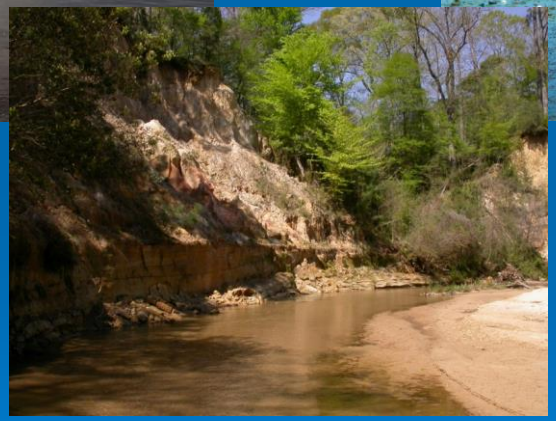
USGS Surface-Water Monitoring Activities in Louisiana



Presented to the Louisiana Water Resources Commission
by John K. Lovelace, September 27, 2017

USGS

Local, State, and Federal Partner Agencies

Sabine River Compact Commission

Bayou Lafourche Fresh Water District

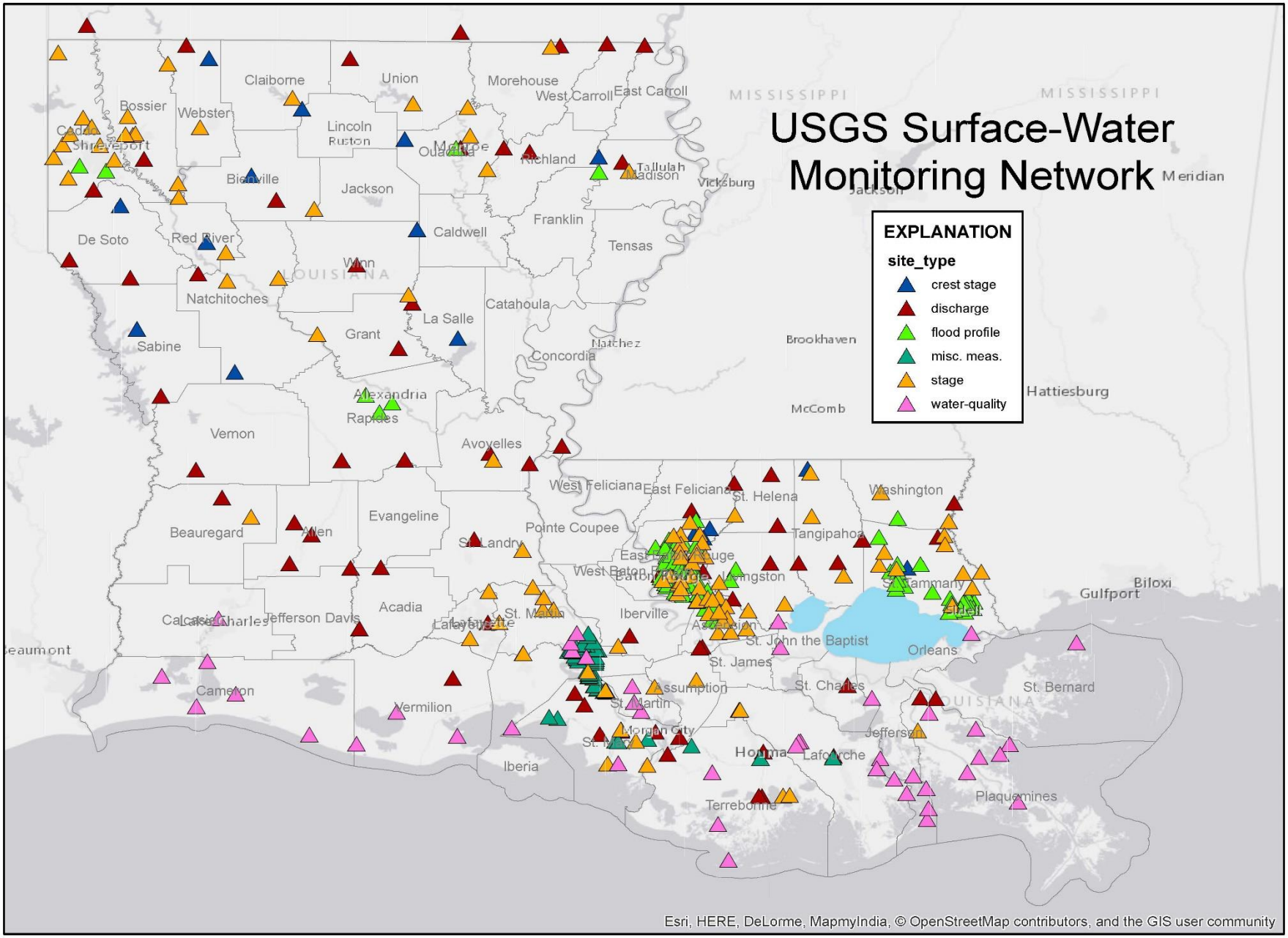
USGS

Data Network—Streams, Lakes, Reservoirs, and Coastal Areas

- Surface Water
  - 24 Index-Velocity sites
  - 53 Stage-Discharge sites
  - 123 Continuous Stage sites
  - 131 Crest-Stage sites
  - 7 Flood-Profile sites
- Water Quality
  - 40 Continuous Monitor Sites
  - 4 NASQAN Sites

