USGS Web and GIS-Based Water Resources Planning and Management Tools in Alabama

Athena P. Clark, P.E.

Deputy Director

USGS Lower Mississippi Gulf Water Science Center

USGS Web & GIS-Based Water Resources in Alabama

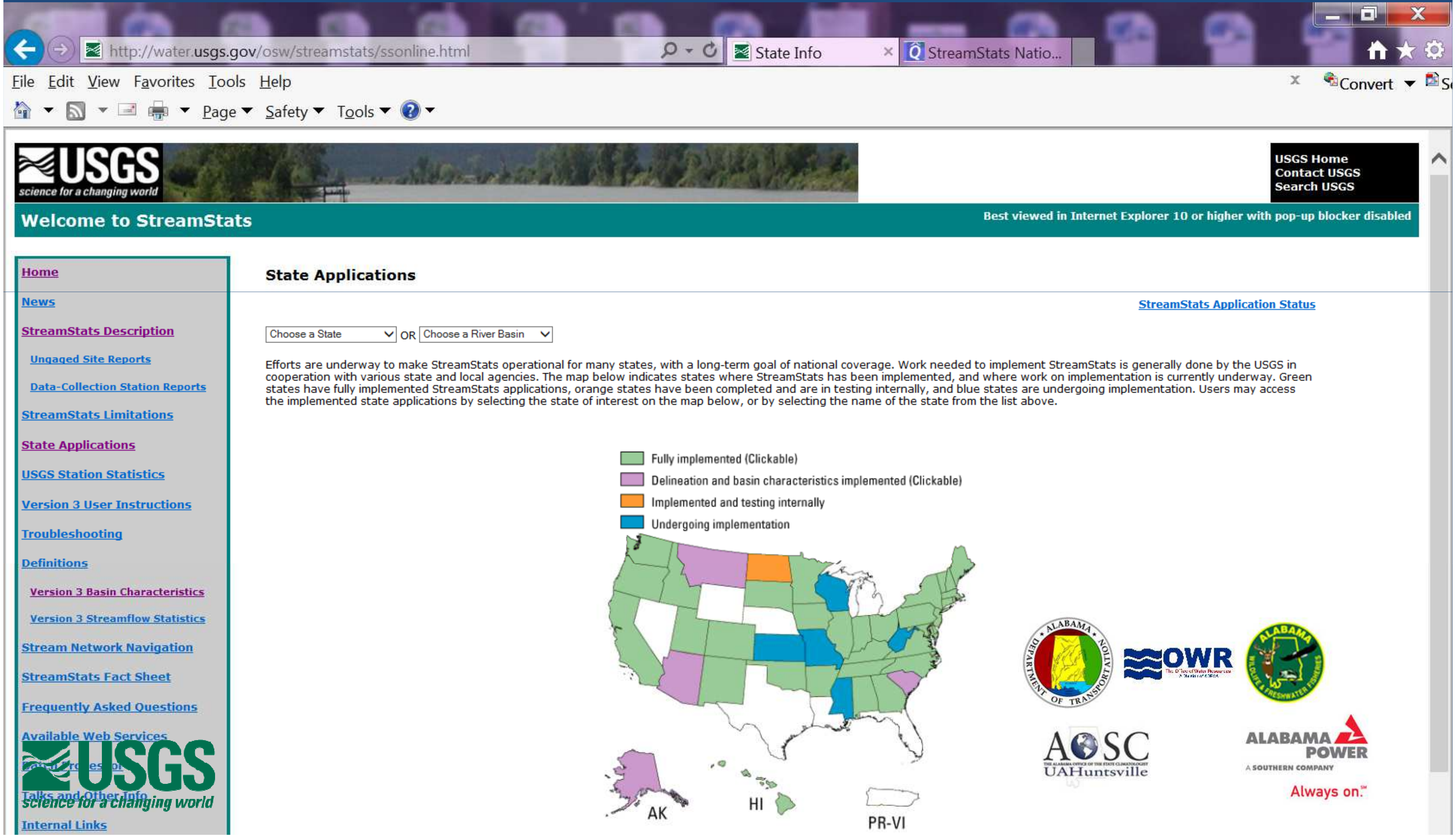
- StreamStats
- PRMS
- SPARROW
- WaterWatch

StreamStats
http://water.usgs.gov/osw/streamstats/

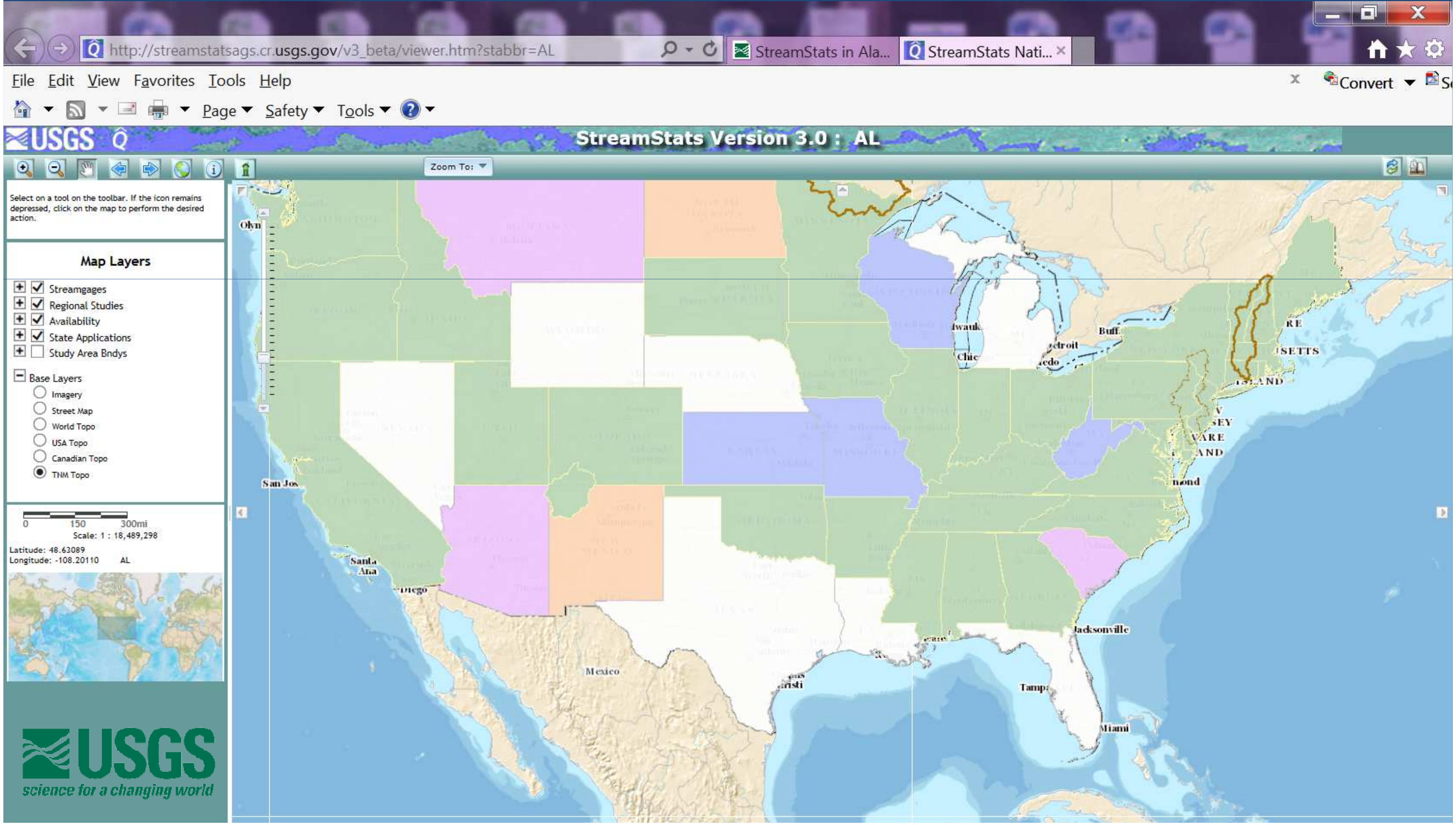
- Users can select USGS gaging stations on a map and obtain previously published information for the stations
- Users can select any location along a stream and obtain
  - Drainage basin boundary
  - Basin characteristics
  - Estimated streamflow statistics

StreamStats

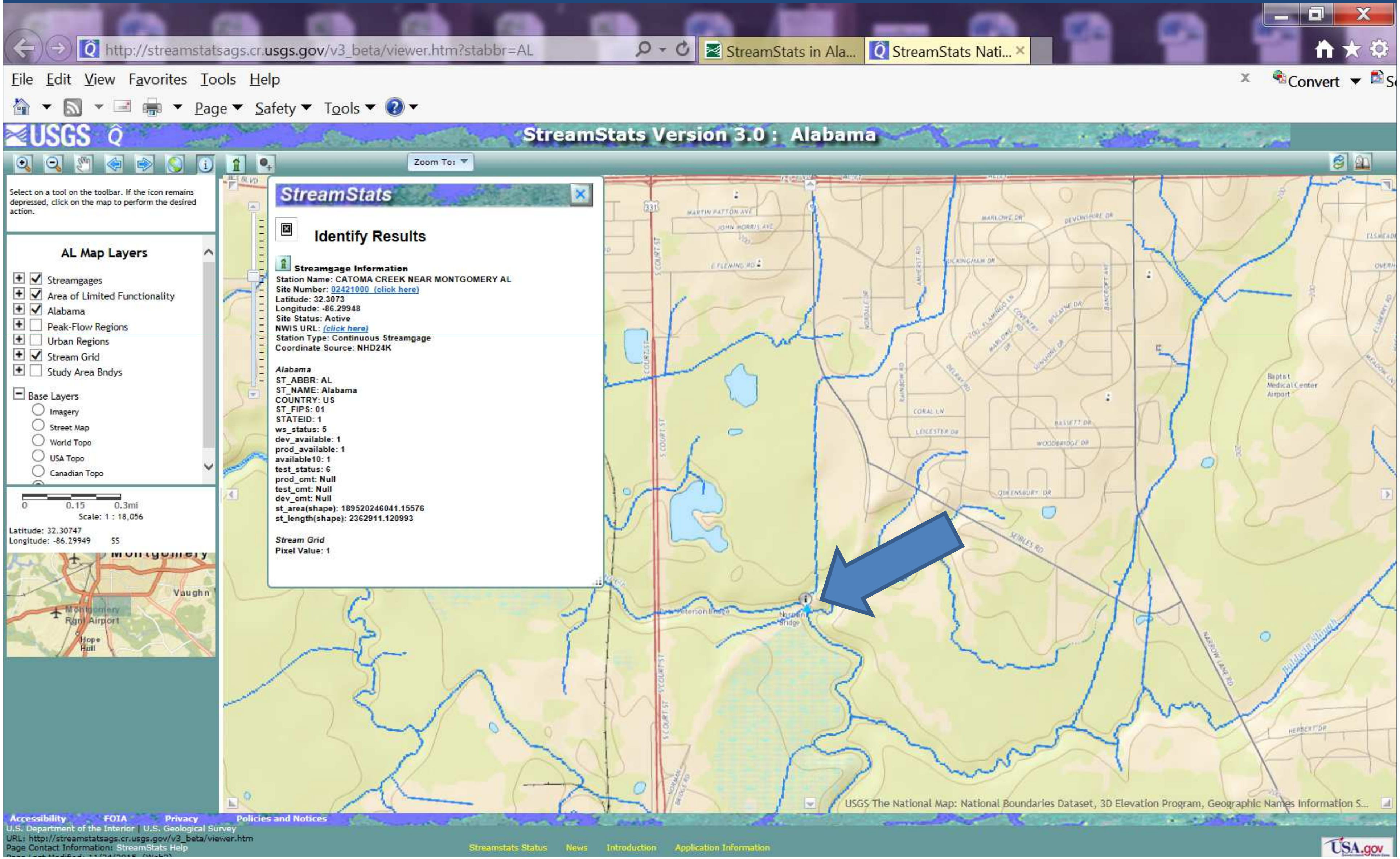
http://water.usgs.gov/osw/streamstats/



StreamStats
http://water.usgs.gov/osw/streamstats/



- Users can select USGS gaging stations on a map and obtain previously published information for the stations



StreamStats
http://water.usgs.gov/osw/streamstats/

science for a changing world

StreamStats Data-Collection Station Report

USGS Station Number	**02421000**
Station Name	**CATOMA CREEK NEAR MONTGOMERY AL**

Click here to link to available data on NWIS-Web for this site.

Descriptive Information

Station Type	Streamgage, continuous record
Location	
Gage	
Regulation and Diversions	
Regulated?	False
Period of Record	1953-2010
Remarks	
Latitude (degrees NAD83)	32.30736
Longitude (degrees NAD83)	-86.29942
Hydrologic unit code	03150201
County	-
[illegible]DN2009	No

science for a changing world

Physical Characteristics

Characteristic Name	Value	Units	Citation Number
Descriptive Information			
Datum_of_Latitude_Longitude	NAD83	dimensionless	30
District_Code	01	dimensionless	30
Begin_date_of_record	7/1/1952	days	41
End_date_of_record	9/30/2001	days	41
Number_of_days_of_record	16893	days	41
Number_of_days_GT_0	16692	days	41
Precipitation Statistics			
24_Hour_2_Year_Precipitation	4.5000	inches	31
24_Hour_100_Year_Precipitation	9.5000	inches	31
Mean_Annual_Precipitation	52.000	inches	31
Temperature Statistics			
Mean_Min_January_Temperature	40.000	degrees F	31
Topographical Characteristics			
Azimuth	305.000	decimal degrees	31
Mean_Basin_Elevation	300.000	feet	31
Land Cover Characteristics			
Percent_Forest	30.000	percent	31
Percent_Storage	7.4000	percent	31
Soil Properties			
Soil_Infiltration	1.9000	inches	31
Stream Channel Properties			
Main_Channel_Length	25.500	miles	31
Stream_Slope_10_and_85_Method	8.4000	feet per mi	31
Basin Dimensional Characteristics			
Contributing_Drainage_Area	290	square miles	30
Drainage_Area	290.000	square miles	31

