



KASMC

Kentucky Agriculture Science and Monitoring Committee
July 23, 2013

U.S. Geological Survey
Kentucky Water Science Center
Hydrologic Monitoring Networks

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Geology



Geography



Biology



Water



Organization Overview

▶ U.S. Geological Survey

- Department of Interior – The Nation’s Science Agency
- 4 disciplines
- 8,000 employees

▶ Midwest Region

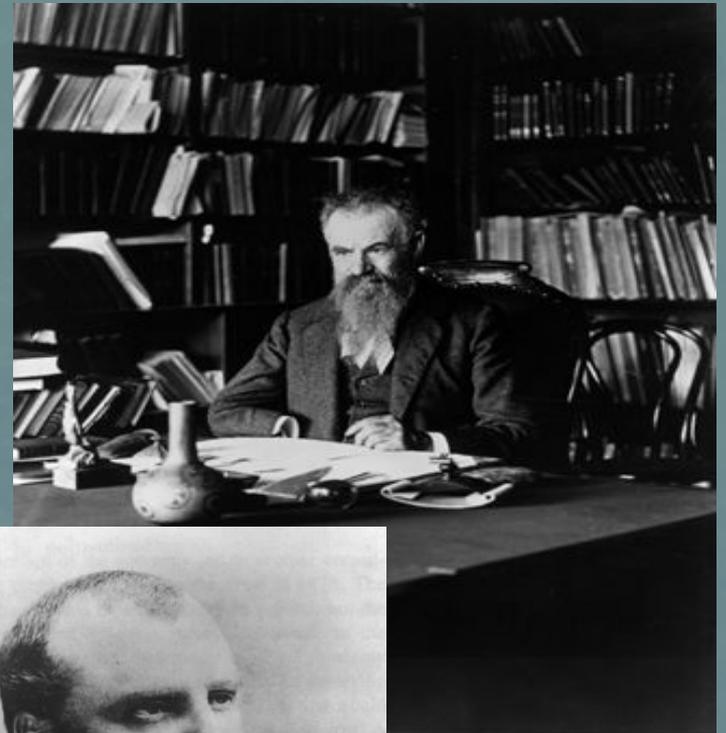
- 17 Science Centers
- 12 States

▶ Indiana–Kentucky Commonwealth

- One Director
- Increased resources

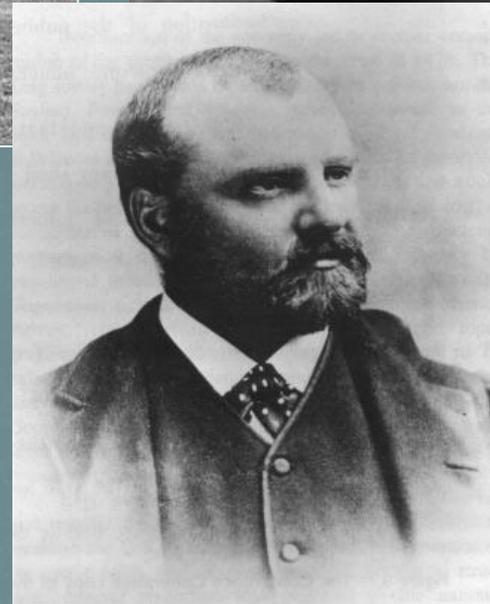


USGS: serving the nation since 1879

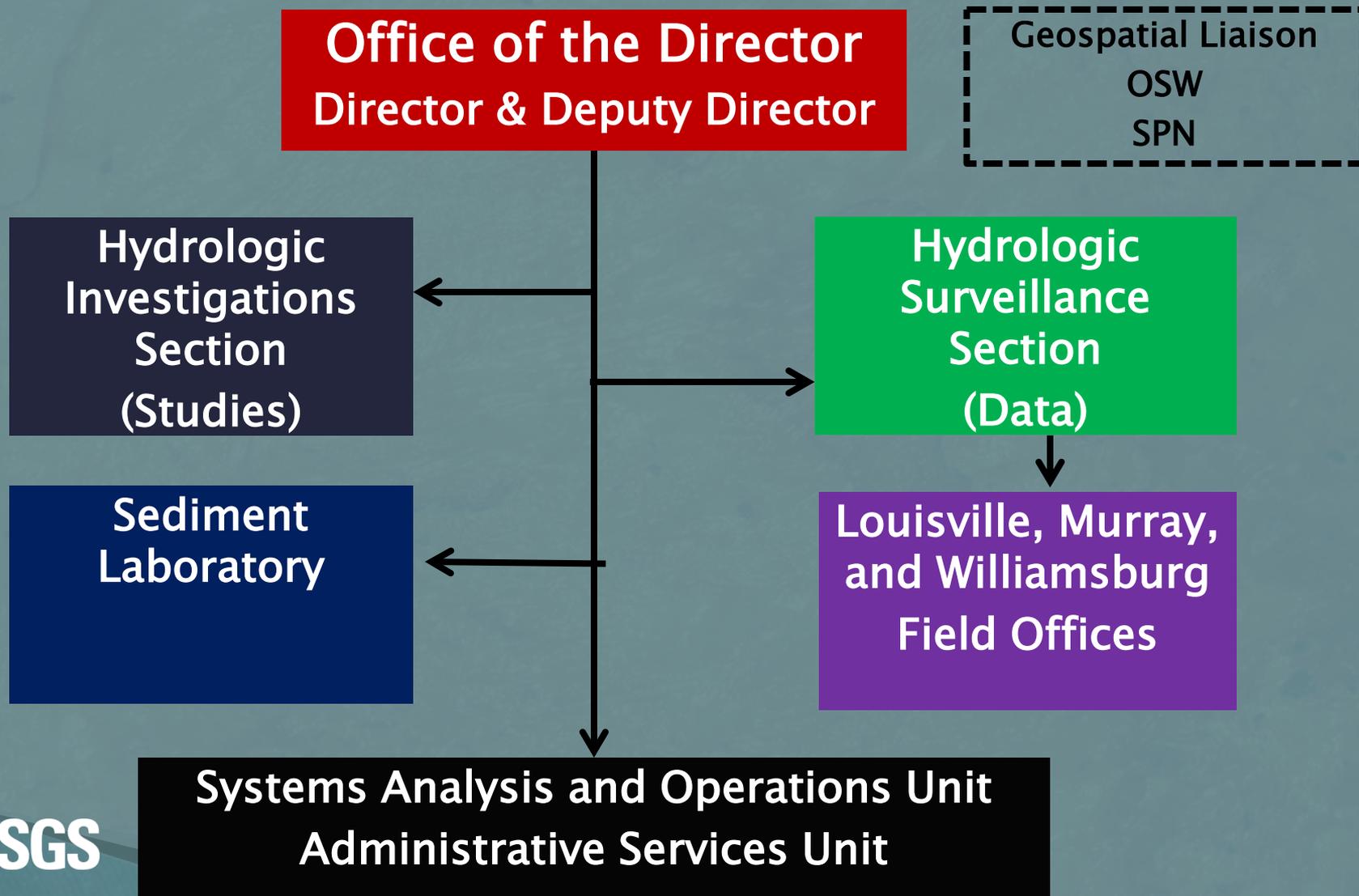


CLARENCE KING (1879-1881)

JOHN WESLEY POWELL (1881-1894)

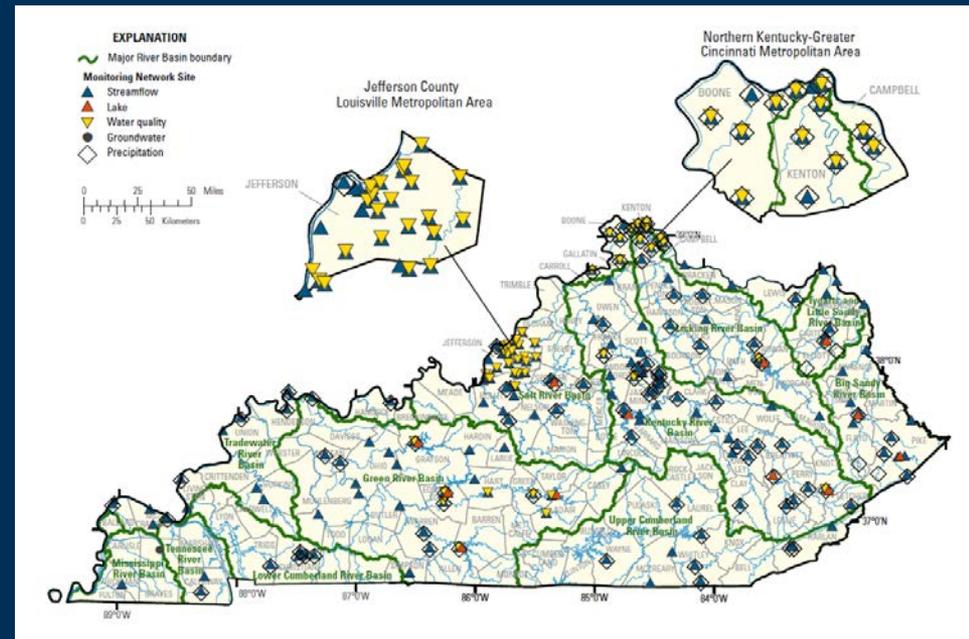


Kentucky WSC – 42 Employees



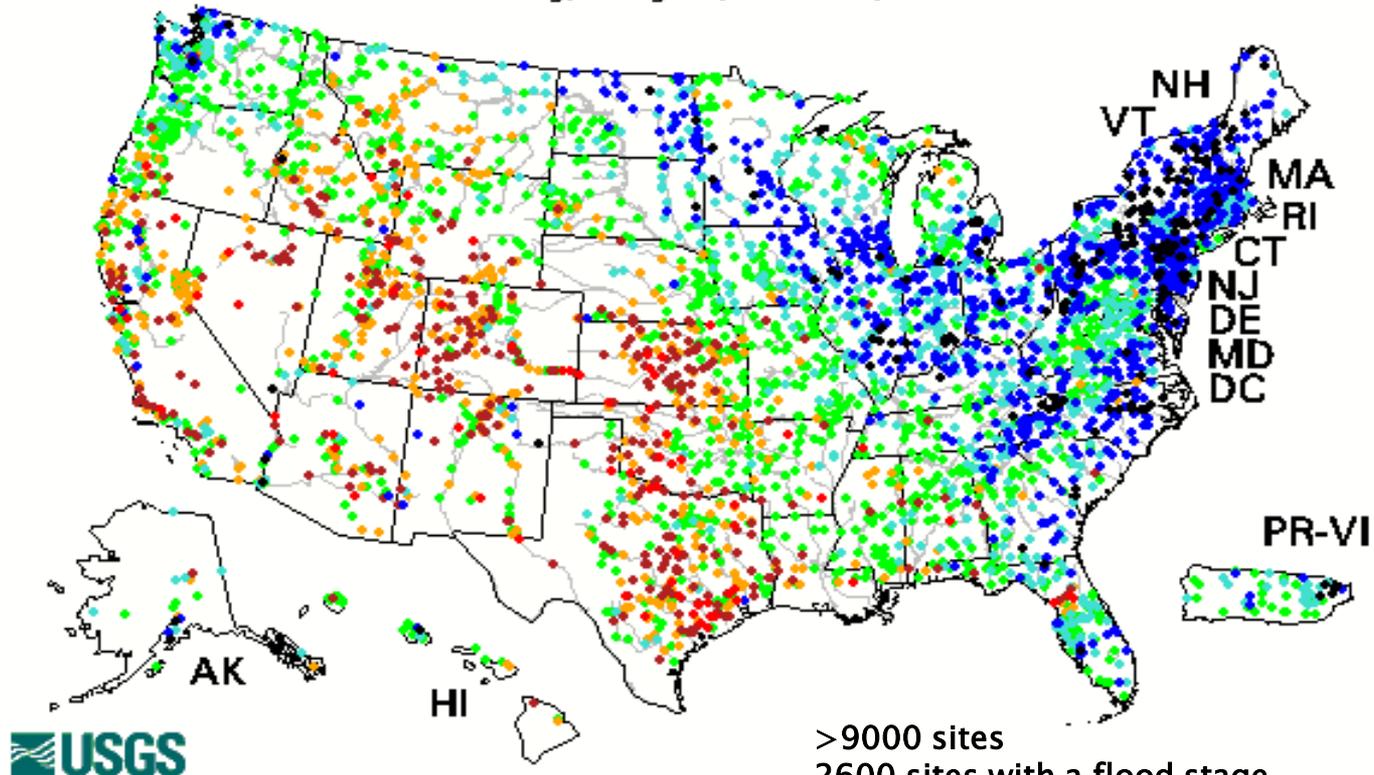
Hydrologic Monitoring Networks

- Stage (gage height)
- Streamflow
- Lake/reservoir level
- Groundwater level
- Precipitation
- Sediment
- Nitrate
- Water temperature
- Other Water Quality Constituents (DO, pH, SC, Turbidity)



USGS Streamgaging Activities

Tuesday, July 02, 2013 09:30ET

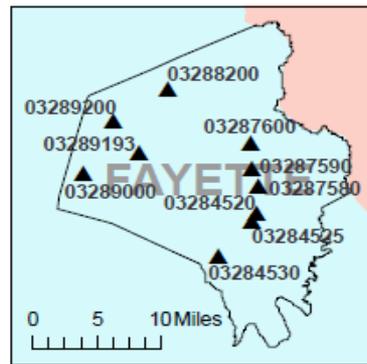
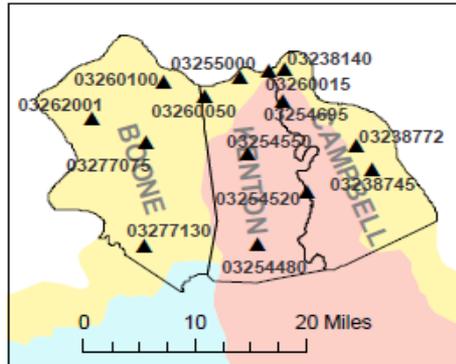
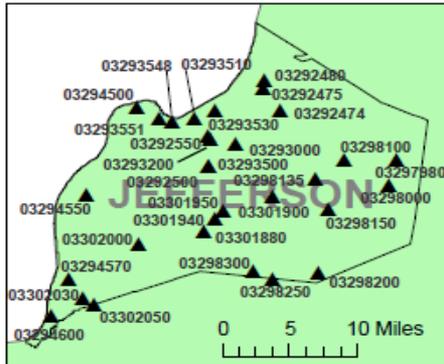


