2014 USGS Kentucky Water Science Center
Hydrologic Workshop
June 10, 2014

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502 493-1913

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

Kentucky Water Science Center Search the WEB?

Kentucky Water Resources Program

The mission of the U.S. Geological Survey (USGS) is to serve the Nation by providing reliable, impartial scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life. *Message from our Director.....*

Hydrologic Data | Studies | Sediment Lab | Publications | Science Center Information | Links | *Internal*

Real-Time Data for Kentucky

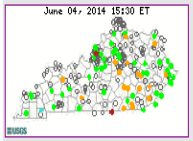
NOTICE: Recently discontinued and threatened USGS streamgages in Kentucky. Click here for more information.

- Streamflow
- Precipitation
- Ground Water
- Water-Quality
- Lake and Reservoir Elevations
- USGS Water Alert - WaterNow

Historical Data

- Streamflow
- Ground Water
- Water Quality
- Peak Flow
- Annual Data Report
- Instantaneous Data Archive (period-of-record unit-value data)

Current Water Conditions



- WaterWatch

Science Highlights

NEW Flood-Inundation Maps for a 6.5-Mile Reach of the Kentucky River at Frankfort, Kentucky

Digital flood-inundation maps for a 6.5-mile reach of Kentucky River at Frankfort, Kentucky, were created by the U.S. Geological Survey (USGS) in cooperation with the City of Frankfort Office of Emergency Management.

The inundation maps, available through the USGS Flood Inundation Mapping Science Web site, depict estimates of the areal extent and depth of flooding corresponding to selected water levels (stages) at the USGS streamgage Kentucky River at Lock 4 at Frankfort, Kentucky, and include **HAZUS** , a tool used to to estimate physical, economic, and social impacts of disasters; HAZUS is used for mitigation and recovery as well as preparedness and response.

In addition, the information has been provided to the National Weather Service (NWS) for incorporation into their Advanced Hydrologic Prediction Service (AHPS) flood warning system. The NWS forecasts flood hydrographs at many places that are often colocated at USGS streamgages. The forecasted peak-stage information, also available on the Internet, may be used in conjunction with the maps developed in this study to show predicted areas of flood inundation. Read more.....

Collaborative Projects

Water Availability Tool for Environmental Resources

The **W**ater **A**vailability **T**ool for **E**nvironmental **R**esources (**WATER**) was developed in cooperation with the Kentucky Division of Water to provide a consistent and defensible method of estimating streamflow, water availability, and other hydrologic information in ungaged basins.

WATER automatically incorporates and processes large amounts of basic and custom geospatial data to quantitatively describe topography, soil-water storage, climate, streamflow, and other parameters. **WATER** is also designed so that it can be expanded for other science and regulatory applications including, but not limited to, sediment and nutrient loads, evaluation of surface mining effects (Cumulative Hydrologic Impact Assessments), as well as flows that are necessary for ecological viability.

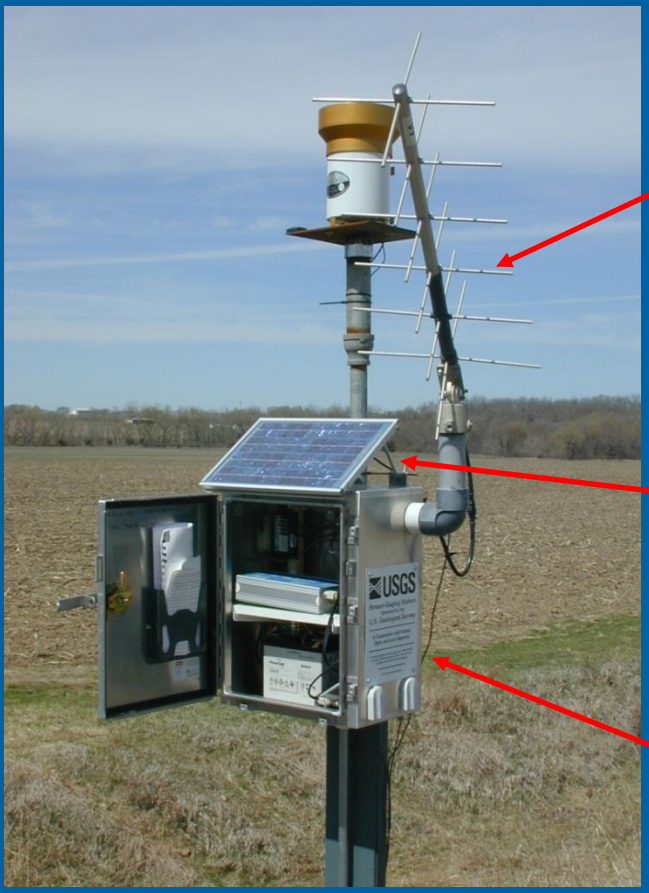
The concept of the Kentucky **WATER** application was born from the need to quantify water availability in areas of the Kentucky Commonwealth with limited long-term monitoring data. Kentucky's wealth of geospatial data was critical to the Kentucky **WATER** application and enabled USGS scientists to take well-known streamflow generation and modeling concepts (*Beven and Kirby, 1979*), develop innovative data-processing methods, and apply the concept across all regions of Kentucky with much greater accuracy and precision than had been previously possible.

View the project page link above to learn more about how the USGS can help you manage your water resources by providing custom input data, user-friendly interfaces, and tailored output to meet your specific management needs through "**WATER**".

Kentucky Agriculture Science and Monitoring Committee

USGS

How does a “Real-Time” work?