USGS
science for a changing world

USGS


USGS Surface-Water Monitoring Network
EXPLANATION
site_type
crest stage
discharge
flood profile
misc. meas.
stage
water-quality
Claiborne
Union
Morehouse
West Carroll
East Carroll
Bossier
Webster
Lincoln
Ruston
Richland
Tallulah
Madison
Vicksburg
Bienville
Jackson
Franklin
Caldwell
Tensas
De Soto
Red River
Winn
Natchitoches
Catahoula
La Salle
Grant
Sabine
Concordia
Natchez
Brookhaven
McComb
Hattiesburg
Alexandria
Rapides
Vernon
Avoyelles
West Feliciana
East Feliciana
St. Helena
Washington
Tangipahoa
Beauregard
Allen
Evangeline
Pointe Coupee
St. Landry
Baton Rouge
Livingston
St. Tammany
Biloxi
Gulfport
Jefferson Davis
Acadia
St. Martin
Iberville
Lafayette
St. John the Baptist
Orleans
St. James
Cameron
Vermilion
Assumption
St. Charles
St. Bernard
Jefferson
Morgan City
Houma
Lafourche
Iberia
Terrebonne
Plaquemines
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Traditional gage construction with stilling well and submersible pressure transducer.

In addition to stage and discharge, many sites also measure rainfall, wind speed, and wind direction.

USGS

Power supply, data recorder, and transmission equipment. Many of these gages are “real-time” and data are typically transmitted to the internet hourly via GOES satellite.

USGS


Newer gages use non-contact radar sensors to measure the water level. These gages can be better located to capture the full range of stage because no in-channel structure is required.

Typical coastal installation on channel marker

USGS

Coastal Monitoring Network

- 40 Continuous monitoring stations
  - 25 Traditional stations
    - LWF Shrimp/Oyster season
    - DNR Diversion operation
  - 10 CRMS stations
    - Marsh health
  - 5 Hurricane hardened stations
    - Hurricane monitoring
- Typical Parameters
  - Temperature
  - Specific Conductance
    - Computed Salinity