USGS
science for a changing world

Streamflow Statistics

Statistic Name	Value	Units	Citation Number	Preferred?
Peak-Flow Statistics				
Mean_Annual_Flood	6620.00	cubic feet per second	31	Y
2_Year_Peak_Flood	9820	cubic feet per second	220	Y
5_Year_Peak_Flood	18200	cubic feet per second	220	Y
10_Year_Peak_Flood	25700	cubic feet per second	220	Y
25_Year_Peak_Flood	37700	cubic feet per second	220	Y
50_Year_Peak_Flood	48800	cubic feet per second	220	Y
100_Year_Peak_Flood	61800	cubic feet per second	220	Y
200_Year_Peak_Flood	77200	cubic feet per second	220	Y
500_Year_Peak_Flood	102000	cubic feet per second	220	Y
Weighted_1_5_Year_Peak_Flood	6970	cubic feet per second	220	Y
Weighted_5_Year_Peak_Flood	18000	cubic feet per second	220	Y
Weighted_10_Year_Peak_Flood	25200	cubic feet per second	220	Y
Weighted_25_Year_Peak_Flood	36200	cubic feet per second	220	Y
Weighted_50_Year_Peak_Flood	46000	cubic feet per second	220	Y
Weighted_100_Year_Peak_Flood	57300	cubic feet per second	220	Y
Weighted_200_Year_Peak_Flood	70300	cubic feet per second	220	Y
Weighted_500_Year_Peak_Flood	91100	cubic feet per second	220	Y
Log_Mean_of_Annual_Peaks	4.0654	Log base 10	31	Y
Log_STD_of_Annual_Peaks	0.2870	Log base 10	31	Y
Log_Skew_of_Annual_Peaks	0.3740	Log base 10	31	Y
WRC_Mean	4.01	Log base 10	220	Y
WRC_STD	0.306	Log base 10	220	Y
WRC_Skew	0.315	Log base 10	220	Y
Systematic_peak_years	51	years	220	Y
Peak_years_with_historic_adjustment	55	years	220	Y
1_5_Year_Peak_Flood	7000	cubic feet per second	220	Y
Weighted_2_Year_Peak_Flood	9770	cubic feet per second	220	Y

USGS
science for a changing world

Flood-Volume Statistics				
1_Day_2_Year_Maximum	9934.50	cubic feet per second	31	Y
1_Day_20_Year_Maximum	27094.3	cubic feet per second	31	Y
1_Day_5_Year_Maximum	16319.6	cubic feet per second	31	Y
1_Day_10_Year_Maximum	21454.9	cubic feet per second	31	Y
1_Day_25_Year_Maximum	29037.2	cubic feet per second	31	Y
1_Day_50_Year_Maximum	35520.8	cubic feet per second	31	Y
3_Day_2_Year_Maximum	7075.10	cubic feet per second	31	Y
3_Day_5_Year_Maximum	10929.6	cubic feet per second	31	Y
3_Day_10_Year_Maximum	13972.0	cubic feet per second	31	Y
3_Day_20_Year_Maximum	17279.5	cubic feet per second	31	Y
3_Day_25_Year_Maximum	18413.4	cubic feet per second	31	Y
3_Day_50_Year_Maximum	22182.0	cubic feet per second	31	Y
3_Day_100_Year_Maximum	26367.0	cubic feet per second	31	Y
7_Day_2_Year_Maximum	4282.60	cubic feet per second	31	Y
7_Day_5_Year_Maximum	6478.70	cubic feet per second	31	Y
7_Day_10_Year_Maximum	8202.10	cubic feet per second	31	Y
7_Day_20_Year_Maximum	10069.6	cubic feet per second	31	Y
7_Day_25_Year_Maximum	10708.8	cubic feet per second	31	Y
7_Day_50_Year_Maximum	12830.1	cubic feet per second	31	Y
7_Day_100_Year_Maximum	15181.8	cubic feet per second	31	Y
15_Day_2_Year_Maximum	2576.80	cubic feet per second	31	Y
15_Day_10_Year_Maximum	4640.20	cubic feet per second	31	Y
15_Day_20_Year_Maximum	5495.30	cubic feet per second	31	Y
15_Day_25_Year_Maximum	5774.00	cubic feet per second	31	Y
15_Day_50_Year_Maximum	6656.00	cubic feet per second	31	Y
15_Day_100_Year_Maximum	7568.70	cubic feet per second	31	Y
30_Day_2_Year_Maximum	1776.00	cubic feet per second	31	Y
30_Day_10_Year_Maximum	3113.80	cubic feet per second	31	Y
30_Day_25_Year_Maximum	3732.80	cubic feet per second	31	Y
30_Day_50_Year_Maximum	4169.00	cubic feet per second	31	Y

Low-Flow Statistics				
1_Day_2_Year_Low_Flow	0.5500	cubic feet per second	31	Y
1_Day_10_Year_Low_Flow	0.0600	cubic feet per second	31	Y
1_Day_20_Year_Low_Flow	0.0300	cubic feet per second	31	Y
3_Day_2_Year_Low_Flow	0.5900	cubic feet per second	31	Y
3_Day_10_Year_Low_Flow	0.0800	cubic feet per second	31	Y
3_Day_20_Year_Low_Flow	0.0500	cubic feet per second	31	Y
7_Day_2_Year_Low_Flow	0.5100	cubic feet per second	31	Y
7_Day_5_Year_Low_Flow	0.1200	cubic feet per second	31	Y
7_Day_10_Year_Low_Flow	0.0500	cubic feet per second	31	Y
7_Day_20_Year_Low_Flow	0.0300	cubic feet per second	31	Y
14_Day_2_Year_Low_Flow	0.7900	cubic feet per second	31	Y
14_Day_10_Year_Low_Flow	0.0800	cubic feet per second	31	Y
14_Day_20_Year_Low_Flow	0.0400	cubic feet per second	31	Y
30_Day_2_Year_Low_Flow	1.5400	cubic feet per second	31	Y
30_Day_10_Year_Low_Flow	0.1400	cubic feet per second	31	Y
30_Day_20_Year_Low_Flow	0.0600	cubic feet per second	31	Y
90_Day_2_Year_Low_Flow	11.950	cubic feet per second	31	Y
90_Day_10_Year_Low_Flow	1.4500	cubic feet per second	31	Y
90_Day_20_Year_Low_Flow	0.7500	cubic feet per second	31	Y

Flow-Duration Statistics					
1_Percent_Duration	5141.4	cubic feet per second	41	Y	48
5_Percent_Duration	1830	cubic feet per second	41	Y	48
10_Percent_Duration	898	cubic feet per second	41	Y	48
20_Percent_Duration	270	cubic feet per second	41	Y	48
25_Percent_Duration	180	cubic feet per second	41	Y	48
30_Percent_Duration	131	cubic feet per second	41	Y	48
40_Percent_Duration	75	cubic feet per second	41	Y	48
50_Percent_Duration	40	cubic feet per second	41	Y	48
60_Percent_Duration	20	cubic feet per second	41	Y	48
70_Percent_Duration	11	cubic feet per second	41	Y	48
75_Percent_Duration	7.4	cubic feet per second	41	Y	48
80_Percent_Duration	5	cubic feet per second	41	Y	48
90_Percent_Duration	1.7	cubic feet per second	41	Y	48
95_Percent_Duration	0.6	cubic feet per second	41	Y	48
99_Percent_Duration	0	cubic feet per second	41	Y	48

USGS
science for a changing world

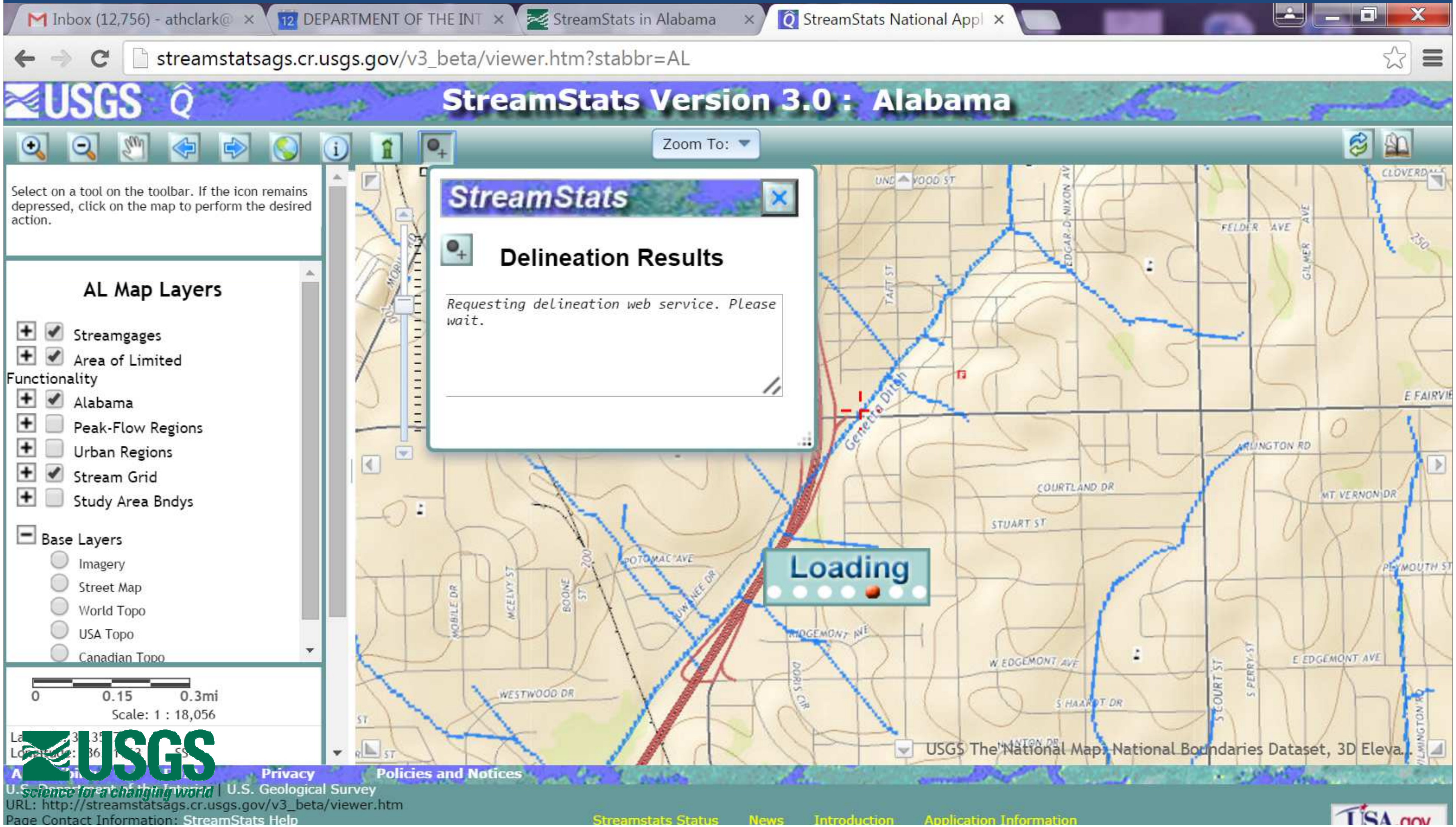
Annual Flow Statistics				
Mean_Annual_Flow	355.200	cubic feet per second	31	Y
Stand_Dev_of_Mean_Annual_Flow	143.600	cubic feet per second	31	Y
Monthly Flow Statistics				
January_Mean_Flow	565.300	cubic feet per second	31	Y
January_STD	421.600	cubic feet per second	31	Y
February_Mean_Flow	1041.00	cubic feet per second	31	Y
February_STD	994.300	cubic feet per second	31	Y
March_Mean_Flow	828.800	cubic feet per second	31	Y
March_STD	519.900	cubic feet per second	31	Y
April_Mean_Flow	725.300	cubic feet per second	31	Y
April_STD	767.500	cubic feet per second	31	Y
May_Mean_Flow	217.000	cubic feet per second	31	Y
May_STD	334.300	cubic feet per second	31	Y
June_Mean_Flow	59.660	cubic feet per second	31	Y
June_STD	81.470	cubic feet per second	31	Y
July_Mean_Flow	58.910	cubic feet per second	31	Y
July_STD	64.830	cubic feet per second	31	Y
August_Mean_Flow	45.810	cubic feet per second	31	Y
August_STD	48.460	cubic feet per second	31	Y
September_Mean_Flow	160.200	cubic feet per second	31	Y
September_STD	228.900	cubic feet per second	31	Y
October_Mean_Flow	80.170	cubic feet per second	31	Y
October_STD	116.600	cubic feet per second	31	Y
November_Mean_Flow	97.390	cubic feet per second	31	Y
November_STD	178.100	cubic feet per second	31	Y
December_Mean_Flow	435.000	cubic feet per second	31	Y
December_STD	542.800	cubic feet per second	31	Y

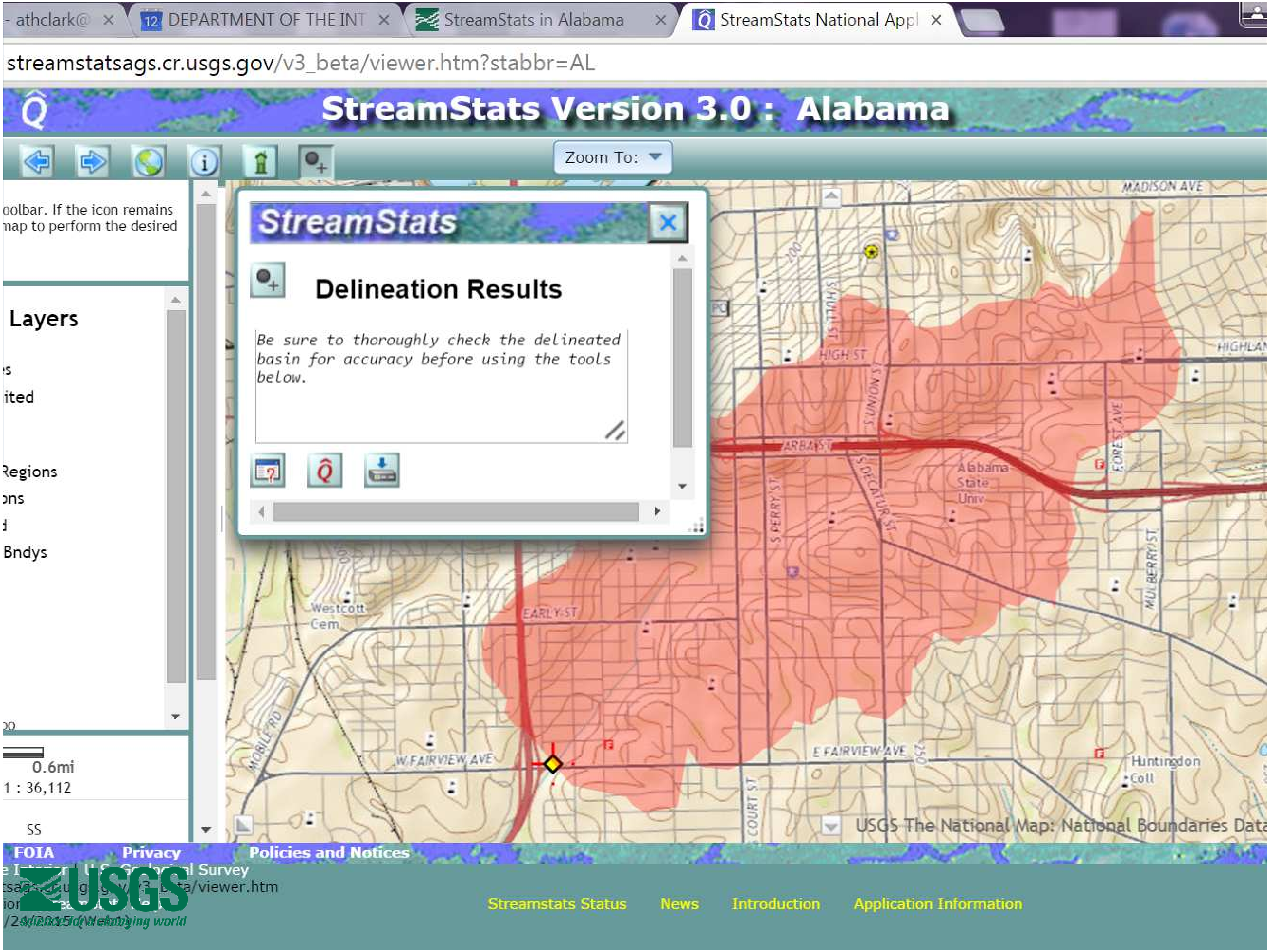
USGS
science for a changing world

General Flow Statistics					
Minimum_daily_flow	0	cubic feet per second	41	Y	48
Maximum_daily_flow	39500	cubic feet per second	41	Y	48
Std_Dev_of_daily_flows	1189.754	cubic feet per second	41	Y	48
Average_daily_streamflow	363.197	cubic feet per second	41	Y	48
Base Flow Statistics					
Number_of_years_to_compute_BFI	46	years	42	Y	48
Average_BFI_value	0.097	dimensionless	42	Y	48
Std_dev_of_annual_BFI_values	0.023	dimensionless	42	Y	48