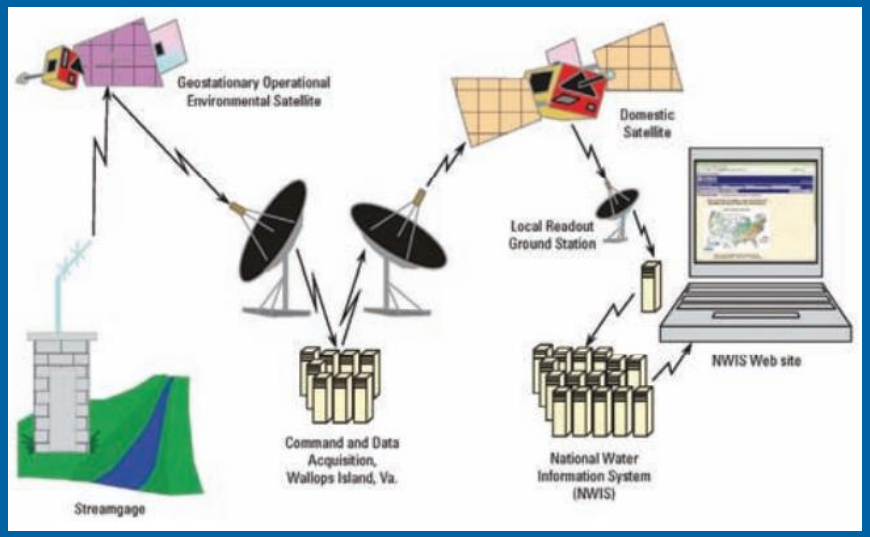


Antenna transmitting to weather satellites

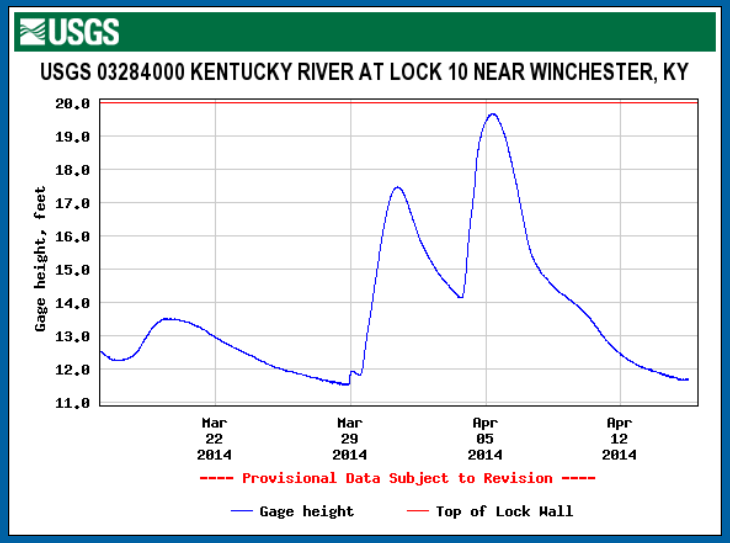
Solar Panel-charges 12-volt battery

Enclosure to protect instruments

Real-Time Streamgage



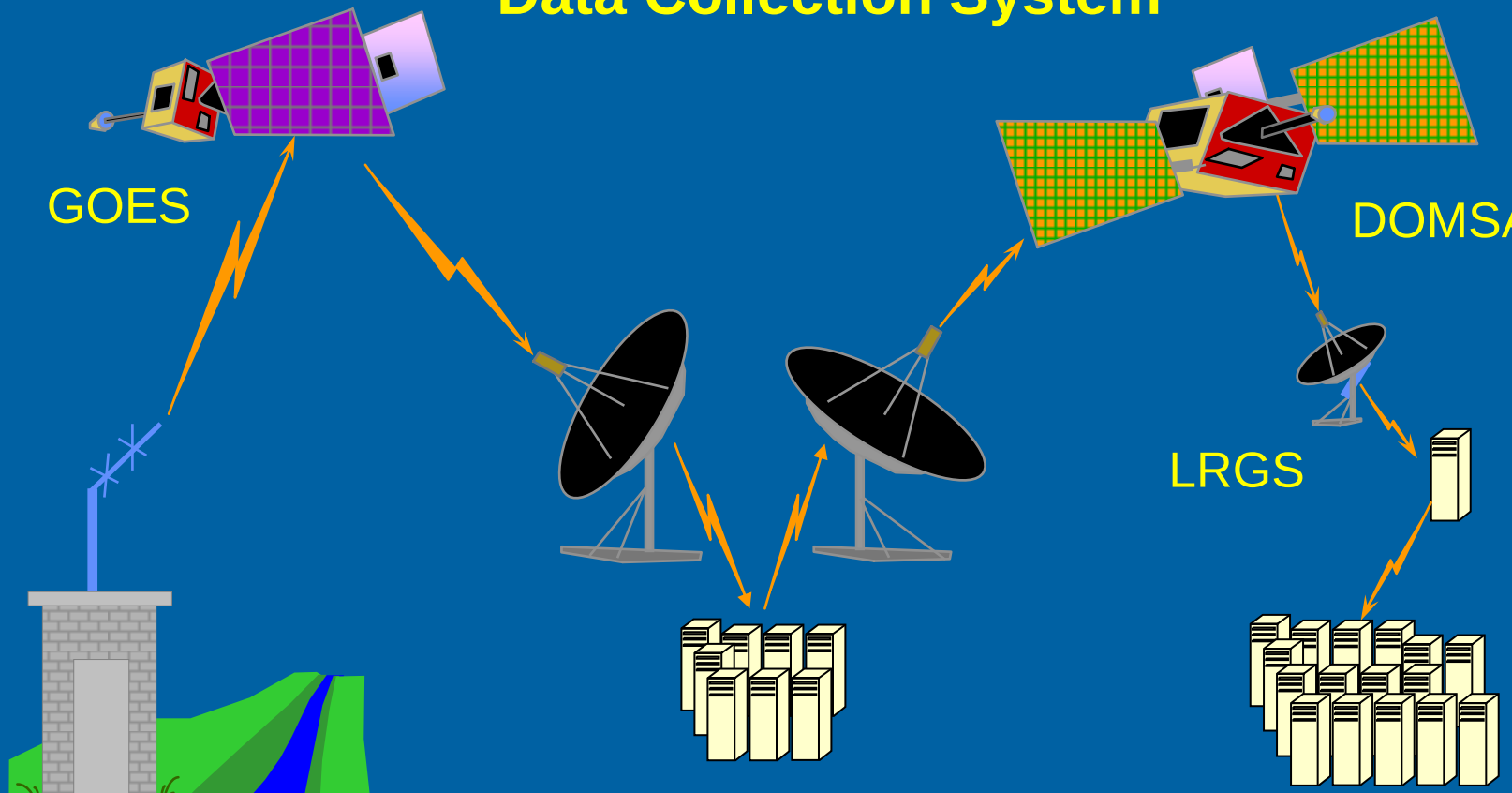
“Data Relay” Path



Real-time Stream Data

USGS

USGS GOES near real-time Data Collection System



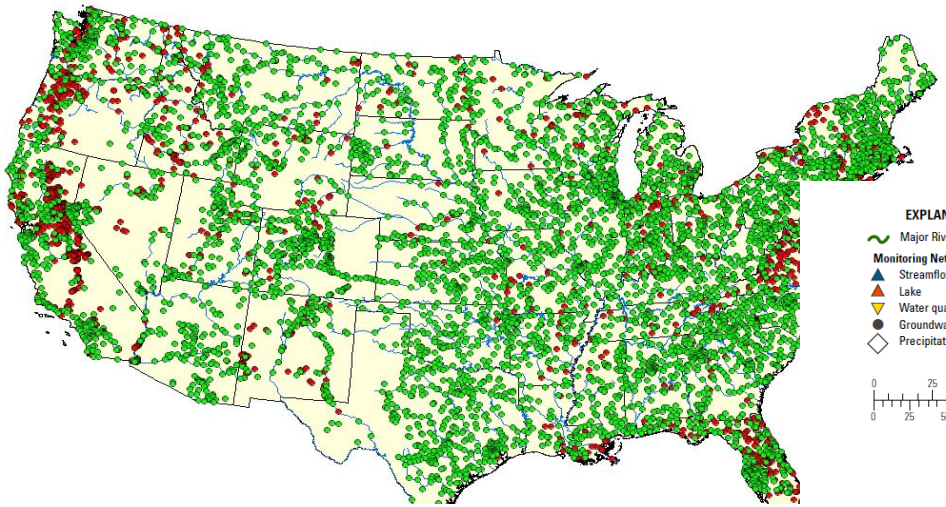
Field Station with Data Collection Platform (DCP)

Data Access and Processing System (DAPS), Wallops Island, VA and EROS Data Center in Sioux Falls, SD

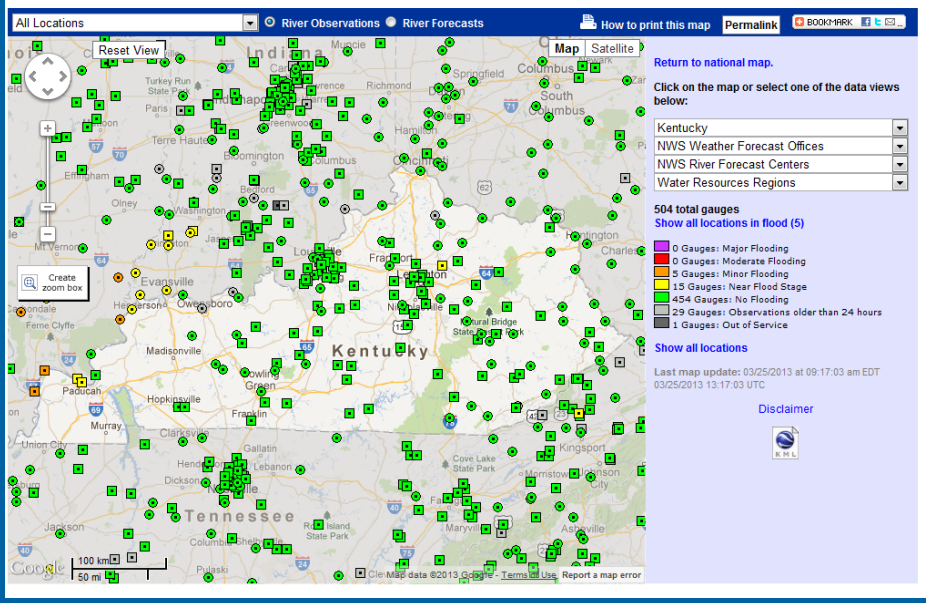
National Water Information System (NWIS)