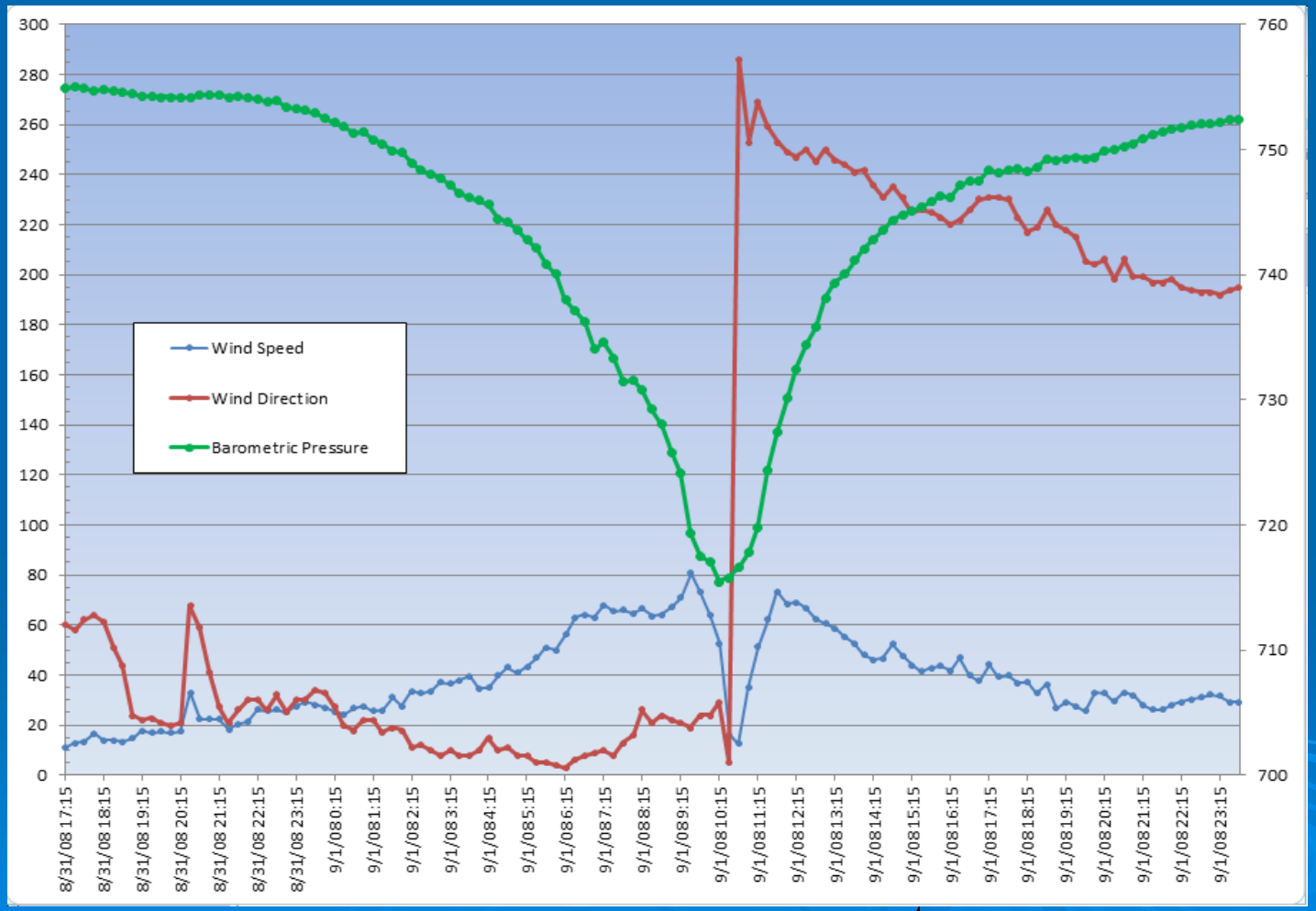
USGS

Hurricane Hardened Stations

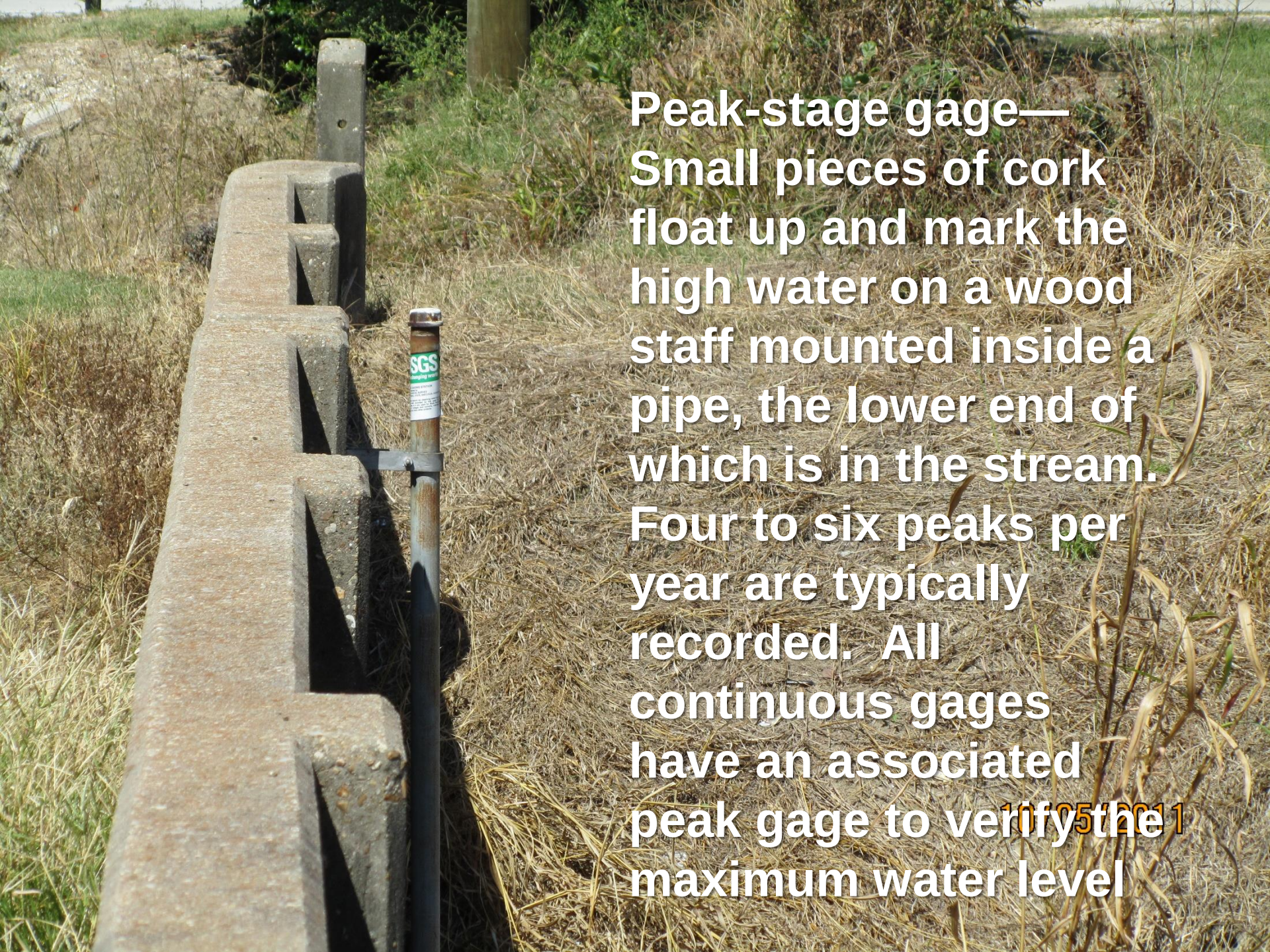
- Hurricane Katrina supplemental funds
  - 10 Stations
    - 5 Louisiana
    - 5 Mississippi
- Construction
  - Contracted with New Orleans COE
  - 90’ Steel pipe
  - 10’x10’ Deck
  - Deck elevation 30.0 ft NAVD 88
  - Installed summer 2008
- Data collection
  - Water level
  - Water temperature
  - Specific conductance
  - Wind speed/direction

USGS

07381349 Caillou Lake SW of Dulac, LA
Hurricane Gustav September 1, 2008



USGS


Peak-stage gage—Small pieces of cork float up and mark the high water on a wood staff mounted inside a pipe, the lower end of which is in the stream. Four to six peaks per year are typically recorded. All continuous gages have an associated peak gage to verify the maximum water level

Continuous nitrate monitors at:

Mississippi River at Baton Rouge

Atchafalaya River at Morgan City

USGS

Mississippi River Nitrate and Turbidity

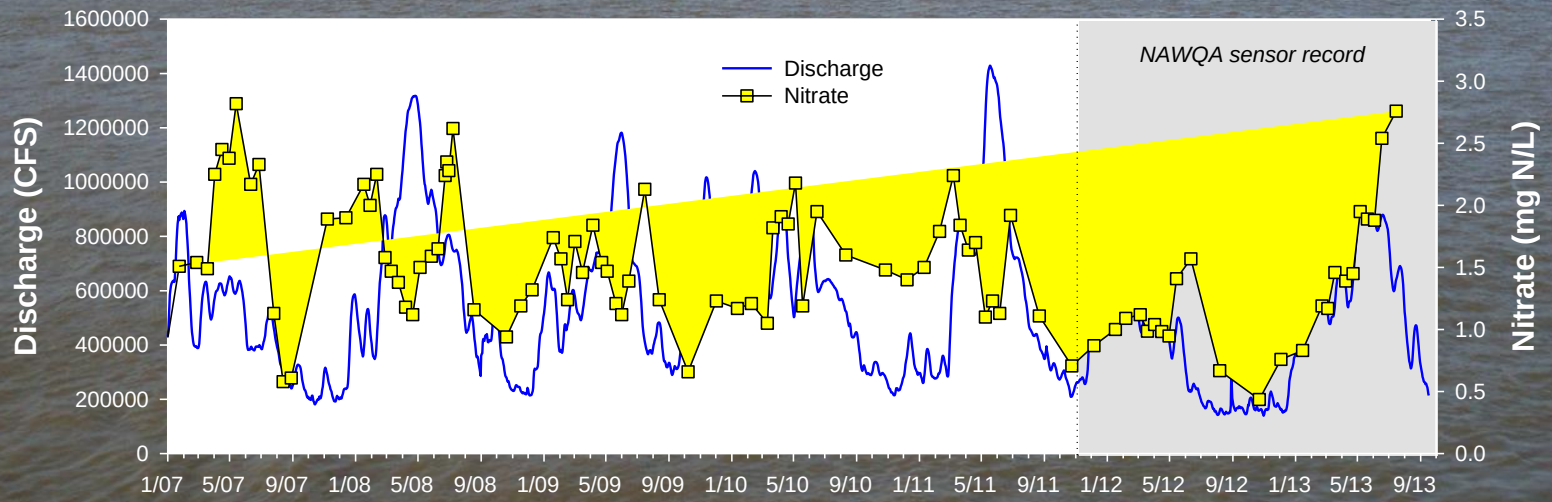
- Continuous Monitoring
- Gage height, discharge, nitrate, pH, salinity, specific conductance, dissolved oxygen, and turbidity from direct or proxy measurements
- Intervals of seconds to hours
- Remote access and control of sensors

Mississippi River at Baton Rouge

USGS
science for a changing world

Continuous Nitrate

Historical data from NWIS (Mississippi River @ Baton Rouge, 07374000)

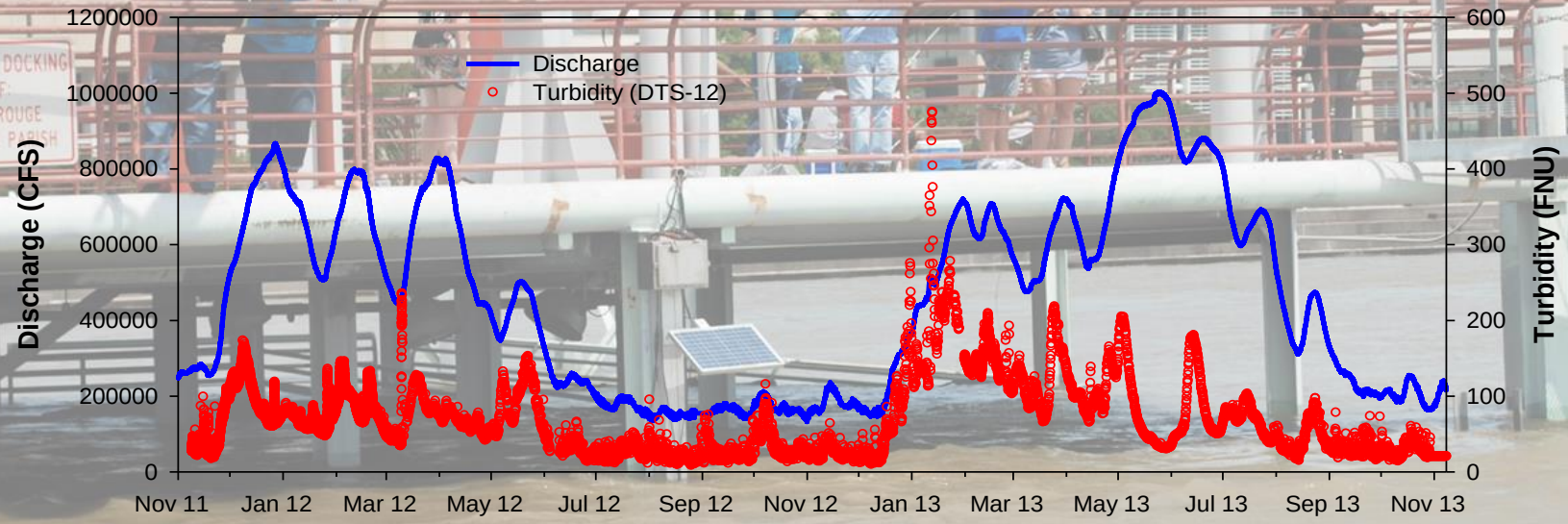


Mississippi River @ Baton Rouge: 1,150,000 mi² drainage area, ~26% of conterminous US total streamflow to the ocean, ~ 43% of total N load

USGS science for a changing world

Continuous Turbidity

- 2 Locations along the Mississippi River
  - Baton Rouge
  - Belle Chasse



USGS
science for a changing world

NASQAN

- 4 Stations sampled 14 or 16 times/year
  - Mississippi River
    - St. Francisville (16 samples/year)
    - Belle Chasse
  - Atchafalaya River
    - Melville (16 samples/year)
    - Morgan City

- Discharge
  - 2 continuous record stations (index velocity)
- Sediment
- Water Quality (parts per billion protocol)
  - Metals
  - Nutrients
  - Organics
  - Pesticides

USGS

What the data are used for:

- Highway and bridge construction
- Flood monitoring, management, and mitigation
- Coastal restoration projects
- Water availability
- Ecological studies
- Fisheries management
- Wastewater management
- Contaminant transport studies
- Navigation
- Recreation

