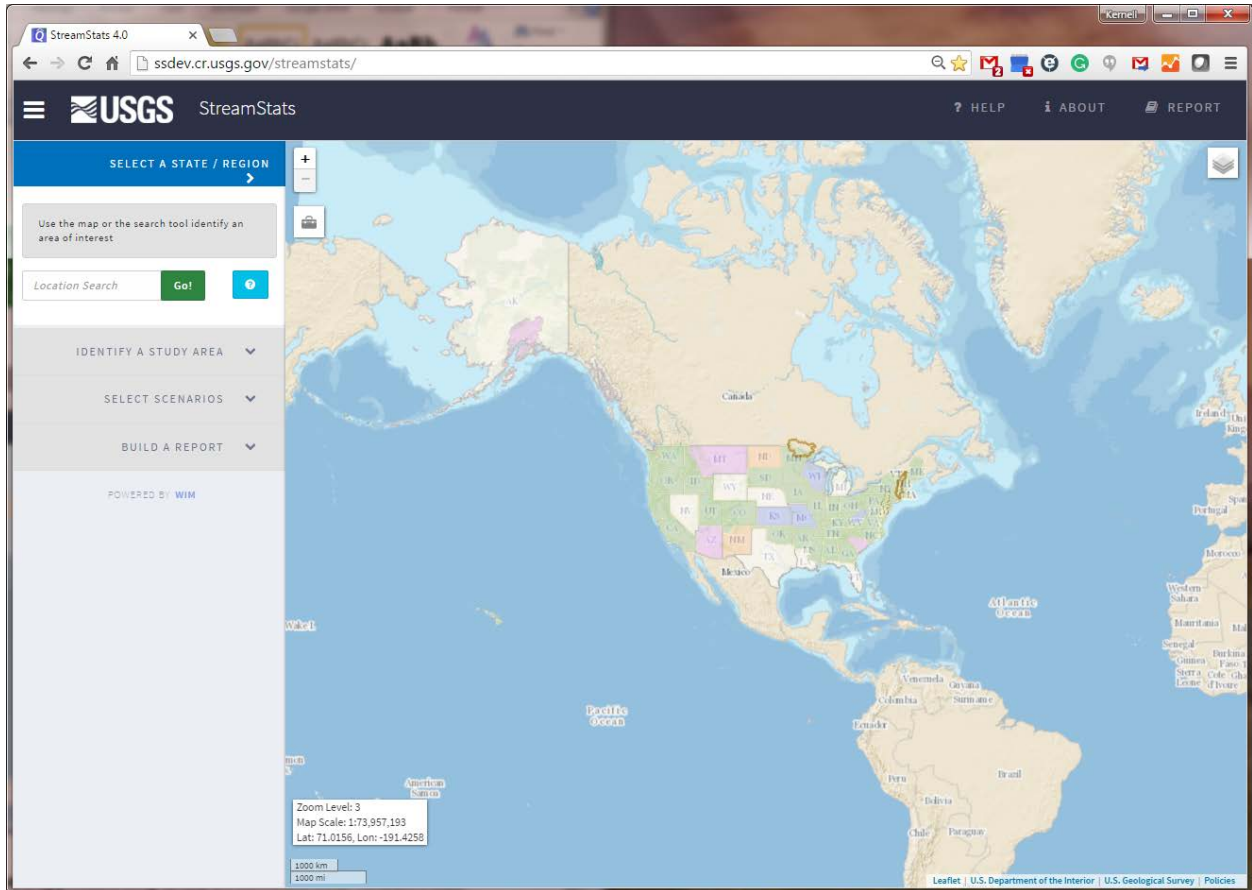# StreamStats Beta Version 4 User Instructions