>9000 sites

2600 sites with a flood stage

4800 sites with at least 20 years of record

STREAM-FLOW GAGE LOCATIONS IN KENTUCKY

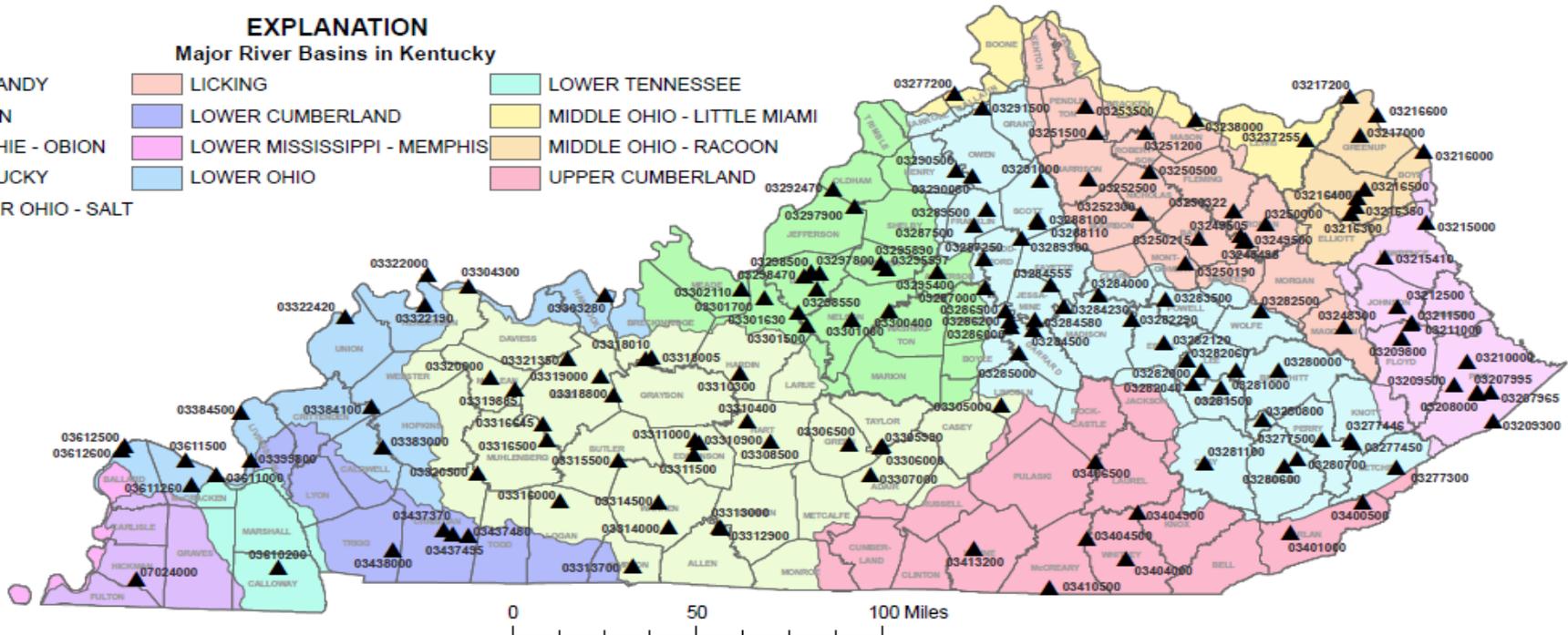


CLICK ON GAGE NUMBERS TO OPEN THE HOME PAGE FOR THAT GAGE

EXPLANATION

Major River Basins in Kentucky

- | | | |
|-------------------|-----------------------------|----------------------------|
| BIG SANDY | LOWER OHIO | LOWER TENNESSEE |
| GREEN | LOWER CUMBERLAND | MIDDLE OHIO - LITTLE MIAMI |
| HATCHIE - OBION | LOWER MISSISSIPPI - MEMPHIS | MIDDLE OHIO - RACCOON |
| KENTUCKY | LOWER OHIO | UPPER CUMBERLAND |
| LOWER OHIO - SALT | | |



Long history of KY streamflow gages

- ▶ First gage was Tennessee River nr Paducah – Started in 1875 (stage only). It then was operated from 1889–1989. Water quality site today.
- ▶ KY River Lock 4 at Frankfort – Stage data started in 1905. Flow started in 1925
- ▶ Dix River at Danville – Stage data started in 1905. Flow started in 1942
- ▶ Cumberland River at Cumberland Falls – First continuous streamflow gage started in August 1907. Went to 1911, started again in 1914–2005 and then brought back in 2010
- ▶ KY River at Lock 10 at Winchester is the longest continuous running station in KY. Started in October 1907 to Present

Status of the KY real-time networks

Surface Water – 207 sites

Stage only – 57 sites

Discharge – 150 sites

Water Quality – 55 sites

Temperature only – 13 sites

4/5 chemical parameters(temp, DO, pH, SC, & turbidity)–42 sites

Ground Water – 2 sites

05/11/2011

Advantages of Real-Time Gages

- ▶ Real-time data 24/7/365
- ▶ NWS flood warnings & forecasts
- ▶ 35,000 data points per parameter annually
 - Publically available
 - Quality assured
 - Stored long term
- ▶ NPDES Compliance
- ▶ Flood Inundation Maps
- ▶ Spill tracking
- ▶ Recreational boating
- ▶ Drought Detection
- ▶ Reservoir Operations
- ▶ KY has one of the Nation's lowest O&M costs



What is a USGS Gaging Station?

A device that can provide continuous information on precipitation, surface water quantity and quality, or groundwater.



Streamgages



Water Quality Gages



Ground Water Gages



Precipitation Gages



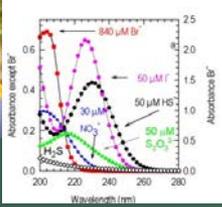
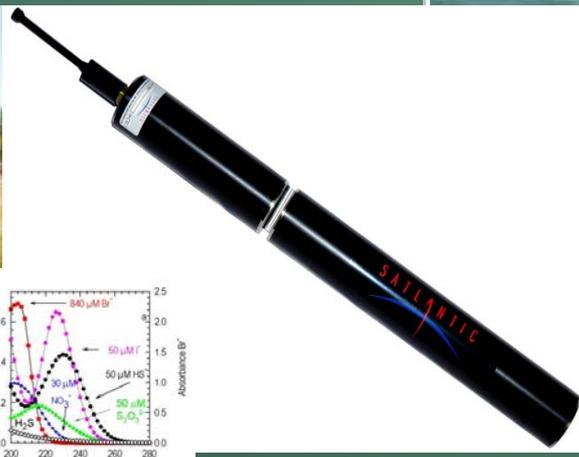
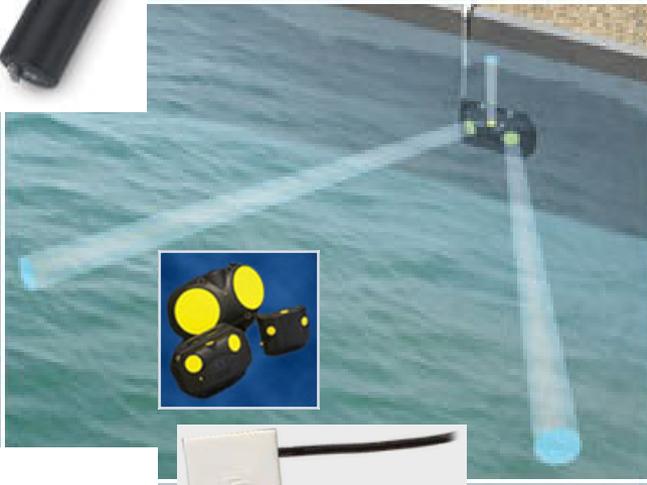
Sentry Gages

- Traditional streamflow gage supplemented with continuous water quality monitors, representative sampling, and surrogate modeling.
- Sentry Gages are designed to answer study specific questions on watershed, regional, and/or national scales.





Sentry Gage Equipment



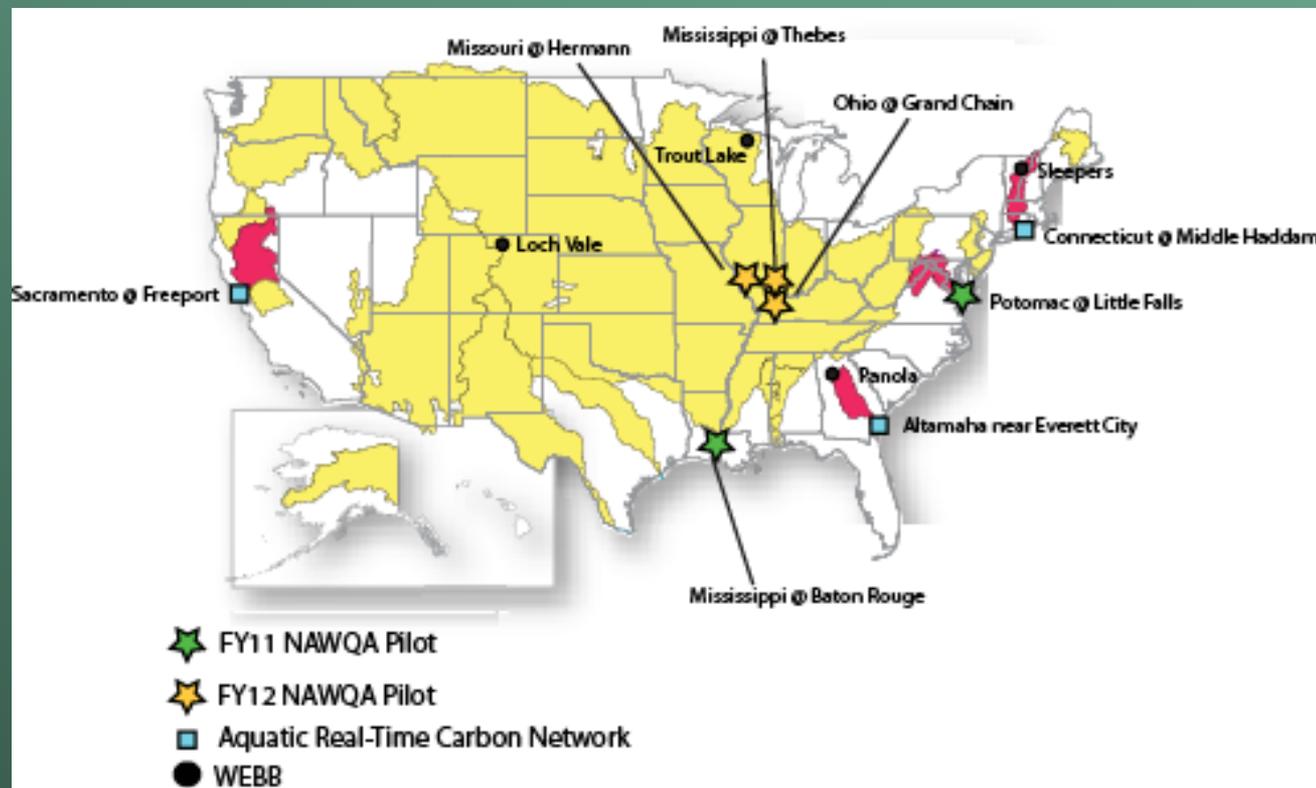
FY11-12 NAWQA Nitrate Pilot Sites

Operational (Nov. 2011)

- 1) Mississippi @ Baton Rouge
- 2) Potomac @ Little Falls

Upcoming (spring 2012-13)