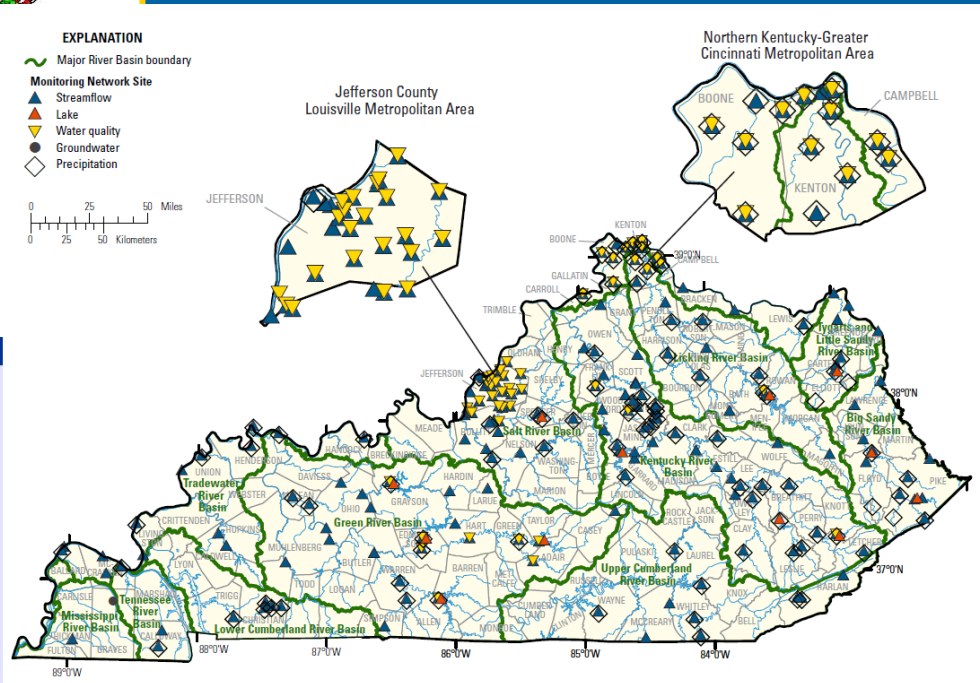
USGS

Over 9,000 USGS streamflow-gaging stations across the Nation. Over 99% are real-time!



All KY Sites (208) are real-time and update hourly!





NWS uses over 4,000 USGS gages for flood forecasting

- **Kentucky River Basin**

03277300 NORTH FORK KENTUCKY RIVER AT WHITESBURG, KY
03277450 CARR FORK NEAR SASSAFRAS, KY
03277500 NORTH FORK KENTUCKY RIVER AT HAZARD, KY
03280000 NORTH FORK KENTUCKY RIVER AT JACKSON, KY
03280600 MIDDLE FORK KENTUCKY RIVER NEAR HYDEN, KY
03280700 CUTSHIN CREEK AT WOOTON, KY
03281000 MIDDLE FORK KENTUCKY RIVER AT TALLEGA, KY
03281100 GOOSE CREEK AT MANCHESTER, KY
03281500 SOUTH FORK KENTUCKY RIVER AT BOONEVILLE, KY
03282000 KENTUCKY RIVER AT LOCK 14 AT HEIDELBERG, KY
03282040 STURGEON CREEK AT CRESSMONT, KY
03282060 KENTUCKY RIVER AT LOCK 13 NEAR WILLOW, KY
03282120 KENTUCKY RIVER AT LOCK 12 NEAR IRVINE, KY
03282290 KENTUCKY RIVER AT LOCK 11 NEAR COLLEGE HILL, KY
03282500 RED RIVER NEAR HAZEL GREEN, KY
03283500 RED RIVER AT CLAY CITY, KY
03284000 KENTUCKY RIVER AT LOCK 10 NEAR WINCHESTER, KY
03284230 KENTUCKY RIVER AT LOCK 9 AT VALLEY VIEW, KY
03284500 KENTUCKY RIVER AT LOCK 8 NEAR CAMP NELSON, KY
03284525 E HICKMAN CR TRIB AT CHILESBURG RD NR LEXINGTON,
03284533 EAST HICKMAN CR AT TATES CR RD NR EAST HICKMAN, K
03284552 WEST HICKMAN CR AT VETERANS PARK NR LEXINGTON,
03284580 HICKMAN CREEK AT HWY 1268 NEAR CAMP NELSON, KY
03285000 DIX RIVER NEAR DANVILLE, KY
03286200 DIX RIVER AT DIX DAM NEAR BURGIN, KY
03286500 KENTUCKY RIVER AT LOCK 7 AT HIGHBRIDGE, KY
03287000 KENTUCKY RIVER AT LOCK 6 NEAR SALVISA, KY
LOWER POOL
UPPER POOL
03287250 KENTUCKY RIVER AT LOCK 5 NEAR TYRONE, KY
FROM LOWER POOL
03287270 2~LITTLE BENSON CREEK TRIBUTARY AT FARMDALE, KY
03287500 KENTUCKY RIVER AT LOCK 4 AT FRANKFORT, KY
03287590 N ELKHORN CR AT WINCHESTER RD NR LEXINGTON, KY
03287600 N ELKHORN CR AT BRYAN STATION RD AT MONTROSE, KY
03288100 NORTH ELKHORN CREEK AT GEORGETOWN, KY
03288110 ROYAL SPRINGS AT GEORGETOWN, KY
03288180 CANE RUN CREEK AT CITATION BLVD NR LEXINGTON, KY
03288190 TRIB TO CANE RUN CR AT NEWTOWN PK NR LEXINGTON,
03289000 SOUTH ELKHORN CREEK AT FORT SPRING, KY
03289193 WOLF RUN AT OLD FRANKFORT PIKE AT LEXINGTON, KY
03289200 TOWN BRANCH AT YARNALLTON ROAD AT YARNALLTON,
03289300 SOUTH ELKHORN CREEK NEAR MIDWAY, KY
03289500 ELKHORN CREEK NEAR FRANKFORT, KY
03290080 KENTUCKY RIVER AT LOCK 3 AT GEST, KY
LOWER POOL
UPPER POOL
03290500 KENTUCKY RIVER AT LOCK 2 AT LOCKPORT, KY
03291000 EAGLE CREEK AT SADIEVILLE, KY
03291500 EAGLE CREEK AT GLENCOE, KY

DESCRIPTION:

Latitude 38°12'06", Longitude 84°52'54" NAD27
Franklin County, Kentucky, Hydrologic Unit 05100205
Drainage area: 5,411.0 square miles
Contributing drainage area: 5,292.00 square miles,
Datum of gage: 462.1 feet above NGVD29.

AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Current / Historical Observations (availability statement)	2007-10-01	2014-04-15	
Daily Data			
Temperature, water, degrees Celsius	2001-06-23	2013-09-30	10917
Discharge, cubic feet per second	1925-10-01	2014-04-14	31422
Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius	2001-06-23	2006-09-30	5502
Dissolved oxygen, water, unfiltered, milligrams per liter	2001-06-23	2006-09-30	4827
pH, water, unfiltered, field, standard units	2001-06-23	2006-09-30	5592
Suspended sediment concentration, milligrams per liter	1952-10-03	1973-09-30	7265
Suspended sediment discharge, tons per day	1952-10-01	1973-09-30	7597
Daily Statistics			
Temperature, water, degrees Celsius	2001-06-23	2013-09-30	3639
Discharge, cubic feet per second	1925-10-01	2013-09-30	31229
Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius	2001-06-23	2006-09-30	1834
Dissolved oxygen, water, unfiltered, milligrams per liter	2001-06-23	2006-09-30	1609
pH, water, unfiltered, field, standard units	2001-06-23	2006-09-30	1864
Suspended sediment concentration, milligrams per liter	1952-10-03	1973-09-30	7265
Suspended sediment discharge, tons per day	1952-10-01	1973-09-30	7597
Monthly Statistics			
Temperature, water, degrees Celsius	2001-06	2013-09	
Discharge, cubic feet per second	1925-10	2013-09	
Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius	2001-06	2006-09	
Dissolved oxygen, water, unfiltered, milligrams per liter	2001-06	2006-09	
pH, water, unfiltered, field, standard units	2001-06	2006-09	
Suspended sediment concentration, milligrams per liter	1952-10	1973-09	
Suspended sediment discharge, tons per day	1952-10	1973-09	
Annual Statistics			
Temperature, water, degrees Celsius	2001	2013	
Discharge, cubic feet per second	1926	2013	
Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius	2001	2006	
Dissolved oxygen, water, unfiltered, milligrams per liter	2001	2006	
pH, water, unfiltered, field, standard units	2001	2006	
Suspended sediment concentration, milligrams per liter	1953	1973	
Suspended sediment discharge, tons per day	1953	1973	
Peak streamflow	1817	2011-04-13	121
Field measurements	1926-01-25	2014-02-21	749
Field/Lab water-quality samples	1951-10-01	1995-07-18	820