These user instructions are applicable only to the StreamStats beta version 4 web application. This application is being made available to the public on a trial basis only to provide some functionality that is not available in version 3 and to seek user feedback. Information for user-selected ungaged sites currently cannot be obtained from beta version 4 for the States of Arkansas, Arizona, Georgia, Iowa, Indiana, Maryland, North Carolina, Oregon, South Carolina, and Tennessee because of unique functionality for those states that is not yet implemented. Users are encouraged to provide comments and report bugs by use of the Help button on the user interface.
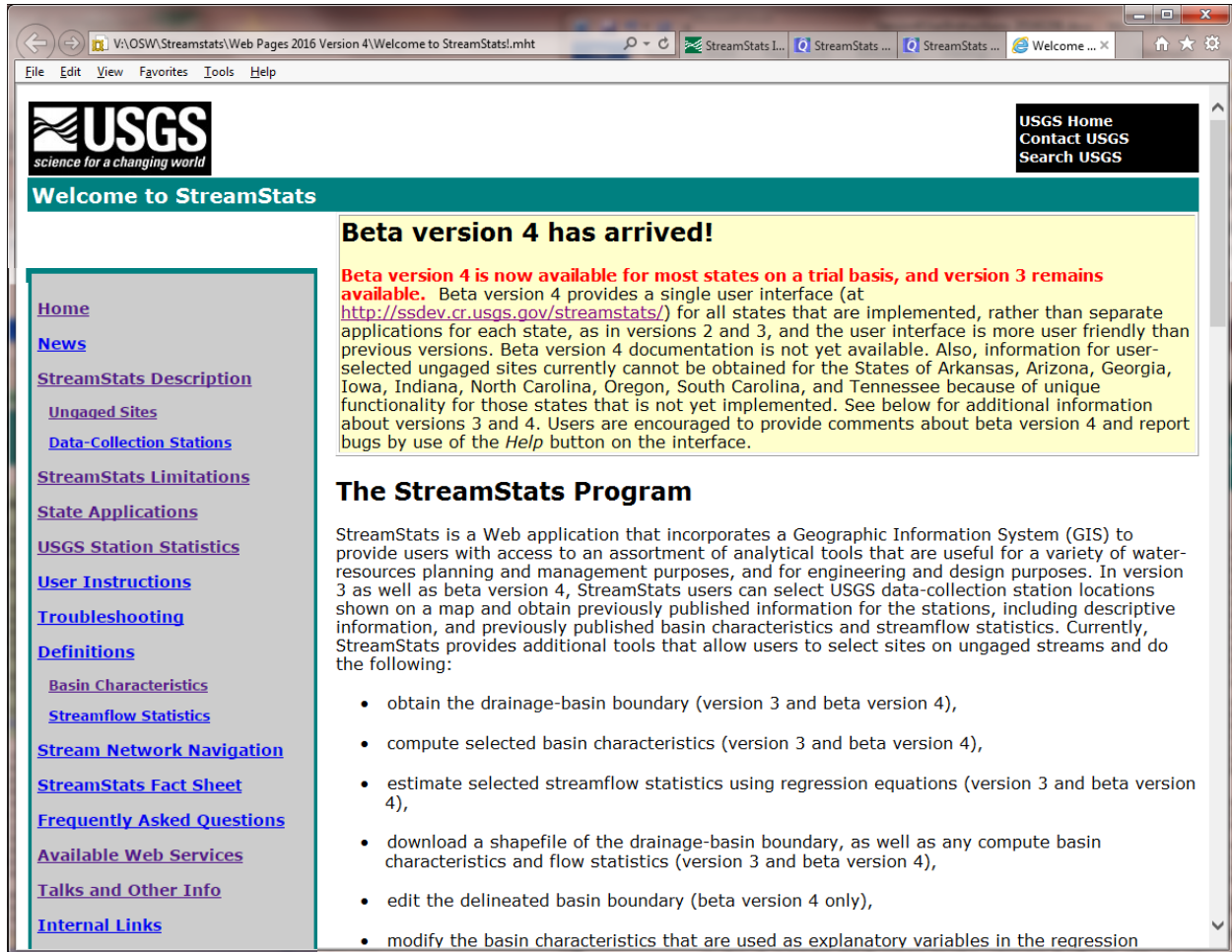
Table of Contents