- 3) Mississippi @ Thebes
- 4) Missouri @ Hermann
- 5) Ohio @ Olmsted L/D



Instruments

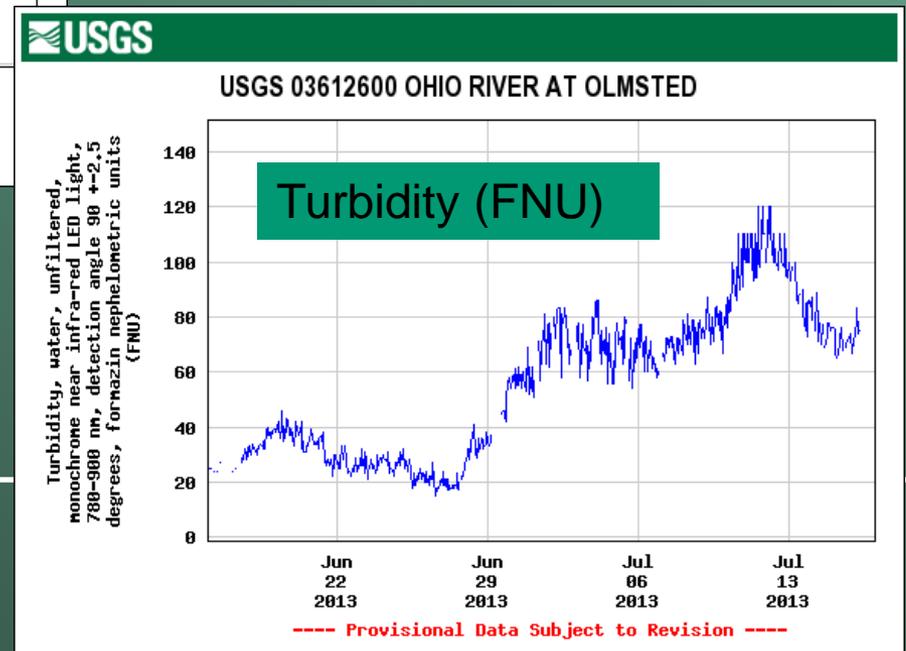
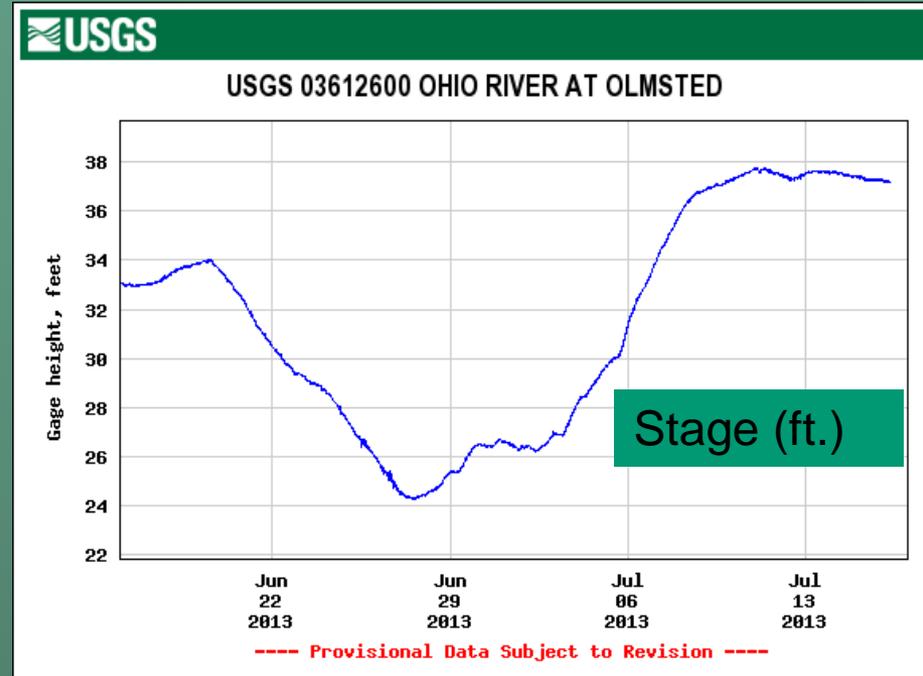
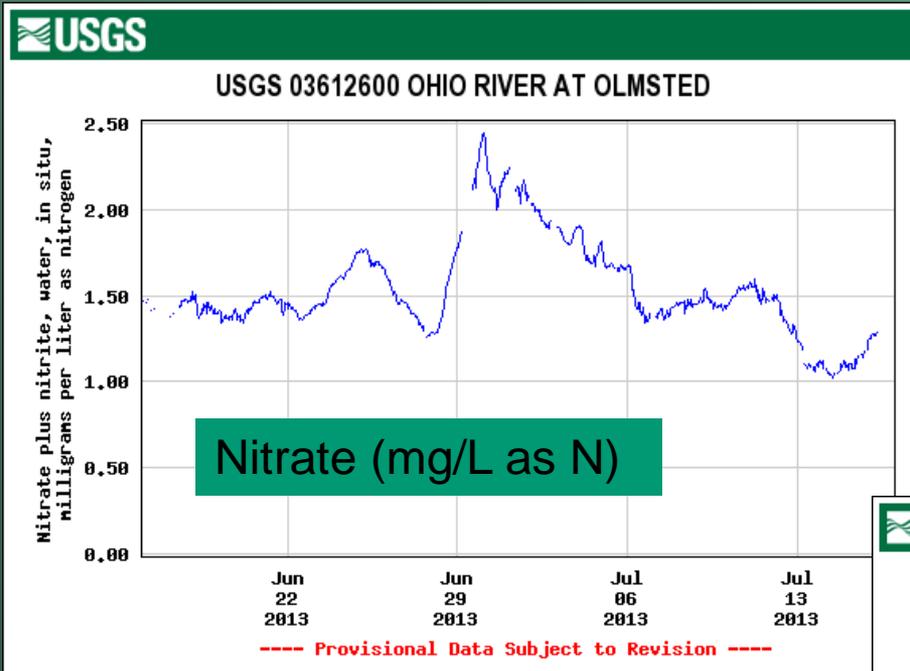
- 1) Continuous nitrate measurements with corrections
- 2) Continuous turbidity, FDOM (colored dissolved organic matter measured by fluorescence)
- 3) Acoustic Doppler Velocity Meter
- 4) Continuous Water Quality Meter (4-paramters) – SC, pH, WT, and DO
- 5) Other??

<u>Site</u>	<u>Nitrate</u>	<u>Turbidity</u>	<u>FDOM</u>	<u>Other</u>
<i>Ohio River at Olmsted Locks and Dam (03612600)</i>	<i>Satlantic SUNA</i>	<i>Campbell Scientific OBS-500</i>	<i>Turner Designs C7</i>	<i>YSI EXO CR1000 datalogger Cell modem</i>
<i>Green River at Lock and Dam No. 1 near Spotsville, KY (03321500)</i>	<i>Satlantic SUNA</i>			<i>Sontek SL500 ADVM Sutron Satlink2 DCP</i>

Ohio River at Olmsted L/D



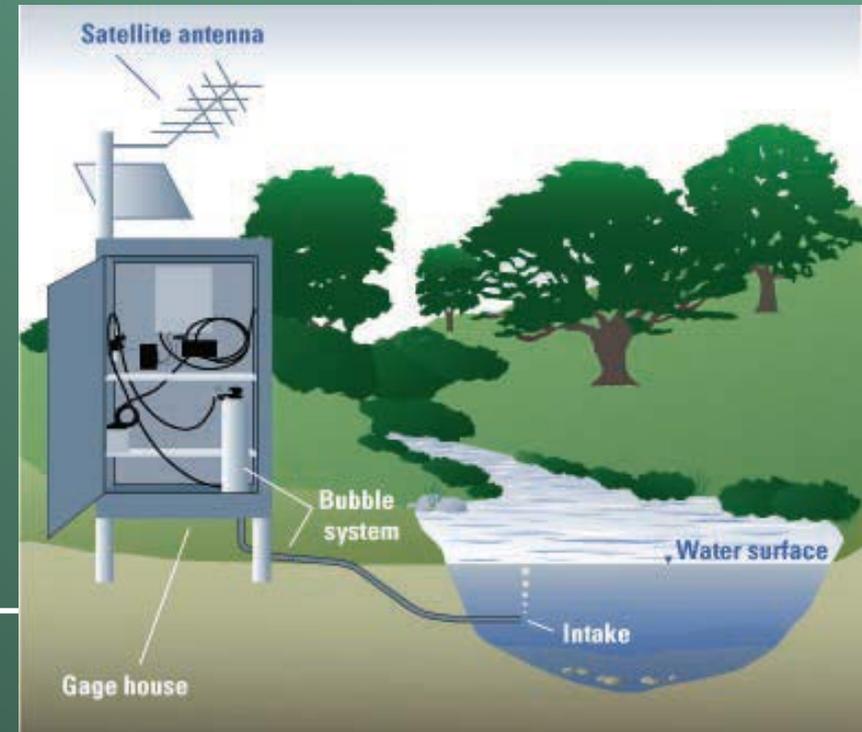
Real-Time Data



How Does a Stream Gage Work?



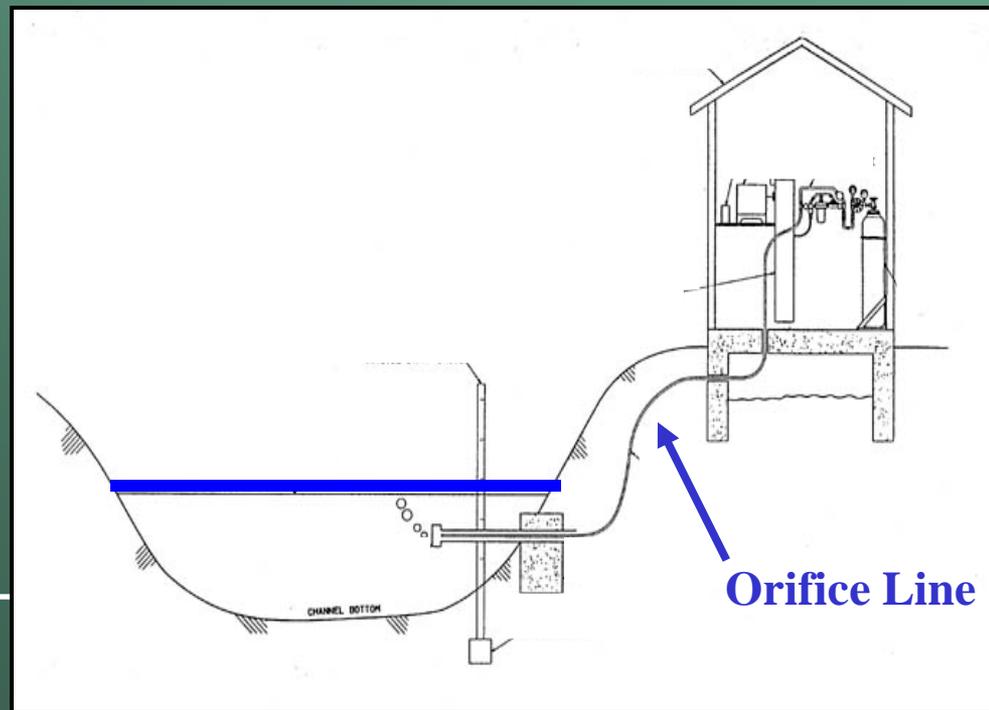
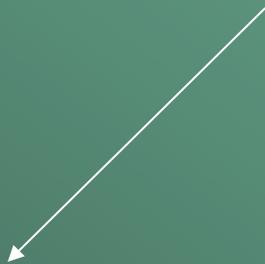
It tracks water-level rises and falls



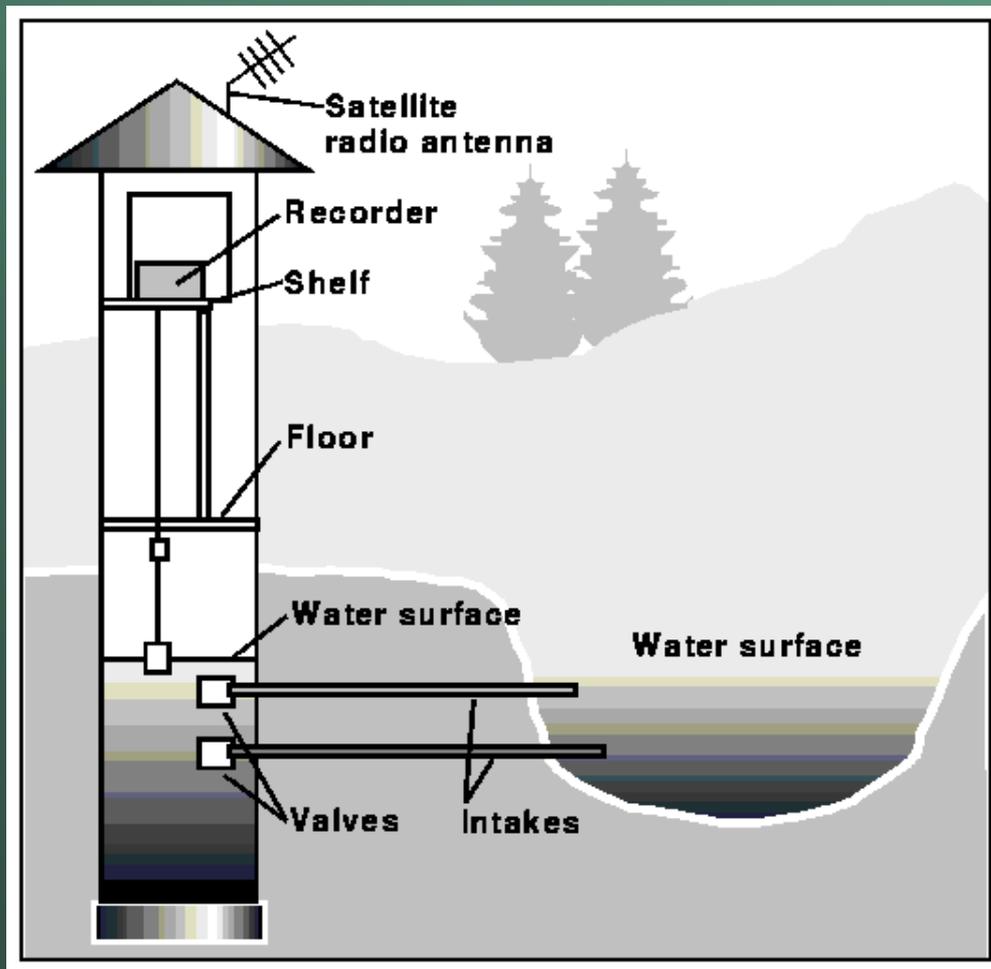
Stage can be sensed using PRESSURE TRANSDUCERS



Kentucky River @
Lock 10



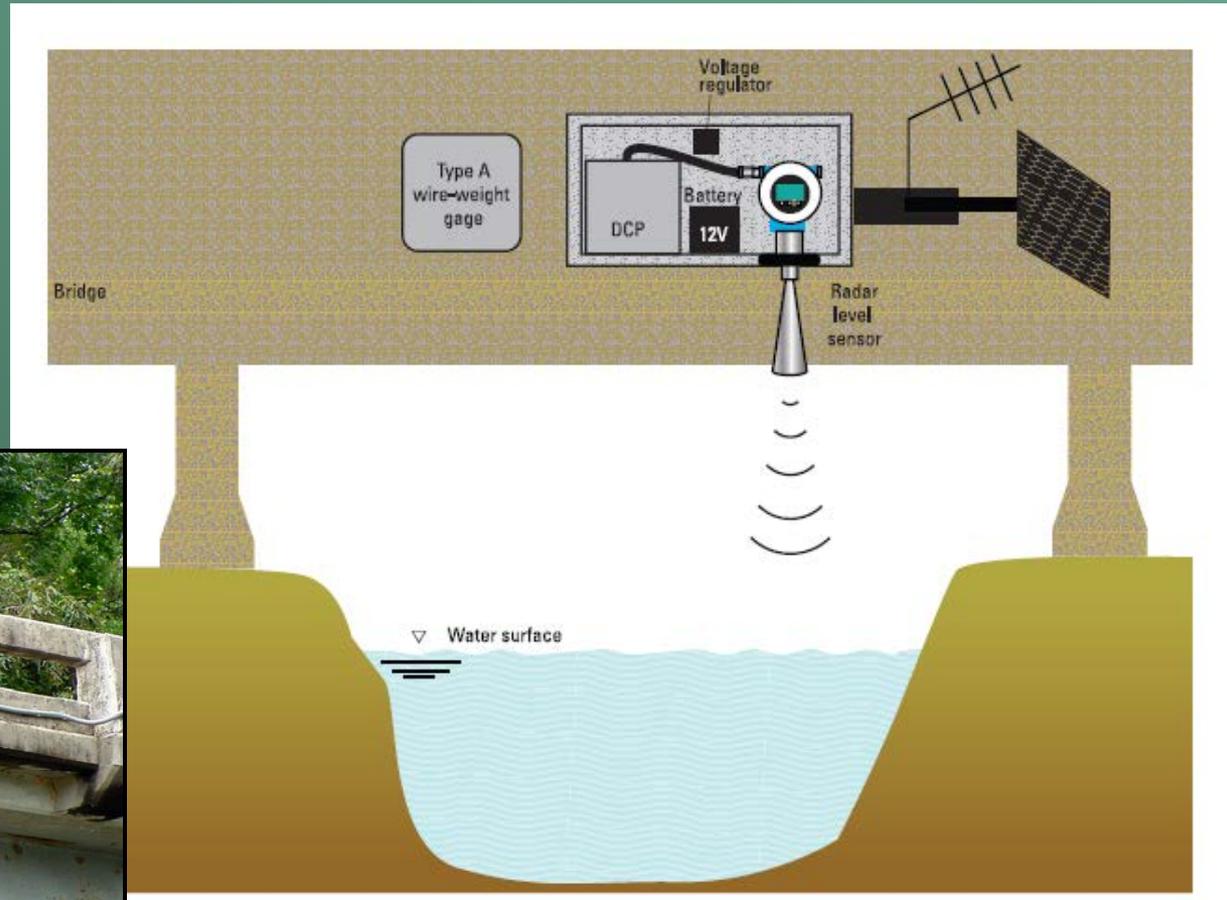
Stage can be sensed using STILLING WELLS