USGS
science for a changing world

- Users can select any location along a stream and obtain
  Drainage basin boundary
  Basin characteristics
  Estimated streamflow statistics





streamstatsags.cr.usgs.gov/v3_beta/viewer.htm?stabbr=AL
StreamStats Version 3.0 : Alabama
Zoom To:
StreamStats
Delineation Results
Be sure to thoroughly check the delineated basin for accuracy before using the tools below.
Layers
0.6mi
1 : 36,112
USGS The National Map: National Boundaries Data
FOIA
Privacy
Policies and Notices
Streamstats Status
News
Introduction
Application Information

Compute Basin Characteristics

StreamStats Basin Characteristics Report - Google Chrome

streamstatsags.cr.usgs.gov/v3_beta/BCreport.htm?rcode=AL&workspaceID=AL20160112132818515000&includeparameters=URBAN;CONTDA;LC06DEV;LC

USGS StreamStats Version 3.0 Print

Basin Characteristics Ungaged Site Report

Date: Tues Jan 12, 2016 2:37:46 PM GMT-6
Study Area: Alabama
NAD 1983 Latitude: 32.3518 (32 21 06)
NAD 1983 Longitude: -86.3195 (-86 19 11)

Label	Value	Units	Definition
URBAN	89.4	percent	Percentage of basin with urban development
CONTDA	2.702	square miles	Area that contributes flow to a point on a stream
LC06DEV	89.4	percent	Percentage of land-use from NLCD 2006 classes 21-24
LC11IMP	41.4	percent	Percentage of impervious area determined from NLCD 2011 impervious dataset
LC11DEV	98.8	percent	Percentage of land-use from NLCD 2011 classes 21-24

Compute Flow Characteristics

StreamStats Flow Statistics Report - Google Chrome

streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm?rcode=AL&workspaceID=AL20160112132818515000&includeflowtypes=PeakFlows,UrbanFlows,SmallBas

USGS StreamStats Version 3.0 Print

Flow Statistics Ungaged Site Report

Date: Tues Jan 12, 2016 2:39:05 PM GMT-6
Study Area: Alabama
NAD 1983 Latitude: 32.3518 (32 21 06)
NAD 1983 Longitude: -86.3195 (-86 19 10)
Drainage Area: 2.702 mi2

Peak- Basin Characteristics

100% Peak Region 3 2007 5204 (2.7 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Contributing Drainage Area (square miles)	2.7	0.45	607

Urban Peak- Basin Characteristics

100% Undefined Region (2.702 mi2)

The selected watershed is entirely in an area for which flow equations were not defined.

Small Basin Peak- Basin Characteristics

100% Peak Statewide Small Stream 2004 5135 (2.7 mi2)

Parameter	Value	Regression Equation Valid Range	
		Min	Max
Contributing Drainage Area (square miles)	2.7	0.24	15

Peak- Statistics

90-Percent Prediction Interval

Compute Flow Characteristics

StreamStats Flow Statistics Report - Google Chrome

streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm?rcode=AL&workspaceID=AL20160112132818515000&includeflowtypes=PeakFlows,UrbanFlows,SmallBas

Contributing Drainage Area (square miles)	2.7	0.24	15

Peak- Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK1 5	445	ft3/s	54	2		
PK2	572	ft3/s	48	2		
PK5	1010	ft3/s	36	6		
PK10	1440	ft3/s	30	12		
PK25	2160	ft3/s	26	26		
PK50	2780	ft3/s	24	38		
PK100	3450	ft3/s	23	50		
PK200	4140	ft3/s	24	59		
PK500	5070	ft3/s	25	63		

http://pubs.usgs.gov/sir/2007/5204/
Hedgecock_ T.S._ 2007_ Magnitude and Frequency of Floods in Alabama_ 2003: U. S. Geological Survey Scientific Investigations Report 2007-5204_ 28 p.

Small Basin Peak- Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	395	ft3/s	53	2		
PK5	685	ft3/s	35	5		
PK10	929	ft3/s	30	9		
PK25	1300	ft3/s	29	13		
PK50	1610	ft3/s	31	14		
PK100	1950	ft3/s	35	14		
[illegible]	[illegible]	ft3/s	40	13		

http://pubs.usgs.gov/sir/2004/5135/
Hedgecock_ T.S._ 2004_ Magnitude and Frequency of Floods on Small Rural Streams in Alabama: U. S. Geological Survey Scientific Investigations Report 2004-5135_ 10 p.

USGS science for a changing world

PRMS

- Precipitation Runoff Modeling System
- The watershed model chosen to assess the natural amount of available water for major river basins that are within Alabama or that cross Alabama's borders.
- Four models were configured and calibrated for the following four river basins:

USGS
science for a changing world

Mobile

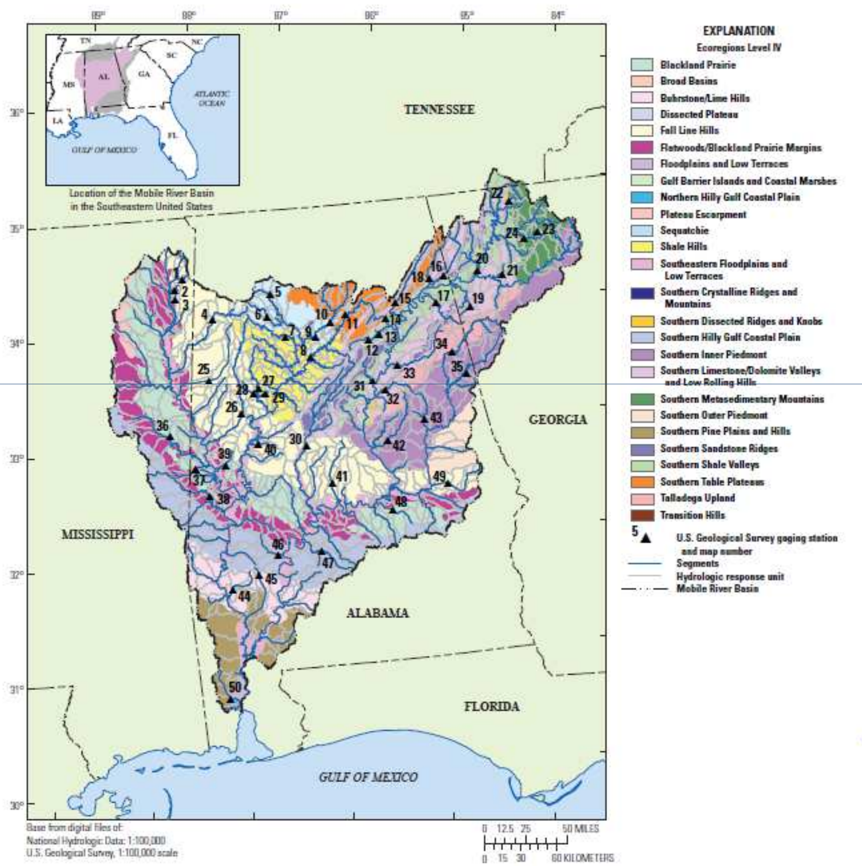


Figure 3. Location of ecoregions, hydrologic response units, segments, and calibration stations for the Mobile Precipitation-Runoff Modeling System model.

Gulf of Mexico

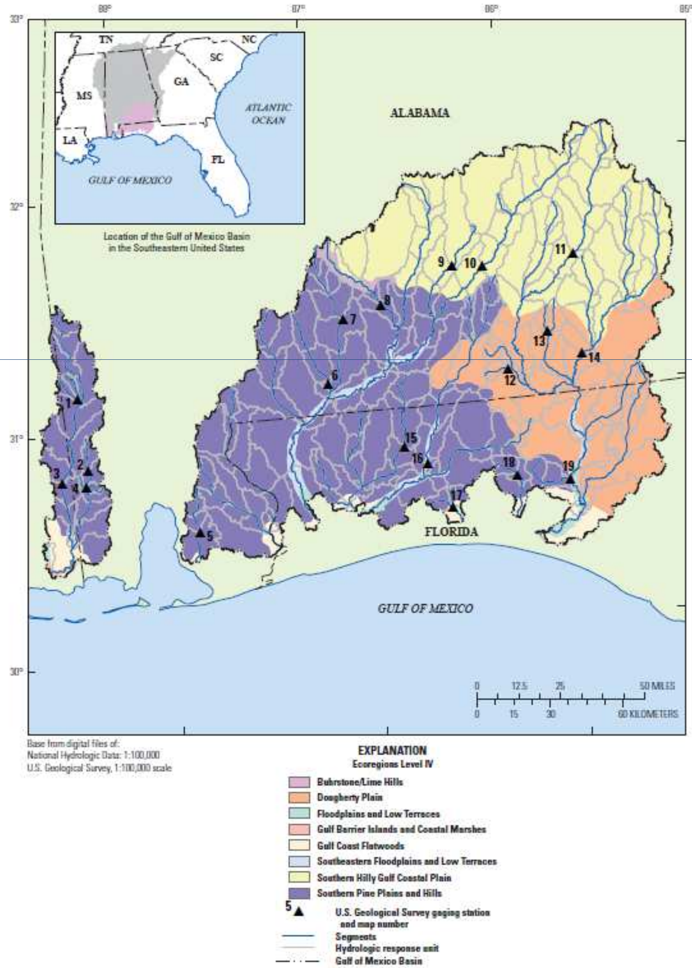


Figure 4. Location of ecoregions, hydrologic response units, segments, and calibration stations for the Gulf of Mexico Precipitation-Runoff Modeling System model.

Middle Tennessee

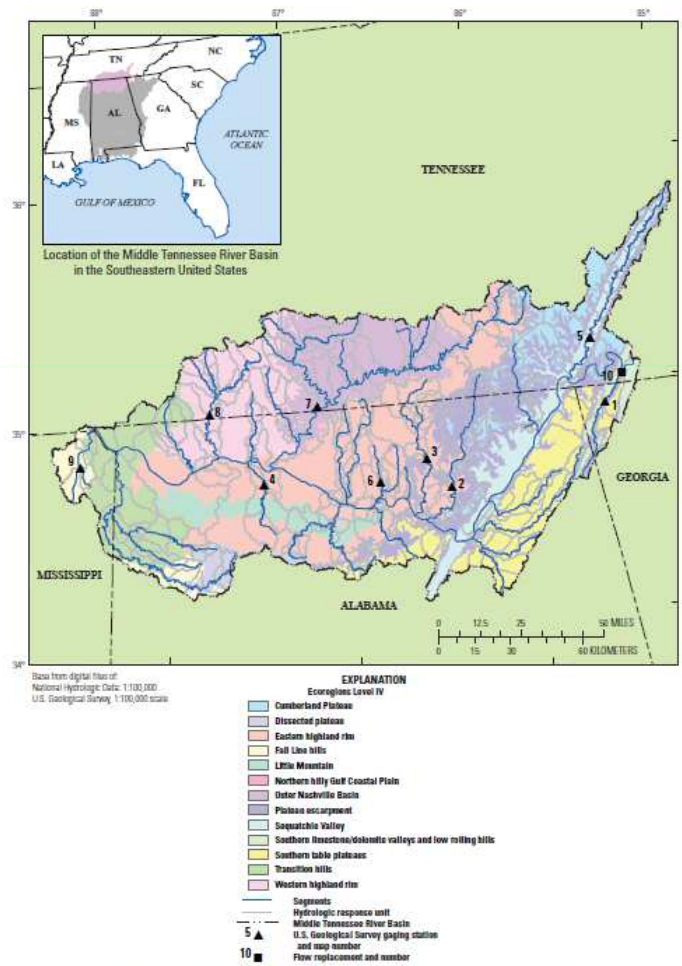


Figure 6. Location of ecoregions, hydrologic response units, segments, and calibration stations for the Middle Tennessee Precipitation-Runoff Modeling System model.

Chattahoochee

8 Simulation of Natural Flows in Major River Basins in Alabama

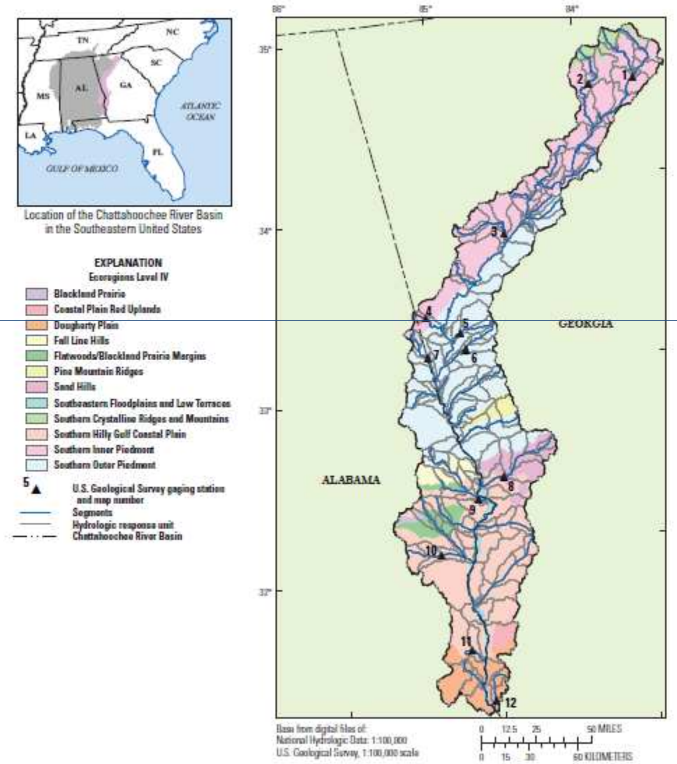


Figure 5. Location of ecoregions, hydrologic response units, segments, and calibration stations for the Chattahoochee Precipitation-Runoff Modeling System model.

