Medina, TX

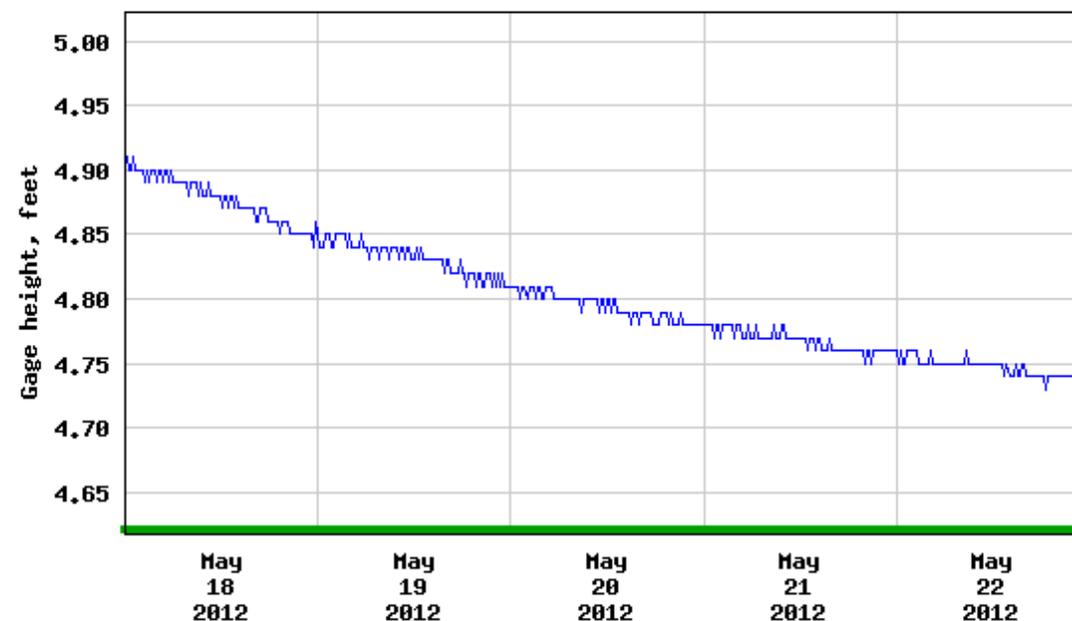


△ Median daily statistic (5 years) — Period of approved data
— Discharge

Create [presentation-quality](#) / [stand-alone](#) graph. Subscribe to [WaterAlert](#)

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USGS 0817887350 Medina Rv at Patterson Rd at Medina, TX



— Gage height — Period of approved data

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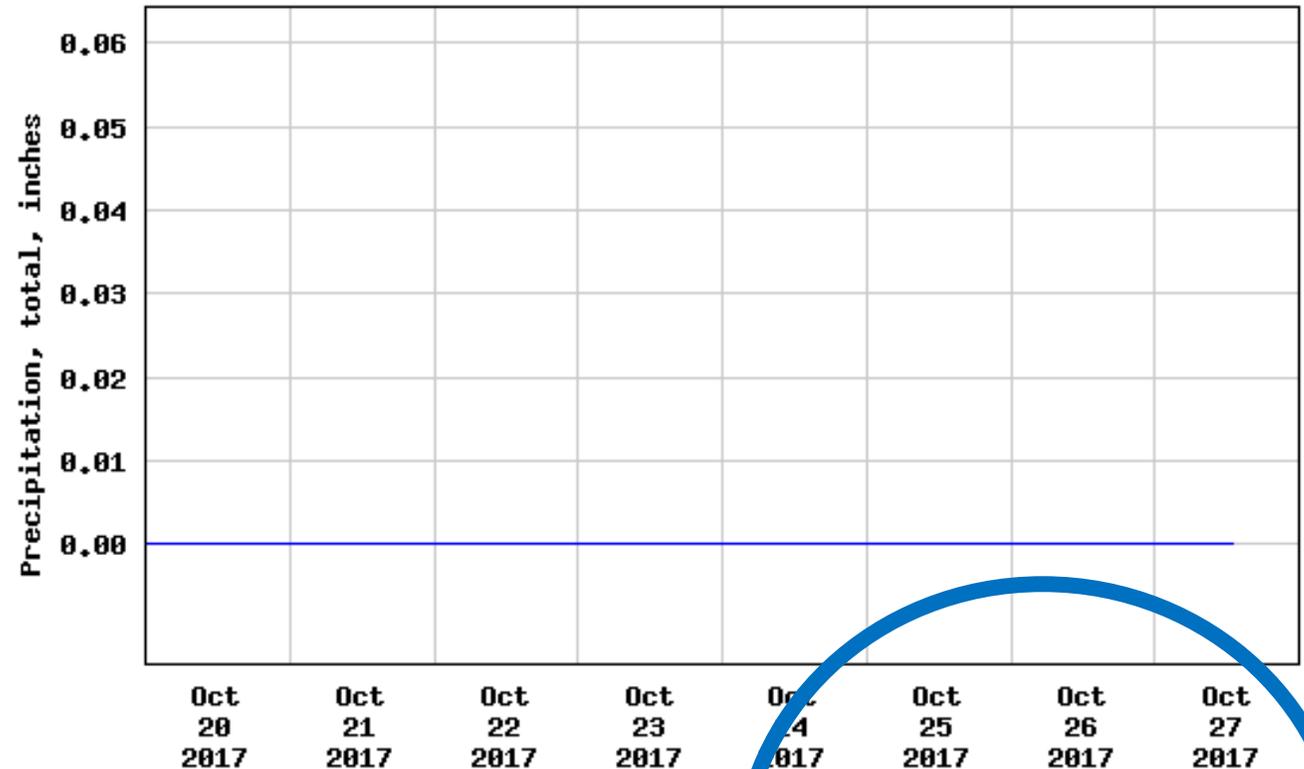
Subscribe to
USGS
WaterAlert
from any
gauge link