**Kentucky River @
Lock 4**

Non-Contact Stage Measurement

Radar Technology



**Most users of
streamflow information
need to know the
discharge of the stream**



**Discharge Measurement
by wading methods**

More ways to collect “Discharge”



Manned Boat

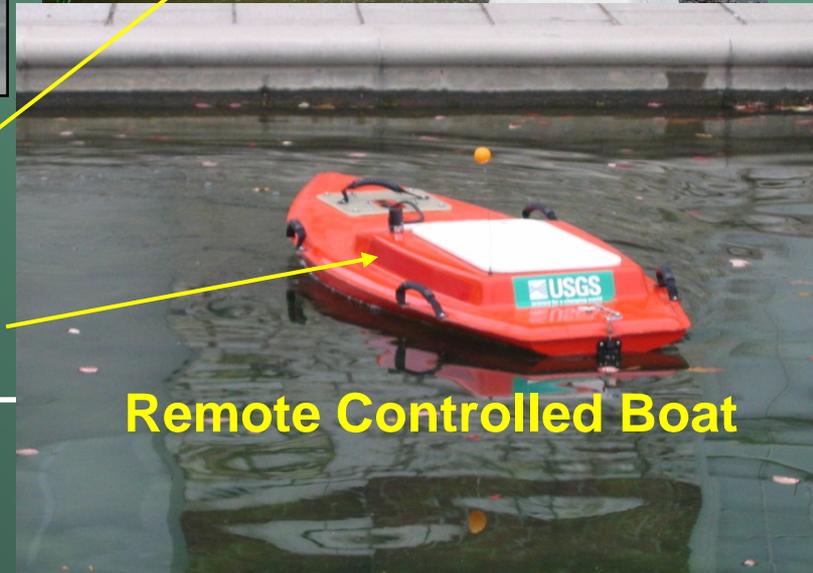


Tethered Boat



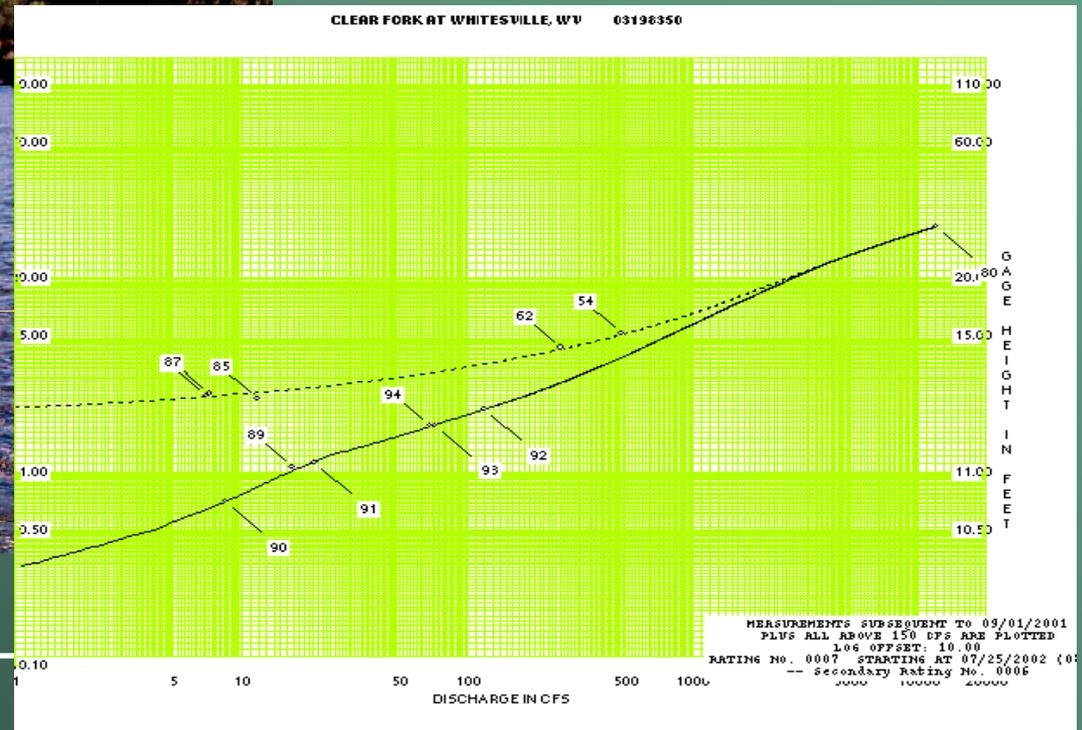
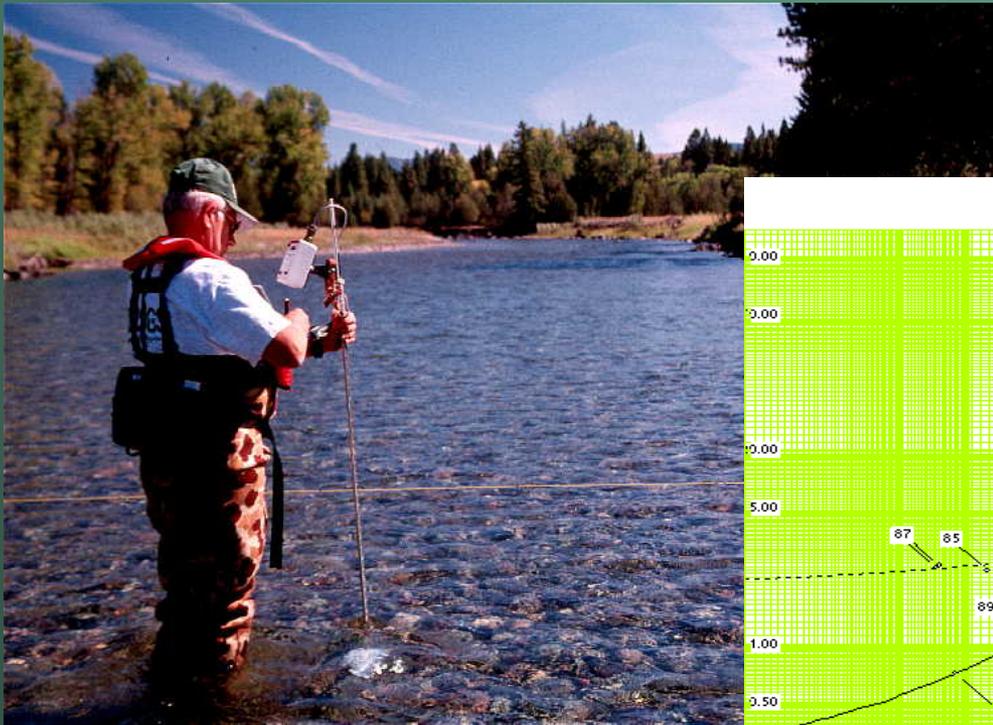
Bridge

ALL use ADCPs

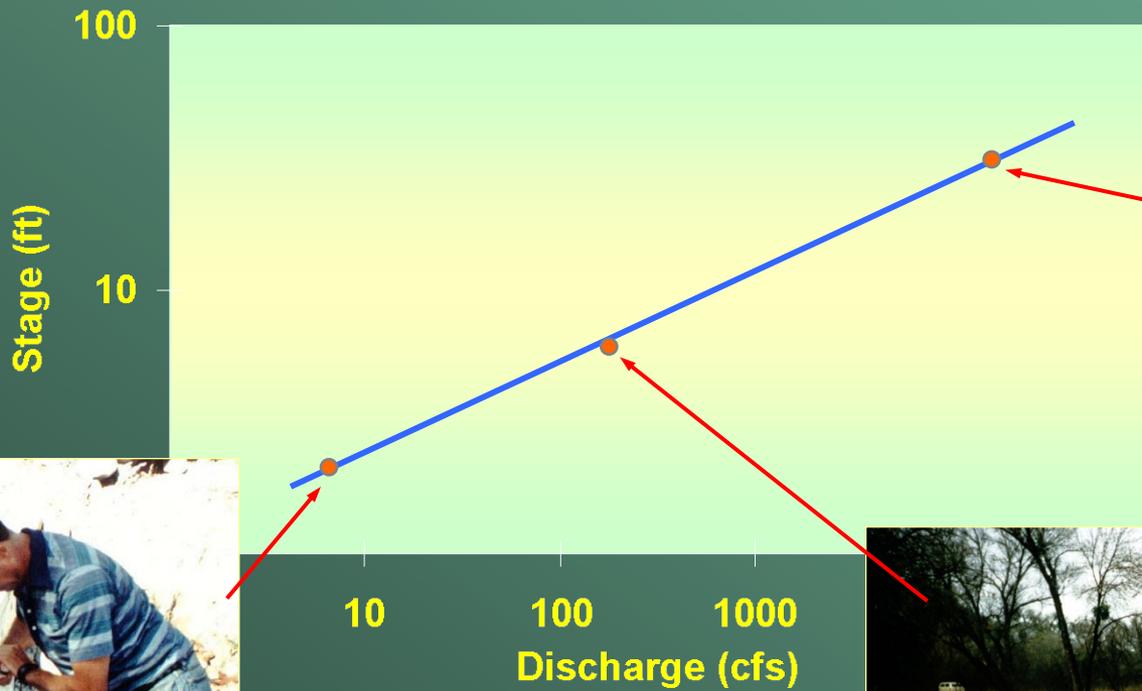


Remote Controlled Boat

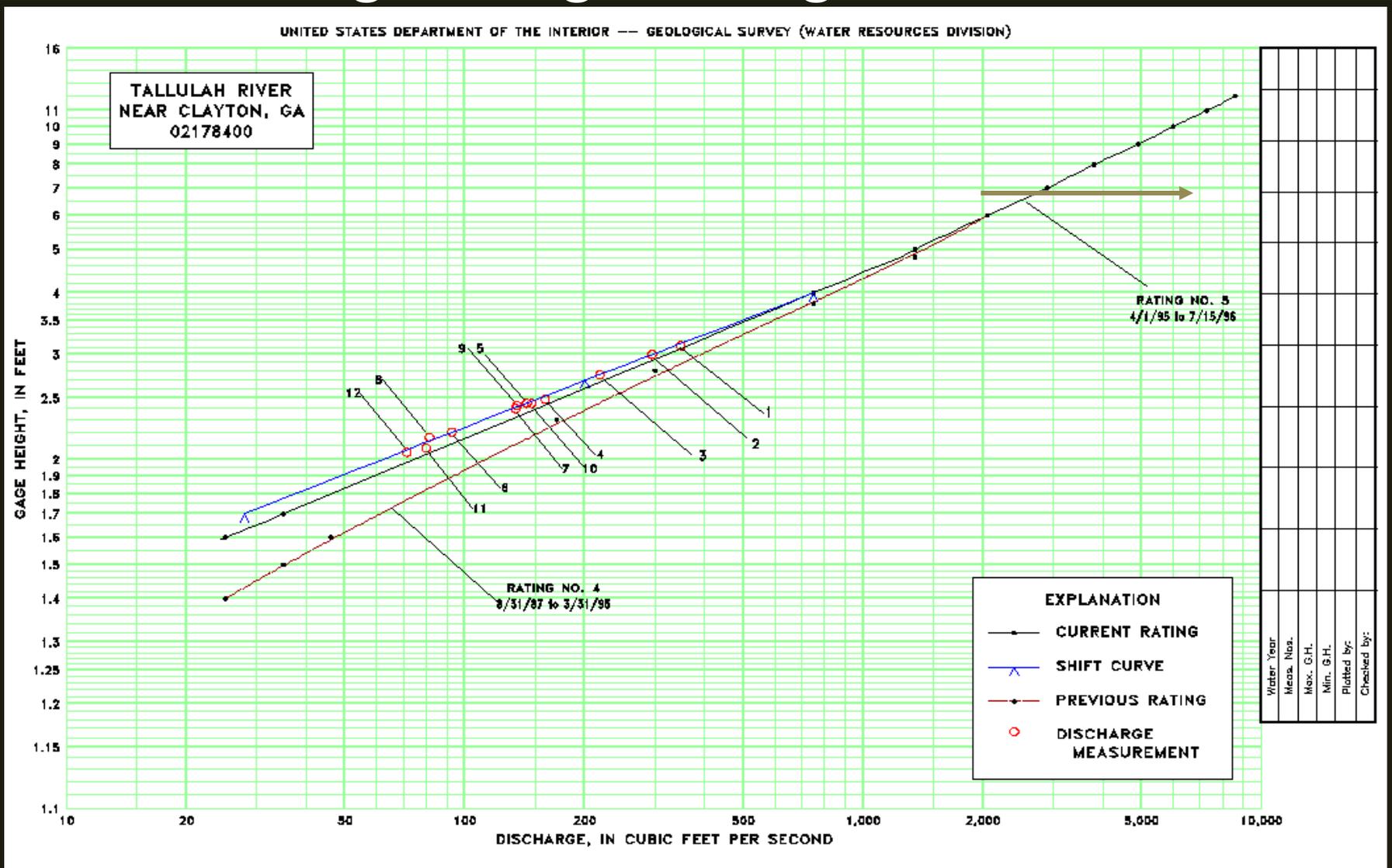
Stage data becomes streamflow or discharge (CFS) by means of a rating curve – this is labor intensive and requires great skill.