Additional Data Sources	Begin Date	End Date	Count
Instantaneous-Data Archive **offsite**	1987-10-01	2007-09-30	223784
Annual Water-Data Report (pdf) **offsite**	2006	2013	8

USGS science for a changing world

National Water Information System: Web Interface

USGS Water Resources (District Access)

News updated April, 2012

Current Conditions for Kentucky: Streamflow -- 205 site(s

PROVISIONAL DATA SUBJECT TO REVISION

--- Predefined displays ---	Group table by	Select sites by number or name
Kentucky Streamflow Table	Major River Basin	go

Cu
curr

Station Number	Station name	Date/Ti		
Undefined				
03213700	TUG FORK AT WILLIAMSON, WV	06/05 13:0		
03378500	WABASH RIVER AT NEW HARMONY, IN	06/05 11:3		
03381700	OHIO RIVER AT OLD SHAWNEETOWN, IL-KY	06/05 10:3		
	[Radar]	06/05 10:3		
Other				
03373550	ORANGEVILLE RISE AT ORANGEVILLE, IN	06/05 12:3		
Ohio River Mainstem				
03216000	OHIO RIVER AT ASHLAND, KY	06/05 13:0		
03216600	OHIO RIVER AT GREENUP DAM NEAR GREENUP, KY			
	STAGE - HEADWATER	06/05 12:3		
	STAGE - TAILWATER	06/05 12:3		
03217200	OHIO RIVER AT PORTSMOUTH, OH	06/05 13:0		
03238000	OHIO RIVER AT MAYSVILLE, KY	06/05 13:0		
03238680	2~OHIO RIVER AT MELDAHL DAM NEAR CHILO, OH	06/05 12:30 EDT	15.08	--
	HEADWATER	06/05 12:30 EDT	12.55	--
03255000	OHIO RIVER AT CINCINNATI, OH	06/05 13:00 EDT	26.92	--
03277200	OHIO RIVER AT MARKLAND DAM NEAR WARSAW, KY	06/05 12:45 EDT	15.18	--
03293548	OHIO RIVER AT 2ND STREET BRIDGE AT LOUISVILLE, KY	06/05 13:00 EDT	12.74	--
03293551	2~OHIO RIVER AT PENN CENTRAL BRIDGE AT LOUISVILLE,KY	06/05 12:15 EDT	12.29	--
03294500	OHIO RIVER AT LOUISVILLE, KY	06/05 13:00 EDT	13.01	67,100
03294600	OHIO RIVER AT KOSMOSDALE, KY	06/05 13:00 EDT	10.73	--
03303280	OHIO RIVER AT CANNELTON DAM AT CANNELTON, IN	06/05 12:00 CDT	12.37	--
03304300	OHIO RIVER AT NEWBURGH LOCK AND DAM, IN	06/05 12:00 CDT	14.76	--
03322000	OHIO RIVER AT EVANSVILLE, IN	06/05 12:00 CDT	14.54	--
03322190	OHIO RIVER AT HENDERSON, KY	06/05 11:45 CDT	12.96	--
03322420	OHIO RIVER AT UNIONTOWN DAM, KY	06/05 12:00 CDT	14.51	--
03384500	OHIO RIVER AT DAM 51 AT GOLCONDA, IL	06/05 12:00 CDT	29.55	--
03399800	OHIO RIVER AT SMITHLAND DAM, SMITHLAND, KY	06/05 12:00 CDT	12.77	--
	HEADWATER	06/05 12:00 CDT	12.39	--
03611000	OHIO RIVER AT PADUCAH, KY	06/05 12:00 CDT	15.66	--
03611500	OHIO RIVER AT METROPOLIS, IL	06/05 11:15 CDT	15.46	95,100
03612500	OHIO RIVER AT DAM 53 NEAR GRAND CHAIN, IL	06/05 12:00 CDT	12.91	--
03612600	OHIO RIVER AT OLMSTED	06/05 12:00 CDT	9.88	--
Lakes and Reservoirs				

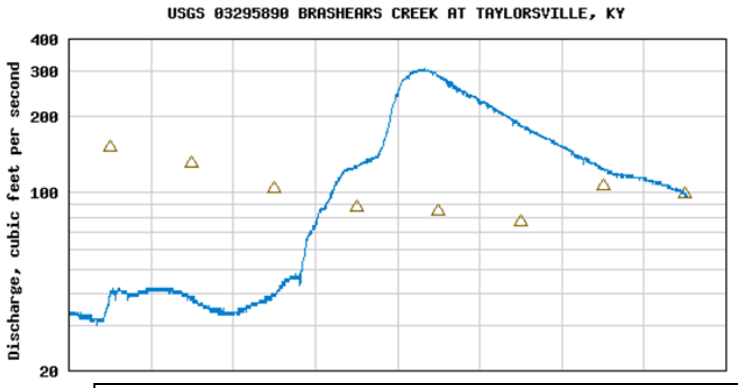
Available Parameters	Available Period	Output format	Begin date
All 4 Available Parameters for this site		Graph	2012-05-29
00060 Discharge	2007-10-01 2012-06-05	Graph w/ stats	End date
00065 Gage height	2012-02-06 2012-06-05	Graph w/o stats	2012-06-05
00045 Precipitation	2012-02-06 2012-06-05	Table	GO
70969 DCP battery voltage	2012-04-13 2012-06-05	Tab-separated	

Summary of all available data for this site

Instantaneous-data availability statement

Discharge, cubic feet per second

Most recent instantaneous value: 97 06-05-2012 12:45 EDT



USGS 03295890 BRASHEARS CREEK AT TAYLORSVILLE, KY

Available data for this site: SUMMARY OF ALL AVAILABLE DATA GO

Stream Site

DESCRIPTION:
Latitude 38°02'13", Longitude 85°20'27" NAD27
Spencer County, Kentucky, Hydrologic Unit 05140102
Drainage area: 259.0 square miles
Datum of gage: 466.85 feet above NGVD29.

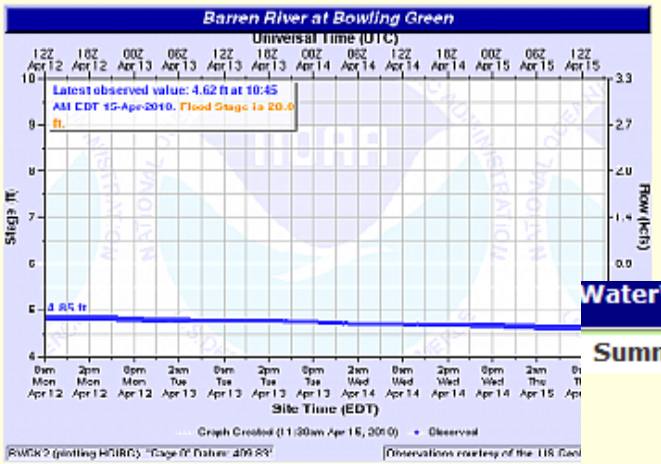
AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Current / Historical Observations (availability statement)	2007-10-01	2012-06-05	
Daily Data			
Discharge, cubic feet per second	1981-07-01	2012-06-04	20447
Daily Statistics			
Discharge, cubic feet per second	1981-07-01	2011-11-07	11087
Monthly Statistics			
Discharge, cubic feet per second	1981-07	2011-11	
Annual Statistics			
Discharge, cubic feet per second	1981	2012	
Peak streamflow	1982-01-23	2010-05-03	29
Field measurements	1981-05-19	2012-05-09	266
Field/Lab water-quality samples	1981-10-16	1995-08-21	137
Additional Data Sources	**Begin Date**	**End Date**	**Count**
Instantaneous-Data Archive **offsite**	1987-10-01	2007-09-30	188479
Annual Water-Data Report (pdf) **offsite**	2006	2011	6