PRMS

- Models were calibrated to unregulated USGS streamflow to estimate natural flows.
- USGS used 90 calibration stations in the PRMS model.

USGS
science for a changing world

PRMS

Model Application 27

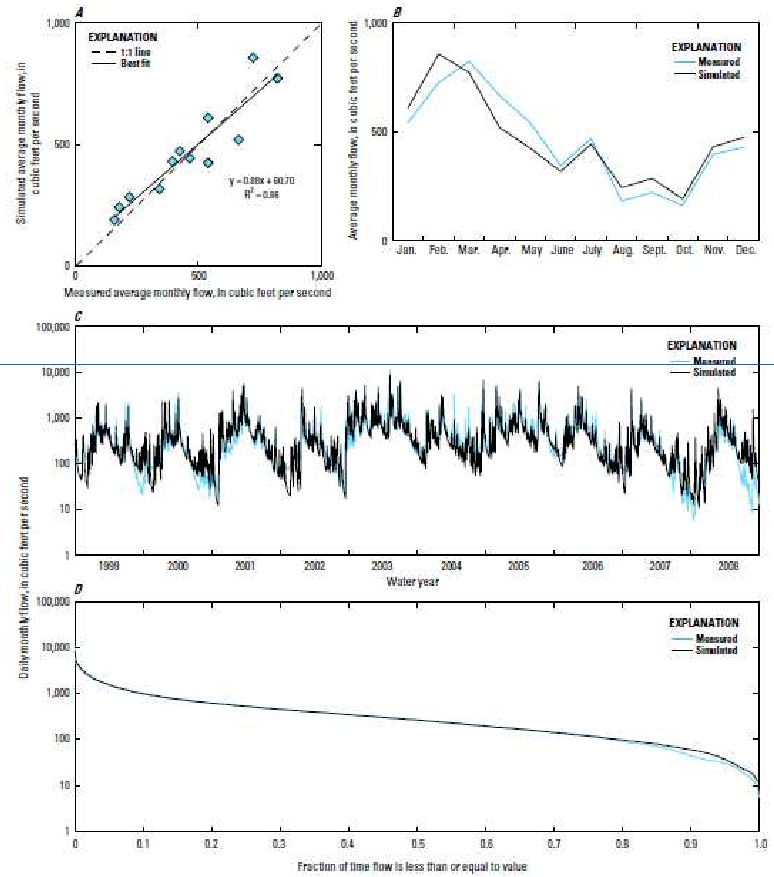
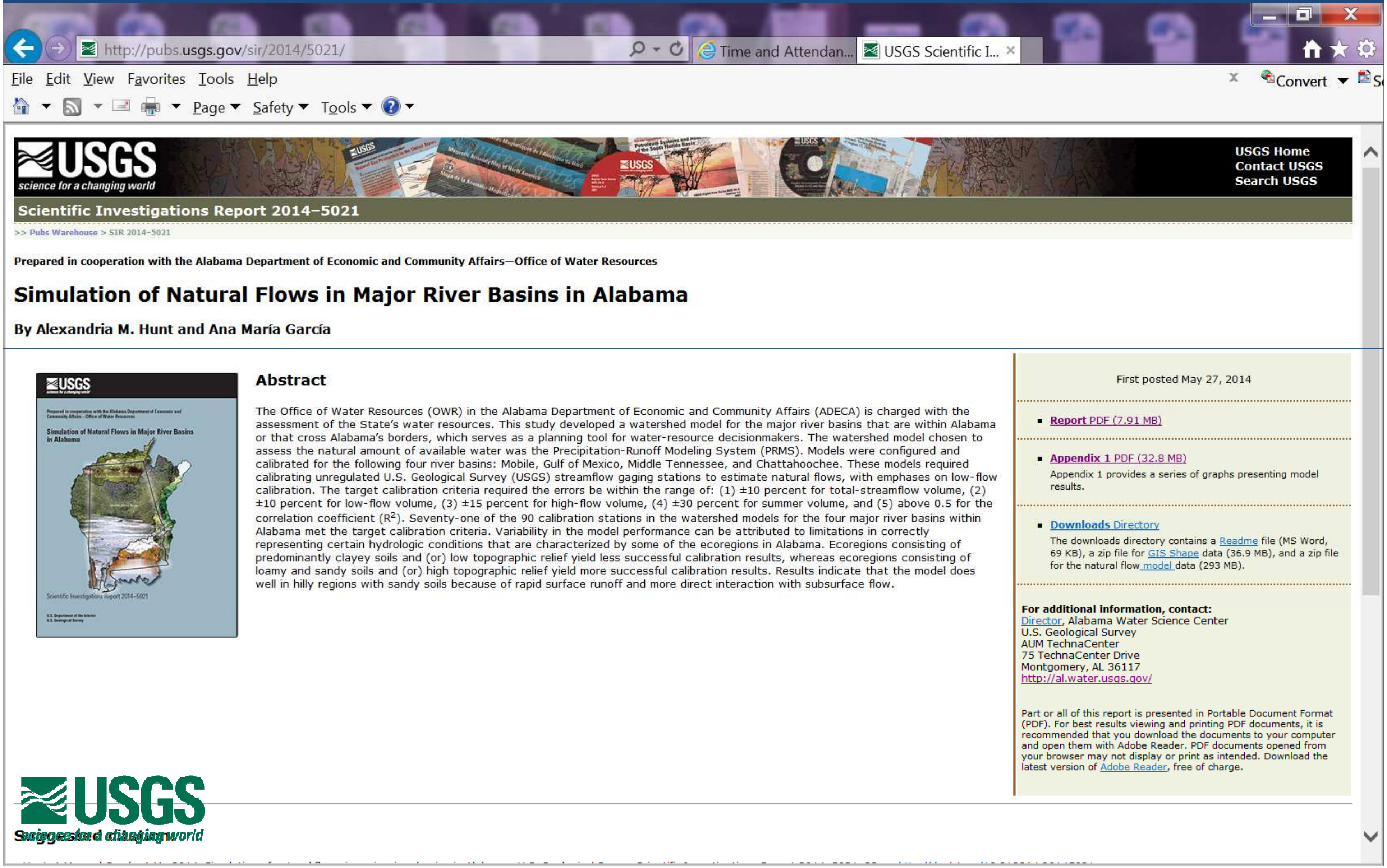


Figure 9. *A*, Best-fit line for simulated versus measured average monthly flow. *B*, Average monthly flow (1999–2008). *C*, Time series of daily flow (1999–2008). *D*, Duration curve of daily flow at the USGS station 02413000, Little Tallapoosa River at U.S. Route 27, at Carrollton, Ga. (1999–2008).

PRMS – Model Application

- Predict streamflow (daily) at ungaged basins
- Predict natural streamflow (daily) at regulated flow locations.
- Model can be used to evaluate withdrawal scenarios and determine their effects on water availability

http://pubs.usgs.gov/sir/2014/5021/



USGS Home
Contact USGS
Search USGS

Scientific Investigations Report 2014–5021

>> Pubs Warehouse > SIR 2014-5021

Prepared in cooperation with the Alabama Department of Economic and Community Affairs—Office of Water Resources

Simulation of Natural Flows in Major River Basins in Alabama

By Alexandria M. Hunt and Ana María García

Abstract

The Office of Water Resources (OWR) in the Alabama Department of Economic and Community Affairs (ADECA) is charged with the assessment of the State's water resources. This study developed a watershed model for the major river basins that are within Alabama or that cross Alabama's borders, which serves as a planning tool for water-resource decisionmakers. The watershed model chosen to assess the natural amount of available water was the Precipitation-Runoff Modeling System (PRMS). Models were configured and calibrated for the following four river basins: Mobile, Gulf of Mexico, Middle Tennessee, and Chattahoochee. These models required calibrating unregulated U.S. Geological Survey (USGS) streamflow gaging stations to estimate natural flows, with emphases on low-flow calibration. The target calibration criteria required the errors be within the range of: (1) ±10 percent for total-streamflow volume, (2) ±10 percent for low-flow volume, (3) ±15 percent for high-flow volume, (4) ±30 percent for summer volume, and (5) above 0.5 for the correlation coefficient (R^2). Seventy-one of the 90 calibration stations in the watershed models for the four major river basins within Alabama met the target calibration criteria. Variability in the model performance can be attributed to limitations in correctly representing certain hydrologic conditions that are characterized by some of the ecoregions in Alabama. Ecoregions consisting of predominantly clayey soils and (or) low topographic relief yield less successful calibration results, whereas ecoregions consisting of loamy and sandy soils and (or) high topographic relief yield more successful calibration results. Results indicate that the model does well in hilly regions with sandy soils because of rapid surface runoff and more direct interaction with subsurface flow.

First posted May 27, 2014

- **Report** PDF (7.91 MB)
- **Appendix 1** PDF (32.8 MB)
  Appendix 1 provides a series of graphs presenting model results.
- **Downloads Directory**
  The downloads directory contains a Readme file (MS Word, 69 KB), a zip file for GIS Shape data (36.9 MB), and a zip file for the natural flow model data (293 MB).

For additional information, contact:
Director, Alabama Water Science Center
U.S. Geological Survey
AUM TechnaCenter
75 TechnaCenter Drive
Montgomery, AL 36117
http://al.water.usgs.gov/

Part or all of this report is presented in Portable Document Format (PDF). For best results viewing and printing PDF documents, it is recommended that you download the documents to your computer and open them with Adobe Reader. PDF documents opened from your browser may not display or print as intended. Download the latest version of Adobe Reader, free of charge.

SPARROW
Decision Support System (DSS)