Discharge must be measured at all stages



Most Ratings Change Through Time



Shifts are often time dependent and phased in and out depending on their cause

New Network Developments

Changes to NWISWEB

- Current / Historical
 - Instantaneous values are now available back to October 1, 2007
 - By 2014, additional instantaneous values before October 1, 2007 will be made available
 - Some streamflow data prior to October 1, 2007 may be available on the [Instantaneous Data Archive \(IDA\)](#). This will be indicated by a link to the IDA page from the summary of available data for that site
- **October 1, 2007 vs 120 days vs 30 days**

Available Parameters	Available Period	Output format	Begin date	End date	
<input type="checkbox"/> All 5 Available Parameters for this site		<input checked="" type="radio"/> Graph	2012-05-28		GO
<input type="checkbox"/> 00010 Temperature, water	2007-10-01 2012-06-04	<input type="radio"/> Graph w/ stats			
<input checked="" type="checkbox"/> 00060 Discharge	2007-10-01 2012-06-04	<input type="radio"/> Graph w/o stats			
<input checked="" type="checkbox"/> 00065 Gage height	2012-02-05 2012-06-04	<input type="radio"/> Table			
<input type="checkbox"/> 70969 DCP battery voltage	2012-04-10 2012-06-04	<input type="radio"/> Tab-separated			
<input type="checkbox"/> 00045 Precipitation	2012-02-05 2012-06-04				

[Summary of all available data for this site](#)

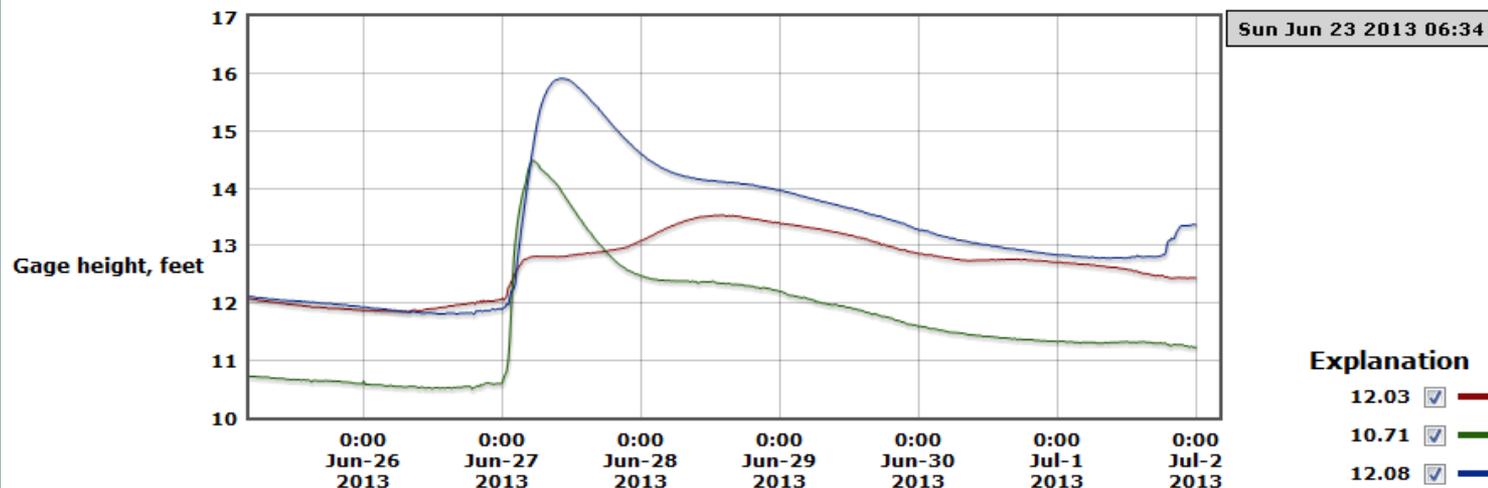
[Instantaneous-data availability statement](#)

PROVISIONAL DATA SUBJECT TO REVISION

Selected Sites <input checked="" type="checkbox"/> 03282290 <input checked="" type="checkbox"/> 03284000 <input checked="" type="checkbox"/> 03284230	Available Period 2013-03-04 2013-07-02 2013-03-04 2013-07-02 2013-03-04 2013-07-02	Output format <input type="radio"/> Graph <input type="radio"/> Graph w/ stats <input type="radio"/> Graph w/o stats <input type="radio"/> Graph w/ (up to 3) parms NEW <input type="radio"/> Table <input type="radio"/> Tab-separated	Days (7) <input type="text"/> -- or -- Begin date <input type="text" value="2013-06-25"/> End date <input type="text" value="2013-07-02"/>	<input type="button" value="GO"/>
---	--	---	---	-----------------------------------

USGS 03282290 KENTUCKY RIVER AT LOCK 11 NEAR COLLEGE HILL, KY
 USGS 03284000 KENTUCKY RIVER AT LOCK 10 NEAR WINCHESTER, KY
 USGS 03284230 KENTUCKY RIVER AT LOCK 9 AT VALLEY VIEW, KY

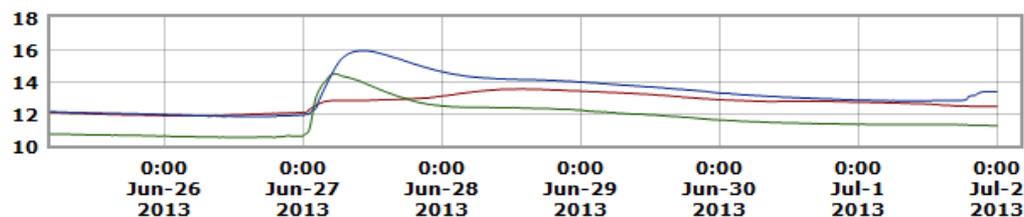
Zoom period plot



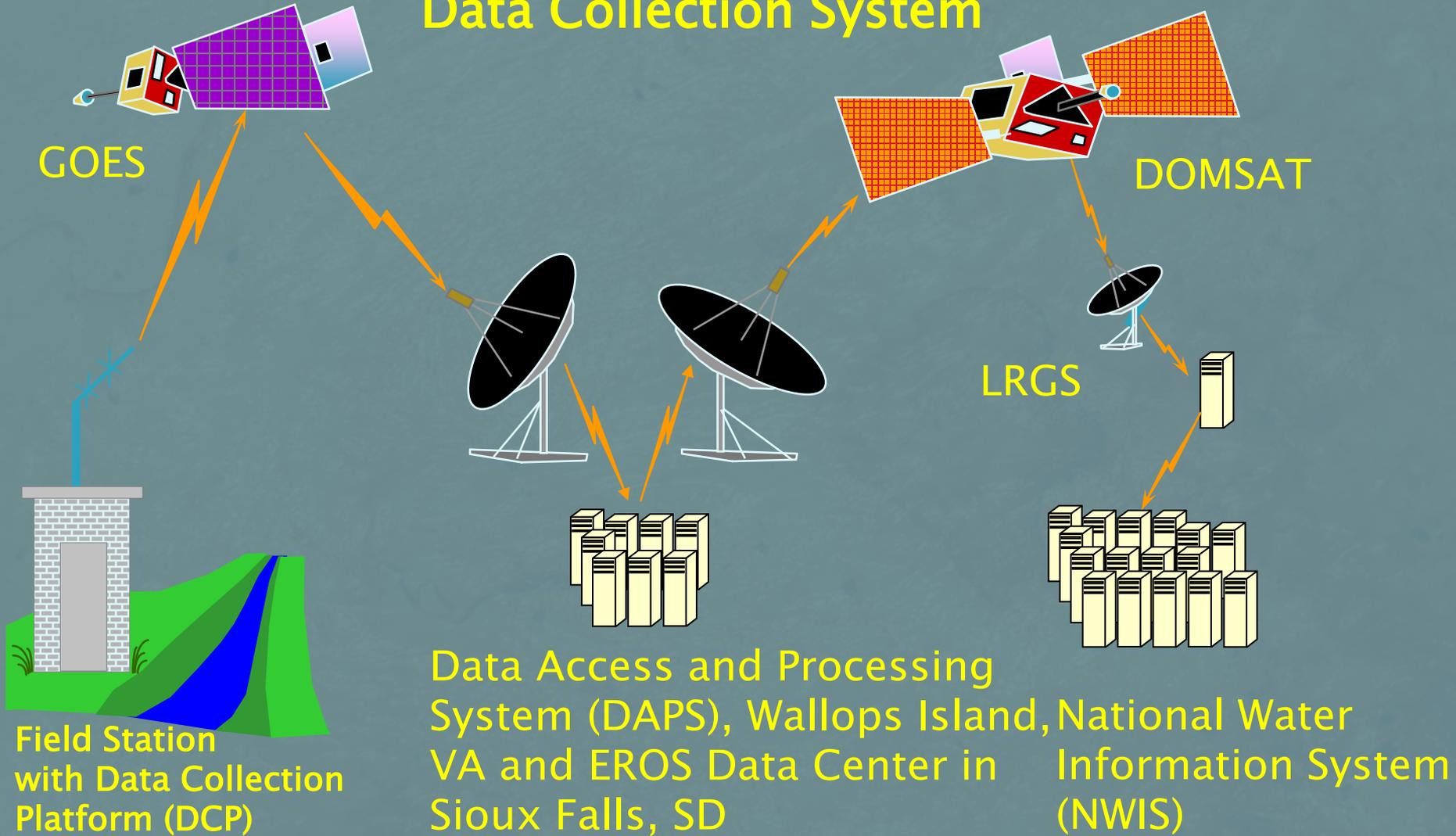
Explanation

- 12.03 USGS 03282290
- 10.71 USGS 03284000
- 12.08 USGS 03284230

Period selected plot



USGS GOES near real-time Data Collection System



USGS Water Data (<http://waterdata.usgs.gov/nwis>)

USGS Water-Data Site Information for the Nation

Site Information (1,585,889 *<publicly viewable>* sites)

Information for each site in the USGS data base can be retrieved for viewing and for download and import into other software, including GIS software. Includes links to all water data available for individual sites.

USGS Water-Data Site Information for Kentucky

Site Information (14,729 *<publicly viewable>* sites)

Information for each site in the USGS data base can be retrieved for viewing and for download and import into other software, including GIS software. Includes links to all water data available for individual sites.

USGS Surface-Water Data for the Nation

Current Conditions (9,561 <publicly viewable> sites)

Current conditions at selected sites based on the most recent data from on-site automated recording equipment. Measurements are commonly recorded at a fixed interval of 15- to 60-minutes and transmitted to the USGS every hour. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). Most current data are provisional.

Historical Observations (11,488 <publicly viewable> sites)

The same data accessed by the Current Conditions link above but including both active and discontinued sites with data for any part of the period October 1, 2007, through the present. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision).

Daily Data (26,239 <publicly viewable> sites)

Summary of all data for each day for the period of record and may represent the daily mean, median, maximum, minimum, and/or other derived value. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). [Example](#).

Statistics (24,882 <publicly viewable> sites)

[Daily](#) [Monthly](#) [Annual](#)

Statistics are computed from approved daily mean data at each site. These links provide summaries of approved historical daily values for daily, monthly, and annual (water year or calendar year) time periods.

Peak-Flow Data (28,328 <publicly viewable> sites)

Annual maximum instantaneous peak streamflow and gage height

Field Measurements (56,180 <publicly viewable> sites)

Manual measurements of streamflow and gage height. Th and (or) verify the accuracy of the automatically recorded streamflow based on gage height.

USGS Surface-Water Data for Kentucky

Current Conditions (206 <publicly viewable> sites)

Current conditions at selected sites based on the most recent data from on-site automated recording equipment. Measurements are commonly recorded at a fixed interval of 15- to 60-minutes and transmitted to the USGS every hour. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). Most current data are provisional.

Historical Observations (207 <publicly viewable> sites)

The same data accessed by the Current Conditions link above but including both active and discontinued sites with data for any part of the period October 1, 2007, through the present. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision).

Daily Data (316 <publicly viewable> sites)

Summary of all data for each day for the period of record and may represent the daily mean, median, maximum, minimum, and/or other derived value. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). [Example](#).

Statistics (309 <publicly viewable> sites)

[Daily](#) [Monthly](#) [Annual](#)

Statistics are computed from approved daily mean data at each site. These links provide summaries of approved historical daily values for daily, monthly, and annual (water year or calendar year) time periods.

Peak-Flow Data (350 <publicly viewable> sites)

Annual maximum instantaneous peak streamflow and gage height

Field Measurements (899 <publicly viewable> sites)

Manual measurements of streamflow and gage height. These measurements are used to supplement and (or) verify the accuracy of the automatically recorded observations, as well as to compute streamflow based on gage height.



USGS Water-Quality Data for the Nation

Current Conditions (1,740 <publicly viewable> sites)

Current conditions at selected sites based on the most recent data from on-site automated recording equipment. Measurements are commonly recorded at a fixed interval of 15- to 60-minutes and transmitted to the USGS every hour. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). Most current data are provisional.

Historical Observations (1,740 <publicly viewable> sites)

The same data accessed by the Current Conditions link above but including both active and discontinued sites with data for any part of the period October 1, 2007, through the present. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision).

Daily Data (10,949 <publicly viewable> sites)

Summary of all data for each day for the period of record and may represent the daily mean, median, maximum, minimum, and/or other derived value. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). [Example](#).

Statistics (4,563 <publicly viewable> sites)

[Daily](#) [Monthly](#) [Annual](#)

Statistics are computed from approved daily mean data at each site. These links provide summaries of approved historical daily values for daily, monthly, and annual (water year or calendar year) time periods.

Field/Lab Samples (390,159 <publicly viewable> sites)

Data from field and/or laboratory analyses of water sampl environmental samples. Data include approved, quality-a recent provisional data, whose accuracy has not been ver

USGS Water-Quality Data for Kentucky

Current Conditions (48 <publicly viewable> sites)

Current conditions at selected sites based on the most recent data from on-site automated recording equipment. Measurements are commonly recorded at a fixed interval of 15- to 60-minutes and transmitted to the USGS every hour. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). Most current data are provisional.

Historical Observations (48 <publicly viewable> sites)

The same data accessed by the Current Conditions link above but including both active and discontinued sites with data for any part of the period October 1, 2007, through the present. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision).

Daily Data (87 <publicly viewable> sites)

Summary of all data for each day for the period of record and may represent the daily mean, median, maximum, minimum, and/or other derived value. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). [Example](#).