OPERATION:
Record for this site is maintained by the USGS Kentucky Water Science Center
Email questions about this site to Kentucky Water Science Center Water-Data Inquiries

WaterWatch: Water Resources Conditions

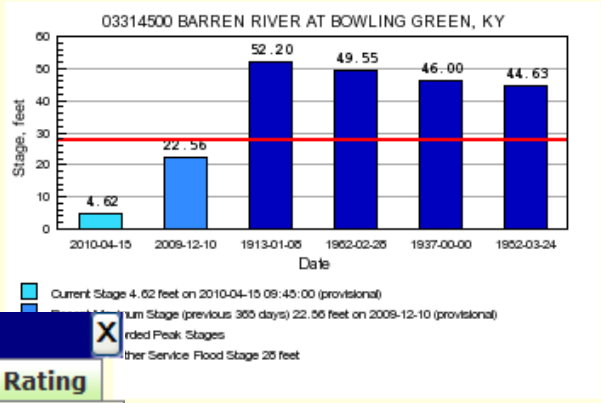
Summary | Hydrograph | Peak | Forecast | Rating



hursday, April 15, 2010 10:

WaterWatch: Water Resources Conditions

Summary | Hydrograph | Peak | Forecast | Rating



WaterWatch: Water Resources Conditions

Summary | Hydrograph | Peak | Forecast | Rating

USGS 03314500 BARREN RIVER AT BOWLING GREEN, KY

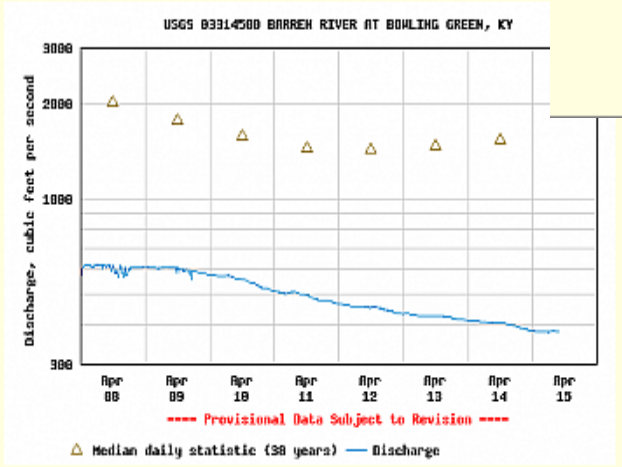
Drainage area:	1849 mi^2
Discharge:	380 cfs
Stage:	4.62 ft
Flood stage:	28 ft
Date:	2010-04-15 08:45:00
Percentile:	2%
Class symbol:	●
% of normal (median):	15%
% of normal (mean):	11%

nal Information:

S Peak Streamflow

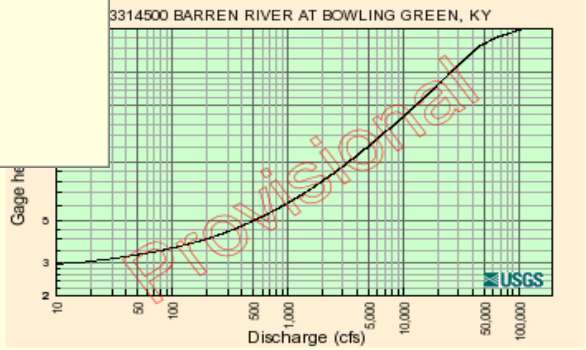
WaterWatch: Water Resources Conditions

Summary | Hydrograph | Peak | Forecast | Rating



h: Water Resources Conditions

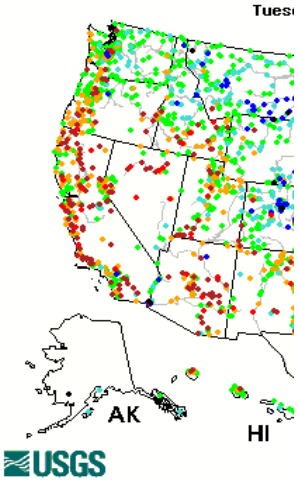
Hydrograph | Peak | Forecast | Rating



Additional Information:

- Explanation
- Shift-adjusted rating table

USGS



Choose a data retr
List of all stations

Expla	
Low	<10 Much below normal

Retrieve Summary of Recent Flood and High Flow Conditions

(Warning: These Data are Provisional and May be Prone to Error.)

(Note: Begin Date cannot precede 2006-10-01)

Geographic area: Kentucky | Water Res. Region: | SW (lat,lng): | NE (lat,lng): | Refresh | GO

Begin Date: 2014-03-15 | End Date: 2014-04-15 | Output: Table | Flooding sites only | Sort by: USGS station number | Sort order: ascend / descend

Summary of Recent Flood and High Flow Conditions

(2014-03-15 -- 2014-04-15)

["--", no data; "<", less than all historical peaks]

USGS station number	USGS station name	Drain. area [mi^2]	NWS flood stage [ft]	No. of days above flood stage	NWS flood class	Highest peak from 2014-03-15 to 2014-04-15				Historical Peaks	
						Date	Stage [ft]	Stream flow (date) [ft^3/s]	Rank	No. of years	Max. (year) [ft^3/s]
03216350	LITTLE SANDY RIVER BELOW GRAYSON DAM NEAR LEON, KY	196.0	31	32	▲	2014-04-05	94.63	--	--	--	--
03301500	ROLLING FORK NEAR BOSTON, KY	1299	35	2	▲	2014-04-06	36.71	17200	62	74	69800 (1997)
03304300	OHIO RIVER AT NEWBURGH LOCK AND DAM, IN	100000.0	38	9	▲	2014-04-08	43.14	--	--	--	--
03314000	DRAKES CREEK NEAR ALVATON, KY	478.00	22	2	▲	2014-04-03	23.61	12300	37	46	113000 (2010)
03319000	ROUGH RIVER NEAR DUNDEE, KY	757.0	25	3	▲	2014-04-05	27.35	--	--	--	--
03320000	GREEN RIVER AT LOCK 2 AT CALHOUN, KY	7566.0	23	4	▲	2014-04-08	24.51	35700	76	82	208000 (1937)
03322420	OHIO RIVER AT UNIONTOWN DAM, KY	108000	37	11	▲	2014-04-11	42.51	--	--	--	--
03384500	OHIO RIVER AT DAM 51 AT GOLCONDA, IL	143900	40	8	▲	2014-04-12	41.62	--	--	--	--