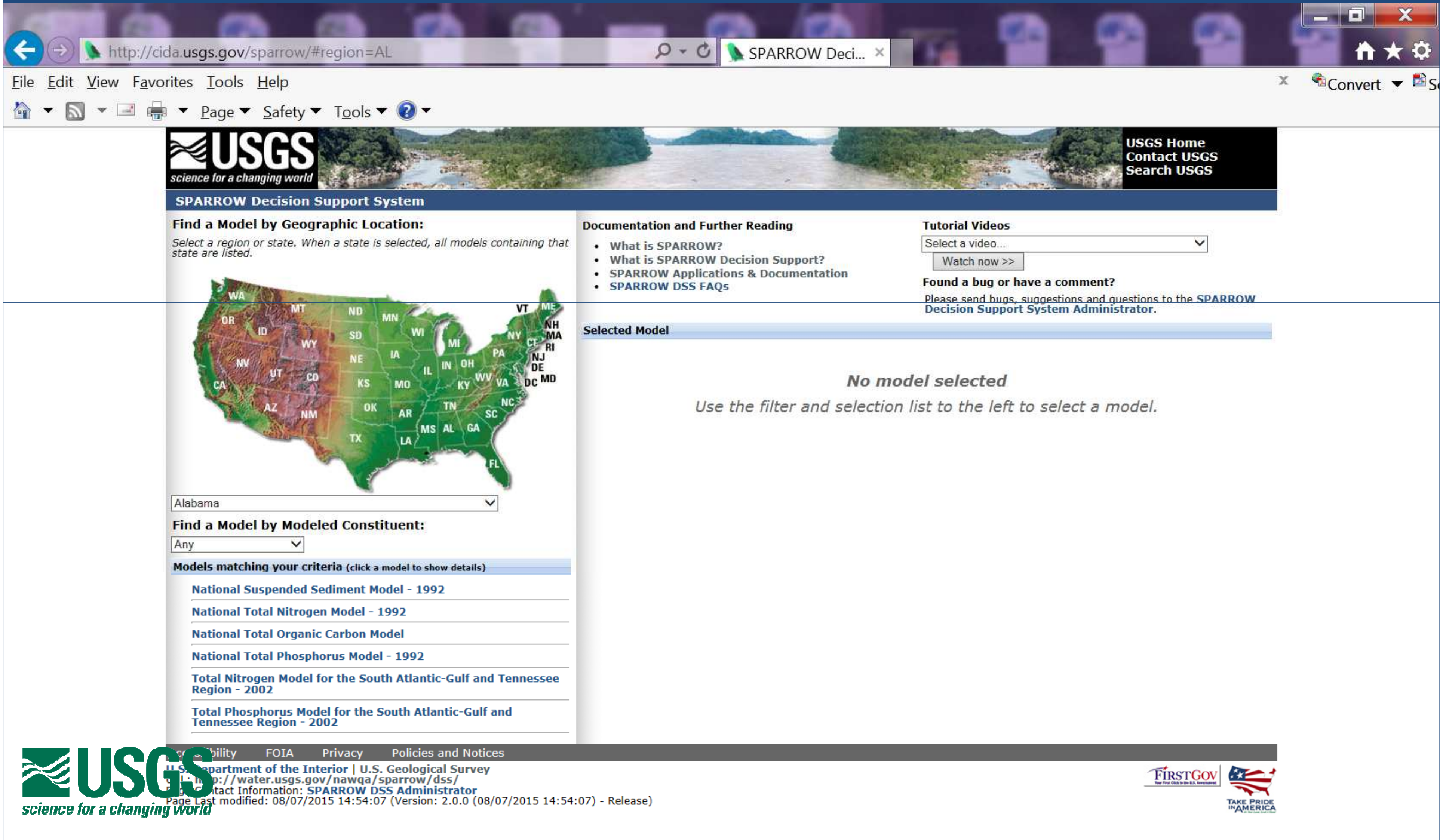
USGS
science for a changing world

SPARROW

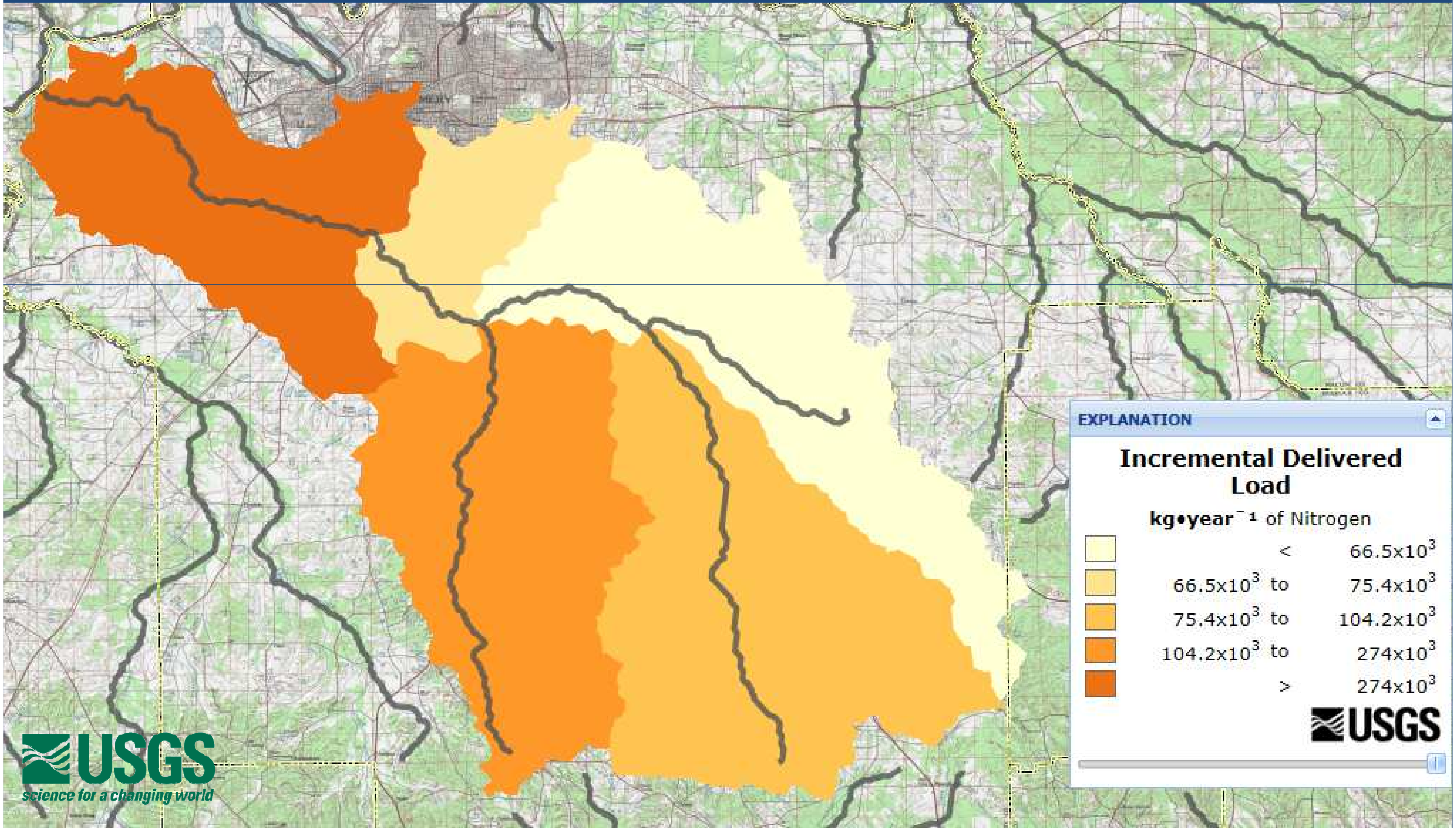
- Spatially Referenced Regression on Watershed attributes
- SPARROW Decision Support System (DSS)
  - Map predictions of long-term average water quality conditions (loads, yields, concentrations)
  - Map source contributions by stream reach and catchment
  - Track transport to downstream receiving waters, such as reservoirs and estuaries

USGS
science for a changing world

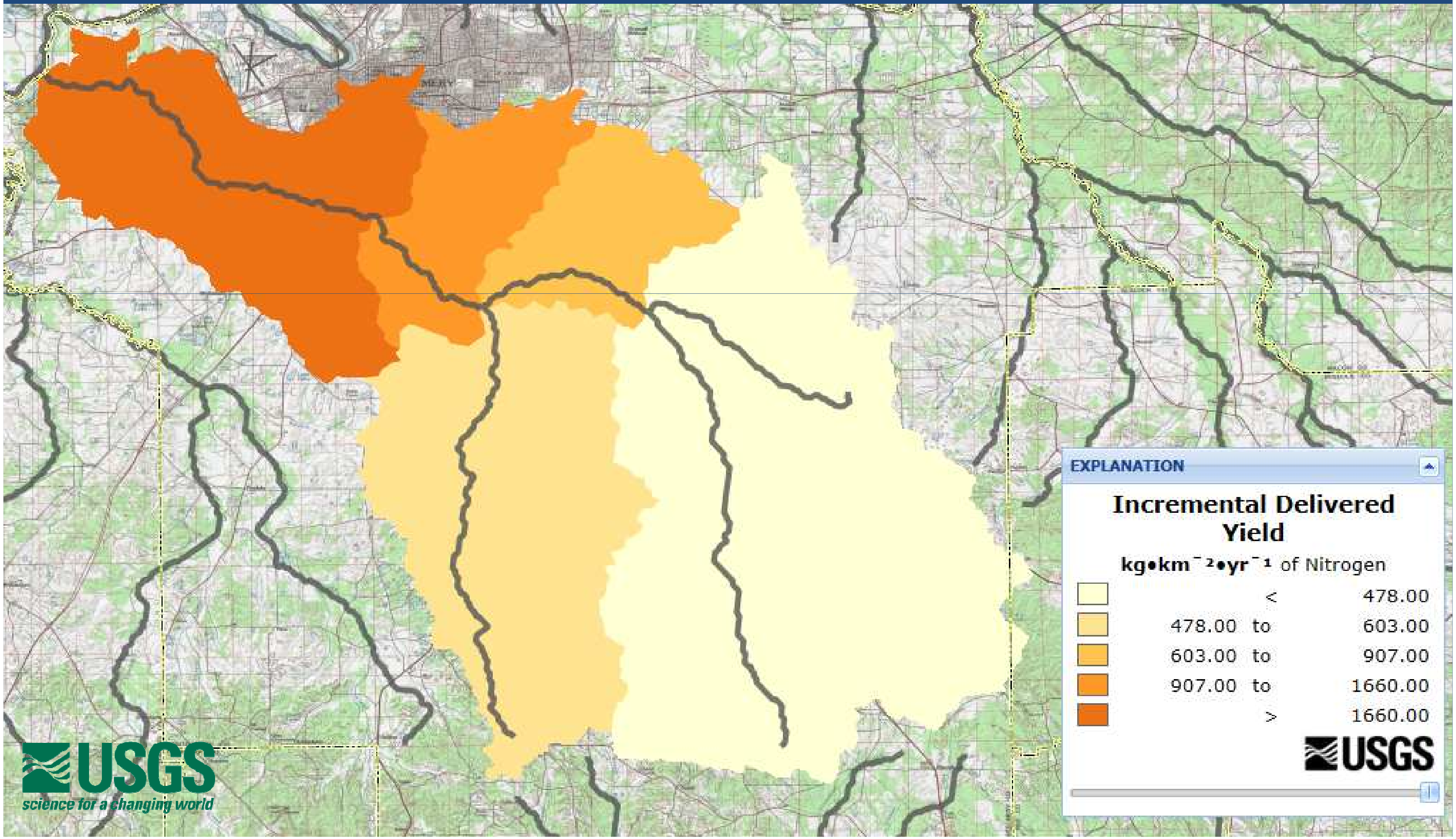
SPARROW
Decision Support System (DSS)



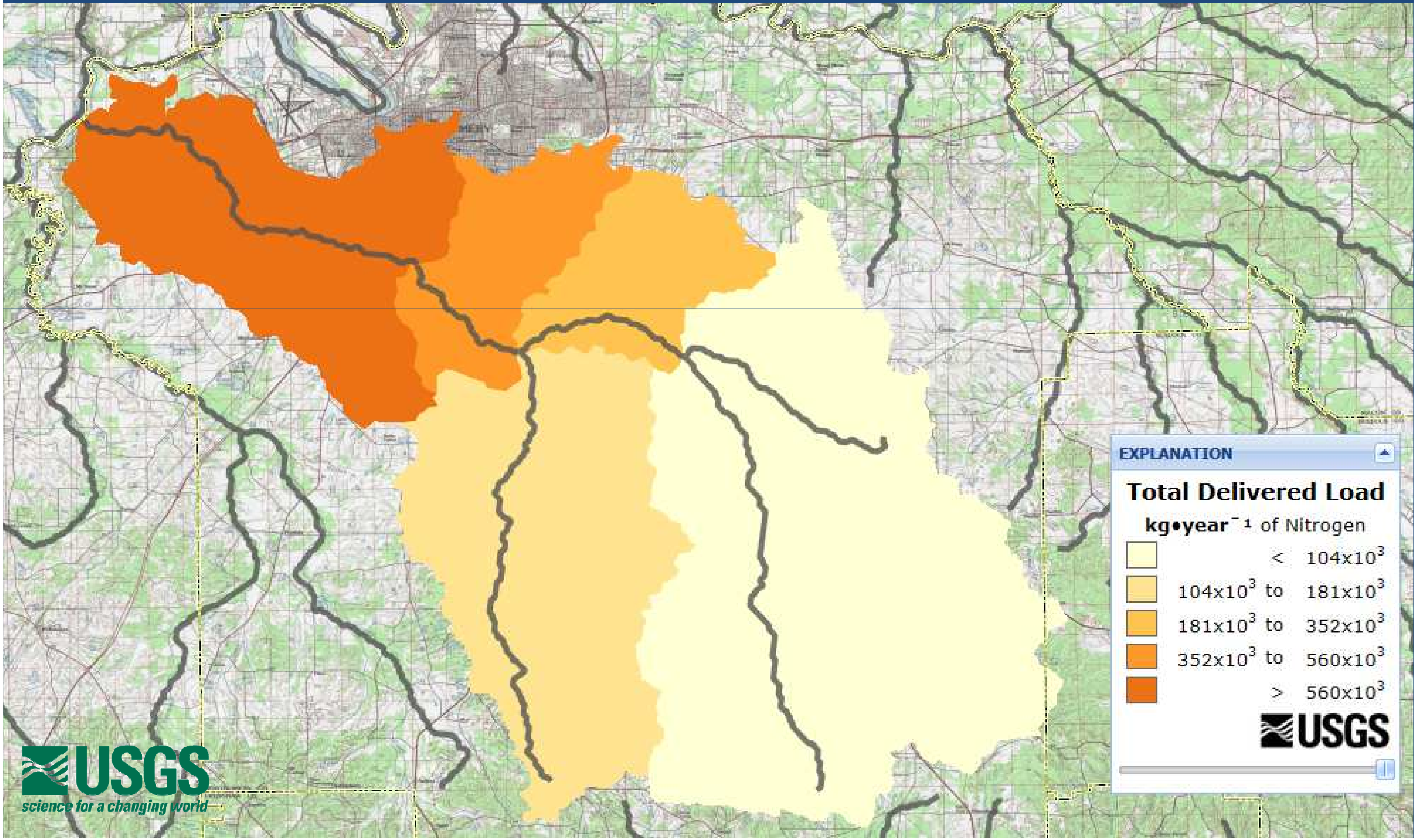
Map predictions of long-term average water quality conditions (loads, yields, concentrations)



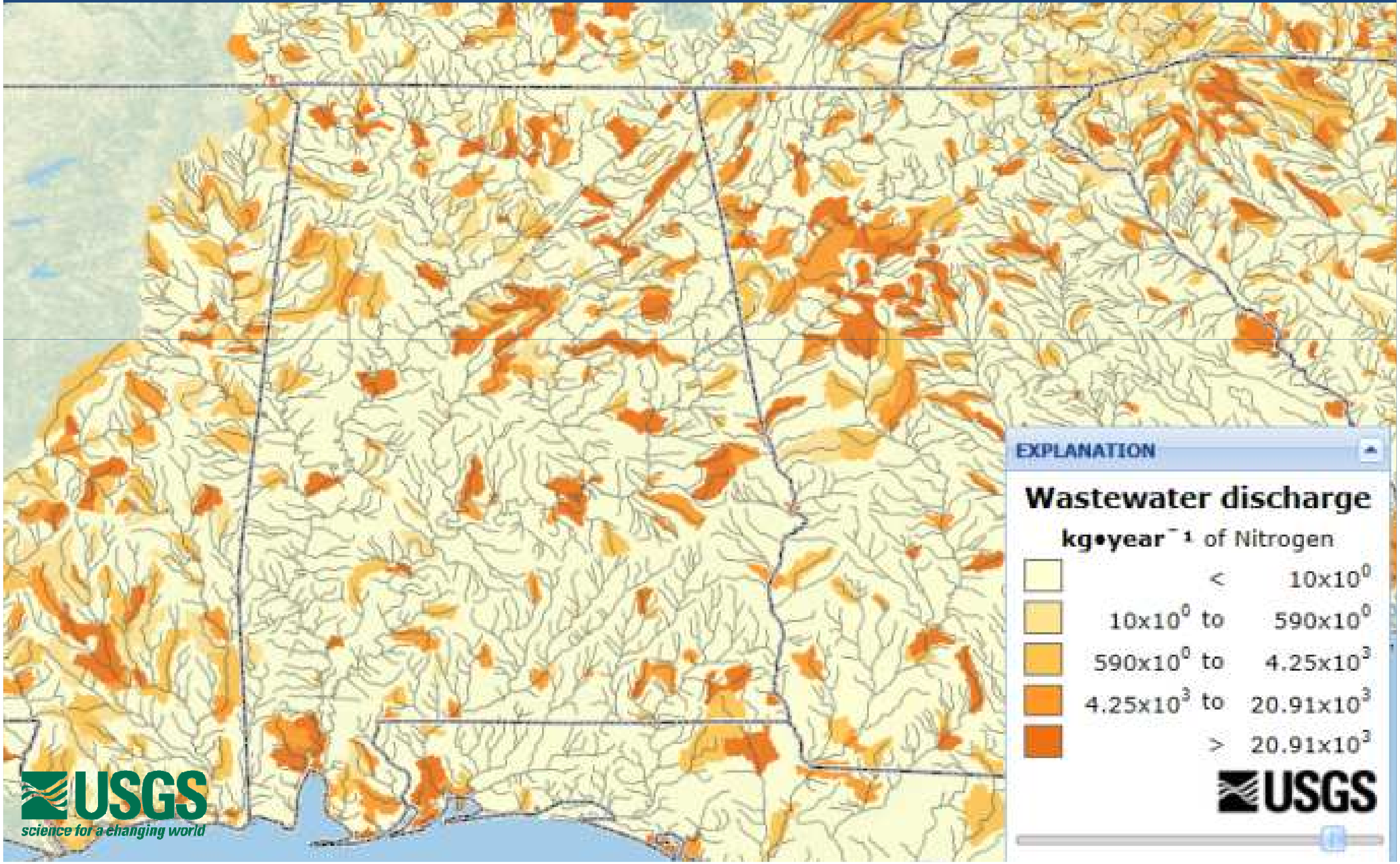
Map predictions of long-term average water quality conditions (loads, yields, concentrations)