USGS

Current Conditions for Louisiana: Streamflow -- 261 site(s) found

PROVISIONAL DATA SUBJECT TO REVISION

--- Predefined displays --- Louisiana Streamflow Table | Group table by Major River Basin | Select sites by number or name | go | show sites on a map

Customize table to display other current-condition parameters

Station Number	Station name	Date/Time	Gage height, feet	Elevation, feet above NGVD	Stream water level above NAVD 1988, feet	Discharge, ft3/s
Undefined						
073802316	Walker Drainage Structure near Kenner, LA					
	[Flood Side]	08/28 13:45 CDT	2.04	--	--	--
	[Protected Side]	08/28 13:45 CDT	0.81	--	--	--
Sabine River Basin						
08022500	Sabine Rv at Logansport, LA	08/28 12:45 CDT	23.86	--	--	--
08023080	Bayou Grand Cane near Stanley, LA	08/28 13:30 CDT	3.50	--	--	3.53
08023400	Bayou San Patricio near Benson, LA	08/28 13:30 CDT	7.66	--	--	10.7
08025500	Bayou Toro near Toro, LA	08/28 13:15 CDT	11.04	--	--	1,410
08026000	Sabine Rv nr Burkeville, TX	08/28 13:15 CDT	24.60	--	--	15,200
08027530	1~Prairie Creek northeast of Anacoco, LA	08/28 13:45 CDT	10.69	--	--	--
08028000	Bayou Anacoco near Rosepine, LA	08/28 13:45 CDT	16.31	--	--	3,260
08028500	Sabine Rv nr Bon Wier, TX	08/28 13:15 CDT	24.85	--	--	15,100
08030500	Sabine Rv nr Ruliff, TX	08/28 12:45 CDT	24.10	--	--	12,200
Red River Basin						
07344370	Red River at Spring Bank, AR	08/28 13:30 CDT	20.70	--	181.14	26,800
07344400	Red River near Hosston, LA.	08/28 13:30 CDT	15.95	--	167.22	--
07344425	Cross Bayou at Hwy 80 west of Greenwood, LA	08/28 13:00 CDT	2.13	--	199.81	--

USGS 07378500 Amite River near Denham Springs, LA

PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site Time-series: Current/Historical Observations ▾ GO

Click to hide station-specific text

Data for this site provided through a cooperative program with the U. S. Army Corps of Engineers, New Orleans District.

Advanced Hydrologic Prediction Service

National Weather Service station , and basin wide forcast.

Precipitation data for this station are temporary and will only be available for 120 days. (more information)

Customized Alerts by Text or E-mail at WaterAlert Subscription

This station managed by the Baton Rouge Field Office.

Available Parameters	Available Period
☐ All 8 Available Parameters for this site	
☐ 00035 Wind speed	2017-04-30 2017-08-28
☐ 00036 Wind direction	2017-04-30 2017-08-28
☐ 00045 Precipitation	2014-08-29 2017-08-28
☑ 00060 Discharge	1995-09-30 2017-08-28
☑ 00065 Gage height	2007-10-01 2017-08-28
☐ 63158 Stream level, NGVD	2017-04-30 2017-08-28
☑ 63160 Stream level, NAVD [GEOID12b EPOCH 2010.0000]	2016-08-01 2017-08-28
☐ 70969 DCP battery voltage	2017-04-30 2017-08-28

Output format

- ◉ Graph
- ○ Graph w/ stats
- ○ Graph w/o stats
- ○ Graph w/ (up to 3) parms
- ○ Table
- ○ Tab-separated

Days (7) GO

-- or --

Begin date 2017-08-21

End date 2017-08-28

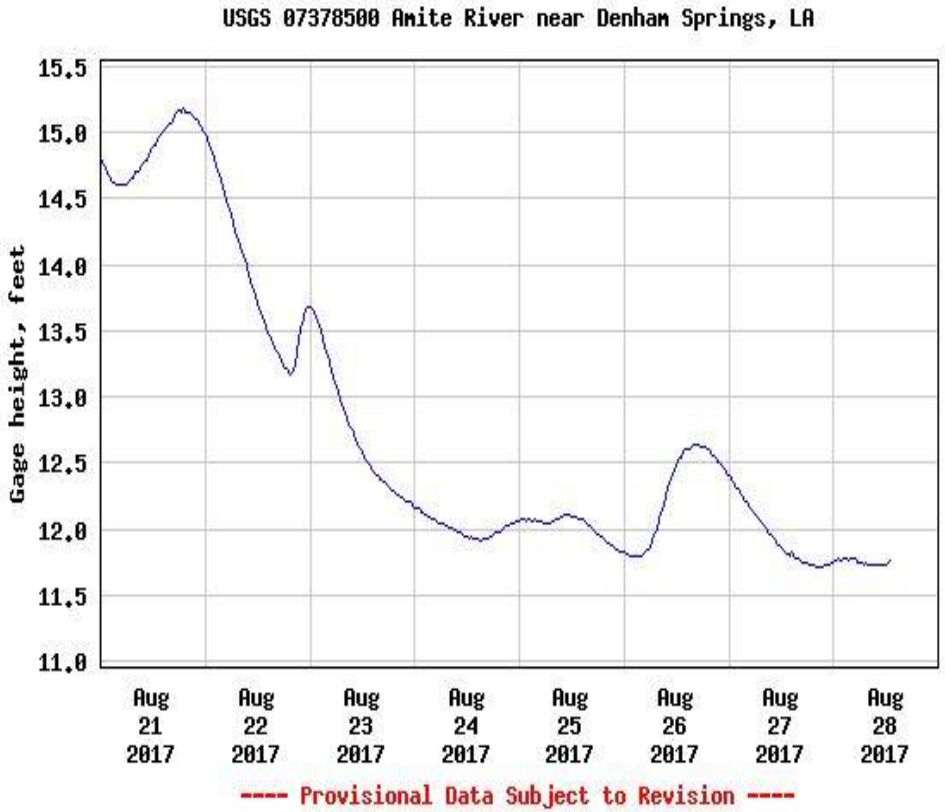
USGS Current Conditions

Secure | https://waterdata.usgs.gov/la/nwis/uv/?site_no=07378500&PARAmeter_cd=00065,72020,63160,00060

