



USGS StreamStats Web Application for Kentucky

Implementation of selected low- and
mean-flow estimating equations

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Overview

- Description / Development / Current status
- Accessing the user interface
- Basic features and functionalities
- General guidelines for use
- Adding statistics and estimating equations for Kentucky StreamStats
- Enhanced / future StreamStats capabilities
- Proposed further studies in Kentucky

What is USGS StreamStats?

- A map-based Web application that provides information that can be used by engineers, hydrologists, managers, planners, and others to make informed decisions on water-related activities
- **Primary products: basin delineations, basin characteristics, and estimates of streamflow statistics**
- Provides information for gaged and user-selected ungaged streams sites
- Allows analysis of upstream/downstream relations along streams; Can provide summaries of water use

StreamStats Home Page

<http://streamstats.usgs.gov>

Welcome to StreamStats - Microsoft Internet Explorer provided by MD-DC-DE WSC

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

File Edit View Favorites Tools Help

Welcome to StreamStats

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Welcome to StreamStats

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Screen resolution of 1024x768

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[News](#)

[StreamStats Description](#)

[Un-gaged Sites](#)

[Data-Collection Stations](#)

[StreamStats Limitations](#)

[State Applications](#)

[USGS Station Statistics](#)

[User Instructions](#)

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StreamStats is a Web-based tool that allows users to obtain streamflow statistics, drainage-basin characteristics, and other information for user-selected sites on streams. StreamStats users can choose locations of interest from an interactive map and obtain information for these locations. If a user selects the location of a U.S. Geological Survey (USGS) data-collection station, the user will get previously published information for the station from a database. If a user selects a location where no data are available (an ungaged site), a Geographic Information System (GIS) program will estimate information for the site. The GIS program determines the boundary of the drainage basin above the site, measures the physical characteristics of the drainage basin, and solves the appropriate regression equations to estimate streamflow statistics for the site. The results are presented in a table and a map showing the basin outline. The estimates assume natural flow conditions at the site. In the past, it could take an experienced person more than a day to estimate this information for an ungaged site. StreamStats reduces the effort to only a few minutes.

Separate applications have been established for each state that has implemented StreamStats. The state applications provide access to all of the functionality that is available for the state. The State Applications link at the left provides access to the individual applications. In addition to the state applications, a separate application has been established for serving information for USGS data-collection stations throughout the Nation. The USGS Station Statistics link to the left provides access to this application.

Some StreamStats options will not work in Netscape. The application continues to be improved and expanded. Please continue to come back to this page to see future enhancements. [Contact us](#) if you have any questions.

Users should familiarize themselves with StreamStats Description, Instructions, and Limitations (using the links on the left) before utilizing the application.

The StreamStats Web application provides access to automated procedures and very large, complex data sets. These data sets are known to contain occasional errors. Users are hereby advised to carefully check all results for accuracy and to exercise their own professional judgment in evaluating the appropriateness of the results for their application. Basin delineations in particular frequently have been found to be erroneous. The Web site provides tools and base maps useful for verifying the accuracy of the basin delineations.

Done

Internet 100%

State Applications

State Info - Microsoft Internet Explorer provided by MD-DC-DE WSC

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

File Edit View Favorites Tools Help

StreamStats in Colorado State Info

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Welcome to StreamStats

Best viewed in Internet Explorer 5 or above
Screen resolution of 1152x864 or greater, with pop-up blocker disabled

State Applications

[StreamStats Application Status](#)

Choose a State

Efforts are underway to make StreamStats operational for many states, with a long-term goal of national coverage. Work needed to implement StreamStats is generally done by the USGS in cooperation with various state and local agencies. The map below indicates states where StreamStats has been implemented, and where work on implementation is currently underway. Green states have fully implemented StreamStats applications, orange states have been completed and are in testing internally, and blue states are undergoing implementation. Users may access the implemented state applications by selecting the state of interest on the map below, or by selecting the name of the state from the list above.

- Fully implemented (Clickable)
- Delineation and basin characteristics implemented (Clickable)
- Implemented and testing internally
- Undergoing implementation

Done

Local intranet 100%

Kentucky Introductory Page

StreamStats in Kentucky - Windows Internet Explorer provided by MD-DE-DC WSC

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

OMB Circular No. A-109

File Edit View Favorites Tools Help

StreamStats in Kentucky @The Core - USGS Emplo... Streamstats Site Status

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Streamflow Statistics

Stream Network Navigation

StreamStats Fact Sheet

Frequently Asked Questions

Kentucky

Kentucky StreamStats incorporates regression equations for estimating instantaneous peak flows with annual exceedance probabilities of 50, 20, 10, 4, 2, 1, 0.5, and 0.2 percent. These peak flows have recurrence intervals of 2, 5, 10, 25, 50, 100, 200, and 500 years, respectively. The report below documents the regression equations available in StreamStats for Kentucky, the methods used to develop the equations and to measure the basin characteristics used in the equations, and the errors associated with the estimates obtained from the equations. Users should familiarize themselves with this report before using StreamStats to obtain estimates of peak flows for unqaged sites.

- [Hodgkins, G.A. and Martin, G.R., 2003. Estimating the Magnitude of Peak Flows for Streams in Kentucky for Selected Recurrence Intervals, U.S. Geological Survey Water-Resources Investigations Report 03-4180, 68 p., 1 plate.](#)

The peak-flow regression equations are implemented only for hydrologic regions 2, 3, 5, 6, and 7 in Kentucky. Drainage area is the only explanatory variable in these equations. Equations for hydrologic regions 1 and 4 are not implemented at this time because an additional explanatory variable, stream slope, is needed to solve the equations. The capability for StreamStats to compute stream slope in a manner that duplicates the method used in the report by Hodgkins and Martin (2003) has not yet been devised.

Interactive Map

[Contact Us](#) if you experience any problems with this application.

Local intranet | Protected Mode: Off

100%

Description of statistics estimated

Report citation with hyperlink

Limitations

Link to application

Kentucky User Interface

The screenshot shows the USGS StreamStats Kentucky User Interface. The browser window title is "USGS StreamStats - Windows Internet Explorer provided by MD-DE-DC WSC". The address bar shows the URL: http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1363984341275. The page features a map of Kentucky with a highlighted stream network. A toolbar is visible at the top of the map area, and a sidebar on the left contains navigation options: Results, Map Contents, Navigation, and Overview. A red box highlights the sidebar area, with an arrow pointing to the text "Panel Banners" and the word "Console" below it. A yellow arrow points to the toolbar with the text "Toolbar". The footer includes links for Accessibility, FOIA, Privacy, and Policies and Notices, along with contact information and logos for USA.gov and TAKE PRIDE IN AMERICA.

USGS
Kentucky StreamStats

Zoom To: 1:3,200,000

Results
Map Contents
Navigation
Overview

Panel Banners

Console

Toolbar

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Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx
Page Contact Information: StreamStats Help
Page Last Modified: 03/22/2013 16:32:25

Streamstats Status News

USA.gov TAKE PRIDE IN AMERICA

AutoRefreshMap:40,1,5 Fri Mar 22 17:07:06 EDT 2013/Fri Mar 22 17:11:28 EDT 2013

Local intranet | Protected Mode: Off 100%

Working With Panels

USGS StreamStats - Windows Internet Explorer provided by MD-DE-DC WSC

http://streamstats.sgs.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1363984341275

Kentucky StreamStats

Zoom To: 1:3,200,000

Results

Map Contents

- KY@ky_ss
 - GlobalWatershedPoint
 - NHDWaterQuality
 - NHDHDam
 - NHDHGage
 - SimilarGages
 - Stream Gages
 - High Res NHD Stream
 - GlobalWatershed

Navigation

Overview

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URL: http://streamstats.sgs.cr.usgs.gov/ky_ss/default.aspx
Page Contact Information: StreamStats Help
Page Last Modified: 03/22/2013 16:32:25

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AutoRefreshMap:48,1,5 Fri Mar 22 17:07:06 EDT 2013/Fri Mar 22 17:19:29 EDT 2013