Introduction

The StreamStats home page can be accessed at:

http://streamstats.usgs.gov

The home page provides a brief description of the application. A gray box on the left side of the page provides links to documentation for use of StreamStats, news items, contact information, and current streamflow conditions at USGS data-collection stations. Also, links are provided to the *State Applications* page, from which users can select a state and access the introductory pages for each state, and the *USGS Station Statistics* page, which accesses the version 3 national application that provides statistical information only for USGS data-collection stations. Beta version 4 provides a single user interface for all states, and is accessed at http://ssdev.cr.usgs.gov/streamstats/.

Users should read and be familiar with the user instructions, the descriptions of the StreamStats output pages, and the introductory pages for any states

of interest before attempting to use the application. In addition, the *Definitions* pages give detailed definitions for the abbreviated names of basin characteristics and streamflow statistics that appear in the output pages.

# Browser Requirements and Troubleshooting

StreamStats is best viewed using the latest versions of Internet Explorer, Microsoft Edge, Chrome, or Firefox. The browser must allow HTML5 asynchronous script execution.

State Introductory Pages

Although version 4 provides a seamless national user interface that provides information for all implemented states, each state is implemented in StreamStats as a separate web application. There are also separate web applications for the Connecticut, Rainy, and Delaware (not yet released) River Basins. An introductory page is provided for each separate application, which (1) describes which statistics StreamStats can estimate for user-selected ungaged sites, (2) provides links to the reports that describe the methods used to determine the estimates, (3) provides special notes about using the selected application, if any, and (4) identifies the agencies that cooperated with the USGS to implement StreamStats. It is important for users to read these introductory pages before using StreamStats so they understand how StreamStats works for the selected state or river basin.

The individual introductory pages can be accessed through links on the *State Applications* page. A link to the *State Applications* page is provided in the gray links box on the left side of the StreamStats home page. The *State Applications* page has a map that shows the status of the various state and basin applications and pull-down lists of implemented states and river basins. Applications are available for states colored in green (full functionality) or purple (flow estimates for ungaged sites not available) on the map. Clicking on the state or river basin name from one of the pull-down lists or clicking on a state on the map causes an introductory page for the selected state or river basin to appear. *It is suggested that frequent users of a state application should bookmark the state introductory page for quick future access.* The Kentucky introductory page, for example, can be accessed directly at http://water.usgs.gov/osw/streamstats/kentucky.html. Other state introductory pages can be accessed directly by changing the state name in this URL to the name of the desired state. The *Interactive Map* links on the state introductory pages provide access to the version 3 application for that state. However, there is a yellow box at the top of each