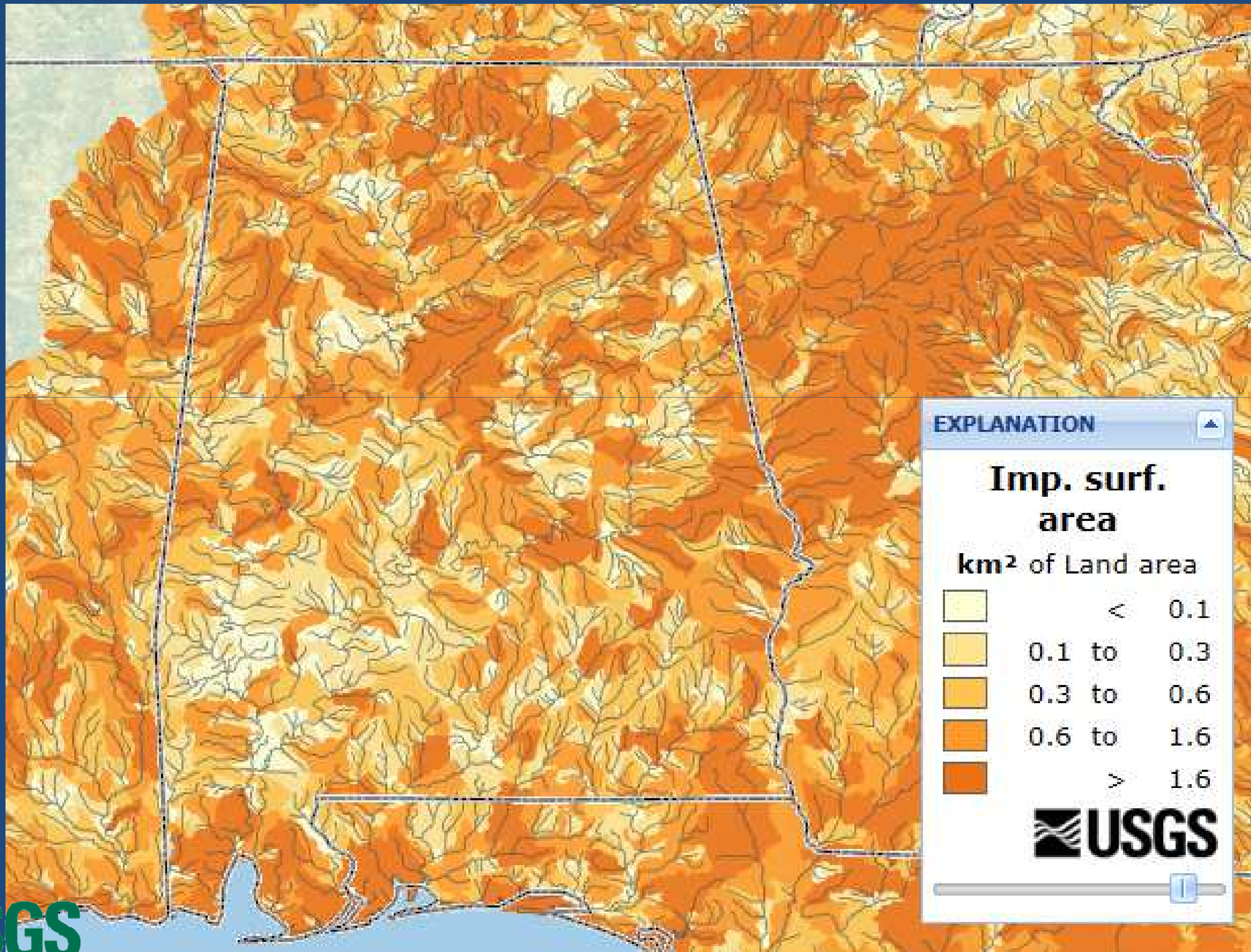
Map predictions of long-term average water quality conditions (loads, yields, concentrations)