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Display Streamgages

USGS StreamStats - Windows Internet Explorer provided by MD-DE-DC WSC

http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1363984341275

USGS
Kentucky StreamStats

Zoom To: 1:3,200,000

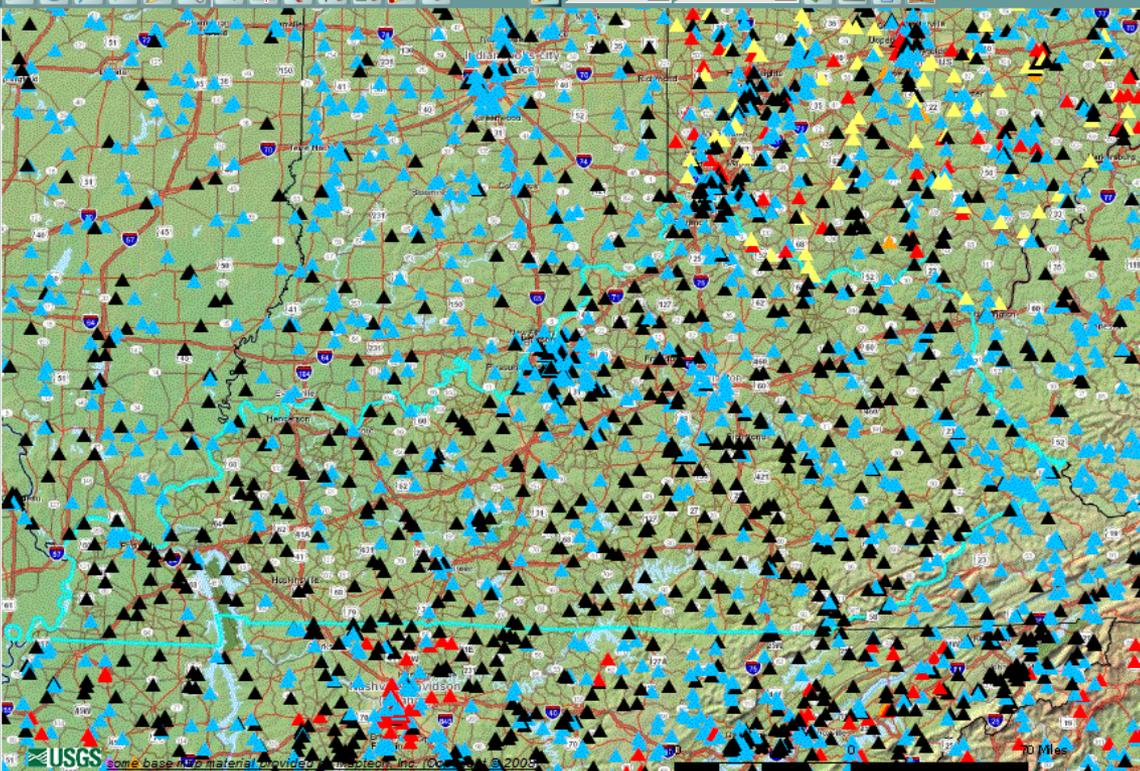
Results

Map Contents

- KY@ky_ss
 - GlobalWatershedPoint
 - NHDWaterQuality
 - NHDHDam
 - NHDHGage
 - SimilarGages
 - Stream Gages
 - High Res NHD Stream
 - GlobalWatershed

Navigation

Overview



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Done Local intranet | Protected Mode: Off 100%

Navigation Panel

The screenshot displays the USGS StreamStats web application in Internet Explorer. The browser address bar shows the URL: http://streamstats.sgs.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1363984341275. The page title is "USGS Kentucky StreamStats".

The interface includes a navigation panel on the left with the following sections:

- Results**: A dropdown menu.
- Map Contents**: A list of map layers with checkboxes:
 - KY@ky_ss
 - GlobalWatershedPoint
 - NHDWaterQuality
 - NHDHDam
 - NHDHGage
 - SimilarGages
 - Stream Gages
 - High Res NHD Stream
 - GlobalWatershed
- Navigation**: A compass rose with a red arrow pointing to the 'E' (East) direction.
- Overview**: A dropdown menu.

The main map area shows a topographic map of Kentucky with numerous data points represented by colored triangles (blue, black, red, yellow). A zoom level of 1:3,200,000 is displayed. A red arrow points from the text box to the compass rose.

Click on points of compass to move map center

At the bottom of the page, there are links for Accessibility, FOIA, Privacy, and Policies and Notices. The footer includes the USGS logo, the text "U.S. Department of the Interior | U.S. Geological Survey", the URL, and the date "Page Last Modified: 03/22/2013 16:32:25". There are also logos for USA.gov and "TAKE PRIDE IN AMERICA".

Overview Map

USGS StreamStats - Windows Internet Explorer provided by MD-DE-DC WSC

http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1363984341275

USGS Kentucky StreamStats

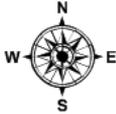
Zoom To: 1:3,200,000

Results

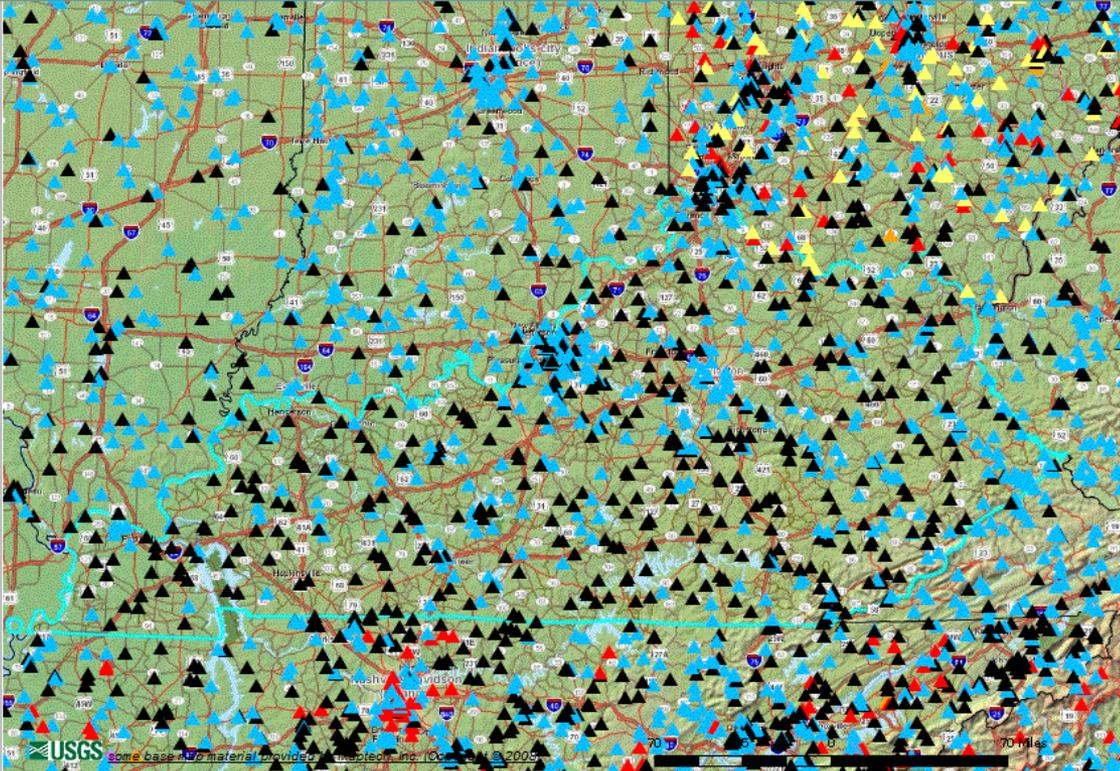
Map Contents

- KY@ky_ss
 - GlobalWatershedPoint
 - NHDHWaterQuality
 - NHDHDam
 - NHDHGage
 - SimilarGages
 - Stream Gages
 - High Res NHD Stream
 - GlobalWatershed

Navigation



Overview



USGS some base map material provided by Esri, Inc. © 2005

70 Miles

Accessibility **FOIA** **Privacy** **Policies and Notices**

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AutoRefreshMap:55,1,5 Fri Mar 22 17:23:14 EDT 2013/Fri Mar 22 17:26:29 EDT 2013

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Results Panel / Identify Tool

The screenshot displays the USGS StreamStats web application interface. The browser window title is "USGS StreamStats - Windows Internet Explorer provided by MD-DE-DC WSC". The address bar shows the URL: http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1363984341275. The page features a map of Kentucky with a detailed view of a stream network. The "Map Contents" panel on the left lists various layers, including "KY@ky_ss", "GlobalWatershedPoint", "NHDHWaterQuality", "NHDHDam", "NHDHGage", "SimilarGages", "Stream Gages", "High Res NHD Stream", and "GlobalWatershed". The "Results" panel in the center displays the following information for the selected gage:

- Object:** KY@ky_ss (5031010.9796, 3950736.2449)
- Layers:** State Boundaries, State, ExcludePoly, Stream Gages
- Selected Gage:** PLUM CR SUBWATER SHED NO 4 NR SIMPSONVILLE, KY
- Metadata:**
 - OBJECTID: 77323
 - Latitude: 38.17436
 - Longitude: -85.36767
 - STA_ID: 03296000
 - STA_NAME: PLUM CR SUBWATER SHED NO 4 NR SIMPSONVILLE, KY
 - STA_TYPE: GS
 - COORDSRC: NHD24K
 - SITESTATUS: I
 - REACH100: 05140102000882
 - MEASURE100: 95.1279
 - REACH24: 05140102000882
 - MEASURE24: 99.1552
 - REACHLOC: 0
 - MEASURELOC: 0
 - FeatureURL: http://waterdata.usgs.gov/nwis/nwisman/?site_no=03296000
 - DRNAREA: 1.5501

The interface also includes a "Navigation" panel with a compass rose and an "Overview" panel showing a smaller map of the region. The footer contains links for Accessibility, FOIA, Privacy, and Policies and Notices, along with the USGS logo and the "USA.gov" logo.