USGS

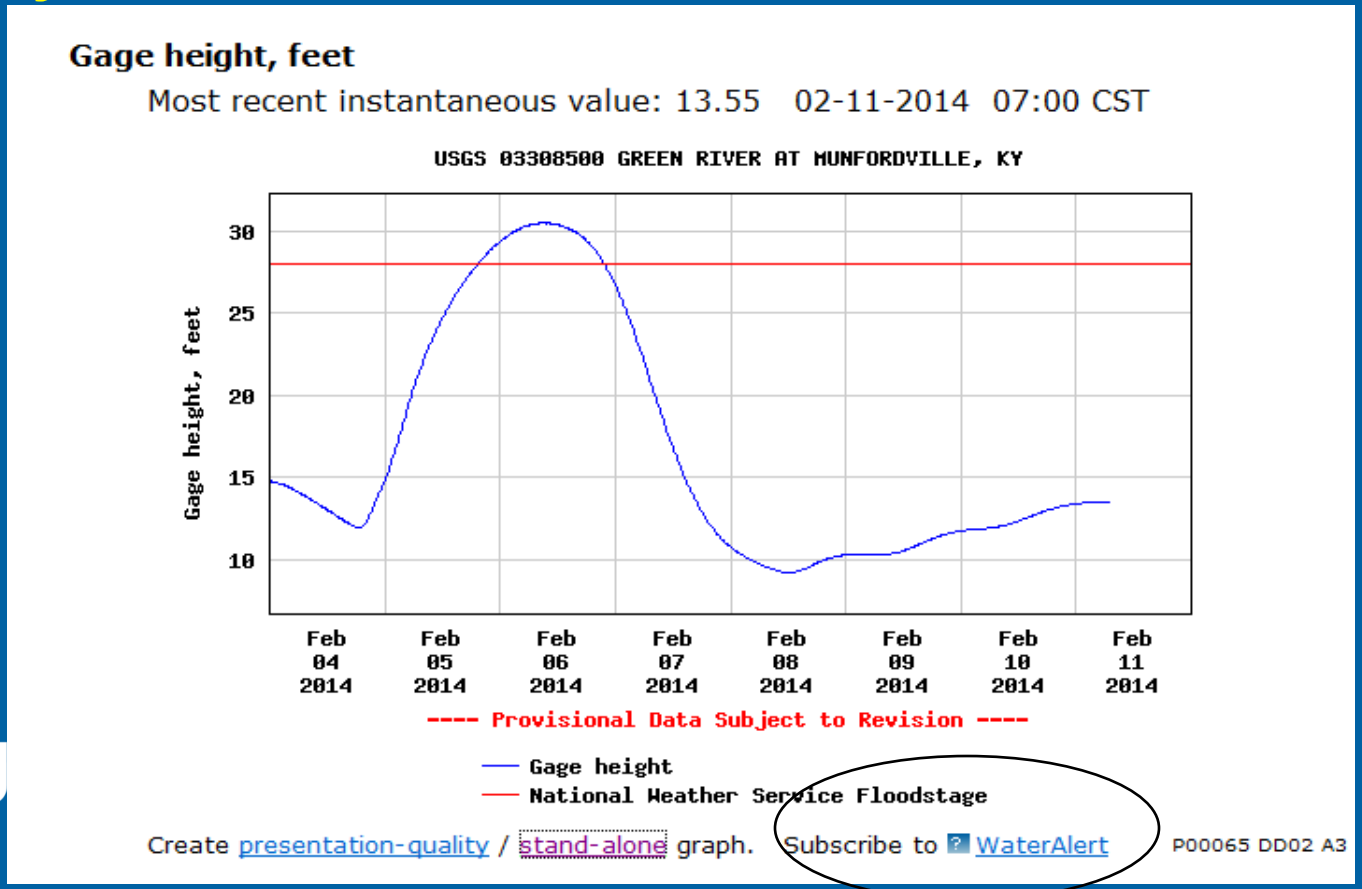
http://waterwatch.usgs.gov

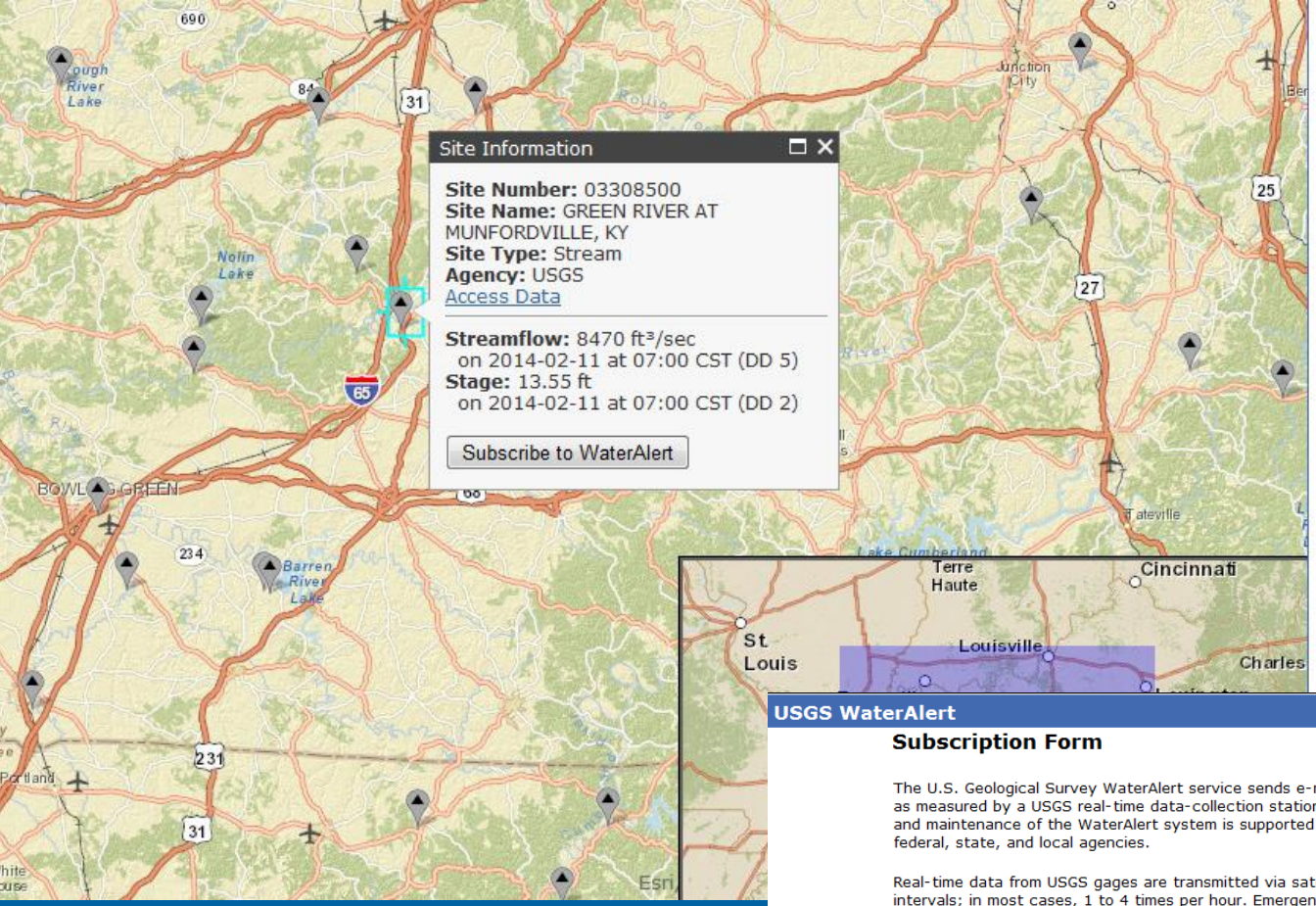
NWISWeb

USGS

WaterAlert

- **WaterAlert allows you to receive daily or hourly updates about current conditions in rivers, lakes and groundwater when they match conditions of concern to you.**





USGS

USGS WaterAlert

[version 1.3]