Map source contributions by stream reach and catchment

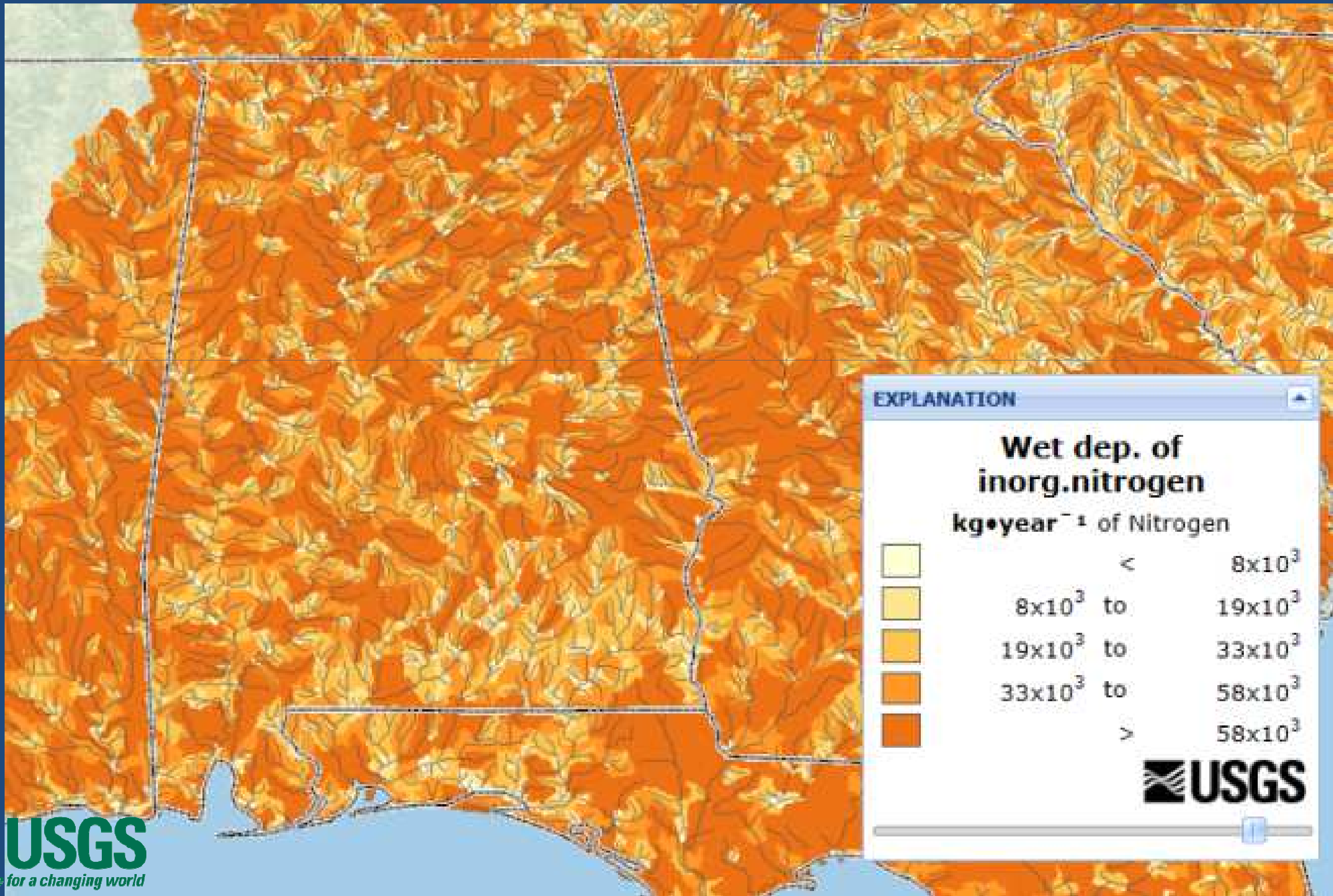


Map source contributions by stream reach and catchment



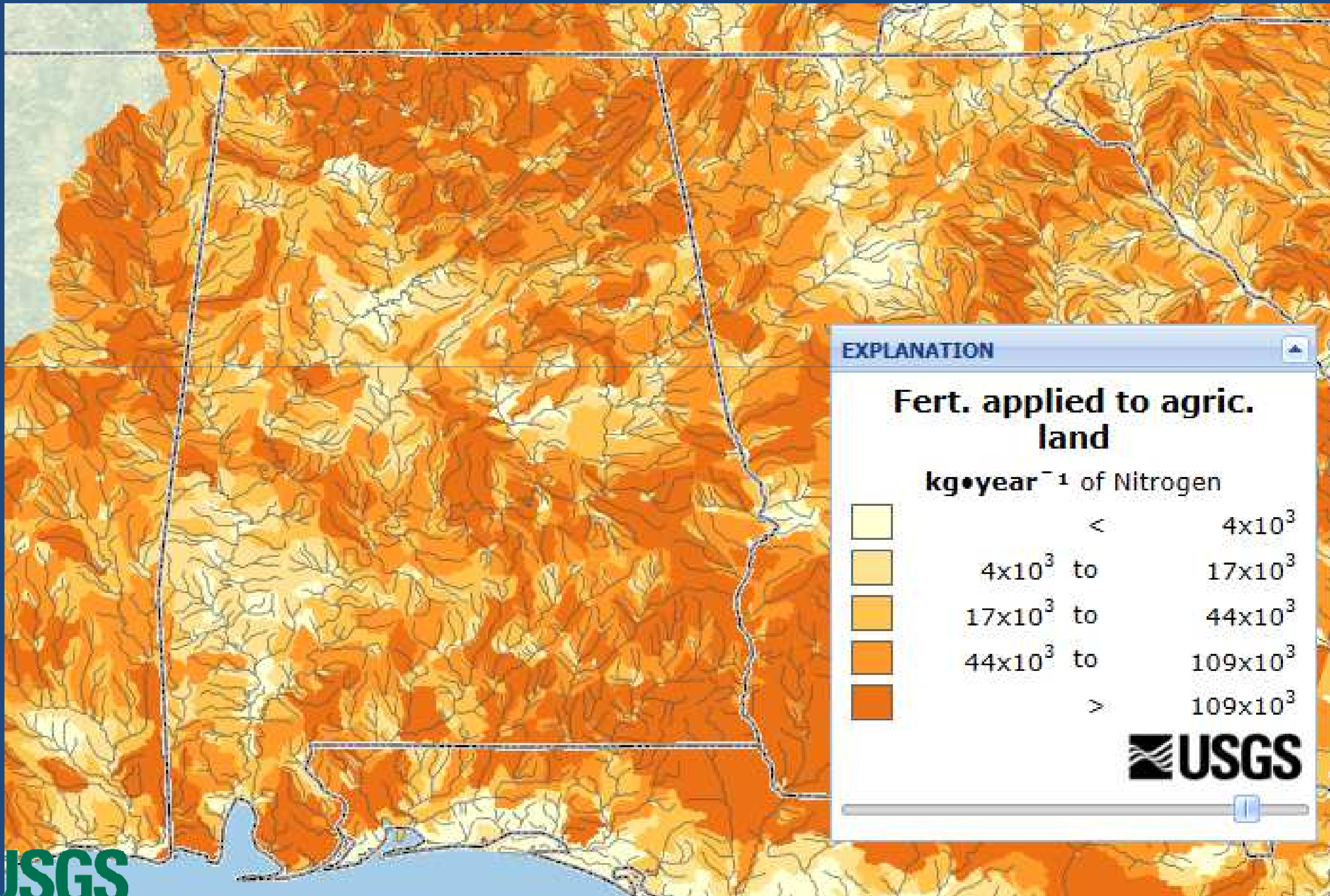
science for a changing world

Map source contributions by stream reach and catchment



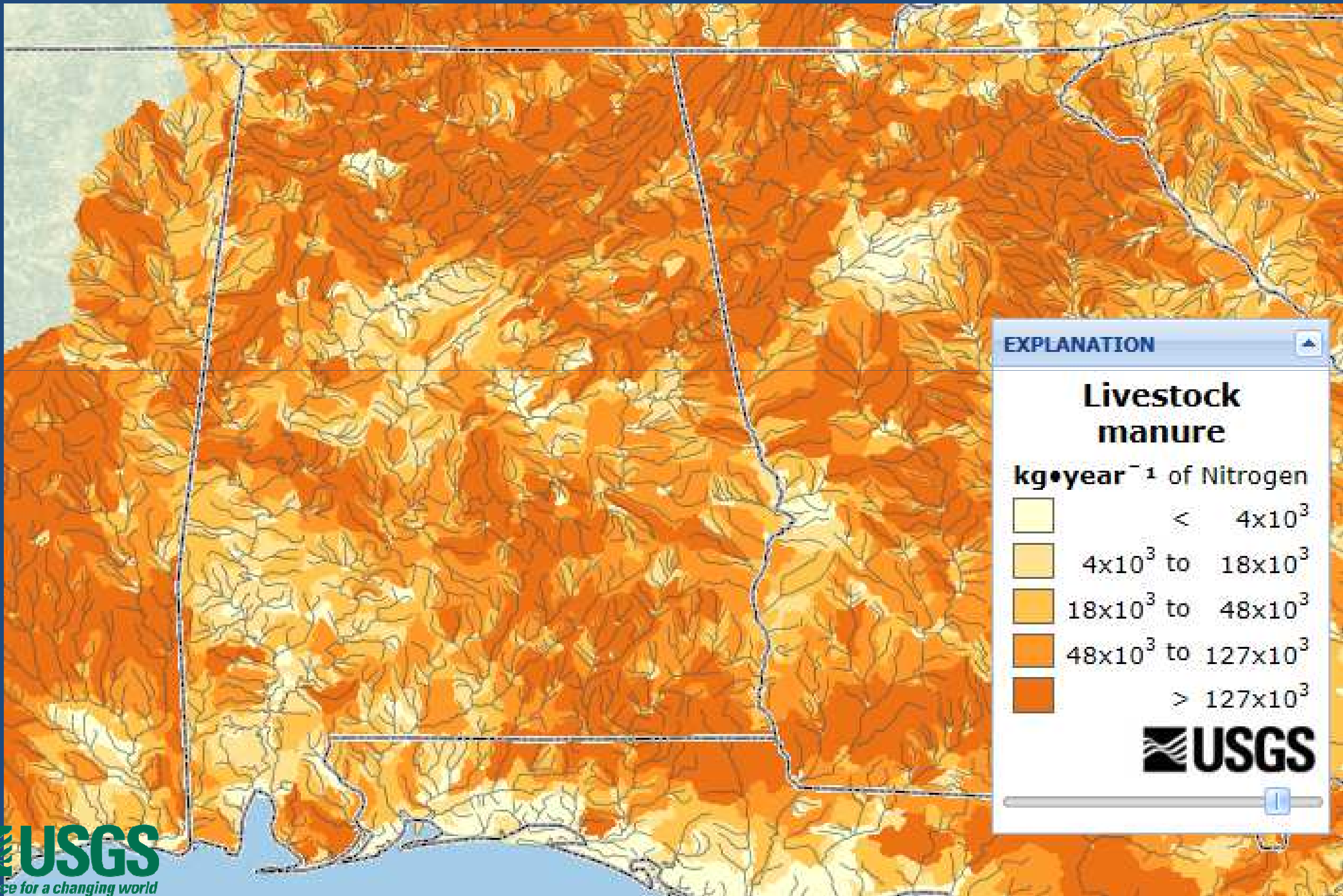
USGS
science for a changing world

Map source contributions by stream reach and catchment



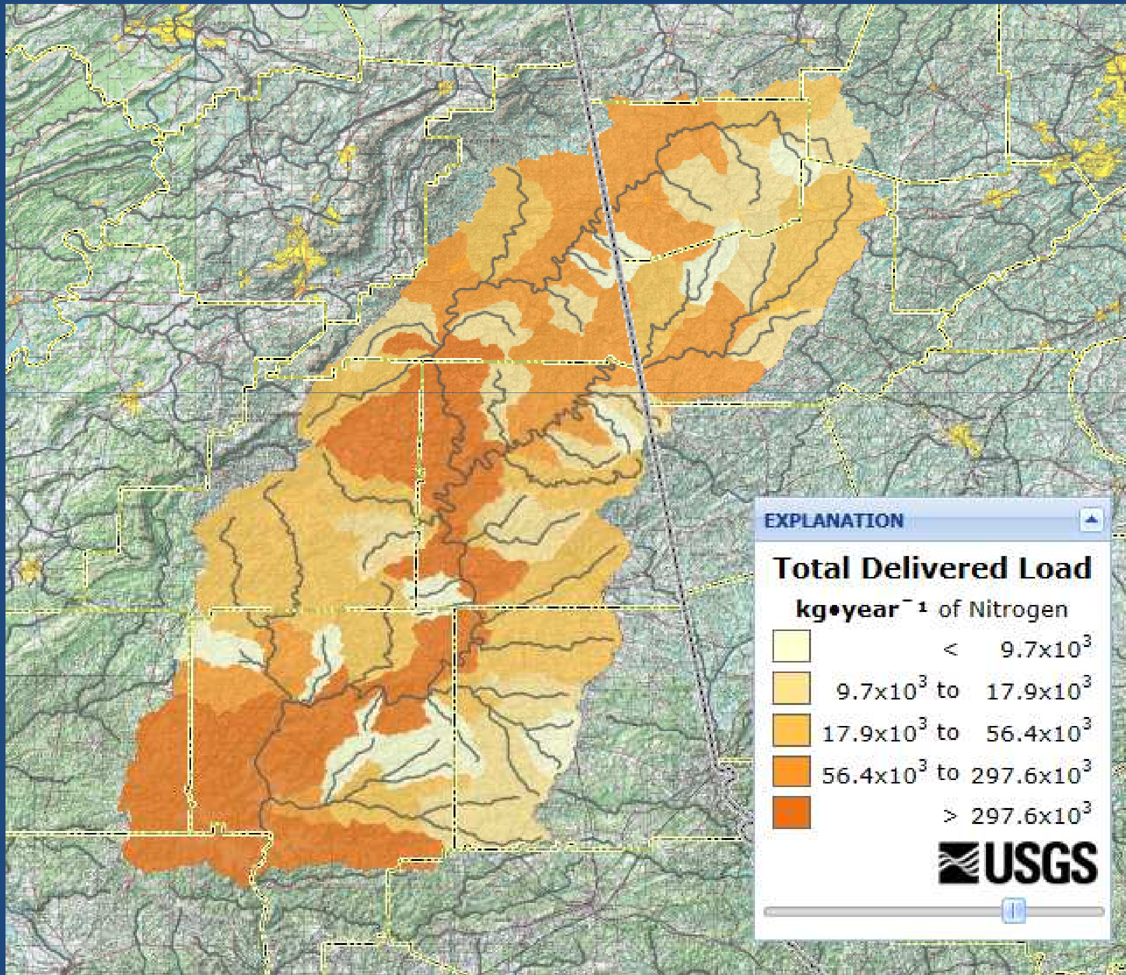
USGS
science for a changing world

Map source contributions by stream reach and catchment



USGS
science for a changing world

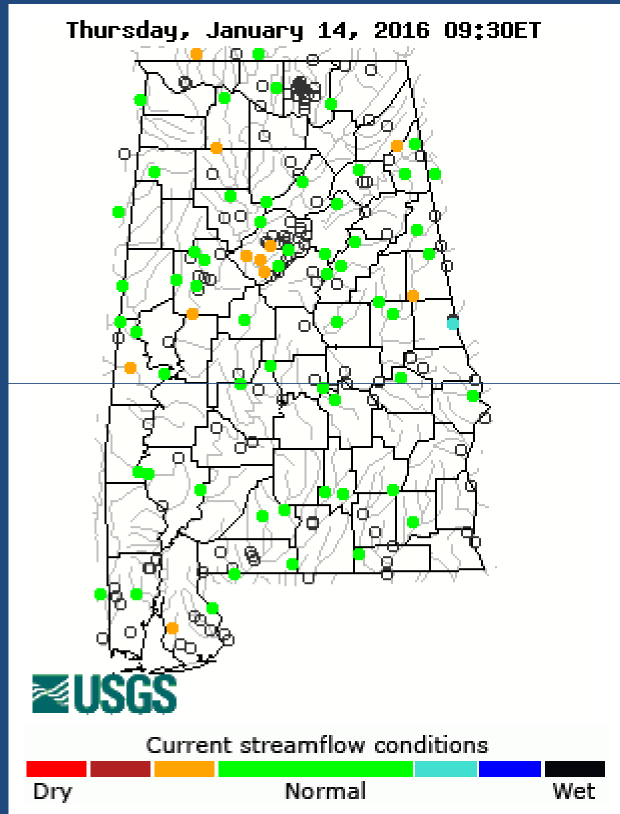
Track transport to downstream receiving waters, such as reservoirs and estuaries

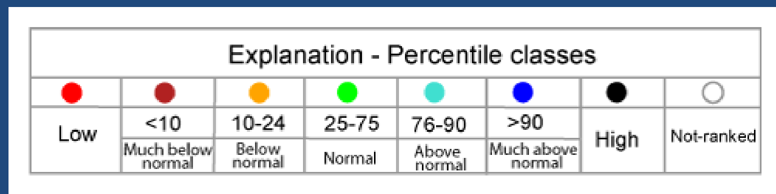


USGS
science for a changing world

Last … but not LEAST
WATERWATCH

- 189 Streamflow
- 1 Lakes Reservoir
- 32 Precipitation
- 7 Groundwater
- 21 Water Quality





http://waterwatch.usgs.gov/index.php
USGS WaterWat...

File Edit View Favorites Tools Help

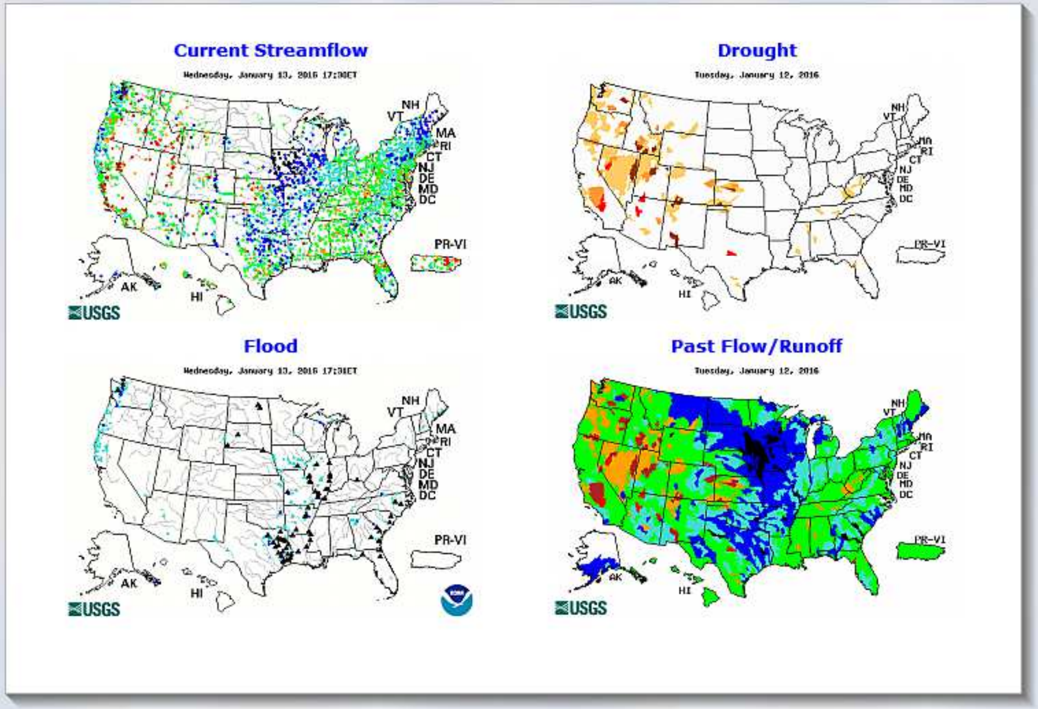
Page Safety Tools

USGS
science for a changing world

WaterWatch

Home

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



Accessibility FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
...ttp://...ater...sgs.gov
...Conta... In...ation: Contact USGS
...ast ...odified: ...sday, January 13, 2016

USGS
science for a changing world

http://waterwatch.usgs.gov/index.php | USGS WaterWat...

File Edit View Favorites Tools Help

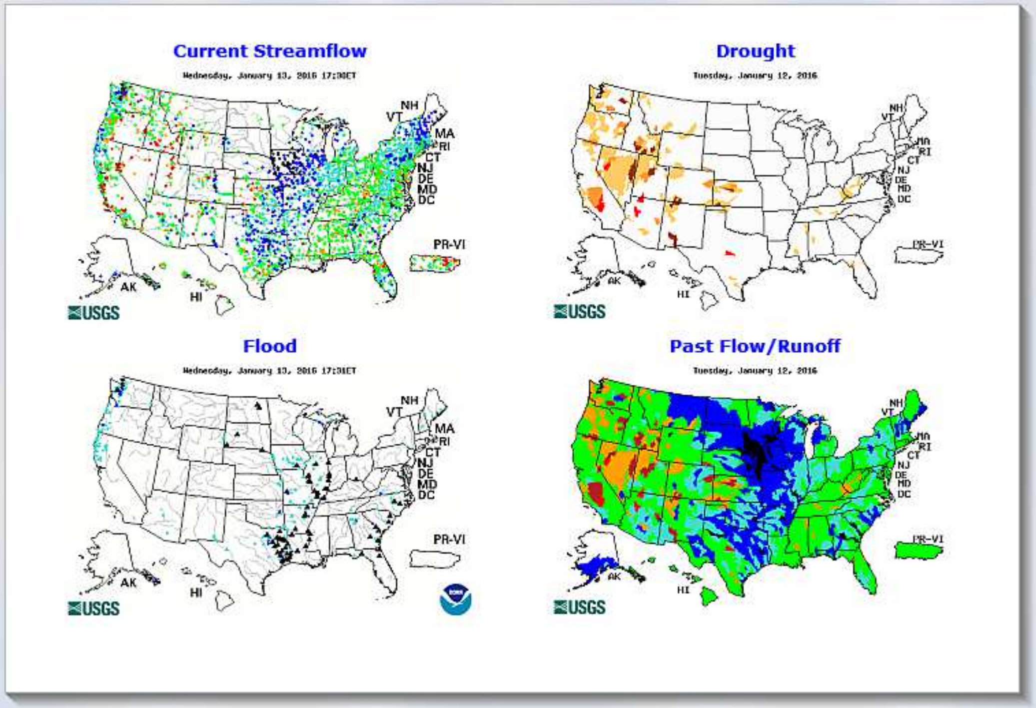
Page Safety Tools

USGS science for a changing world

WaterWatch

Home

- Current Streamflow
- Flood
- Drought
- Past Flow/Runoff
- Animation
  - Animation Builder
  - Real-Time Maps by Month
  - Flood Maps by Month
- Toolkit
- Toolkit (internal)
- Annual Summaries
- Additional Information
- About WaterWatch



Accessibility FOIA Privacy Policies and Notices

U.S. Department of the Interior | U.S. Geological Survey
...s.gov
Contact USGS
...day, January 13, 2016

http://waterwatch.usgs.gov/index.php?id=ww_animation

Streamflow Map Animation (United States)

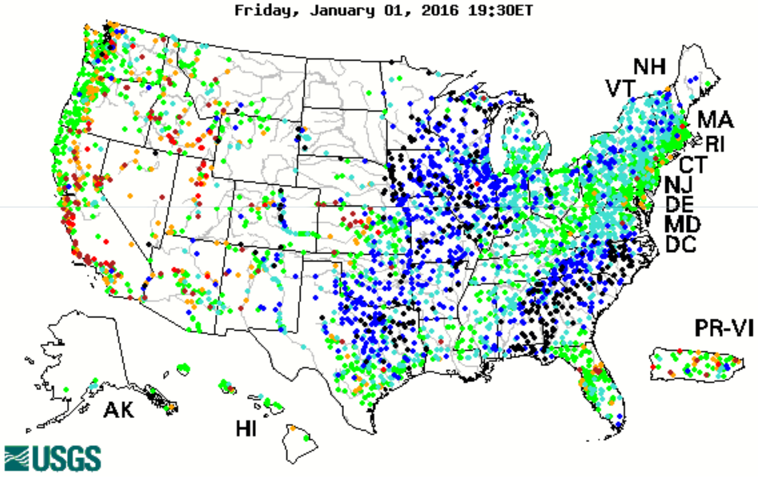
(Warning: Building an animation longer than 365 days is not advised as it may cause the system to timeout)