Streamgauge Information



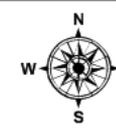
USGS
Kentucky StreamStats

Results

Map Contents

- KY@ky_ss
 - GlobalWater
 - NHDHWate
 - NHDHDam
 - NHDHGage
 - SimilarGag
 - Stream Ga
 - High Res N
 - GlobalWate
 - WPD_Cat

Navigation



Overview



Accessibility
U.S. Department of the Interior
URL: <http://streamstats.usgs.gov>
Page Contact Information
Page Last Modified: 03/25/2013

StreamStats Data-Collection Station Report - Windows Internet Explorer provided by MD-DE-DC WSC

80_Percent_Duration	0	cubic feet per second	41
90_Percent_Duration	0	cubic feet per second	41
95_Percent_Duration	0	cubic feet per second	41
99_Percent_Duration	0	cubic feet per second	41
Annual Flow Statistics			
Daily_flow_years	9.0000	years	31
General Flow Statistics			
Average_daily_streamflow	1.633	cubic feet per second	41
Maximum_daily_flow	135	cubic feet per second	41
Minimum_daily_flow	0	cubic feet per second	41
Std_Dev_of_daily_flows	6.571	cubic feet per second	41
Base Flow Statistics			
Average_BFI_value	0.177	dimensionless	42
Number_of_years_to_compute_BFI	9	years	42
Std_dev_of_annual_BFI_values	0.067	dimensionless	42
Precipitation Statistics			
24_Hour_10_Year_Precipitation	4.4000	inches	31
24_Hour_100_Year_Precipitation	6.2000	inches	31
24_Hour_2_Year_Precipitation	3.2000	inches	31
24_Hour_25_Year_Precipitation	5.2000	inches	31
24_Hour_50_Year_Precipitation	6.6000	inches	31
Mean_Annual_Precipitation	44.000	inches	31
Temperature Statistics			
Mean_Min_January_Temperature	26.500	degrees F	31

Citations

Citation Number	Citation Name and URL
31	Imported from Basin Characteristics file
41	Wolock, D.M., 2003, Flow characteristics at U.S. Geological Survey streamgages in the conterminous United States: U.S. Geological Survey Open-File Report 03-146, digital data set
42	Wolock, D.M., 2003, Base-flow index grid for the conterminous United States: U.S. Geological Survey Open-File Report 03-263, digital data set



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AutoRefreshMap:5,0,5 Mon Mar 25 08:45:22 EDT 2013/Mon Mar 25 08:46:33 EDT 2013

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StreamStatsDB Database

- MS Access database that contains information for streamgages and regression equations used in StreamStats. Gage data from national databases now.
- WSCs provide updates as part of local studies
- For Kentucky, StreamStatsDB will be updated to include streamgage information from:
 - [SIR 2010-5217](#), Low-Flow Frequencies
 - [WRIR 02-4206](#), Mean-Annual Streamflows
 - [WRIR 92-4173](#), Harmonic-Mean Streamflows

Display of Layers

USGS StreamStats - Windows Internet Explorer provided by MD-DE-DC WSC

http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1364215344631

USGS Kentucky StreamStats

Map Contents

- KY@ky_ss
 - GlobalWatershedPoint
 - NHDHWaterQuality
 - NHDHDam
 - NHDHGage
 - SimilarGages
 - ▲ Gaging Station, Conti
 - ▲ Low Flow, Partial Rec
 - ▲ Peak Flow, Partial Re
 - ▲ Peak and Low Flow, P
 - ▲ Stage Only
 - ▲ Low Flow, Partial Rec
 - ▲ Miscellaneous Record
 - ▲ Unknown
 - Stream Gages

Navigation

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URL: http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx
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Hydrologic Regions

USGS StreamStats - Windows Internet Explorer provided by MD-DE-DC WSC

http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1364215344631

USGS Kentucky StreamStats

Lat/Long 1:3,597,763

Results

Map Contents

- Low Flow, Partial Rec
- Miscellaneous Record
- Unknown
- High Res NHD Stream
- GlobalWatershed
- WBD_Subregions
- WBD_Regions
- NHDPlus
- ExcludePoly
- ArchHydro
- PeakFlow Regions
 - Region 1 (Flowstats no
 - Region 2
 - Region 3
 - Region 4 (Flowstats no
 - Region 5
 - Region 6
 - Region 7
- Stream Grid
- ESRI_Imagery_World_20
- ky_ss_base

Navigation

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AutoRefreshMap:72,2,5 Mon Mar 25 09:52:58 EDT 2013/Mon Mar 25 09:53:34 EDT 2013

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100%

Select Ungaged Site

USGS
Kentucky StreamStats

Results >>
Map Contents >>
Zoom To: 1:11,179

Click on Watershed Delineation from a Point

Scale must indicate 1:24,000 or greater

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx
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Page Last Modified: 03/22/2013 17:51:48

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AutoRefreshMap: 15,0,5 Fri Mar 22 18:05:48 EDT 2013/Fri Mar 22 18:05:50 EDT 2013

Delineated Basin

The screenshot displays the USGS StreamStats web application in a Windows Internet Explorer browser. The browser's address bar shows the URL: http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx?stabbr=ky&dt=1363984341275. The page title is "USGS Kentucky StreamStats".

The main content area features a topographic map of a watershed basin, which is shaded in a light pink color. The basin is outlined with a thick black border. The map includes a scale bar at the bottom right, indicating distances in miles (0, 2.5, 5, 7.5, 10). The zoom level is set to 1:212,760.

On the left side of the map, there is a "Map Contents" panel with a tree view of layers. The "KY@ky_ss" folder is expanded, showing the following layers and their status:

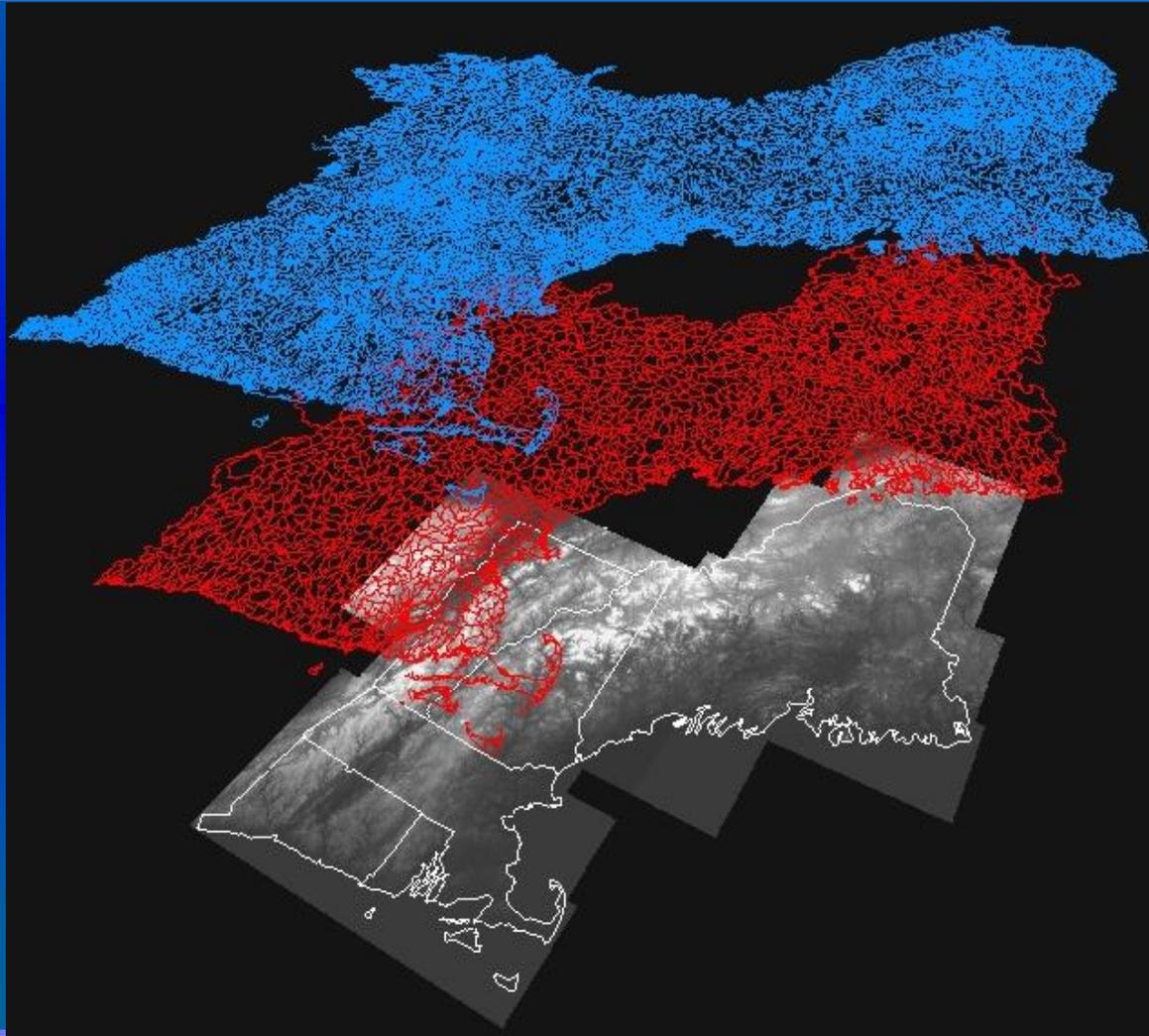
- GlobalWatershedPoint
- NHDWaterQuality
- NHDHDam
- NHDHGage
- SimilarGages
- Stream Gages
- High Res NHD Stream
- GlobalWatershed
- WBD_Subregions

Below the map content, there are sections for "Accessibility", "FOIA", "Privacy", "Policies and Notices", and "Overview". The footer contains the following information:

U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstatsags.cr.usgs.gov/ky_ss/default.aspx
Page Contact Information: StreamStats Help
Page Last Modified: 03/22/2013 17:51:48

Additional footer elements include the USGS logo, "Streamstats Status", "News", "USA.gov", and "TAKE PRIDE IN AMERICA". The browser's status bar at the bottom shows "Local intranet | Protected Mode: Off" and a zoom level of 100%.