introductory page with a notice about the availability of beta version 4 and a link to that application.
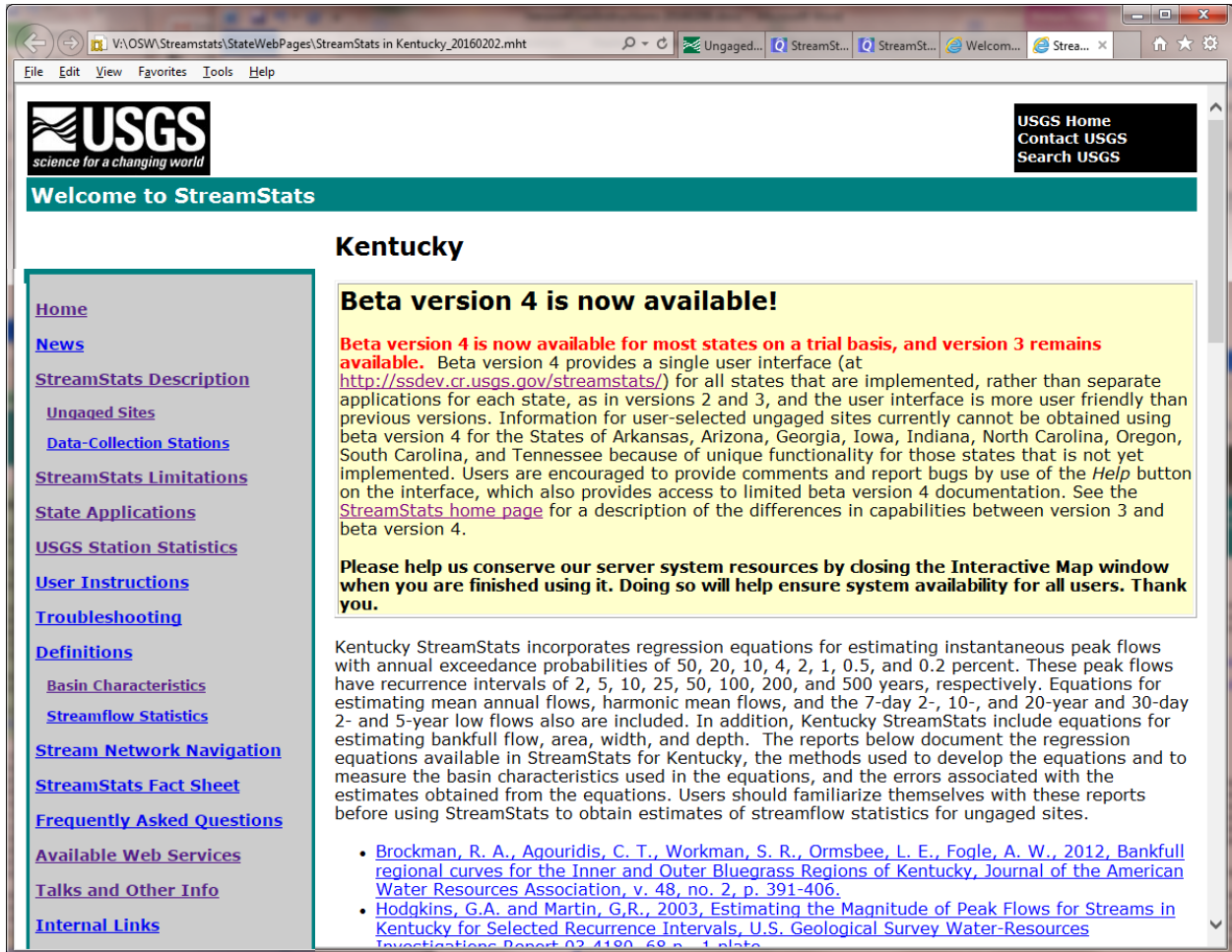
The introductory pages describe the streamflow statistics that can be estimated for ungaged sites by use of regression equations, and the reports from which those equations were taken. Citations and links to online versions of the reports are provided. The introductory pages also describe any unique issues with use of StreamStats for the selected state or river basin. In addition, the pages identify the agencies with which the USGS has partnered to develop StreamStats. Links to the home pages of those agencies are provided. *It is important to read the discussion on the introductory page and review the cited reports before using a state application.*

The state introductory pages also can be accessed from links provided in the user interface, as described below.