Apps bookmarks

Gage height, feet

Most recent instantaneous value: 11.76 08-28-2017 13:00 CDT



Add up to 2 more sites and replot for "Gage height, feet"

Add site numbers Note

Enter up to 2 site numbers separated by a comma. A site number consists of 8 to 15 digits

GO

Create presentation-quality / stand-alone graph. Subscribe to WaterAlert P00065 62711 A(0)

Share this graph |

USGS 07378500 Amite River near Denham Springs, LA

PROVISIONAL DATA SUBJECT TO REVISION

Available data for this site Time-series: Current/Historical Observations ▾ GO

Click to hide station-specific text

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National Weather Service station , and basin wide forcast.

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- ○ Tab-separated

Days (7) GO

-- or --

Begin date 2017-08-21

End date 2017-08-28

National Weather Service

water.weather.gov/ahps2/hydrograph.php?wfo=lix&gage=denl1

Apps bookmarks

National Weather Service
Advanced Hydrologic Prediction Service

weather.gov

Home News Organization Search for: NWS All NOAA Go BOOKMARK

Local weather forecast by "City, ST"
City, ST Go

National Conditions
Rivers
Satellite
Climate
Observed Precip

Local Conditions
Warnings
Weather Forecast
Radar

AHPS Documentation
User Guide
User Brochure

What is AHPS?
Facts
Our Partners

Feedback/Questions
Provide Feedback
Ask Questions

WHEN FLOODED TURN AROUND DON'T DROWN

FLOODSMART.GOV

USA.gov

National Observations > WFO Observations > Hydrograph

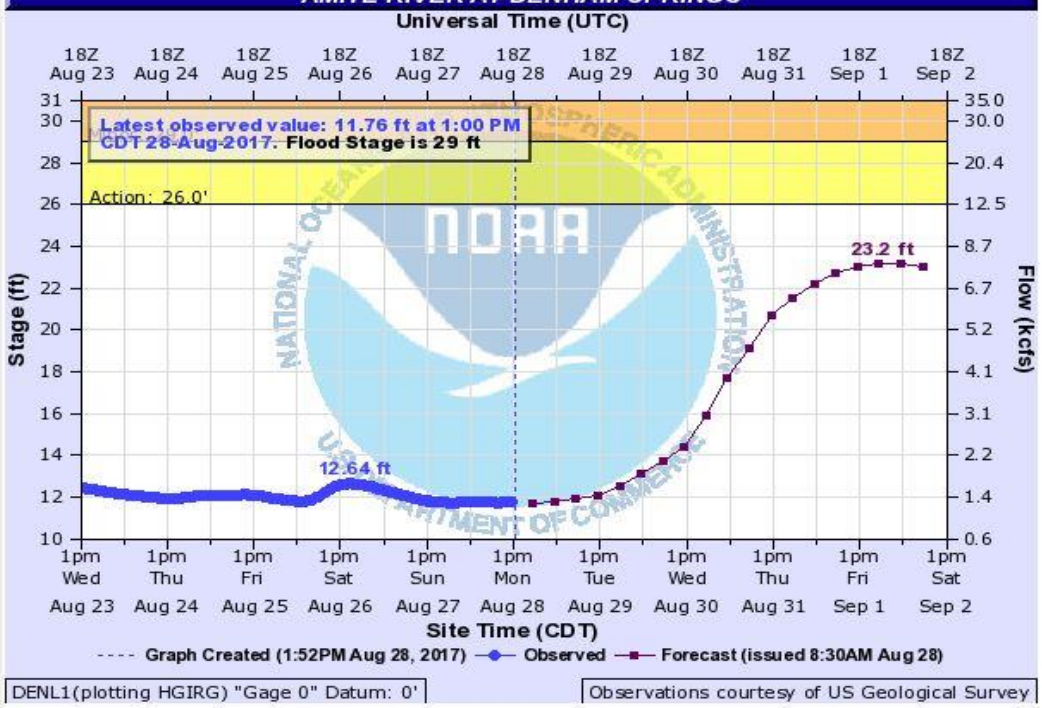
Weather Forecast Office New Orleans/Baton Rouge, LA — Lower Mississippi River Forecast Center

Flash Flood Watch

Hydrograph | River at a Glance | Download | Probability Information

Auto Refresh: OFF

AMITE RIVER AT DENHAM SPRINGS



DENL1(plotting HGIRG) "Gage 0" Datum: 0'

Observations courtesy of US Geological Survey

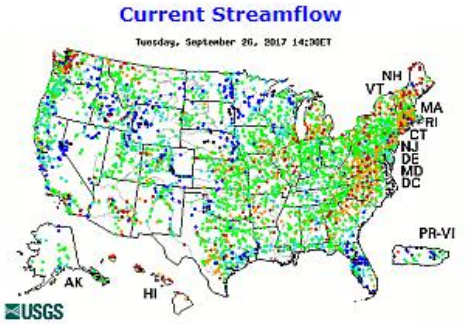
Secure | https://waterwatch.usgs.gov/index.php?id=ww