StreamStats Integrates NHD, WBD and NED in ArcHydro



**National
Hydrography
Dataset (NHD)**

**Watershed
Boundary
Dataset (WBD)**

**National
Elevation
Dataset (NED)**

Flow Statistics from Regression Equations

USGS Kentucky StreamStats

Streamstats Unengaged Site Report

Date: Fri Mar 22 2013 16:09:57 Mountain Daylight Time
 Site Location: Kentucky
 NAD27 Latitude: 37.5640 (37 33 50)
 NAD27 Longitude: -83.2952 (-83 17 43)
 NAD83 Latitude: 37.5641 (37 33 51)
 NAD83 Longitude: -83.2952 (-83 17 43)
 Drainage Area: 152 mi²

Peak Flows Region Grid Streamflow Statistics

100% Upper East Region 2 (152 mi²)

Parameter	Value	Regression Equation Valid Range
Drainage Area (square miles)	152	0.09 - 1232

Peak Flows Region Grid Streamflow Statistics

Statistic	Flow (ft ³ /s)	Prediction Error (percent)	Equivalent years of return period	90-Percent Prediction Interval
PK2	5894	34	1.9	
PK5	8940	34	3	
PK10	11760	34	4	
PK25	13800	34	5.6	
PK50	15900	34	6.9	
PK100	18000	35	7.9	
PK200	20200	36	8.7	
PK500	23100	37	9.6	

Flows equations

- Regression equation estimates assume natural flow conditions at the selected site
- Availability of equations varies among states

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Example Regression Equation

- Regression equations take the form:

$$Q_{100} = 0.3467A^{0.750}S^{0.14}P^{1.35}$$

- where:

Q_{100} is the 100-year flood flow, cubic feet per second

A is drainage area, in square miles

S is mean basin slope, in percent

P is a mean annual precipitation, in inches

This equation is for the Colorado Mountain Region

Adding Regression Equations

Low flow -- [SIR 2010-5217](#)

- $7Q_2$, $7Q_{10}$, $7Q_{20}$, $30Q_2$, $30Q_5$, Prob. zero flow
~ A, V

Mean-annual flow -- [WRIR 02-4206](#)

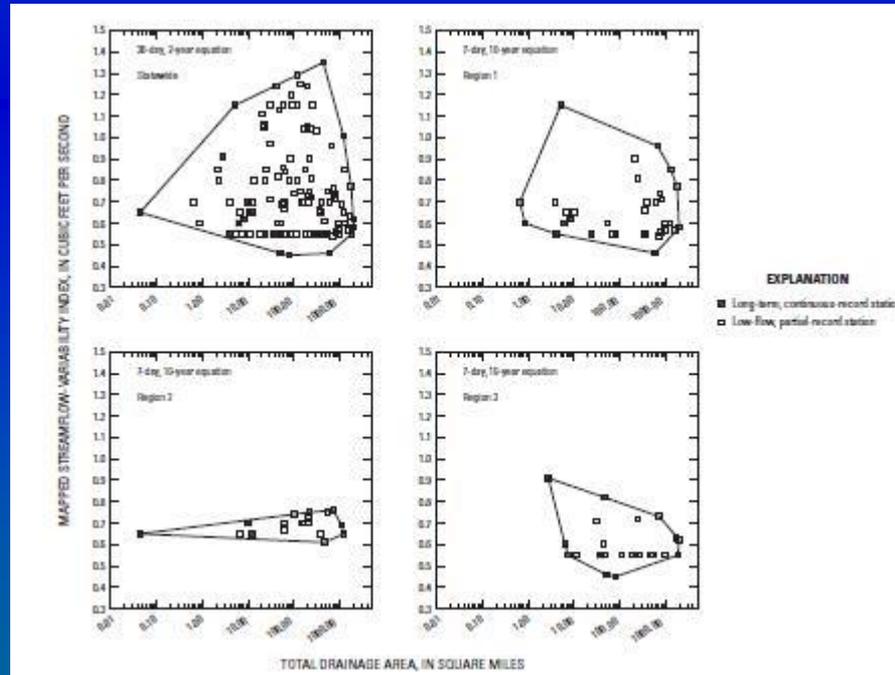
- Q_a ~ A, E, Lat

Harmonic-mean flow -- [WRIR 92-4173](#)

- Q_h ~ A, V

Regression Equation Limitations

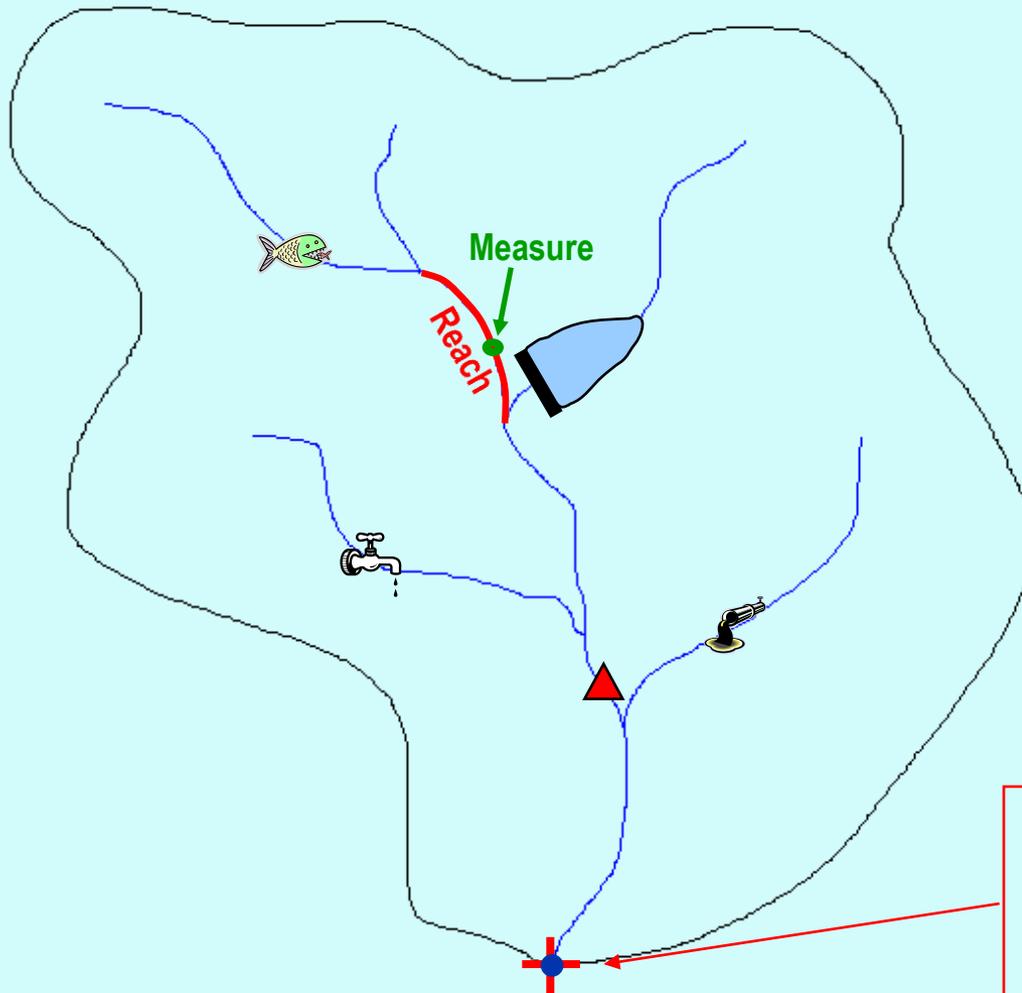
Low flows: SIR 2010-5217 Errors/applicable range



Other Tools for Use With Delineated Basins

- **Edit a Delineated Basin**
 - Add or remove areas
- **Get Basin Characteristics**
 - Computes additional BCs
- **Edit Parameters and Recompute Flows**
 - Allows testing of scenarios
- **Download Shapefile**
- **Print maps**
- **Estimate Flows Based on Similar Streamgaging Stations**
 - Estimates flows using nearby streamgages and drainage-area ratio method
 - Relies on stream network navigation

Network Navigation/NHD Reach Indexing



Explanation

-  User-selected site
-  Streamgaging station
-  Dam site
-  Point discharge
-  Water withdrawal
-  Biological sampling site

StreamStats provides reach addresses for user-selected sites, consisting of reach number and percentage distance from downstream end of reach

Flow Estimation Based on Similar Gages

Flows Report based on gages - Microsoft Internet Explorer provided by MD-DC-DE WSC

MAXDV Maximum_daily_flow 1.0557 1570 37 1660

Estimated flows for the user-selected site determined by weighting of regression equation-based estimates and nearby streamgaging station estimates.

Weighted flows based on regression and gage station estimates

Low-Flow Statistics

Flow types	Flow description	Regression estimates	Drainage-area ratio estimates	Weighted estimates	Weighted equivalent years of record
M7D10Y	7_Day_10_Year_Low_Flow	2.5	3.5	3.39	
M7D2Y	7_Day_2_Year_Low_Flow	4.23999977	5.67	5.51	

Flow-Duration Statistics

Flow types	Flow description	Regression estimates	Drainage-area ratio estimates	Weighted estimates	Weighted equivalent years of record
D99	99_Percent_Duration	2.53999996	3.8	3.66	
D98	98_Percent_Duration	2.53999996	3.8	3.66	
D95	95_Percent_Duration	4.69000005	5.91	5.78	
D90	90_Percent_Duration	8.14999961	9.61	9.44	
D85	85_Percent_Duration	8.14999961	9.61	9.44	
D80	80_Percent_Duration	11.10000038	13.7	13.4	
D75	75_Percent_Duration	11.10000038	13.7	13.4	
D70	70_Percent_Duration	13.5	16.9	16.5	
D60	60_Percent_Duration	18.29999923	23.2	22.7	
D50	50_Percent_Duration	25.89999961	31.7	31	

See Ries, 2006, USGS
 Techniques and Methods
 Book 4-A6, p 9 for
 weighting equations

provided if
 .5 and <= 1.5



Network Tracing in StreamStats

■ Configure trace

- Specify layer used (NHD, NHDPlus, etc.)
- Direction of tracing (upstream, downstream, both)
- Participating event layers (gages, dams, etc.)
- Load event layer