The User Interface
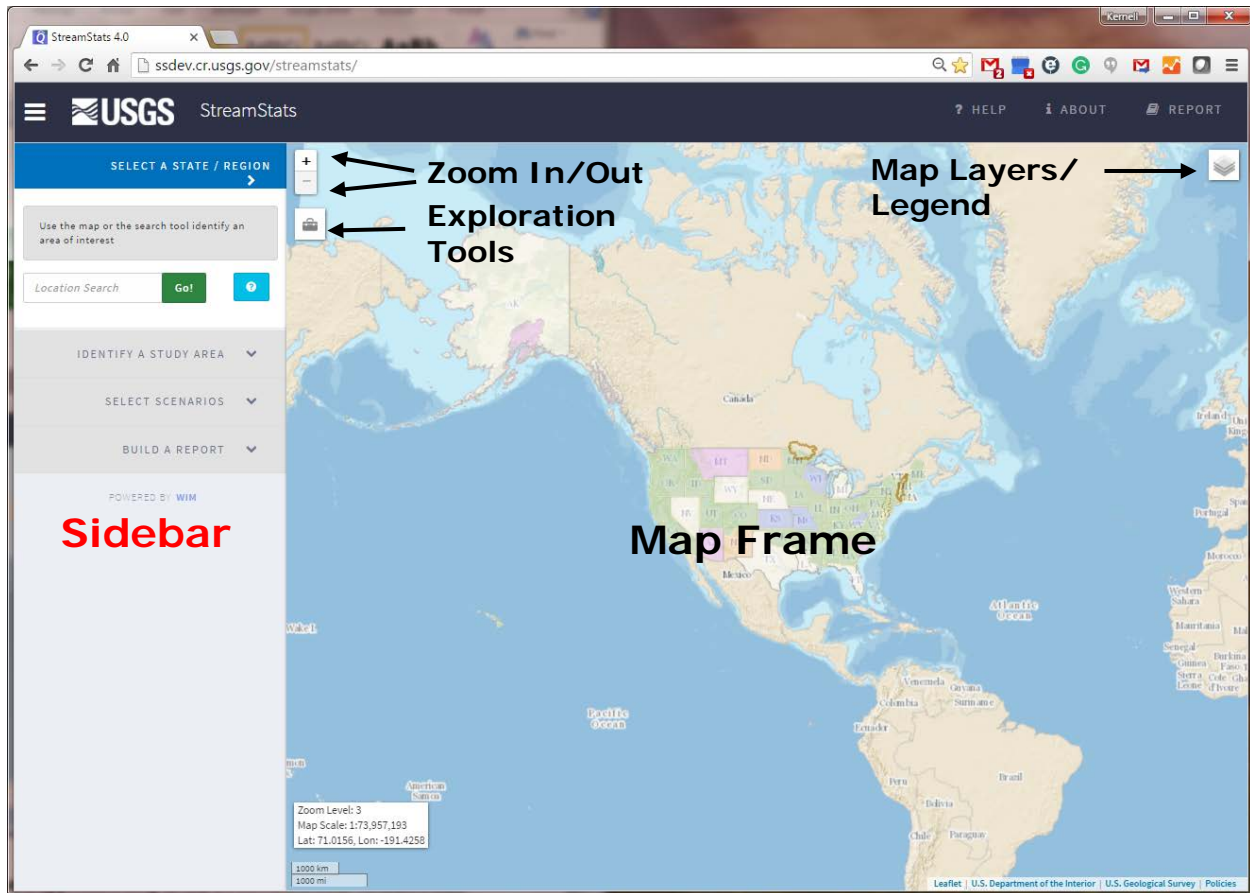
StreamStats version 4 provides a single national user interface, shown above, through which the application for any implemented state can be accessed. The two main areas on the user interface are the Map Frame and the Sidebar. Also, in the black banner above the map are the Help, About, and Report links, which are explained below.

The Map Frame

The Map Frame, forming the major part on the user interface, displays the map. It is used primarily to locate places of interest and get information. Initially, the map is focused on North America, and the U.S. states are colored to indicate the status of StreamStats in the states. The colors and their meanings are:

- Green - implemented with the full functionality that is available;
- Purple – implemented, but it is not possible to get estimates of flow statistics for user-selected ungaged sites;

- Orange - implemented internally and undergoing testing before release to the public;
- Blue – undergoing implementation;
- White – no StreamStats activity.