Statistics (87 <publicly viewable> sites)

[Daily](#) [Monthly](#) [Annual](#)

Statistics are computed from approved daily mean data at each site. These links provide summaries of approved historical daily values for daily, monthly, and annual (water year or calendar year) time periods.

Field/Lab Samples (5,179 <publicly viewable> sites)

Data from field and/or laboratory analyses of water samples, biological tissue, sediments, or other environmental samples. Data include approved, quality-assured data that may be published, and more recent provisional data, whose accuracy has not been verified.



USGS Groundwater Data for the Nation

Current Conditions (1,529 <publicly viewable> sites)

Current conditions at selected sites based on the most recent data from on-site automated recording equipment. Measurements are commonly recorded at a fixed interval of 15- to 60-minutes and transmitted to the USGS every hour. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). Most current data are provisional.

Historical Observations (2,209 <publicly viewable> sites)

The same data accessed by the Current Conditions link above but including both active and discontinued sites with data for any part of the period October 1, 2007, through the present. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision).

Daily Data (6,506 <publicly viewable> sites)

Summary of all data for each day for the period of record and may represent the daily mean, median, maximum, minimum, and/or other derived value. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). [Example.](#)

Statistics (3,106 <publicly viewable> sites)

[Daily](#) [Monthly](#) [Annual](#)

Statistics are computed from approved daily mean data at each site. These links provide summaries of approved historical daily values for daily, monthly, and annual (water year or calendar year) time periods.

Field Measurements (850,463 <publicly viewable> sites)

Manual measurements of depth to water in wells.

USGS Groundwater Data for Kentucky

Current Conditions (1 <publicly viewable> sites)

Current conditions at selected sites based on the most recent data from on-site automated recording equipment. Measurements are commonly recorded at a fixed interval of 15- to 60-minutes and transmitted to the USGS every hour. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). Most current data are provisional.

Historical Observations (1 <publicly viewable> sites)

The same data accessed by the Current Conditions link above but including both active and discontinued sites with data for any part of the period October 1, 2007, through the present. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision).

Daily Data (41 <publicly viewable> sites)

Summary of all data for each day for the period of record and may represent the daily mean, median, maximum, minimum, and/or other derived value. Values may include "Approved" (quality-assured data that may be published) and/or more recent "Provisional" data (of unverified accuracy and subject to revision). [Example.](#)

Statistics (0 <publicly viewable> sites)

[Daily](#) [Monthly](#) [Annual](#)

Statistics are computed from approved daily mean data at each site. These links provide summaries of approved historical daily values for daily, monthly, and annual (water year or calendar year) time periods.

Field Measurements (8,159 <publicly viewable> sites)

Manual measurements of depth to water in wells.



NWIS WEB – Water Data for the Nation

Site -- Location --	Site -- Identifier --	Site -- Attribute --	Data -- Attribute --
<input type="checkbox"/> County	<input type="checkbox"/> Site Name	<input checked="" type="checkbox"/> Site type	<input type="checkbox"/> Number of observations
<input type="checkbox"/> Hydrologic Unit (by Code)	<input type="checkbox"/> Site Number	<input type="checkbox"/> Drainage area	
<input type="checkbox"/> Hydrologic Unit (by Name)	<input type="checkbox"/> Multiple Site Numbers		
<input type="checkbox"/> Lat-Long box	<input type="checkbox"/> Agency Code		
	<input type="checkbox"/> File of Site Numbers		

Choose Output Format

Display Summary of Selected Sites

Choose one of the following options for displaying descriptions of the sites meeting the criteria above:

- Show sites on a map **NEW**
 - Table of sites sorted by grouped by
 - Scroll list of sites -- allows selection of data for multiple sites
 - Brief descriptions -- allows selection of data for multiple sites
 - Site-description information displayed in
- | | |
|---|--|
| <input type="checkbox"/> Agency | <--Select fields to include in site-description output |
| <input type="checkbox"/> Site identification number | |
| <input type="checkbox"/> Site name | |
| <input type="checkbox"/> Site type | |
- Save file of selected sites to local disk for future upload
 - Raw NWISWeb sitefile review (internal)

Retrieve USGS Surface-Water Daily Data for Selected Sites

Choose one of the following options for displaying data for the sites meeting the criteria above

Retrieve data for:

- the previous days (1 - 365) **OR**
- for the date range: First date: Last date: (1838-03-10 through 2013-07-08)

Output Options:

- Graphs of data -- use arithmetic Y-axis for streamflow
- Graphs of data with long-term statistics -- use arithmetic Y-axis for streamflow
- Graphs of data without long-term statistics -- use arithmetic Y-axis for streamflow
- Graphs of data with field measurements -- use arithmetic Y-axis for streamflow
- Table of data
- Tab-separated data *

* Save compressed files with a .gz file extension.

- Raw NWISWeb rdb format (internal)

Select sites which meet all of the following criteria:

Define one or more values for each of the following site-selection criteria: --- or select [new criteria](#)

Site Number -- enter a full or partial site ID (optional)

exact match match from the start match any part

Site type -- select one or more (selection of a left-justified option will retrieve any subsequent indented entries)

- Atmosphere
- Glacier
- Ocean
 - Coastal
- Estuary
- Lake
- Stream
- Canal
- Ditch
- Tidal stream
- Spring
- Well
 - Collector or Ranney type well
 - Extensometer well
 - Hyporheic-zone well

Available parameters -- select sites that have data for the following parameters:

Select one or more parameters --or-- leave blank to select all:

Water Level/Flow Parameters

- Depth to water level, ft below land surface (41 sites)
- Gage height, ft (2 sites)
- Stream velocity, ft/s (1 sites)
- Streamflow, ft³/s (307 sites)

Water Quality Parameters

- Dissolved oxygen, water, unfiltered, mg/L (15 sites)
- pH, water, unfiltered, field, standard units (15 sites)
- Specific conductance, water, unfiltered, µS/cm at 25 °C (15 sites)
- Suspended sediment concentration, mg/L (65 sites)
- Suspended sediment discharge, tons/d (66 sites)
- Temperature, water, °C (23 sites)
- Turbidity, water, unfiltered, monochrome near infra-red LED light, 780-900 nm, detection angle 90 +/-2.5 degrees, FNU (13 sites)

Meteorological Parameters

- Precipitation, total, in (3 sites)

USGS 03284000 KENTUCKY RIVER AT LOCK 10 NEAR WINCHESTER, KY

Available data for this site SU

Stream Site

DESCRIPTION:

Latitude 37°53'41", Longitude 84°15'44" NAD27
Madison County, Kentucky, Hydrologic Unit 05100205
Drainage area: 3,955 square miles
Datum of gage: 556.76 feet above NGVD29.

AVAILABLE DATA:

Data Type	Begin Date	End Date	Count
Current / Historical Observations (availability statement)	2007-10-01	2012-05-16	
Daily Data			
Discharge, cubic feet per second	1907-10-01	2012-05-15	37483
Daily Statistics			
Discharge, cubic feet per second	1907-10-01	2011-09-30	37256
Monthly Statistics			
Discharge, cubic feet per second	1907-10	2011-09	
Annual Statistics			
Discharge, cubic feet per second	1908	2011	
Peak streamflow	1908-04-03	2010-05-03	103
Field measurements	1924-08-19	2012-03-05	655
Field/Lab water-quality samples	1970-10-08	1995-07-11	156
Additional Data Sources			
Instantaneous-Data Archive **offsite**	1987-01-30	2007-09-30	206317
Annual Water-Data Report (pdf) **offsite**	2006	2011	6

OPERATION:

How do you get to the Data?

http://ky.water.usgs.gov/



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 mineral resources; and enhance and protect our quality of life.

Hydrologic Data
Studies
Sediment Lab
Publications

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 - StreamMail

Historical Data

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

Current Water Conditions

Science Highlights

Flood-Inundation Maps of the South Fork Little River at Hopkins Kentucky

Digital flood-inundation maps for an 8.6-mile reach of South Fork Little River at Hopkinsville were created by the USGS Kentucky Water Science Center.

Real-Time Data for Kentucky

NOTICE: Recently discontinued and threatened USGS streamgages in Kentucky. Click [here](#) for more information.

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- Precipitation
- Ground Water
- Water Quality
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- USGS Water Alert - StreamMail

Historical Data

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

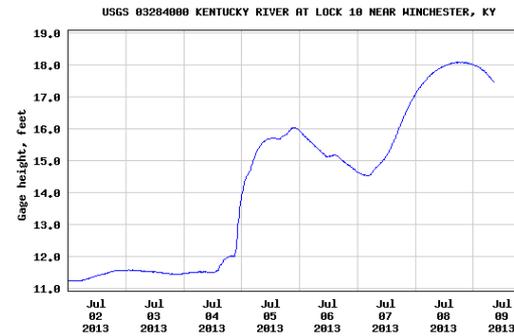
Current Water Conditions

Available Parameters	Available Period	Output format	Days (7)
<input type="checkbox"/> All 4 Available Parameters for this site		<input checked="" type="radio"/> Graph	<input type="text" value="7"/>
<input checked="" type="checkbox"/> 00065 Gage height	2013-03-11 2013-07-09	<input type="radio"/> Graph w/ stats	-- Or --
<input type="checkbox"/> 00045 Precipitation	2013-03-11 2013-07-09	<input type="radio"/> Graph w/o stats	<input type="text" value="2013-07-02"/>
<input type="checkbox"/> 00060 Discharge	2007-10-01 2013-07-09	<input type="radio"/> Graph w/ (up to 3) parms ***	<input type="text" value="2013-07-02"/>
<input checked="" type="checkbox"/> 70969 DCP battery voltage	2013-06-01 2013-07-09	<input type="radio"/> Table	<input type="text" value="2013-07-09"/>
		<input type="radio"/> Tab-separated	

Summary of all available data for this site
 Instantaneous-data availability statement

Gage height, feet

Most recent instantaneous value: 17.47 07-09-2013 08:30 EDT



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

Add site numbers

GO

Create [presentation-quality](#) / [stand-alone](#) graph. Subscribe to [WaterAlert](#) P00065 D002

Share this graph | [Facebook](#) [Twitter](#) [Email](#) [Print](#)

03280000	NORTH FORK KENTUCKY RIVER AT JACKSON, KY	07/09 08:00 EDT	4.76	2,810	--	549
03280600	MIDDLE FORK KENTUCKY RIVER NEAR HYDEN, KY	07/09 08:30 EDT	5.98	--	--	--
03280700	CUTSHIN CREEK AT WOOTON, KY	07/08 18:30 EDT	3.01	240	--	35.0
03281000	MIDDLE FORK KENTUCKY RIVER AT TALLGATE, KY	07/09 08:45 EDT	12.22	3,030	--	326
03281100	GOOSE CREEK AT MANCHESTER, KY	07/09 08:45 EDT	8.92	599	--	56.0
03281500	SOUTH FORK KENTUCKY RIVER AT BOONEVILLE, KY	07/09 08:00 EDT	9.33	2,850	--	360
03282000	KENTUCKY RIVER AT LOCK 14 AT HEIDELBERG, KY	07/09 07:45 EDT	15.41	13,300	--	1,270
03282040	STURGEON CREEK AT CRESSMONT, KY	07/09 08:30 EDT	3.13	134	--	17.0
03282060	KENTUCKY RIVER AT LOCK 13 NEAR WILLOW, KY	07/09 08:15 EDT	16.67	13,900	--	827
03282120	KENTUCKY RIVER AT LOCK 12 NEAR IRVINE, KY	07/09 08:15 EDT	17.30	16,200	--	1,380
03282290	KENTUCKY RIVER AT LOCK 11 NEAR COLLEGE HILL, KY	07/09 08:15 EDT	19.35	19,200	--	1,120
03282500	RED RIVER NEAR HAZEL GREEN, KY	07/09 08:30 EDT	2.20	165	--	30.0
03283500	RED RIVER AT CLAY CITY, KY	07/09 08:15 EDT	6.87	1,410	--	306
03284000	KENTUCKY RIVER AT LOCK 10 NEAR WINCHESTER, KY	07/09 08:30 EDT	17.47	25,600	--	1,950
03284230	KENTUCKY RIVER AT LOCK 9 AT VALLEY VIEW, KY	07/09 07:45 EDT	19.32	27,000	--	960
03284500	KENTUCKY RIVER AT LOCK 8 NEAR CAMP NELSON, KY	07/09 08:15 EDT	21.08	30,600	--	1,330
03284525	E HICKMAN CR TRIB AT CHILESBURG RD NR LEXINGTON, KY	07/09 08:05 EDT	1.84	2.6	--	.86
03284533	FAST HICKMAN CR AT TATES CR RD NR FAST HICKMAN, KY	07/09 08:05 EDT	2.22	56	--	---
03284552	WEST HICKMAN CR AT VETERANS PARK NR LEXINGTON, KY	07/09 08:05 EDT	1.71	43	--	---
03284580	HICKMAN CREEK AT HWY 1268 NEAR CAMP NELSON, KY	07/09 07:45 EDT	4.99	450	--	63.0
03285000	DIX RIVER NEAR DANVILLE, KY	07/09 08:30 EDT	4.56	1,160	--	120