■ Trace from delineated

- Display identified reach
- Identify point events

■ Raindrop trace to nearest

- Display path from point
- Compute reach address

Configure Network Trace - Windows Internet Explorer

USGS WebEx Enterprise Site

USGS
Kentucky StreamStats

Network Tracing Configuration

Network: NHDPlus.NET

Trace: Upstream

Select layers participating in the trace

NHDFlowline

NPDES

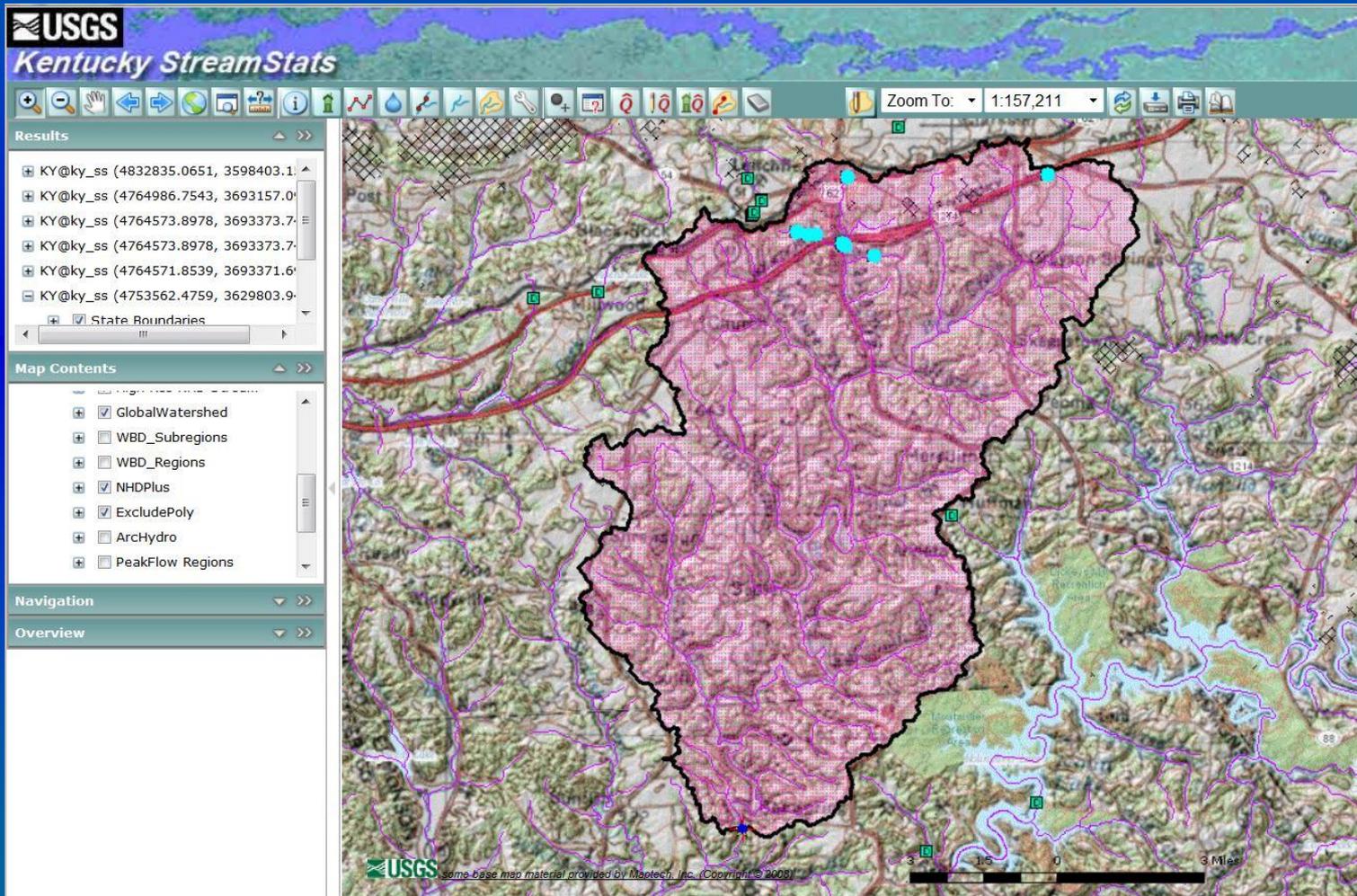
OK

Close

Browse... Upload

stream

Network Tracing in StreamStats



Network Tracing in StreamStats

USGS Kentucky StreamStats

Zoom To: 1:157,211

Results

- KY@ky_ss (4832835.0651, 3598403.1)
- KY@ky_ss (4764986.7543, 3693157.0)
- KY@ky_ss (4764573.8978, 3693373.7)
- KY@ky_ss (4764573.8978, 3693373.7)
- KY@ky_ss (4764571.8539, 3693371.6)
- KY@ky_ss (4753562.4759, 3629803.9)

Map Contents

- GlobalWatershed
- WBD_Subregions
- WBD_Regions
- NHDPlus
- ExcludePoly
- ArcHydro
- PeakFlow Regions

Navigation

Overview

Trace Report - Windows Internet Explorer

USGS WebEx Enterprise Site

USGS Kentucky StreamStats

Date: Sun Jun 9 2013 23:11:34 Mountain Daylight Time
Network: NHDPlus_NET
Linear Reference Layer: NHDFlowline
Trace direction: Upstream
ReachCode: 05110001000618
Measure: 63.36
NAD27 Latitude: 37.2891 (37 17 21)
NAD27 Longitude: -86.3258 (-86 19 33)
NAD83 Latitude: 37.2891 (37 17 21)
NAD83 Longitude: -86.3257 (-86 19 33)

NPDES

ReachCode	Measure	SOURCE_FEAT
05110001000640	100.0000	KY0090590
05110001001077	100.0000	KYR001075
05110001001279	51.3949	KYR000947
05110001001280	10.3807	KY0022934
05110001001283	71.0528	KYR001563
05110001001283	71.0528	KYR001563
05110001001283	71.0528	KYR001563

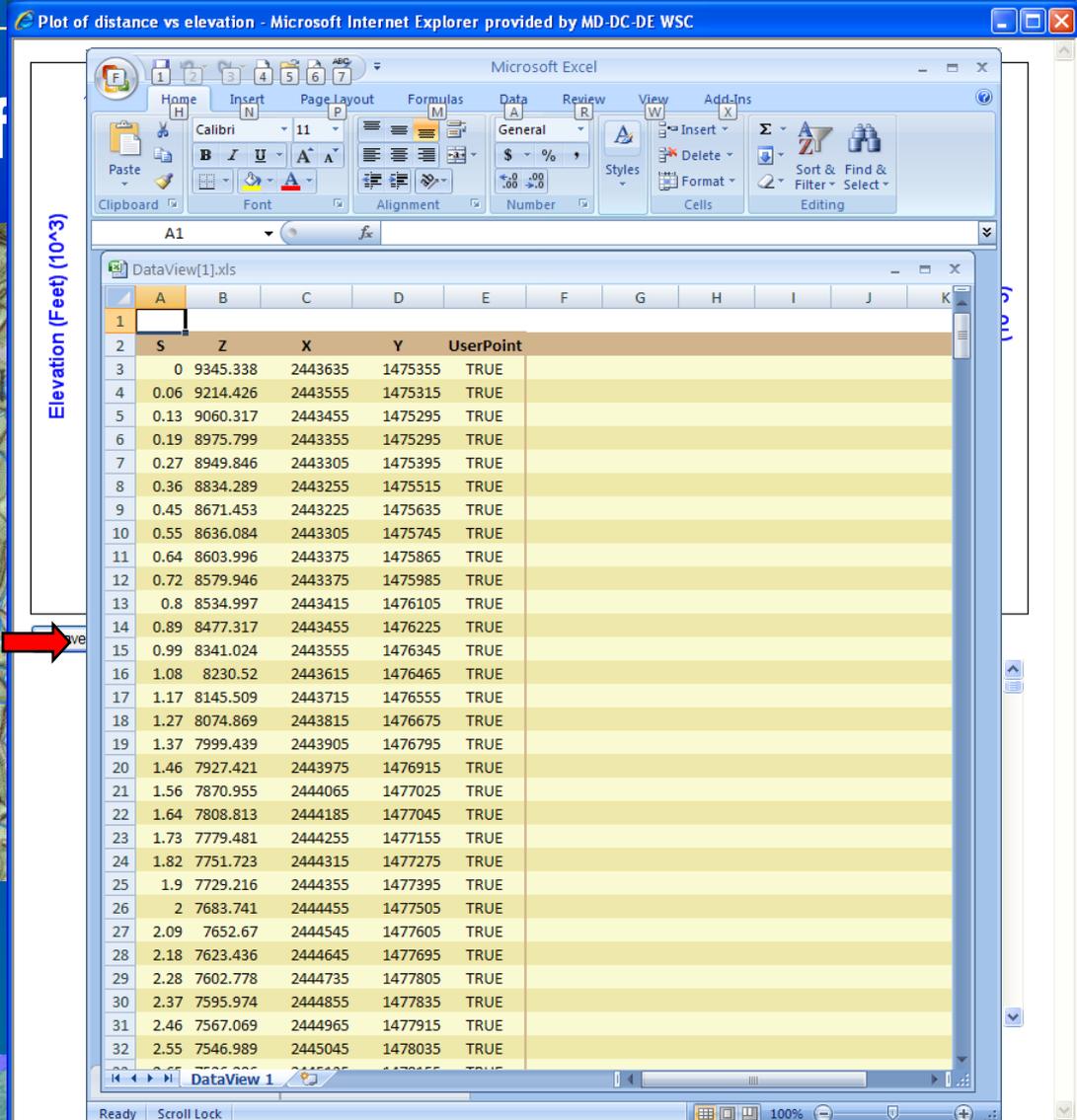
Network Tracing in StreamStats

The screenshot displays the USGS Kentucky StreamStats web application. The top section shows a map with a network tracing overlay. Below the map is a toolbar with various navigation and analysis tools. The main content area is a browser window showing the ICIS (Integrated Compliance Information System) search results page. The page title is "ICIS" and it includes a "Return" button. The report text states: "This page was created on JUN-10-2013. Results are based on data extracted on MAY-15-2013." A note explains that the data is from the modernized ICIS system, not the historic PCS system. A "Run a PCS Search" button is provided. Below the text is a table titled "Facility" with the following data:

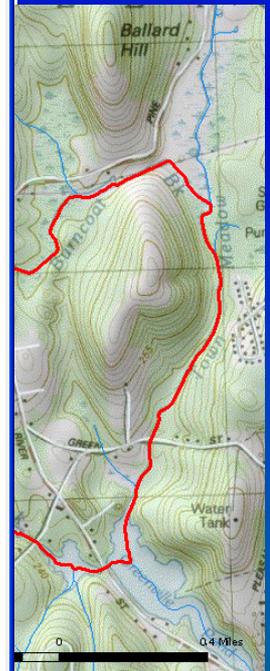
FACILITY NAME (1)	CLARKSON STP	NPDES	KY0090590
STREET 1	SPRING ST & WESTERN KY PKWY	SIC CODE	
CITY	LEITCHFIELD	MAJOR / MINOR	
COUNTY NAME	Grayson	TYPE OF OWNERSHIP	Municipal or Water District
STATE	KY	ACTIVITY STATUS	Effective

Network Profile Plots

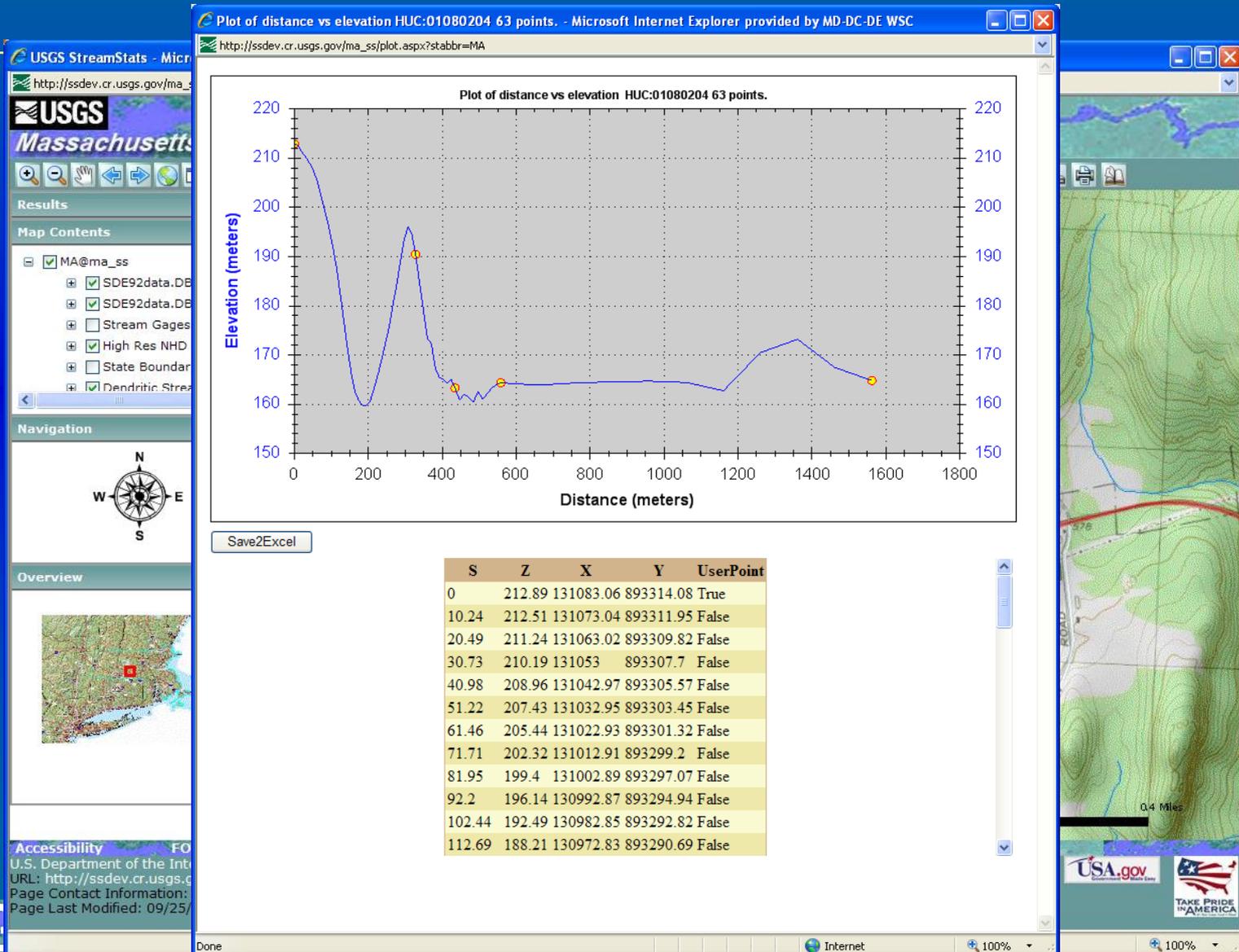
Trace f



ershed



Terrain Profile Tool



Batch Processing

- http://streamstatsags.cr.usgs.gov/ss_bp/
- Input: a point shapefile snapped to the stream grid
- Uses Web Services to perform the computations
- Emails the user when the output is available

StreamStats Web Services

Available for:

- Basin delineation
- Gaging station statistics
- Ungaged site statistics
- Compute NHD reach and measure
- More coming

See [Available Web Services](#) link from StreamStats home page for more information

USGS Streamstats

Web Service Query Builder

Request: Returns the geometry for the basin boundary starting at the user-requested point.

State:

Output Format:

Input CRS: NAD83 State Plane Kentucky FIPS 1600 US Feet

x:

y:

The request to Server:
`http://streamstats09.cr.usgs.gov/ss_ws_client/ngi.aspx?request=DoDelineation&stabbr=KY&outputformat=application/gml+xml&x=5871440&y=3689777&CRS=EPSG:6.6:3089`

The response from Server:

```
<?xml version="1.0" encoding="UTF-8"?>
<gml:Polygon srsName="urn:ogc:def:crs:EPSG:6.6:3089" xmlns:gml="http://www.opengis.net/gml">
<gml:exterior>
<gml:LinearRing>
<gml:posList>
5871007 96517518 3688215 75261655 5870977 96517517 3688215 75261655 5870977 96517517 3688245 75261656 5870767 96517507 3688245 75261656 5870767 96517507 3688275 75261658 5870737 96517505 3688275 75261658 5870737 96517505 3688365 75261662 5870707 96517504 3688365 75261662 5870707 96517504 3688635 75261675 5870737 96517505 3688635 75261675 5870737 96517505 3688665 75261676 5870767 96517507 3688665 75261676 5870767 96517507 3688695 75261677 5870797 96517508 3688695 75261677 5870797 96517508 3688755 7526168 5870827 9651751 3688755 7526168 5870827 9651751 3688785 75261682 5870857 96517511 3688785 75261682 5870857 96517511 3688815 75261683 5870887 96517512 3688815 75261683
```

Enhanced / future capabilities

- Detailed water-use /water-budget modeling
- Estimating daily mean streamflows

Maryland Water-Use Summaries

Streamflow Statistics Report - Microsoft Internet Explorer provided by MD-DC-DE WSC

Water-Use Report

Withdrawal-Discharge Summary Report for 2005

[values are in million c

Available to all users

Totals	January	February	March	April	May	June	July	August	September	October	November	December	Annual mean	Annual sum
Withdrawals	0.0027	0.0027	0.0027	0.024	0.0293	0.0497	0.04	0.0343	0.073	0.0087	0.0027	0.0007	0.0225	8.223
Discharges	0.009	0.009	0.1	0.01	0.01	0.01	0.01	0.008	0.009	0.01	0.01	0.01	0.0171	0.205
Net	0.0063	0.0063	0.0973	-0.014	-0.0193	-0.0397	-0.03	-0.0263	-0.064	0.0013	0.0073	0.0093	-0.022	-8.018

Done Local intranet 100%

$$\text{Net} = \sum \text{Discharges} - \sum \text{Withdrawals}$$

Detailed Water-Use Site Information

Streamflow Statistics Report - Microsoft Internet Explorer provided by MD-DC-DE WSC

Detailed Site Report

[values are in million gallons per day; FA-DV is a surface-water withdrawal, FA-OF is a surface-water discharge, GW is a ground-water withdrawal]

NAME	TYPE	WATUSECD	PERMITNUM	PERMITCODE	SWUDSID	YEAR	January	February	March	April	May	June	July	August	September	October	Nov
SW Intake-Deer Creek near Mine Field, MD	FA-DV	IR	HA1												0.007	0.004	0.001
SW Intake-Deer Creek at Street, MD	FA-DV	IR	HA1												0.04	0.002	0
HA Ba 89	GW	CO	HA1												0	0	0
HA Bc 40	GW	IR	HA1992G010	ALLC	2147446188	2005	0	0	0	0.003	0.003	0.004	0.005	0.006	0.006	0.002	0.001
HA Bc 39	GW	IR	HA1989G026	ALLC	2147446191	2005	0.0003	0.0003	0.0003	0.005	0.0057	0.0083	0.003	0.0047	0.01	0.0003	0.000
HA Bc 36	GW	IR	HA1989G026	ALLC	2147446082	2005	0.0003	0.0003	0.0003	0.005	0.0057	0.0083	0.003	0.0047	0.01	0.0003	0.000
BA Ad 152	GW	IR	BA1992G027	ALLC	2147447410	2005	0	0	0	0	0	0	0	0	0	0	0
SW Outfall-Deer Creek at Federal Hill, MD	FA-OF		MD0024953	NPDS	2147446325	2005	0.009	0.009	0.1	0.01	0.01	0.01	0.01	0.008	0.009	0.01	0.01