Moving Around on the Map

Beta version 4 is set initially for panning, meaning moving the center of the map while remaining at the same scale. Panning is accomplished by clicking on a point on the map, holding down on the mouse button, moving the cursor to another location, and then releasing the button. Alternately, on a touch screen or mobile device, users can pan by touching a point on the map, maintaining contact with the screen while moving their finger to a new location, and then releasing it. Zooming in, meaning changing the map to a larger scale, can be accomplished by the following methods:

- If your mouse has a scroll wheel, then turn the wheel upward (away from your body) to zoom in or downward to zoom out.
- Click on a state to zoom into roughly the extent of the state on the map.
- Click on the plus and minus buttons at the top left of the map to zoom in [+] and zoom out [−].
- Hold down the shift key on your keyboard and then draw a box by clicking at the location of a corner of where you want the box to be, holding down the mouse button while moving the mouse to the opposite corner of where you want the box to be, and then releasing the mouse button.
- On a touch screen or mobile device, use a pinching action to zoom in by touching the screen at two locations and then moving your fingers together to zoom in or moving them apart to zoom out.
- A location search option also is available, and is explained below.
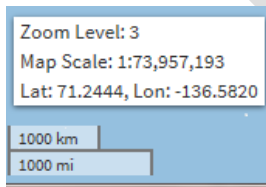
Toward the bottom left of the Map Frame is a white text box that displays the current zoom level (between 1 and 20), the map scale ratio, and the latitude and longitude of the location at which the user's cursor is pointing on the map. Initially, the map appears at zoom level 3. Below the text box is a scale bar, which indicates the length that is shown on the map for a given distance. As you zoom in and out, the displayed zoom level and map scale will change accordingly.

Displaying Layers and the Map Legend

The Map Layers/Legend button is at the top right of the map. Clicking on it results in the appearance of a small window over the right side of the map, with banners for (top to bottom) closing the legend, base maps and national layers. Clicking on the Close Legend banner will close the window. Clicking on the Base Maps banner will display a list of the base maps that can be displayed on the map, with radio buttons to the left of each listed layer. Clicking on the radio button for a layer will cause the layer to be displayed in the map frame. The Base Maps banner can be collapsed by clicking again on the banner. Likewise, clicking on the National Layers banner will display a legend for the layers that can be displayed nationally in beta version 4. These include layers for the display of USGS data-collection station locations and types, regional study area boundaries, state application status, and state HUCpolys (polygons indicating separate areas where data needed for delineations have been prepared). This last layer defines the boundaries of separate areas for which geospatial data were prepared to implement StreamStats.
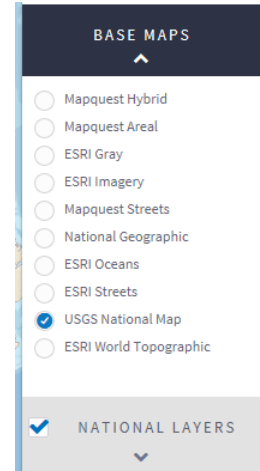
Each banner within the Map Layers/Legend window has a check box that allows turning off or on all layers that are associated with the banner. By default, the boxes have check marks in them, meaning that the layers will be displayed on the map. Clicking on the boxes will make the check mark disappear and the layers associated with the box will no longer be displayed.

Some layers do not appear until the map is zoomed into a minimum scale. For example, the layer of USGS data-collection station locations and types will not appear until zoomed into zoom level 9, and the stream grid used to select points for delineating basin boundaries will not appear until zoomed into zoom level 15. Also, once a state application has been selected, an additional banner will appear in the Map Layers/Legend window to provide access to the layers for that state.

Exploration Tools

To the left of the map, below the plus and minus zoom buttons, is the *Exploration Tools* button, which has a tool box on it. Clicking on the button will cause a small window to appear over the map. The exploration tools includes *Query Streamgages*, *Measure Tool*, *Elevation Profile Tool*, *Show your location*, and *Reset the view*. Clicking on one of these tool buttons causes the button to turn from blue to orange to indicate that the tool is active.
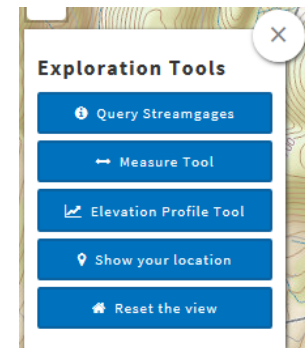
Query Streamgages