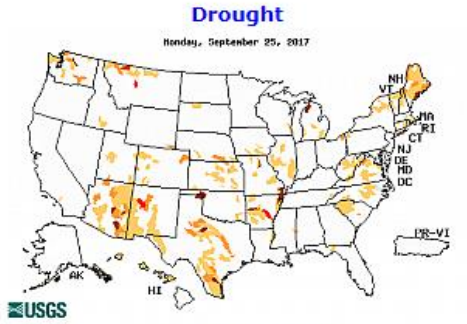
Apps bookmarks

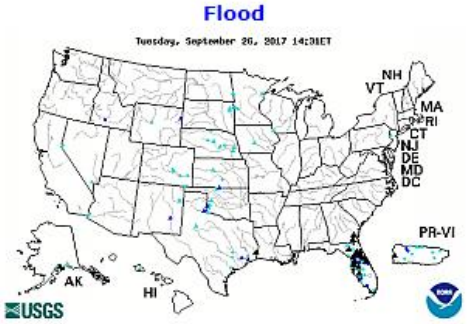
USGS science for a changing world

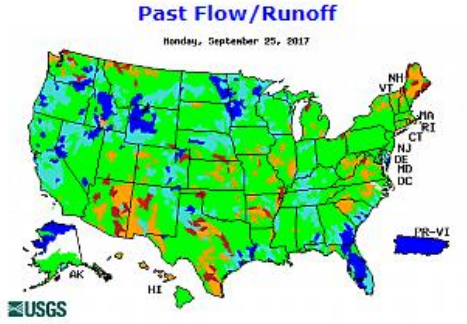
WaterWatch

- Puerto Rico Flood
- **Home**
- Current Streamflow
- Flood
- Drought
- Past Flow/Runoff
- Animation
- Toolkit
- Toolkit (internal)
- Annual Summaries
- Additional Information
- About WaterWatch