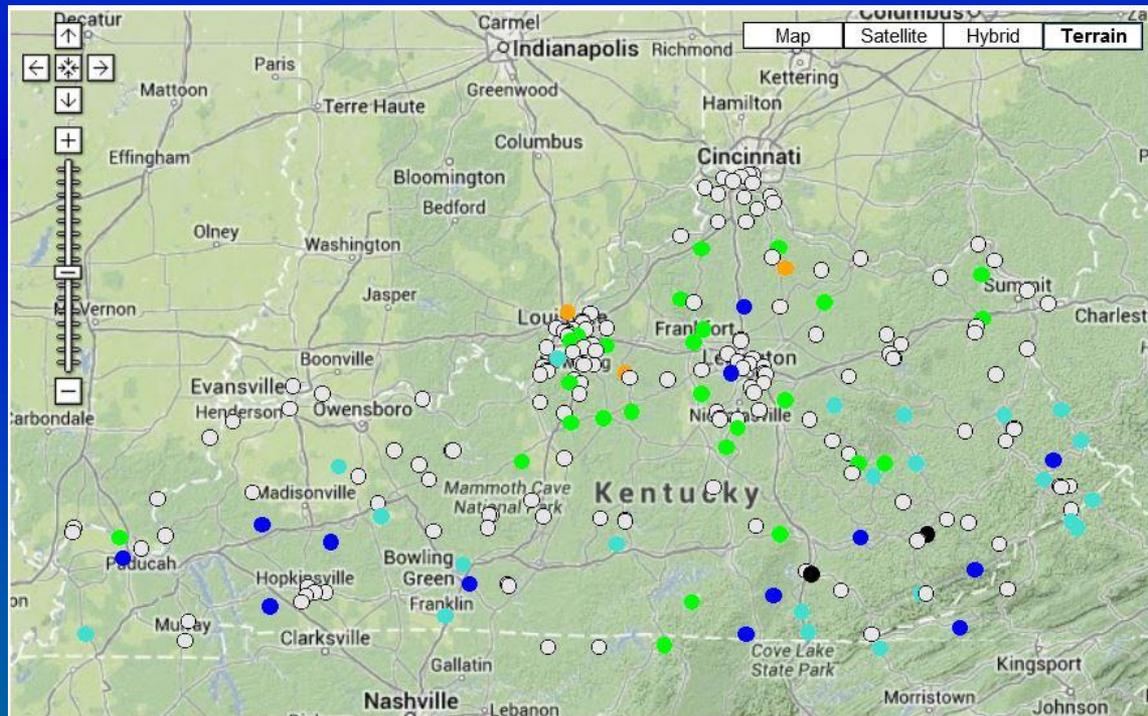
Done

Local intranet 100%

Available only for users with login privileges (mostly gov't agencies)

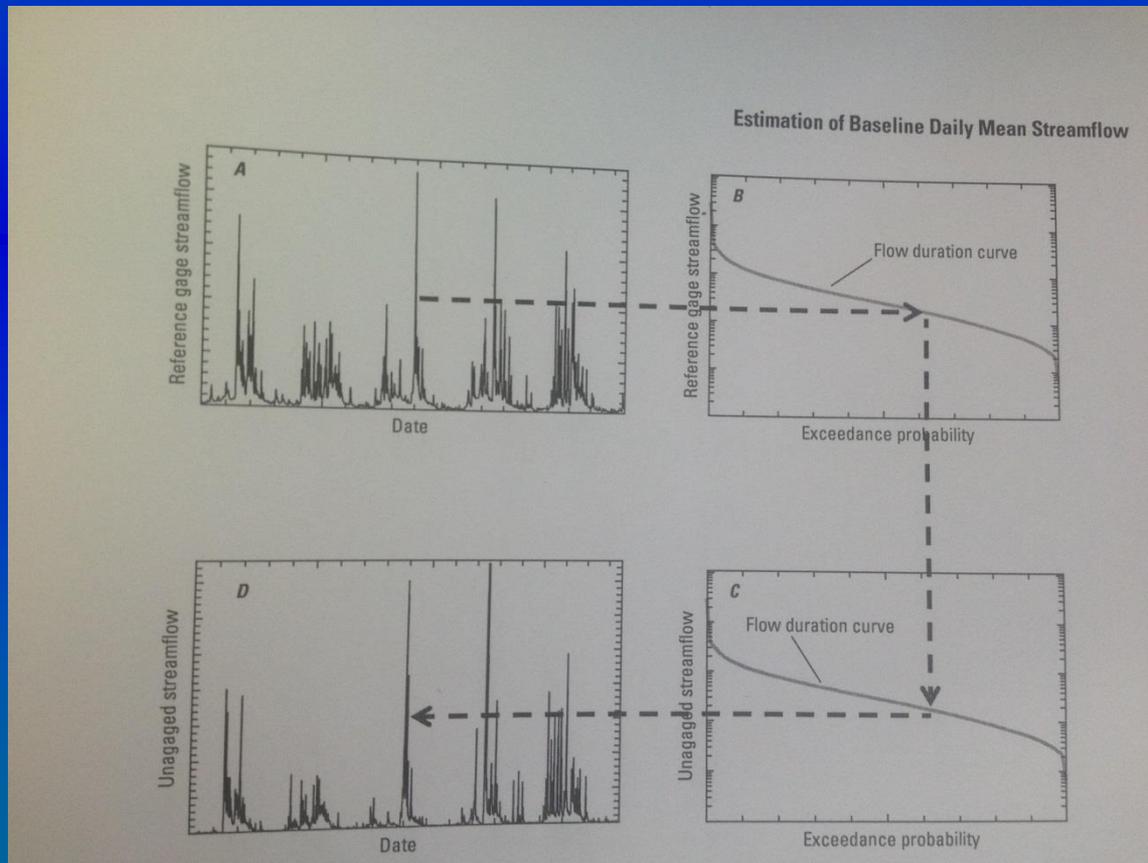
Estimating daily mean streamflow: QPPQ method

- ❑ Connecticut River UnImpacted Streamflow Estimation (CRUISE) tool
- ❑ Pennsylvania Baseline Streamflow Estimator (BaSE)



Estimating daily mean streamflow: QPPQ method

- ❑ Connecticut River UnImpacted Streamflow Estimation (CRUISE) tool
- ❑ Pennsylvania Baseline Streamflow Estimator (BaSE)



Proposed Further Kentucky Studies

- Estimating regulated low-flow statistics
- Validate water-use (withdrawal/discharge data)
- Update/regionalize harmonic-mean flow, flow durations, and other selected low-flow statistics (30Q10, 1Q10, 90Q10, and 4B3)
- Update statewide rural and urban peak flows

Planned StreamStats Enhancements

- Migration from ArcGIS Server 9.2 to 10, with web services for all functionality
- A single user interface for seamless access to all state and regional applications
- Automated annual update of non-interpretive streamflow statistics
- Enhanced descriptive information and indicators of errors of computed statistics for streamgages
- Estimation of daily flows for Connecticut R. and Delaware R. Basins, NY, PA, probably others
- Improved and expanded tracking of water use
- Improved documentation

Questions or Suggestions?

■ URL

- <http://streamstats.usgs.gov>

■ StreamStats national team email

- [GS-W StreamStats@usgs.gov](mailto:GS-W_StreamStats@usgs.gov)

■ Kentucky project email

- grmartin@usgs.gov
- pcinotto@usgs.gov

Overview

- **Description / Development / Current status**
- **Accessing the user interface**
- **Basic features and functionalities**
- **General guidelines for use**
- **Adding statistics and estimating equations for Kentucky StreamStats**
- **Enhanced / future StreamStats capabilities**
- **Proposed further studies in Kentucky**

New User Interface

StreamStats National Application - Windows Internet Explorer provided by MD-DE-DC WSC

http://137.227.233.150/ss/viewer.aspx?stabbr=SS

USGS StreamStats

Testing Site Only.
Select on a tool on the toolbar. If the icon remains depressed, click on the map to perform the desired action.

StreamStats

- Streamgages
- Test Site Availability
- Regional Studies
- State Applications

Base Layers

0 500 1000mi
Scale: 1 : 73,957,191

Latitude: 31.72283
Longitude: -159.11914 SS

NHD Plus, Esri, DeLorme, FAO, EPA, NOAA | USGS, Office of Surface

[Accessibility](#) [FOIA](#) [Privacy](#) [Policies and Notices](#)

U.S. Department of the Interior | U.S. Geological Survey
URL: <http://137.227.233.150/ss/viewer.aspx>
Page Contact Information: [StreamStats Help](#)
Page Last Modified: 02/20/2013 09:38:19