You must be zoomed into at least zoom level 9 before the USGS data-collection stations will appear as various-colored triangles on the map. The map legend indicates the meanings of the various colors. Once the triangles have appeared, clicking on the *Query Streamgages* tool button and then on a triangle will cause a blue point to appear on the map at the selected streamgage location and a white dialog box will appear above it, which lists the latitude and longitude of the location, the USGS station identification number, the station name, a link to the NWIS page for the station, a link to the StreamStats page for the station, and the drainage area for the station. The NWIS page for the station provides access to all instantaneous and time-series data that are available for the station. The StreamStats page provides access to descriptive information and previous published basin characteristics and streamflow statistics for the station. Clicking on one of the links in the dialog box will cause the respective page to open in a separate window.

### Measure Tool

This tool computes the distance between selected points on the map. When the *Measure Tool* button is selected, a blue dialog box will appear below the tool button with instructions on how to use the tool. Also, the user's cursor will change from their chosen default pointer to a cross-hair. Locate the starting point on the map where you want to measure a distance, click on it,

and then move the cross-hair to another point or the end point. If the next point is an intermediary point then click once there. Double-click on the end point to complete definition of the shape for which the length is needed. The total length will appear in the blue dialog box which previously provided instructions for use of the tool.
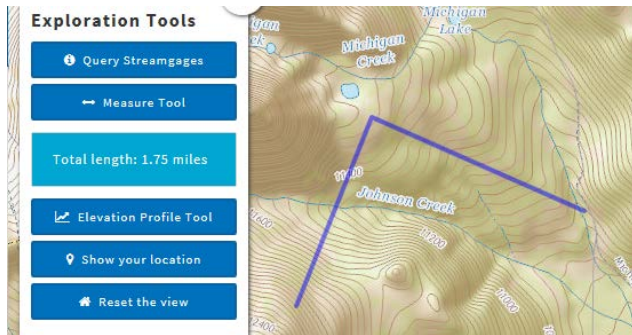
Elevation Profile Tool

This tool produces a plot of the elevation profile between selected points on the map. As with the *Measure Distance* tool, when the *Measure Tool* button is selected, the user's cursor will change from their chosen default pointer to a cross-hair. Locate the starting point on the map where you want to begin the elevation profile, click on it, and then move the cross-hair to another point or the end point. If the next point is an intermediary point then click once there. Double-click on the end point to complete defining the extent of the desired cross section. A plot of the cross section will appear in the *Exploration Tools* window below the *Elevation Profile Tool* button. Previous StreamStats versions allowed displaying and downloading of the data used to develop the plot. This functionality is not yet available in version 4.
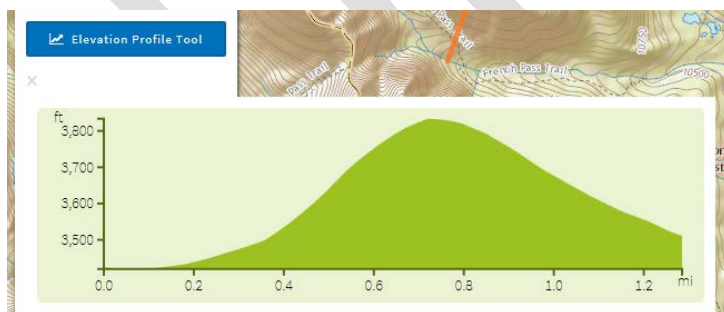
Show Your Location

The *Show Your Location* tool is primarily for use of StreamStats on mobile devices. Clicking on the button will cause the map to redraw centered on the user's location, with a blue dot shown at the user's location.

Reset This View

Clicking on the *Reset This View* button will cause the map to redraw with the initial view that was centered on North America.