<http://www.bcragd.org/river-gages/>

Precipitation, total, inches

Most recent instantaneous value: 0.00 10-27-2017 13:00 CDT

USGS 08178871 W Prong Medina Rv at Carpenter Ck Rd nr Medina, TX



----- Provisional Data Subject to Revision -----

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Subscription Form

Subscription Form

The U.S. Geological Survey WaterAlert service sends e-mail or text (SMS) messages when [certain parameters](#), as measured by a USGS real-time data-collection station, exceed user-definable thresholds. The development and maintenance of the WaterAlert system is supported by the USGS and its partners, including numerous federal, state, and local agencies.

Real-time data from USGS gages are transmitted via satellite or other telemetry to USGS offices at various intervals; in most cases, 1 to 4 times per hour. Emergency transmissions, such as during floods, may be more frequent. *Notifications will be based on the data received at these site-dependent intervals.*

Site Info:

Number: 08178880
Name: Medina Rv at Bandera, TX
Agency: USGS
Transaction ID: sTVM3

Send Notification To:

[about this...](#)

- My mobile phone
 My email address

Notification Frequency:

[about this...](#)

- Hourly
Daily

Streamflow Parameter(s):

[about this...](#)

Recent value:

Discharge, in ft³/s

23.4 [\[peak chart\]](#)

Alert Threshold Condition:

[about this...](#)

- Greater than (>)
 Less than (<)
 Outside a range (< or >)
 Inside a range (> and <)

Real-time value is greater than: ft³/s

I have read and acknowledge the [Provisional Data Statement](#) and [Disclaimer](#).

Submit

Reset

Cancel

WaterWatch

Home

Current Streamflow

Flood

Drought

Past Flow/Runoff

Animation

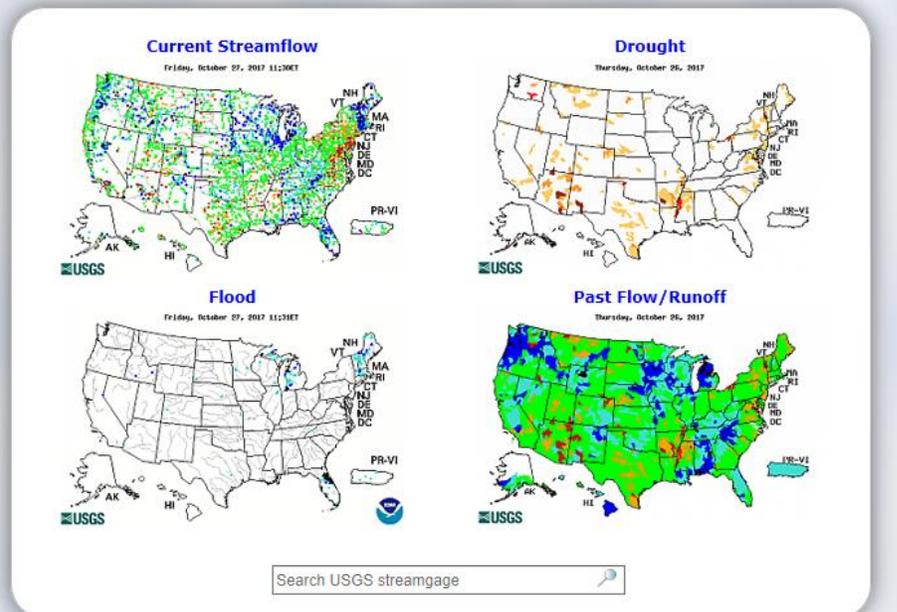
Toolkit

Annual Summaries

Additional Information

About WaterWatch

Search We



Additional
Resource: USGS
WaterWatch
[https://waterw
atch.usgs.gov/](https://waterwatch.usgs.gov/)