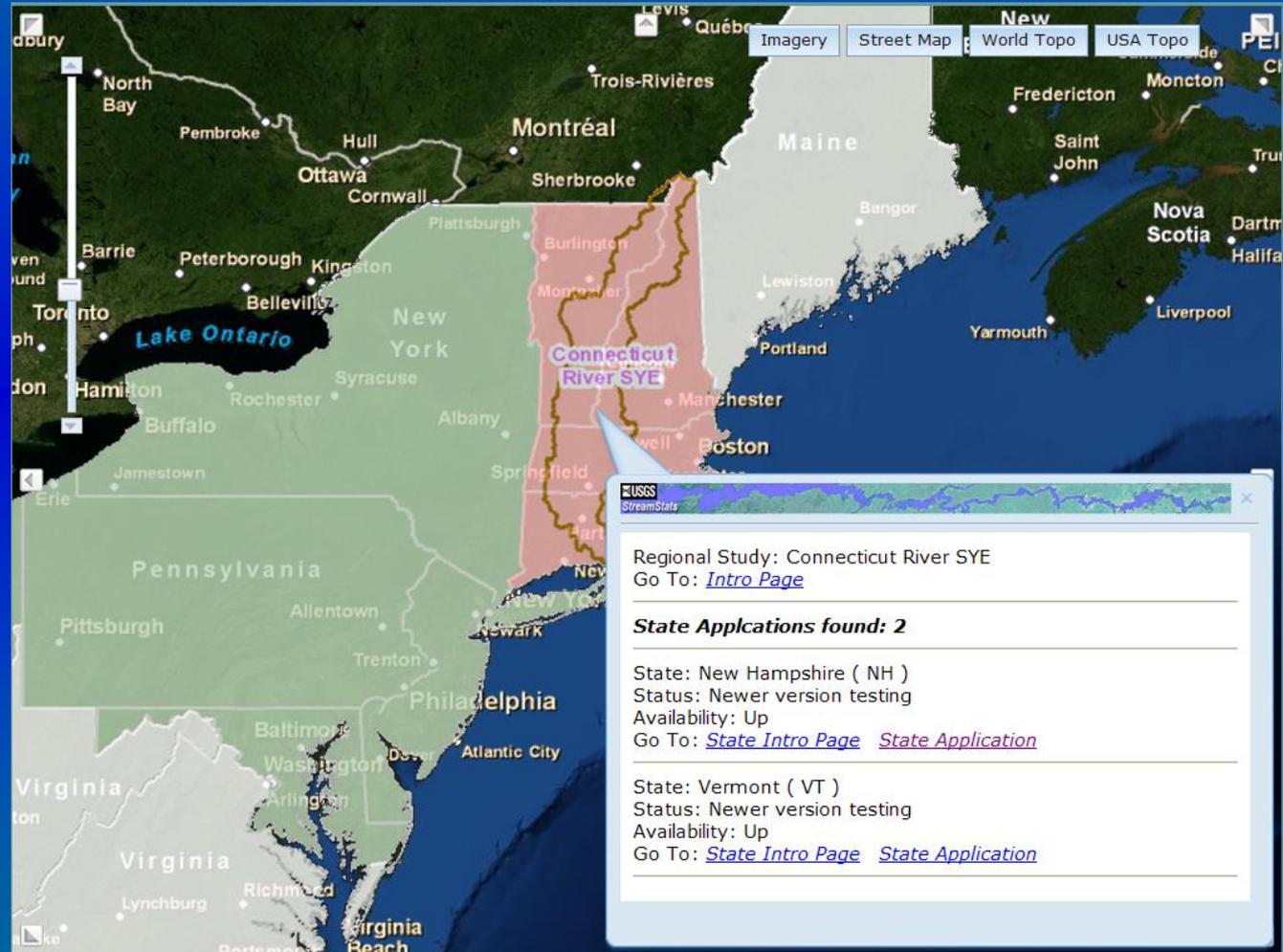
[Streamstats Status](#)

USA.gov
TAKE PRIDE IN AMERICA

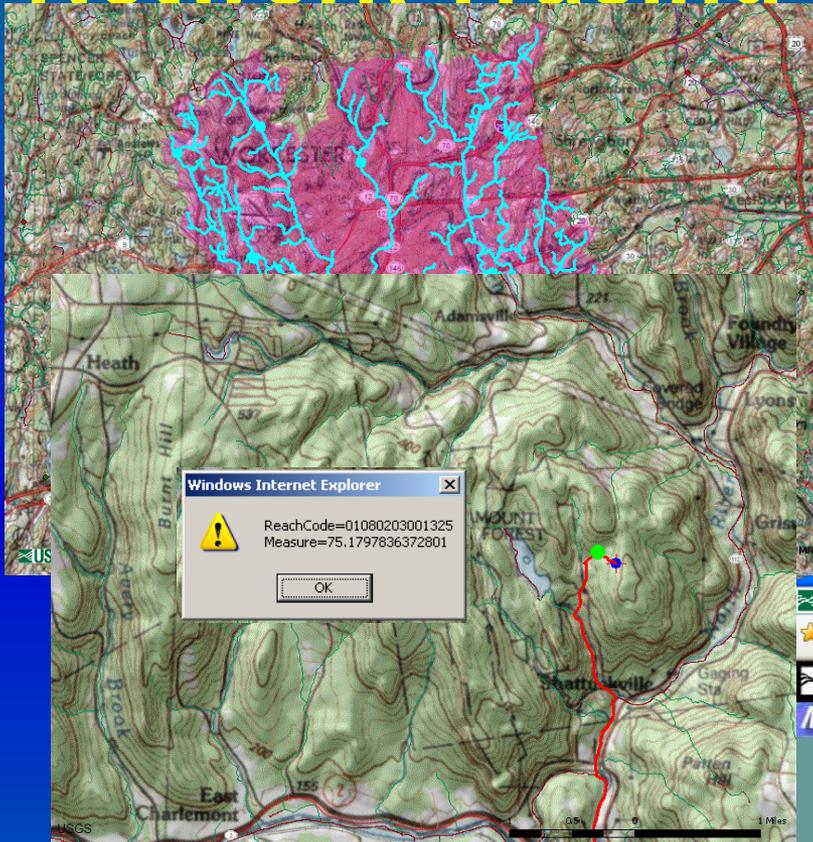
Done Internet | Protected Mode: On 100%

Application Selection

■ Displays all regional and state applications near the point that was clicked



Network Tracing in StreamStats



Trace Report - Microsoft Internet Explorer provided by MD-D...

http://ssdev.cr.usgs.gov/gisimg/Reports/NHDTraceReport3072_2009926125417.htm

bing 63°F

USGS
Massachusetts StreamStats

Date: Sat Sep 26 2009 13:54:17 Mountain Daylight Time

Network
Linear
Trace
Reach
Measure

NHD
Sou

USGS

60 30 0 60 Miles

NHDHgage_MA

Source_FeatureID	ReachCode	Measure
01110000	01090003000106	64.59123672
01109730	01090003000317	8.62007276
01110500	010900030005705	81.42261045
01109439	01090003000341	54.97050468
01109595	010900030006172	53.00156966
01109500	01090003000336	28.05403123

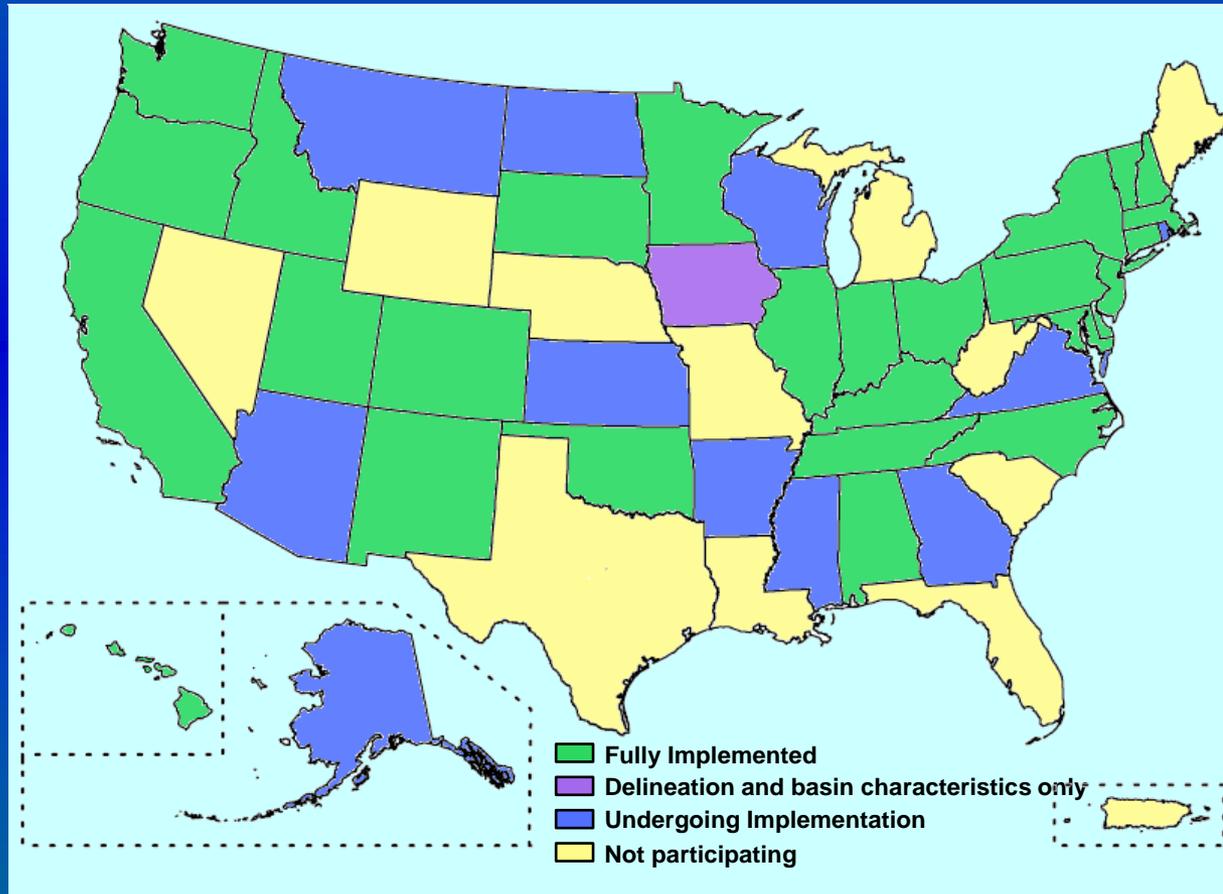
Done Internet 100%

■ Raindrop trace to network

- Display path from point
- Compute reach address

Stream

National Implementation Status



- 28 states fully implemented
- 1 state partly implemented
- 10 states in implementation process