Subscription Form

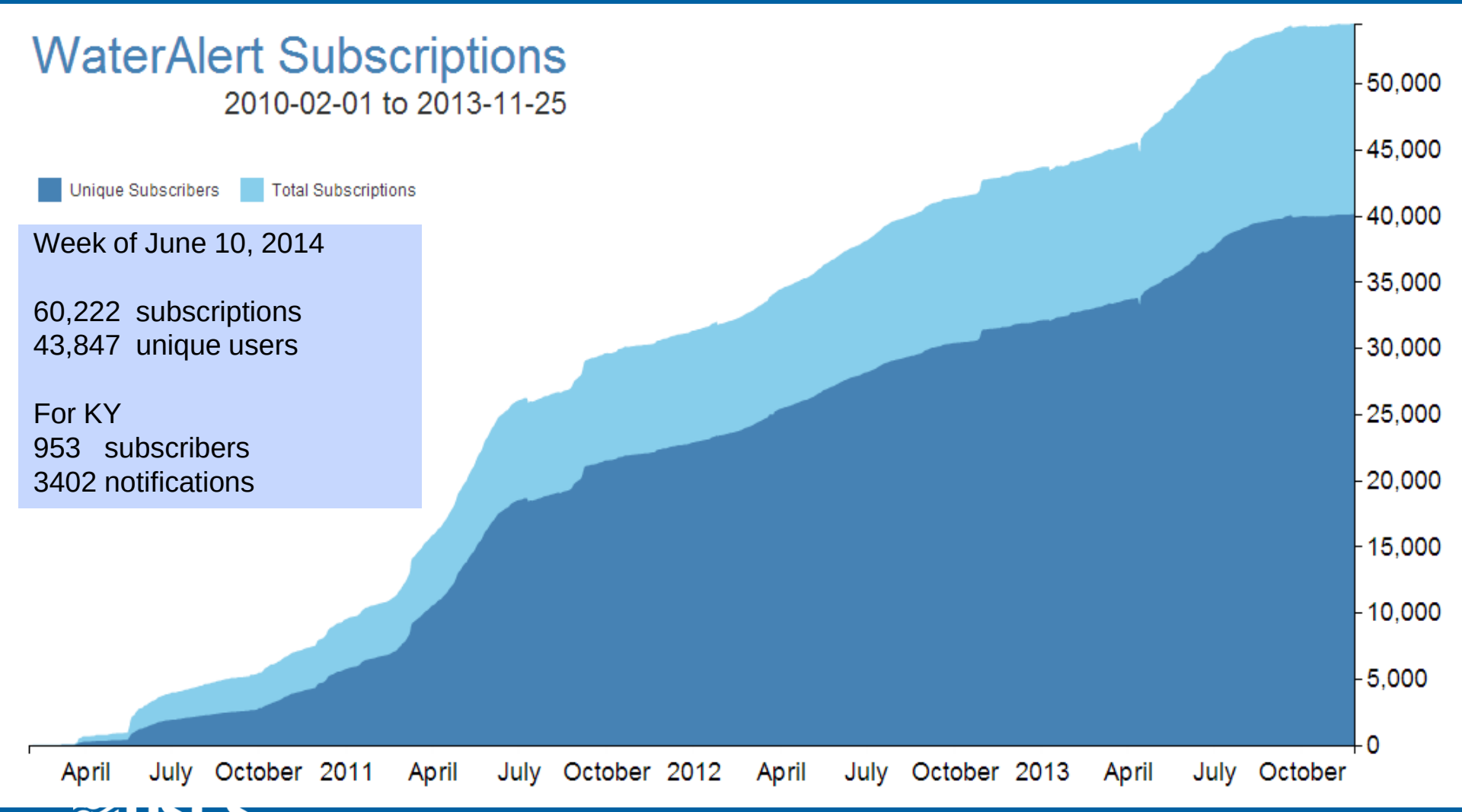
The U.S. Geological Survey WaterAlert service sends e-mail or text (SMS) messages when certain parameters, as measured by a USGS real-time data-collection station, exceed user-definable thresholds. The development and maintenance of the WaterAlert system is supported by the USGS and its partners, including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

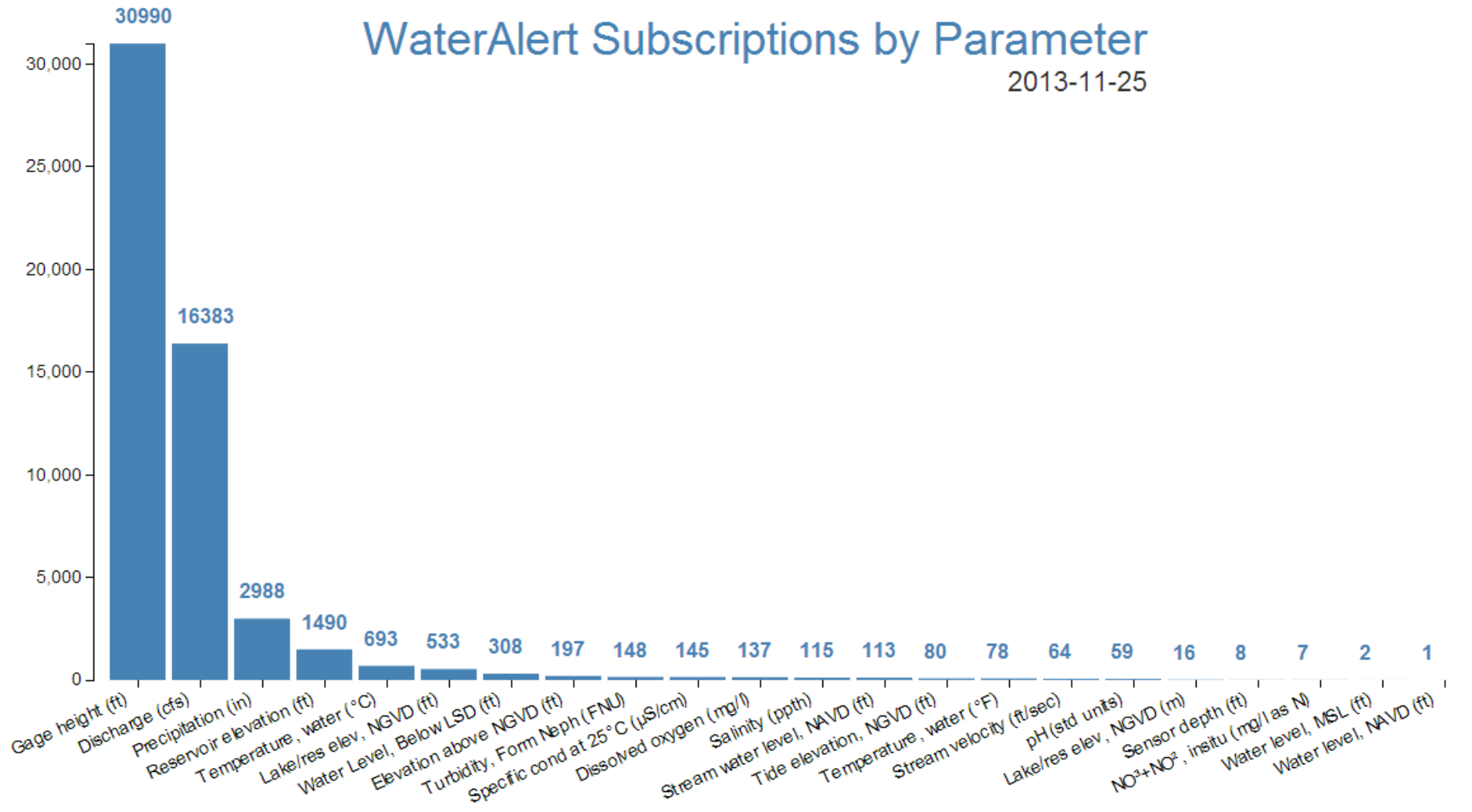
Site Info:		
Site Number:	03308500	
Site Name:	GREEN RIVER AT MUNFORDVILLE KY	
Agency:	USGS	
Transaction ID:	N5Gwf	
Send Notification To:	about this...	
○ My mobile phone		
○ My email address		
Notification Frequency:	about this...	
Hourly	○	
Daily	◉	
Streamflow Parameter(s):	about this...	Recent value:
Gage height, DD2 (ft)	◉	13.55 [peak chart | NWS flood stage = 28]
Discharge, DD5 (cfs)	○	8470 [peak chart]
Threshold Condition:	about this...	
◉ Greater than (>)		
○ Less than (<)		Real-time value isgreater than: ft
○ Outside a range (< or >)		
○ Inside a range (> and <)		

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

WaterAlert - Statistics



WaterAlert - Statistics



USGS

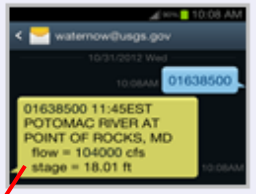
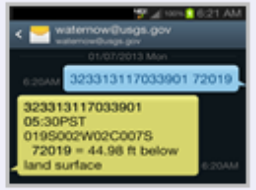
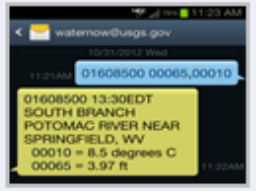
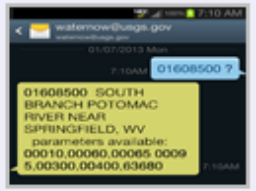
USGS – WaterNow