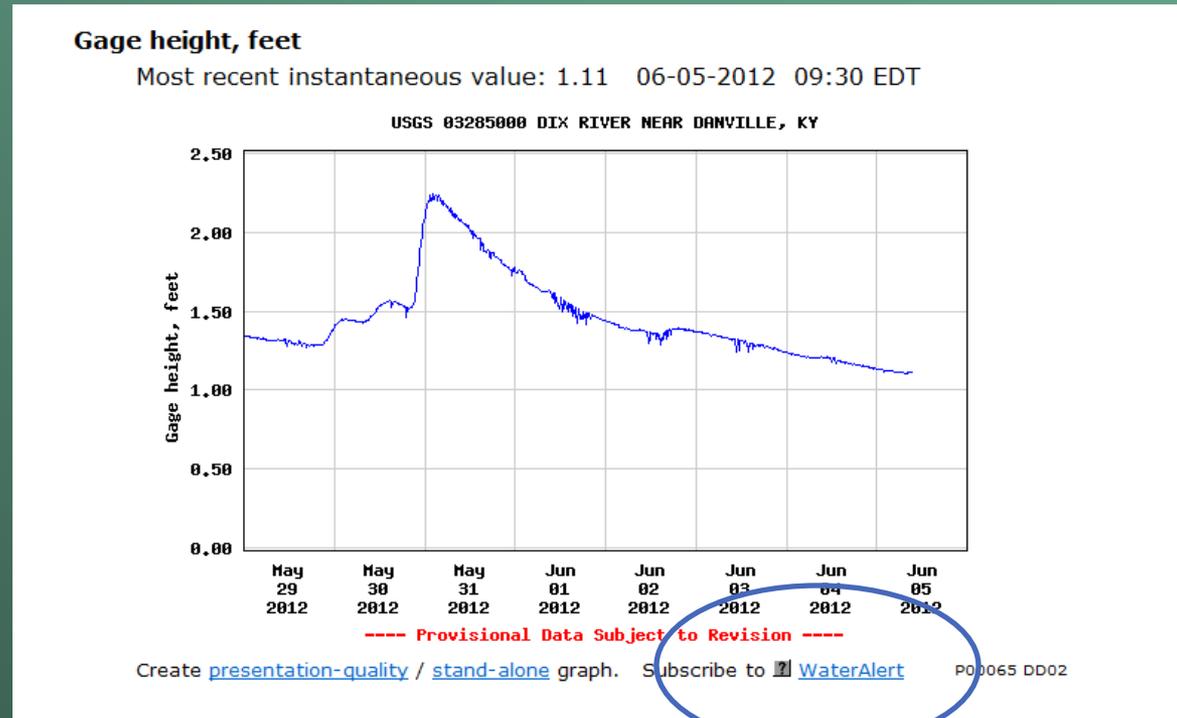


New Products and Tools

- ▶ USGS WaterAlert
- ▶ USGS WaterNow
- ▶ Water Watch

How to I get to 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 WaterAlert

The U.S. Geological Survey WaterAlert service sends e-mail or text (SMS) messages when [certain parameters](#), as measured by a USGS real-time gage, 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, once per hour. *data received at these site-dependent intervals.*

[Instructions](#)

SITE SELECTION

State or Territory
(select one or more)

- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- Dist. of Columbia
- Florida

Data Type

- Surface Water
- Groundwater
- Water Quality
- Precipitation

Reset Search

1. Connect off the KYWSC homepage

2. Connect off the real-time data graph pages

USGS WaterAlert

The U.S. Geological Survey WaterAlert service sends e-mail or text (SMS) messages when [certain parameters](#), as measured by a USGS real-time gage, is supported by the USGS and its partners, including numerous federal, state, and local agencies.

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[Instructions](#)

Kentucky Water Resources Program

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[Hydrologic Data](#)

[Studies](#)

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](#) - [StreamMail](#)

SITE SELECTION

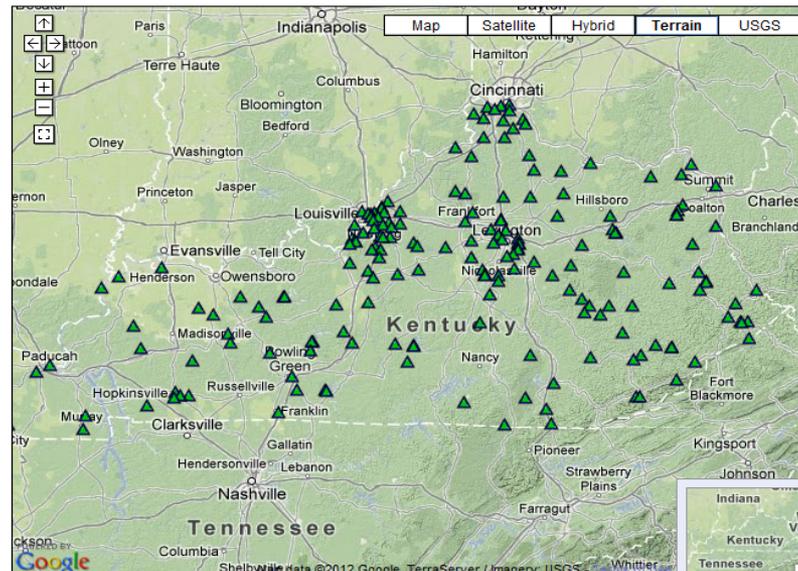
State or Territory
(select one or more)

- Alabama
- Alaska
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- Dist. of Columbia
- Florida
- Georgia
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Louisiana
- Maine
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

Data Type

- Surface Water
- Groundwater
- Water Quality
- Precipitation

Reset Search



U.S. Department of the Interior (DOI) products do not constitute an endorsement by the DOI. By viewing the Google Maps API on this web site the user agrees to the [Terms of Service set forth by Google.](#)

SITE SELECTION

State or Territory
(select one or more)

- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky**
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan

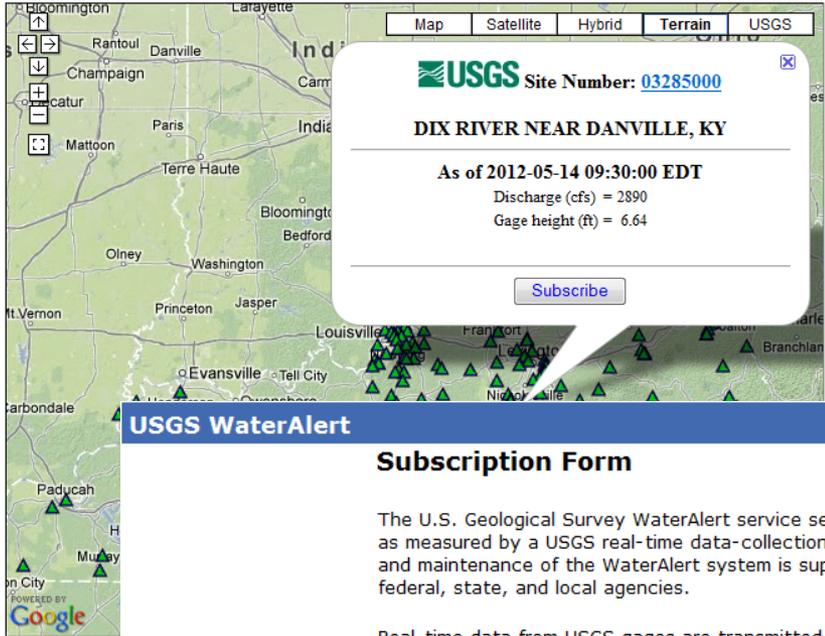
Data Type

- Surface Water
- Groundwater
- Water Quality
- Precipitation

Search this selection

Reset Search

▲ = streamflow site



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, once every 1 or 4 hours. 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: 03285000
 Site Name: DIX RIVER NEAR DANVILLE, KY
 Agency: USGS
 Transaction ID: kcNwC

Send Notification To: [about this...](#)

My mobile phone
 My email address

Notification Frequency: [about this...](#)

Hourly
 Daily

Streamflow Data-type Parameter: [about this...](#) Recent value:

Discharge (cfs) 2890 [\[peak chart\]](#)
 Gage height (ft) 6.64 [\[peak chart\]](#)

Threshold Condition: [about this...](#)

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

Real-time value is greater than: ft

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

Submit Reset Cancel



USGS – WaterNow (replaces Streamail)

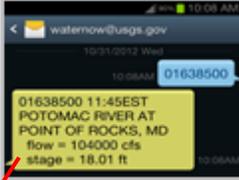
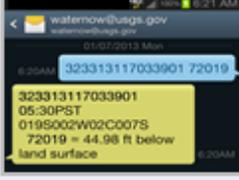
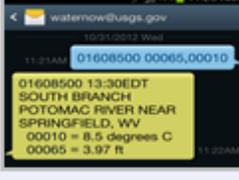
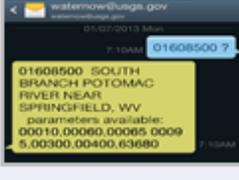
▶ Using WaterNow with email:

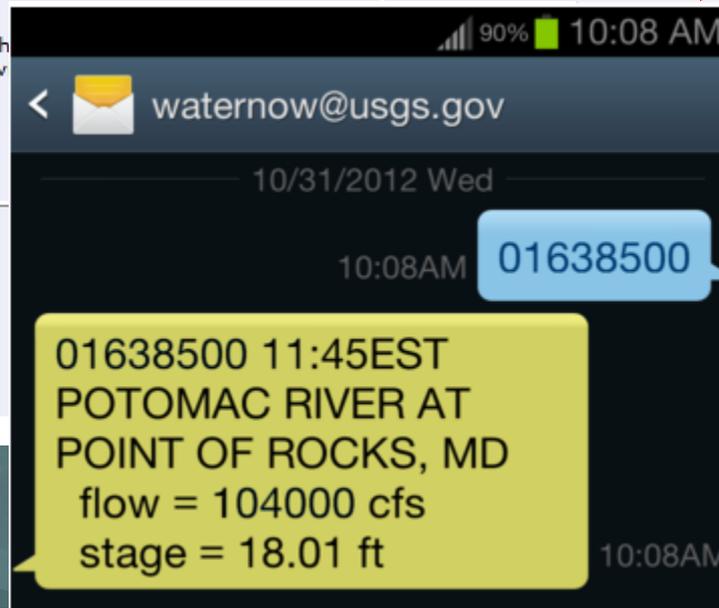
- Send an email message to WaterNow@usgs.gov where either the Subject or the first line of the message contains the USGS Site Number of the gage you want to query (optionally add parameter codes to customize your query). You will receive a response within a few minutes.

▶ 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.

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 than three characters and truncate the message with most phone services)	Requesting more than three parameters will return more than three characters and truncate the message with most phone services	
SiteNumber ?	Requesting more than three parameters will return more than three characters and truncate the message with most phone services	



WaterNow – <http://water.usgs.gov/waternow/>

Email Subject	Action	Example Result
SiteNumber example To <input type="text" value="WaterNow@usgs.gov"/> Subject <input type="text" value="01638500"/>	Query for flow and/or stage (if available; otherwise returns a list of available parameters)	01638500 09:45EST POTOMAC RIVER AT POINT OF ROCKS, MD 00060 Discharge, cubic feet per second = 4910 00065 Gage height, feet = 2.15
SiteNumber parameter example To <input type="text" value="WaterNow@usgs.gov"/> Subject <input type="text" value="323313117033901 72019"/>	Query for a specific parameter (parameter codes are 5 digits; leading zeros, if any, are required)	323313117033901 06:30PST 019S002W02C007S 72019 Depth to water level, feet below land surface = 45.10
SiteNumber parm1,parm2,... example To <input type="text" value="WaterNow@usgs.gov"/> Subject <input type="text" value="01608500 00060,00010"/>	Query multiple parameters (parameters must be separated by commas with no spaces)	01608500 09:30EST SOUTH BRANCH POTOMAC RIVER NEAR SPRINGFIELD, WV 00010 Temperature, water, degrees Celsius = 1.1 00060 Discharge, cubic feet per second = 749
SiteNumber * example To <input type="text" value="WaterNow@usgs.gov"/> Subject <input type="text" value="01608500 *"/>	Query for all available parameters	01608500 11:30EDT SOUTH BRANCH POTOMAC RIVER NEAR SPRINGFIELD, WV 00010 Temperature, water, degrees Celsius = 25.9 00060 Discharge, cubic feet per second = 896 00065 Gage height, feet = 2.63 00095 Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius = 225 00300 Dissolved oxygen, water, unfiltered, milligrams per liter = 8.7 00400 pH, water, unfiltered, field, standard units = 8.2
SiteNumber ? example To <input type="text" value="WaterNow@usgs.gov"/> Subject <input type="text" value="01608500 ?"/>	Get list of available parameters	01608500 SOUTH BRANCH POTOMAC RIVER NEAR SPRINGFIELD, WV parameters available 00010,00060,00065,00095,00300,00400

Water Watch – <http://waterwatch.usgs.gov/new/>

WaterWatch

Home

Current Streamflow

Flood

Drought

Past Flow/Runoff

Animation

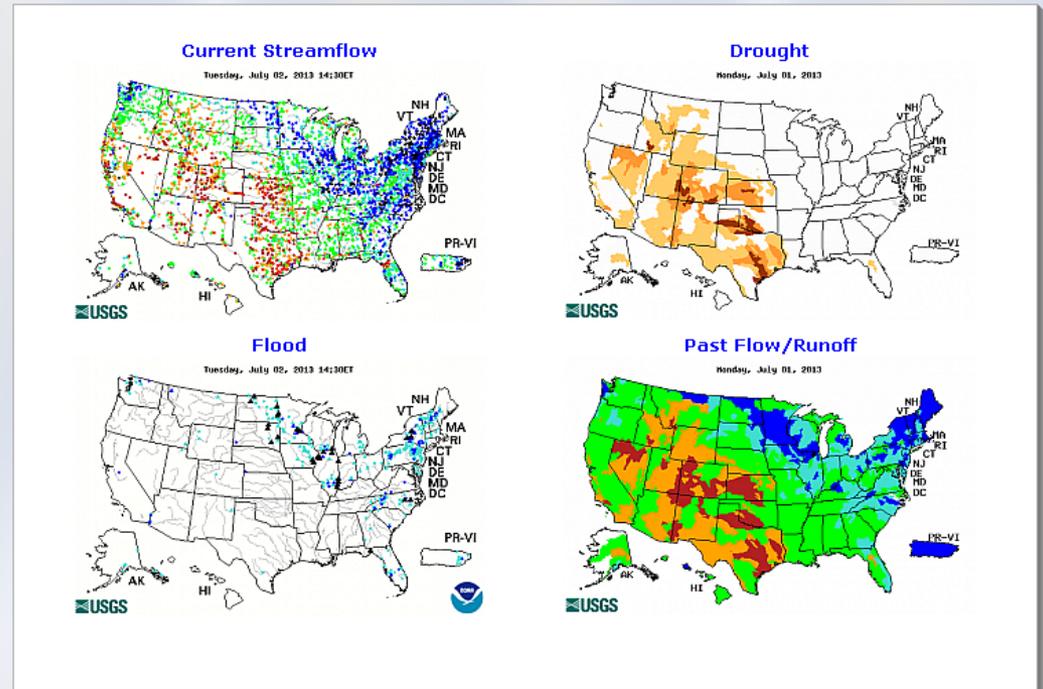
Toolkit

Toolkit (internal)

Annual Summaries

Additional Information

About WaterWatch



USGS WaterWatch Toolkit

Streamflow Conditions Map Builder



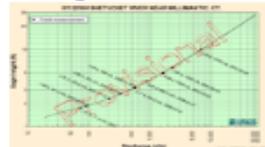
This builder is used to customize the streamflow conditions maps in size and color.