Choose options to build a map animation Go

Begin: 2016 January 1 **End:** 2016 January 1 **Interval(days):** 1

Map type: Real-time **Delay(secs):** 0.5 **Loops:** Continuous **Width:** px

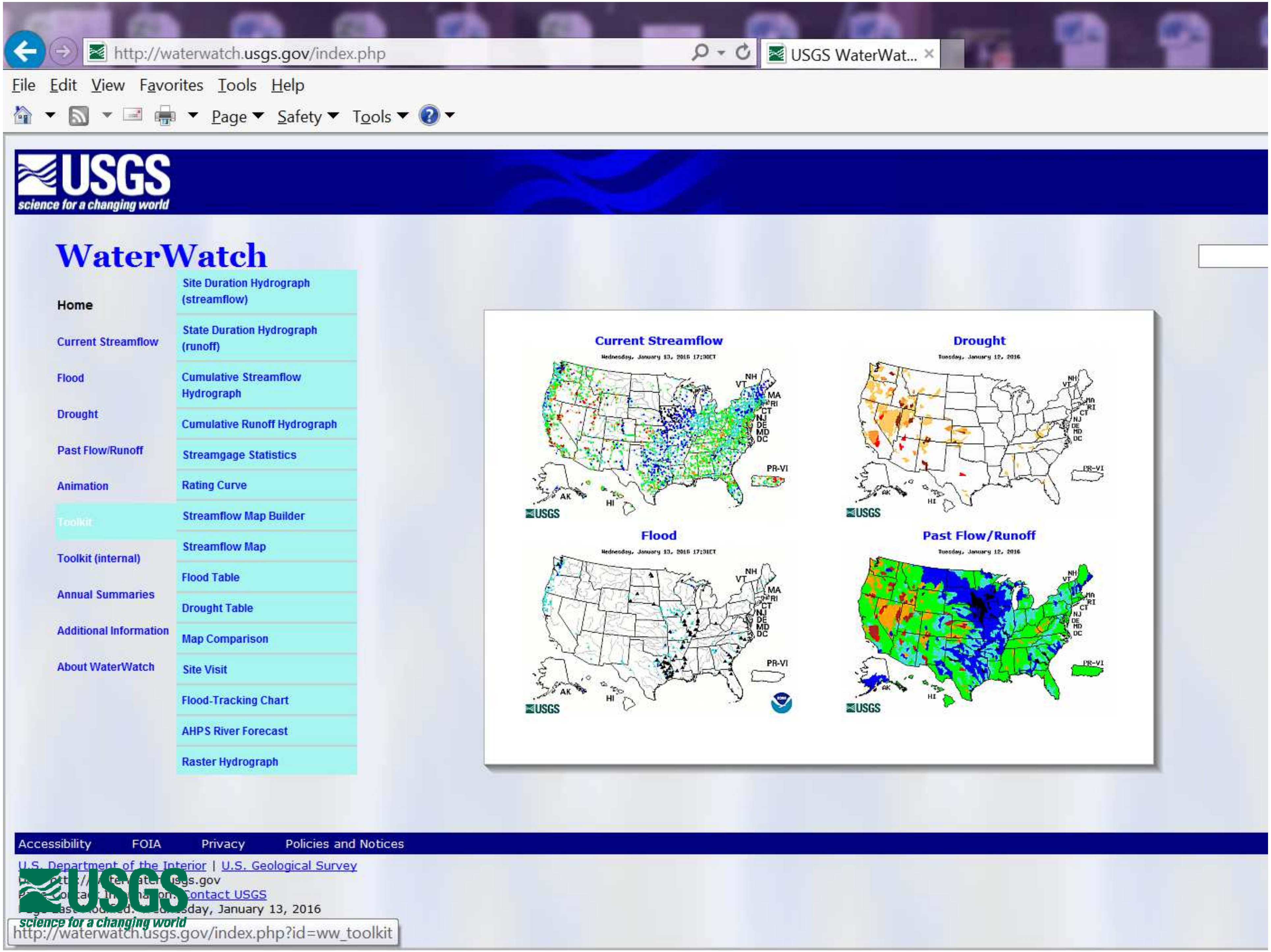
Friday, January 01, 2016 19:30ET



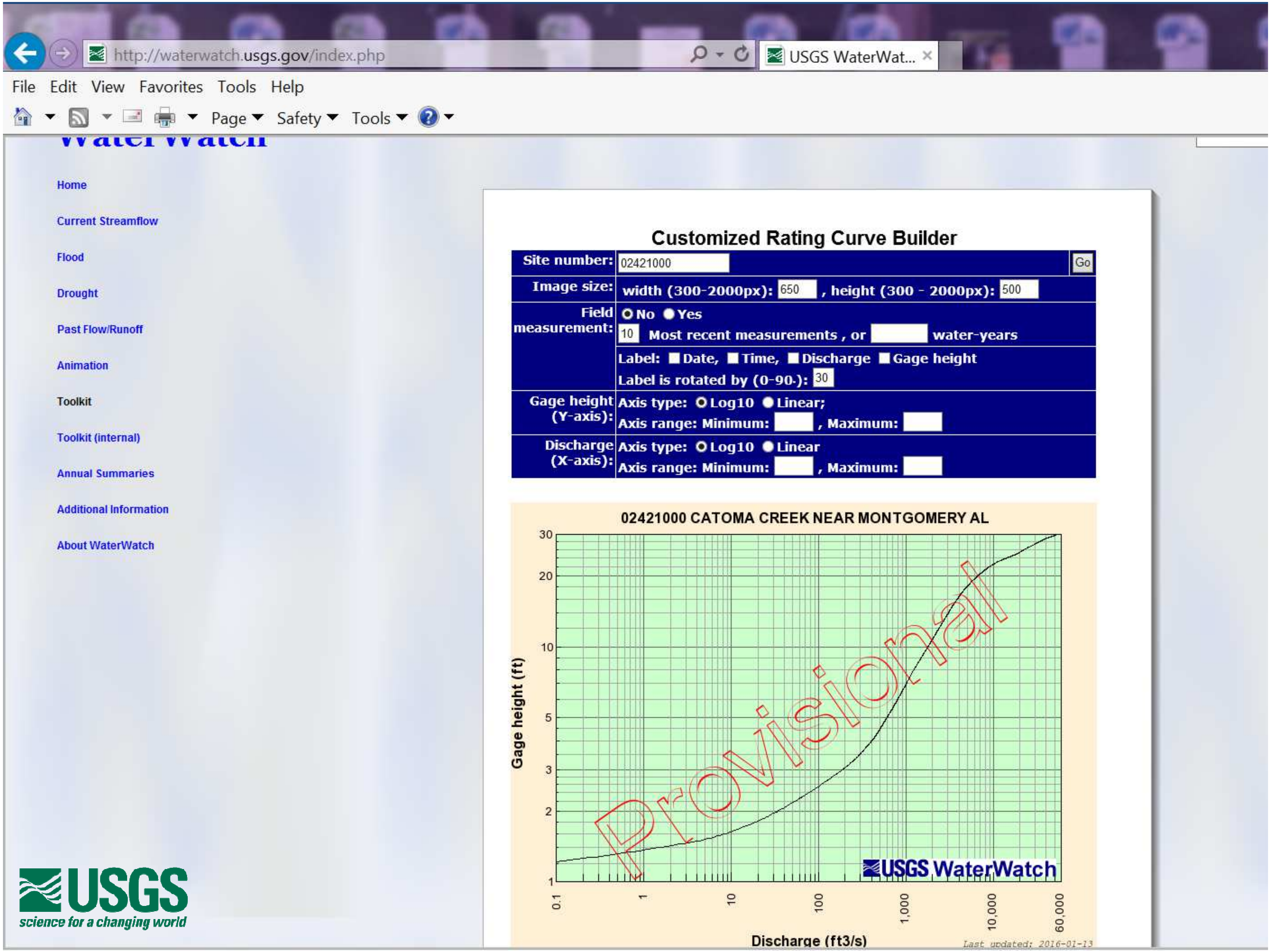
Explanation - Percentile classes						
●	●	●	●	●	●	●
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High

The data used to produce this map are provisional and have not been reviewed or edited. They may be subject to significant change.

science for a changing world



http://waterwatch.usgs.gov/index.php
USGS WaterWat...
File Edit View Favorites Tools Help
Page Safety Tools
USGS
science for a changing world
WaterWatch
Home
Current Streamflow
Flood
Drought
Past Flow/Runoff
Animation
Toolkit
Toolkit (internal)
Annual Summaries
Additional Information
About WaterWatch
Site Duration Hydrograph (streamflow)
State Duration Hydrograph (runoff)
Cumulative Streamflow Hydrograph
Cumulative Runoff Hydrograph
Streamgage Statistics
Rating Curve
Streamflow Map Builder
Streamflow Map
Flood Table
Drought Table
Map Comparison
Site Visit
Flood-Tracking Chart
AHPS River Forecast
Raster Hydrograph
Current Streamflow
Drought
Flood
Past Flow/Runoff
Accessibility
FOIA
Privacy
Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
Contact USGS
day, January 13, 2016
http://waterwatch.usgs.gov/index.php?id=ww_toolkit



http://waterwatch.usgs.gov/index.php
USGS WaterWat...
File Edit View Favorites Tools Help
Page Safety Tools
Home
Current Streamflow
Flood
Drought
Past Flow/Runoff
Animation
Toolkit
Toolkit (internal)
Annual Summaries
Additional Information
About WaterWatch
USGS
science for a changing world
Customized Rating Curve Builder
Site number: 02421000 Go
Image size: width (300-2000px): 650 , height (300 - 2000px): 500
Field measurement: No Yes
10 Most recent measurements , or water-years
Label: Date, Time, Discharge Gage height
Label is rotated by (0-90-): 30
Gage height (Y-axis): Axis type: Log10 Linear;
Axis range: Minimum: , Maximum:
Discharge (X-axis): Axis type: Log10 Linear
Axis range: Minimum: , Maximum:
02421000 CATOMA CREEK NEAR MONTGOMERY AL
Gage height (ft)
30
20
10
5
3
2
1
0.1
1
10
100
1,000
10,000
60,000
Discharge (ft3/s)
Provisional
USGS WaterWatch
Last updated: 2016-01-13

http://waterwatch.usgs.gov/index.php

USGS WaterWat...

File Edit View Favorites Tools Help

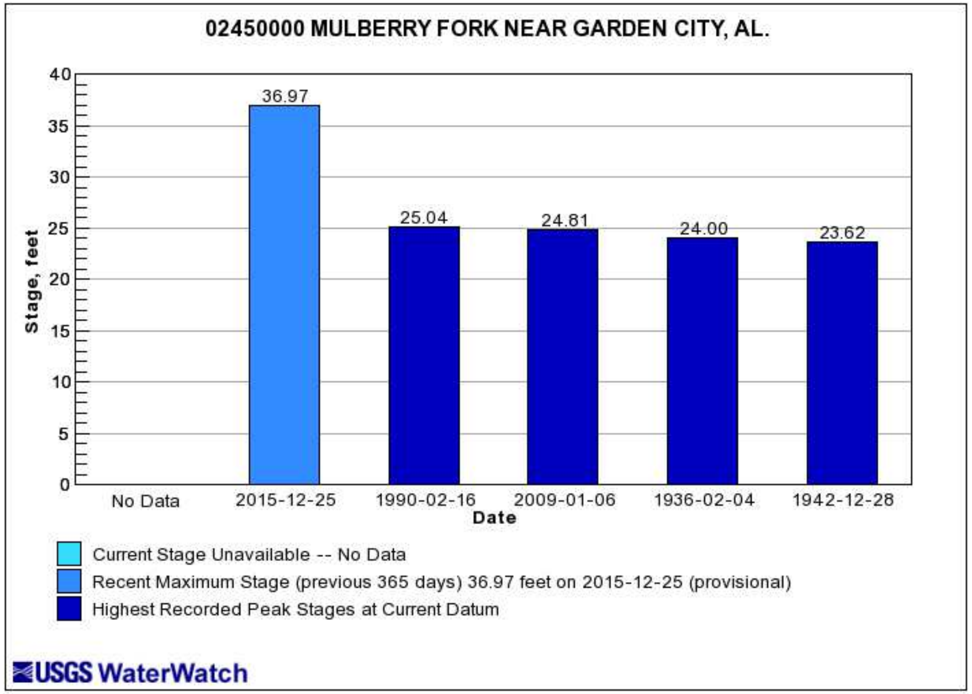
Page Safety Tools

WaterWatch

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

Flood Tracking Chart Builder

Site Number: 02450000 **Value type:** Gage Height **Size:** Normal (700x500) GO



Additional Information

- USGS real-time streamflow data
- USGS peak streamflow

USGS
science for a changing world

http://waterwatch.usgs.gov/index.php?r=al&id=statesum
USGS WaterWat...

File Edit View Favorites Tools Help

Page Safety Tools

Home

Current Streamflow

Flood

Drought

Past Flow/Runoff

Animation

Toolkit

Toolkit (internal)

Annual Summaries

Additional Information

About WaterWatch

USGS
science for a changing world

Table of computed runoff by water-year for Alabama

(Download version)

Alabama or Water-Resources Regions

Region	Year	Runoff (mm)	Runoff (in)	Rank	Percentile
AL	1901	654.61	25.77	26	77.59
AL	1902	595.34	23.44	45	61.21
AL	1903	665.04	26.18	23	80.17
AL	1904	234.53	9.23	115	0.86
AL	1905	414.57	16.32	89	23.28
AL	1906	552.45	21.75	56	51.72
AL	1907	557.45	21.95	53	54.31
AL	1908	577.65	22.74	50	56.90
AL	1909	655.24	25.80	25	78.45
AL	1910	358.60	14.12	101	12.93
AL	1911	337.18	13.27	104	10.34
AL	1912	752.81	29.64	10	91.38
AL	1913	596.21	23.47	43	62.93
AL	1914	278.98	10.98	112	3.45
AL	1915	472.31	18.59	76	34.48
AL	1916	650.12	25.60	28	75.86
AL	1917	635.99	25.04	33	71.55
AL	1918	391.15	15.40	94	18.97
AL	1919	706.00	27.80	18	84.48
AL	1920	892.67	35.14	1	99.14
AL	1921	550.47	21.67	57	50.86
AL	1922	689.76	27.16	19	83.62
AL	1923	619.80	24.40	36	68.97
AL	1924	529.37	20.84	61	47.41
AL	1925	363.58	14.31	100	13.79

http://waterwatch.usgs.gov/index.php?r=al&id=statesum

USGS WaterWat...

File Edit View Favorites Tools Help

Page Safety Tools

AL	1991	654.59	25.77	27	76.72
AL	1992	446.34	17.57	84	27.59
AL	1993	622.72	24.52	35	69.83
AL	1994	587.15	23.12	46	60.34
AL	1995	504.02	19.84	69	40.52
AL	1996	724.83	28.54	13	88.79
AL	1997	644.76	25.38	31	73.28
AL	1998	716.65	28.21	16	86.21
AL	1999	455.76	17.94	82	29.31
AL	2000	259.31	10.21	113	2.59
AL	2001	505.47	19.90	67	42.24
AL	2002	397.26	15.64	93	19.83
AL	2003	810.38	31.90	4	96.55
AL	2004	462.83	18.22	80	31.03
AL	2005	718.97	28.31	15	87.07
AL	2006	352.73	13.89	102	12.07
AL	2007	255.16	10.05	114	1.72
AL	2008	293.46	11.55	110	5.17
AL	2009	586.23	23.08	47	59.48
AL	2010	759.46	29.90	9	92.24
AL	2011	368.95	14.53	98	15.52
AL	2012	346.37	13.64	103	11.21
AL	2013	617.90	24.33	38	67.24
AL	2014	554.88	21.85	55	52.59
AL	2015	421.95	16.61	88	24.14

http://water.usgs.gov/wateralert/subscribe2/?site_no=02421000&parm=00060 | USGS Current Con... | USGS WaterAler...

File Edit View Favorites Tools Help

Page Safety Tools

USGS science for a changing world

USGS WaterAlert

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:	02421000	
Name:	CATOMA CREEK NEAR MONTGOMERY AL	
Agency:	USGS	
Transaction ID:	VhFD3	
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, DD1 (ft3/s)	◉	71 [peak chart]
Threshold Condition:	about this...	
◉ Greater than (>)		
○ Less than (<)	Real-time value isgreater than: ____ ft3/s	
○ Outside a range (< or >)		
○ Inside a range (> and <)		

☐ I have read and acknowledge the Provisional Data Statement and Disclaimer.

Submit Reset Cancel

USGS science for a changing world

Questions?

Athena Clark, P.E.

Deputy Director, Hydrologic Data Programs
USGS

Lower Mississippi Gulf Water Science Center

athclark@usgs.gov

(334) 395-4141

USGS
science for a changing world