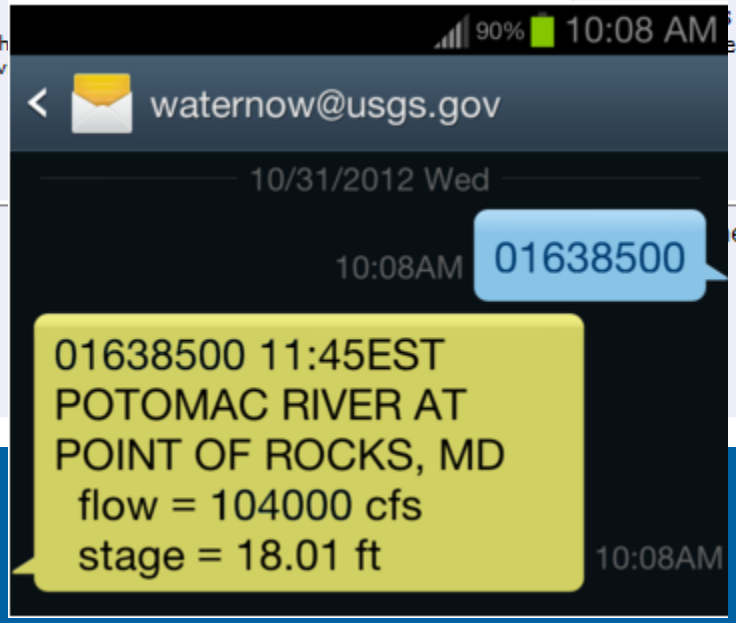
- **Using WaterNow with email:**
  - **Send an email message to WaterNow@usgs.gov where either the Subject or the first line of the message contains the USGS Site Number of the gage you want to query (optionally add parameter codes to customize your query). You will receive a response within a few minutes.**

- **Using WaterNow with text messaging**
  - **Send a text message to WaterNow@usgs.gov containing the USGS Site Number of the gage you want to query (optionally add parameter codes to customize your query). You will receive a response within a few minutes.**

USGS

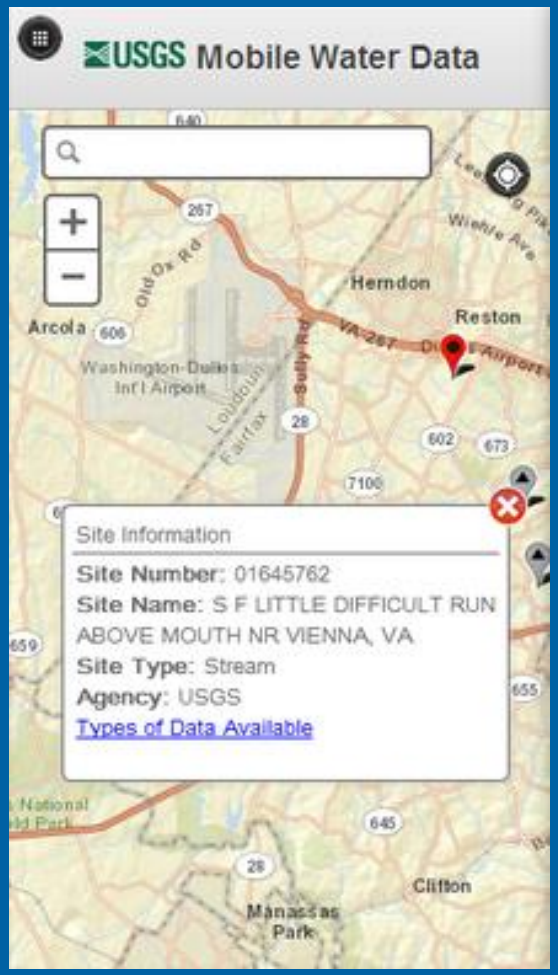
WaterNow - Text Message

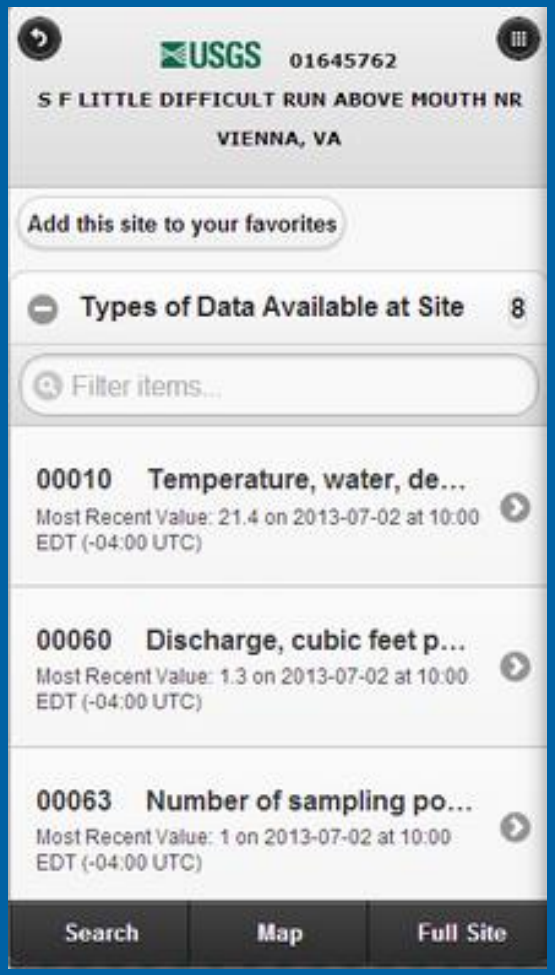
Text Message Content	Action	Example (click to enlarge)
SiteNumber	Query for flow and/or stage (if available; otherwise returns a list of available parameters)	
SiteNumber parameter	Query for a specific parameter (parameter codes are 5 digits; leading zeros, if any, are required)	
SiteNumber parm1,parm2,... (requesting more than three parameters will return more th characters and truncate the message with most phone serv	ed by	
SiteNumber ?	eters	

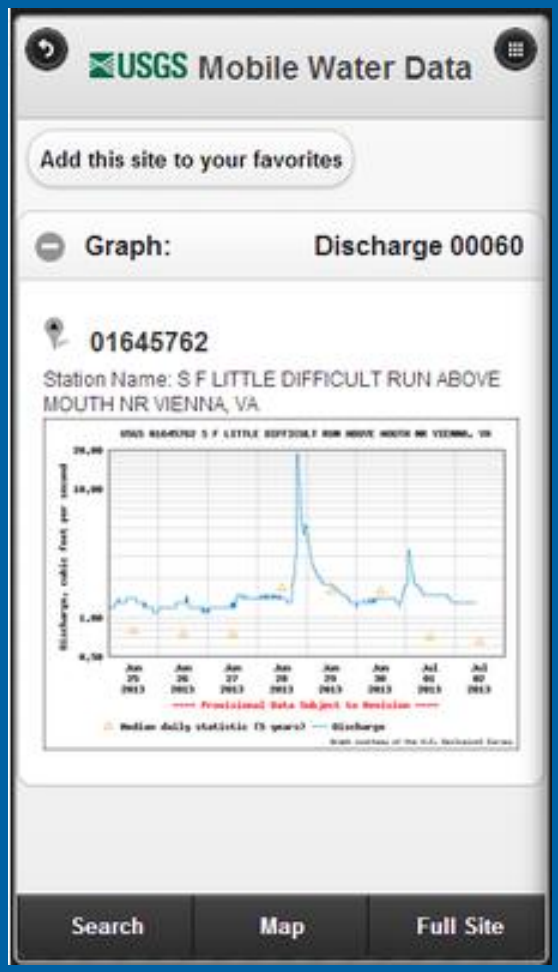


USGS

Mobile Water Data - beta







http://m.waterdata.usgs.gov

Twitter

USGS

Questions

USGS

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mgriffin@usgs.gov

Lets Go Live!!!!

USGS