State Google Map Builder



A Google Maps version of the streamflow conditions map can be created in users web sites.

Rating Curve Builder



The rating curve builder is used to create a USGS streamflow rating curve. The rating table is from the USGS ratings depot. Field measurements can also

be appended to the curve.

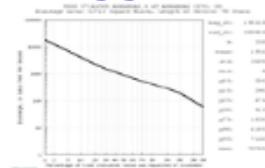
Flood Table Builder



This tool summarizes the flood and high flow conditions for a state or a region for a given time period. Tables and Google Maps are used to summarize conditions and to show locations,

respectively.

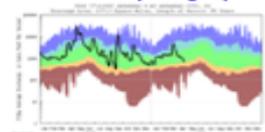
Streamgage Statistics Retrieval Tool



The "streamgage statistics" retrieval tool provides a list of basic summary statistics and duration graph for the selected streamgage, as computed from daily values, for the period of

record.

Duration Hydrograph Builder



streamgages.

The builder is used to present a time-history of streamflow for the past two years along with historical streamflow percentiles for individual

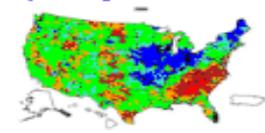
Streamflow Map Animation Builder



respectively.

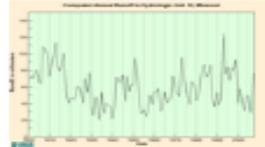
This tool is to create a streamflow map animation for a time period for real-time streamflow and flood-and-high flow maps,

Hydrologic Unit Runoff Maps



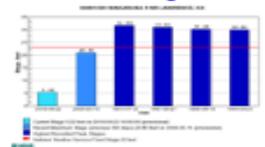
Hydrologic unit runoff and runoff condition maps since 1901 are available.

Runoff Hydrograph



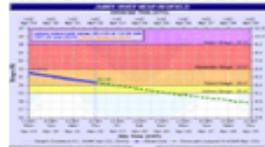
Monthly, quarterly, and annual HUC runoff time-series plots are available in a HUC area and a state.

Flood Tracking Chart

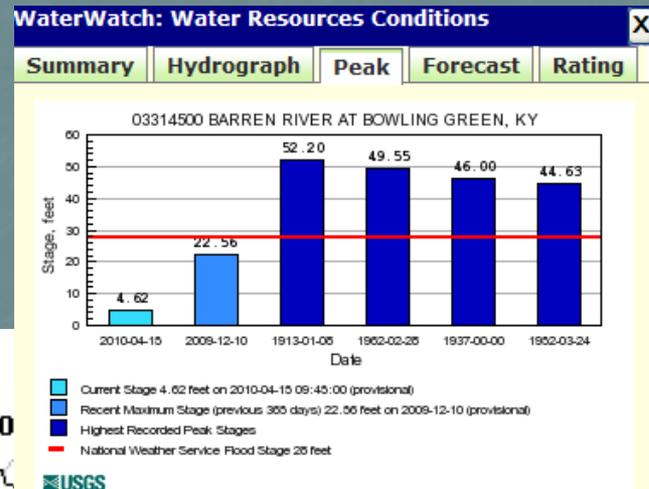


A URL is provided to create flood-tracking chart which shows current state, recent peak stage, historical highest peaks, and flood stage.

AHPS River Forecast



AHPS river forecast chart can be assessed by a USGS station number.

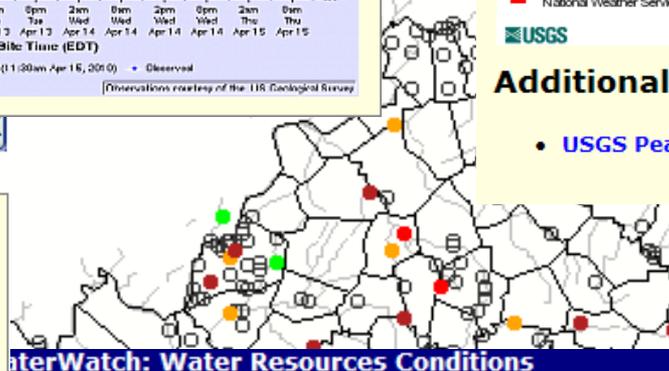
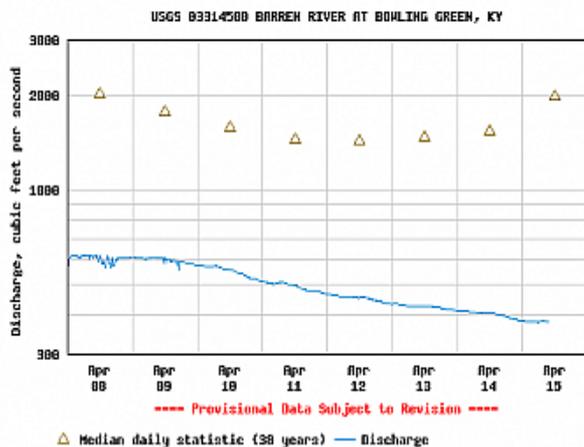


Additional Information:

- USGS Peak Streamflow

WaterWatch: Water Resources Conditions

Summary | Hydrograph | Peak | Forecast | Rating



WaterWatch: Water Resources Conditions

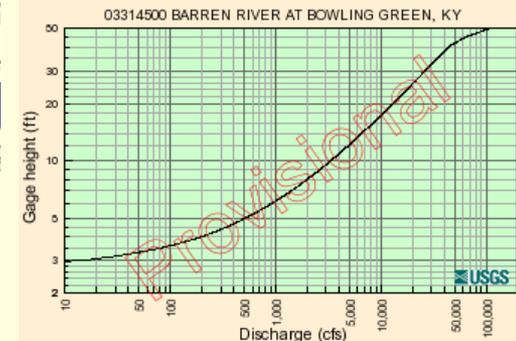
Summary | Hydrograph | Peak | Forecast | Rating

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%

WaterWatch: Water Resources Conditions

Summary | Hydrograph | Peak | Forecast | Rating



Additional Information:

- Explanation
- Shift-adjusted rating table



Flood Tracking Chart Builder

Site number:

03284000

Value type:

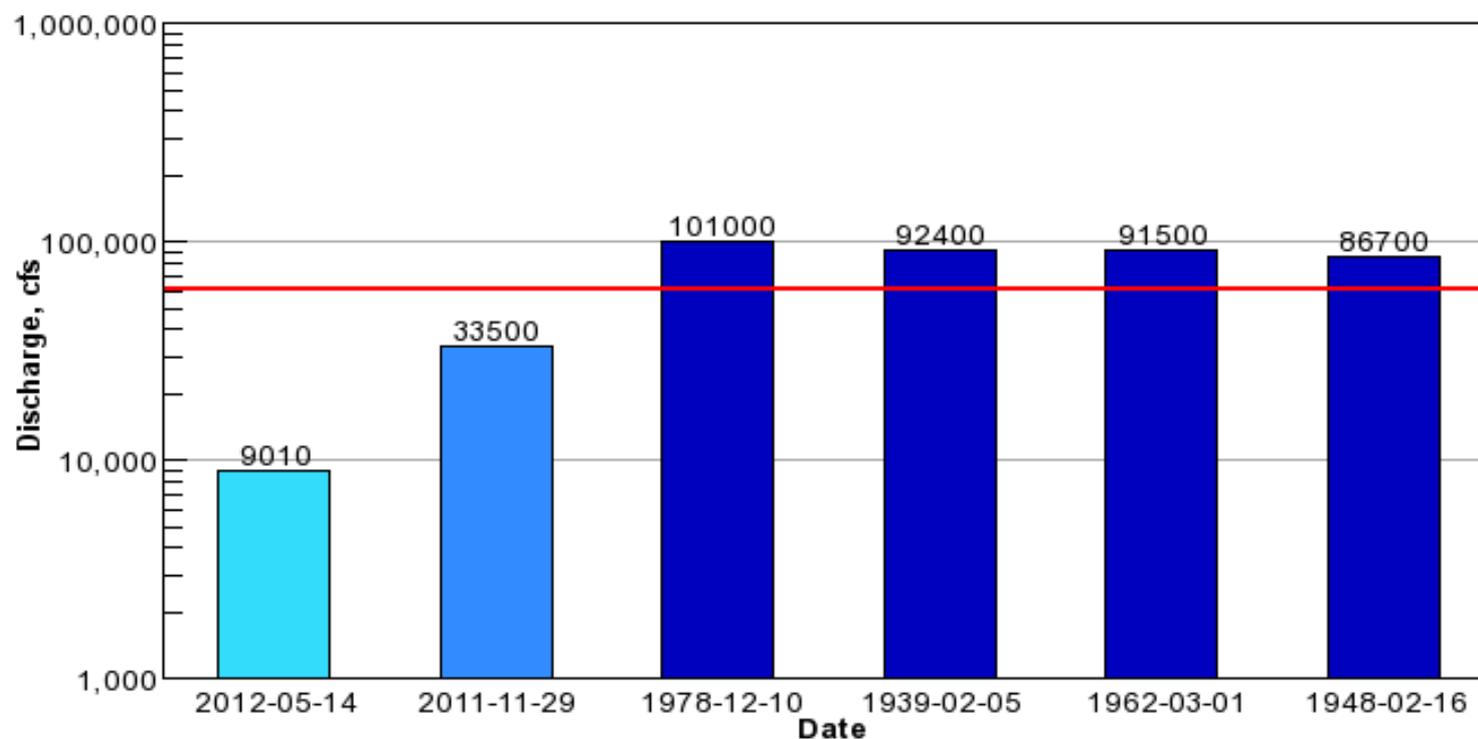
Flow

Size:

Normal (700x500)

GO

03284000 KENTUCKY RIVER AT LOCK 10 NEAR WINCHESTER, KY



Current Discharge 9010 cfs on 2012-05-14 09:30:00 (provisional)



Recent Maximum Discharge (previous 365 days) 33500 cfs on 2011-11-29 (provisional)



Highest Recorded Peak Discharges



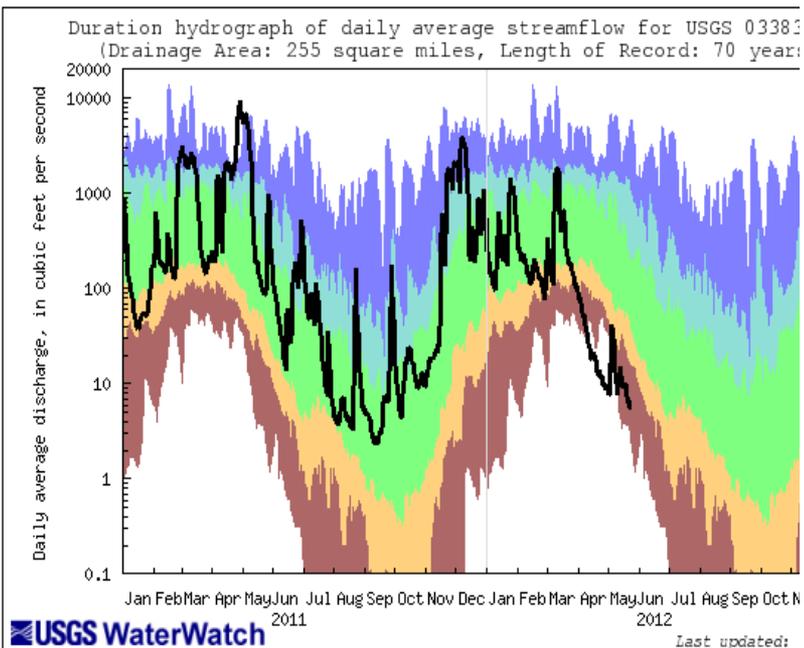
Estimated Discharge 62400 cfs from NWS Flood Stage of 26 feet and USGS Rating Curve

Duration Curves–Good Drought Indicators

USGS Streamflow Duration Hydrograph Build

Site Number: 03383000 Year: 2012 Flow type: Daily streamflow

For some streams, flow statistics may have been computed from mixed regulated and unregulated flows; this can lead to inaccurate depictions of flow conditions.

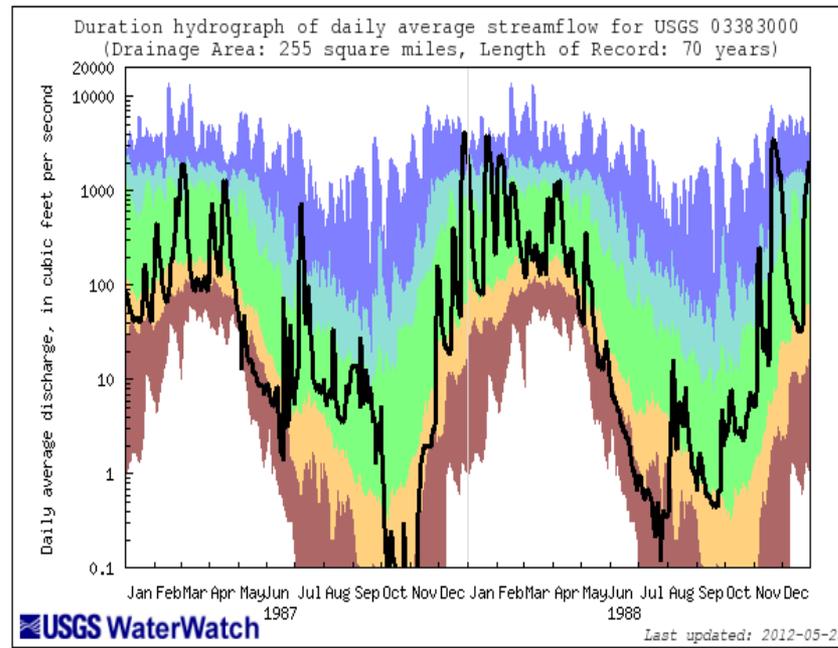


Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	FLOW
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS Streamflow Duration Hydrograph Builder

Site Number: 03383000 Year: 1988 Flow type: Daily streamflow GO

For some streams, flow statistics may have been computed from mixed regulated and unregulated flows; this can lead to inaccurate depictions of flow conditions.



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	FLOW
Much below normal	Below normal	Normal	Above normal	Much above normal	

Questions?



*I wish I had
signed up for
the USGS
WaterAlert!!*



Mike Griffin
Deputy Director
502 493-1913
mgriffin@usgs.gov