Texas Water Development Board (TWDB) - [TexasFlood.org](https://www.texasflood.org)

[Home](#) [Board](#) [SWIFT](#) [Financial Assistance](#) [Water Planning](#) [Groundwater](#) [Surface Water](#) [Flood](#) [Conservation](#) [Innovative Water](#)



TWDB- “Are the Rivers Near Me Rising?”

TEXAS FLOOD.org

MAP LAYERS

- Flood Gages
 - Major
 - Moderate
 - Minor
 - Action
 - No Flooding
 - Low
 - Stage Not Defined
 - Observations Not Current
 - Out of Service
- Lake Conditions
- Weather Alerts
- Weather Radar

SIGN IN

Resources About Contact

Texas Water Development Board TNRIS

Leaflet | Tiles © Esri — Source: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012, NOAA National Weather Service

TWDB- [TexasFlood.org](https://texasflood.org)

You can subscribe to mobile alerts via USGS gages by going to texasflood.org. From there, click "Are the rivers near me rising?" and zoom into your area. Then click the dots near you to see river gage info along with the option to subscribe to mobile alerts.

Road conditions can also be accessed from texasflood.org. From there, click "I need to evacuate, which roads are open?"

Connect on Social Media

Follow @USGS_TexasFlood and @USGS_TexasRain on Twitter to get current water level and precipitation data during flooding or severe rainfall events.

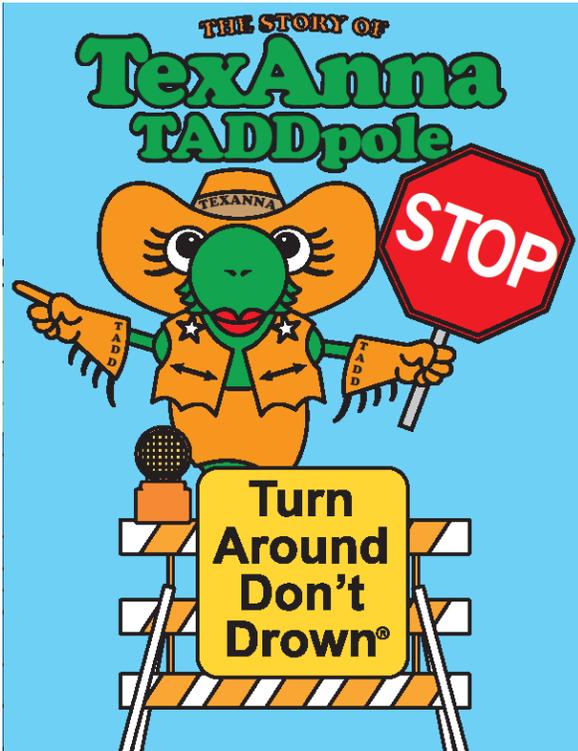
Texas Floodplain Management Association (TMFA)



Organization of professionals with a wide range of experience and expertise in:

- Floodplain Management
- Flood Hazard Mitigation
- National Flood Insurance Program (NFIP)
- Flood Preparedness
- Flood Warning
- Flood Awareness

TFMA Major Programs



- Professional Certified Floodplain Managers (CFM) Program
- Education and Training
- Mentor Program
- Governmental Relations
- Freeboard Survey
- Public Outreach

Video by Travis County STAR Flight

This is Flash
Flood Alley
because of a
Repeated
Reality

NEVER drive into a flooded roadway, it only takes **ONE** foot of moving floodwaters to carry away a car.

Also, be aware that roads may be damaged underneath floodwaters.



Contact TFMA

P.O. Box 1237
Cedar Park, Texas 78630
Phone: (512) 260-1366
Fax: (512) 260-1409
Web Site: tfma.org
NEW Email: tfma@tfma

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<https://www.facebook.com/TXFMA>



Thank you to Today's Collaborators!

National Weather Service

Bandera County Emergency Management

Bandera Electric Cooperative (host)