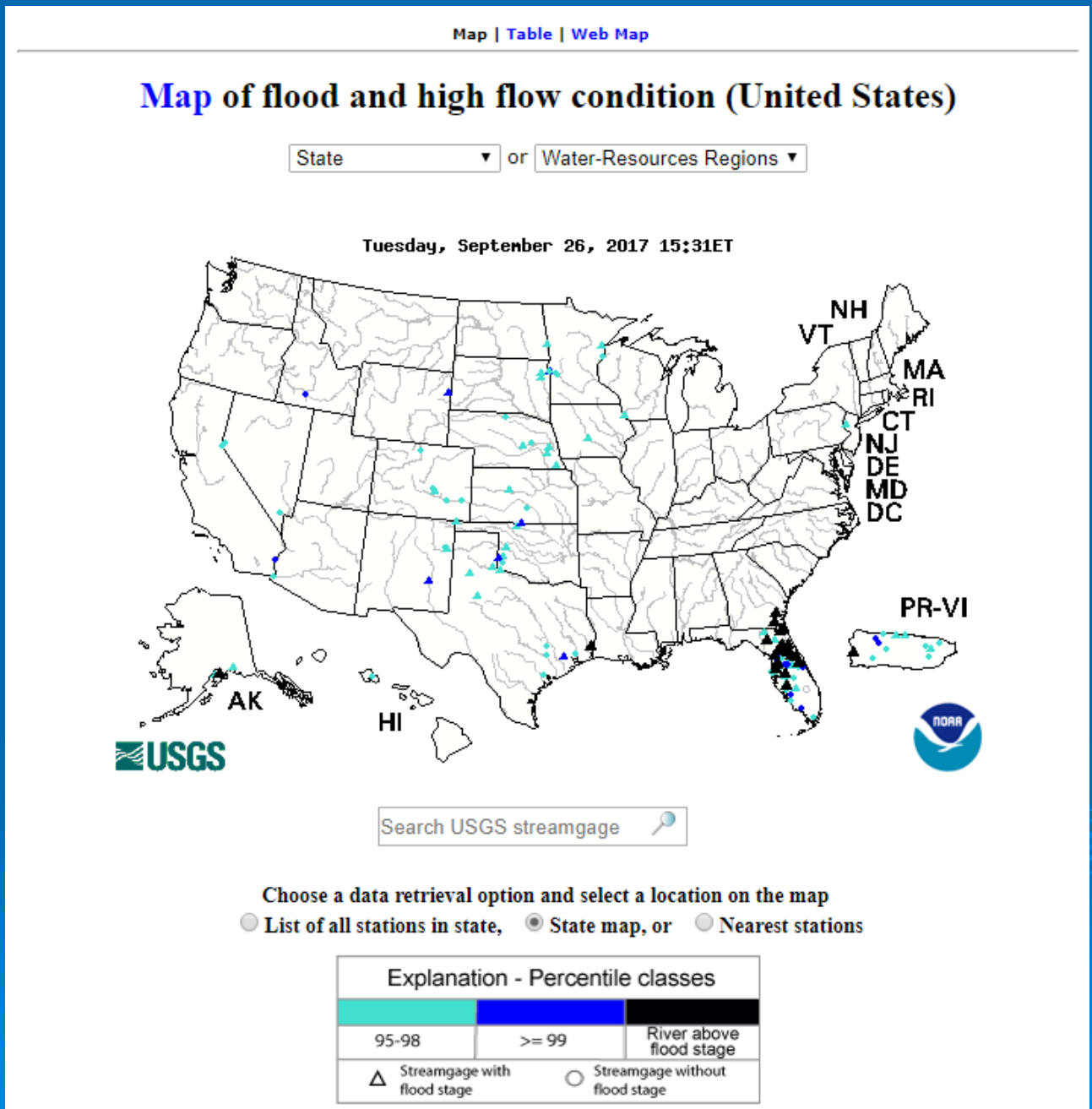




Search USGS streamgage

USGS

Flood conditions



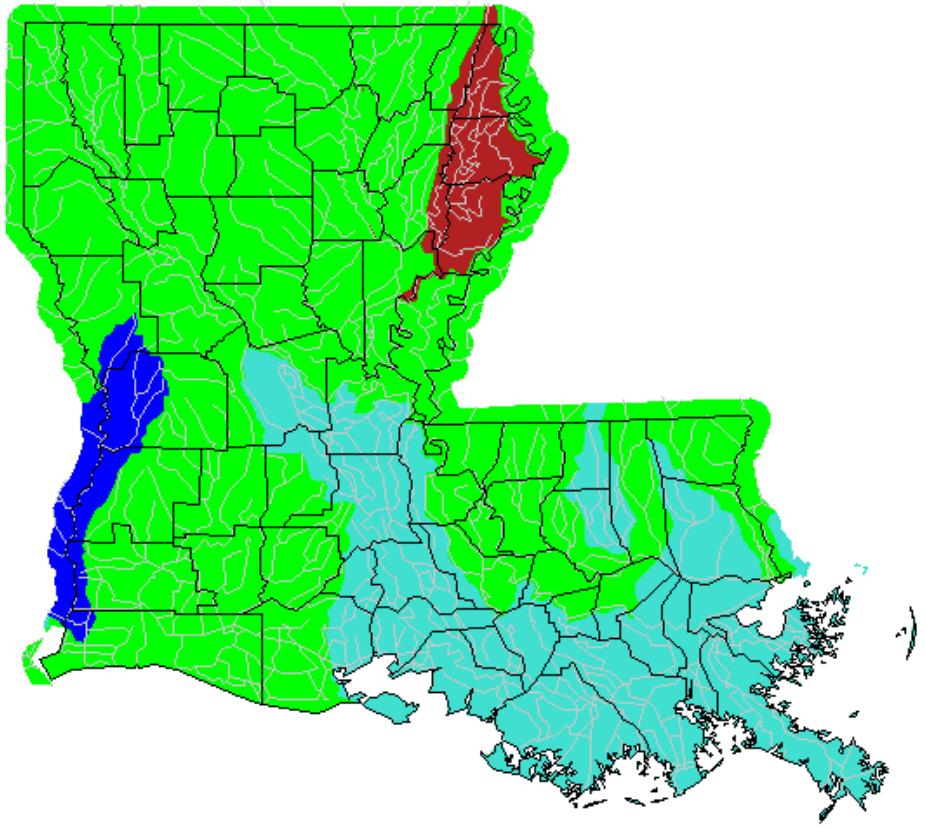
USGS

Streamflow conditions

Map of daily streamflow compared to historical streamflow for the day of the year (Louisiana)

Louisiana ▾ or Water-Resources Regions ▾ All Days

Monday, September 25, 2017



USGS

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

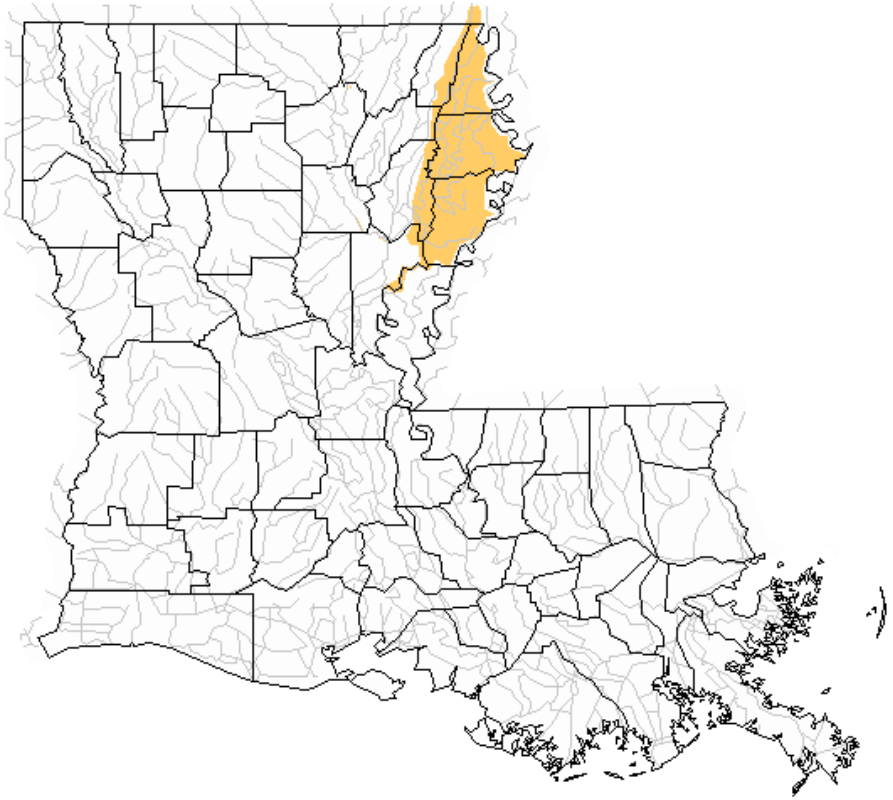
USGS

Drought conditions

Map of below normal 7-day average streamflow compared to historical streamflow for the day of year (Louisiana)

Louisiana

Monday, September 25, 2017



USGS

Click map to obtain more detailed drought information for the state

Explanation - Percentile classes				
Low	<=5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

USGS

The USGS WaterNow smartphone app can be programmed to provide alerts when streamflow conditions reach user-defined thresholds at gages of interest

USGS WaterNow – Current-conditions for water data directly to your mobile phone or email

Send an email or text message containing a USGS current-conditions gaging site number and quickly receive a reply with its most recent observation(s).

How to use WaterNow

USGS

QUESTIONS?

John Lovelace
U.S. Geological Survey
jlovelac@usgs.gov