NOTE: Users should always wait until processing is completed and the map is re-drawn before attempting to do additional work with StreamStats. In addition, please help us conserve our server system resources and close the Interactive Map window when you are finished using it. Doing so will help ensure system availability for all users. Thank you.

Help, About, and Report

The Help, About, and Report buttons are to the right side of the black banner above the map, which also contains the USGS logo.

Help

Clicking on the help button will result in a window popping up over the user interface. The Help banner contains a link to this document and to a page with Troubleshooting tips. Below that are two tabs. Initially, the tab labeled "Frequently Asked Questions" tab will be on top. It provides a list of previous questions submitted by users and their answers. The "Submit a Support Request" tab provides a form for use in submitting requests for assistance or comments to the StreamStats development team. The team will respond to your submittals by email.

About

Clicking on the About button will result in a window popping up over the user interface, which has two tabs at the top. The "About the project" tab appears on top by default, and provides a brief description of the StreamStats application. The Limitations tab states that StreamStats version 4 currently is in beta testing and provides a disclaimer regarding the accuracy and completeness of the information that is provide, along with a link to a web page that describes additional limitations.

Report

The report button is used to generate a report that contains the outputs from whatever processes the user has completed thus far using the tools in the sidebar, which may include a basin delineation, computed basin characteristics, estimated flow statistics, or outputs from any special tools
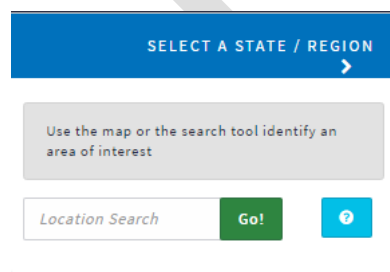
that are available for the state in which the selected site is located. The report output provides buttons that allow (1) printing the report, (2) saving the basin boundary as a shapefile or a geodatabase, with any computed basin characteristics and estimated flow statistics included as attributes, and (3) saving the report as a comma-delineated file (.csv), which can be imported into various other programs.

The Sidebar

The sidebar presents a series of banners that will open like an accordion when the banner is selected to expose a panel with instructions in a medium blue box just below the banner and tool buttons below the instructions. The active banner will appear in dark blue. Inactive banners appear in light gray. The provided instructions guide the user through the steps necessary to delineate a basin, calculate basin characteristics, and compute flow statistics and other scenarios. In some cases, the banners will allow users to complete custom functions for a specific state or region.

Select a State/Region

When StreamStats beta version 4 is started, the *Select a State/Region* banner will be shown in dark blue at the top of the sidebar. On the panel just below the banner is a medium blue box that instructs users to click on a state or region on the map, or use the location search box to zoom to a point or area of interest. Clicking on a location on the map will cause the map to zoom into the approximate extent of the state in which the selected point is located. Use the location search box to enter in a geographic name, a USGS station ID number, a zip code, a 2-letter state code, a telephone area code, a latitude and longitude (in a variety of formats), and a street address. The location search tool uses the USGS Search API for Javascript, which is documented at http://txpub.usgs.gov/DSS/search_api/1.1/web/index.html#tab1?top.

The geospatial data used for delineating drainage basins for user-selected sites are prepared separately for each state, usually using the map projection that is preferred by the local state agencies. In the data-preparation process, areas that are in adjoining states but that drain into the state for which the data are being prepared also need to be processed in the

selected map projection. As a result, data from multiple state applications are available at many user-selected locations.

If a user-selected point is in an area where there is overlapping data, then StreamStats will provide a list of the states and river basins with available

data at that location. Users generally should select the state in which the selected site is located, but there are some exceptions. In the example to the right, the map was zoomed into the location of streamgage 01154000 Saxtons River at Saxtons River, VT. As a result, Vermont should be selected if the user will want to obtain estimates of streamflow statistics from regression equations. Alternately, if the user will want to obtain information that is needed as input to a model for estimating daily flows at the selected site, then the Connecticut River Basin application should be selected. Refer to the introductory pages for *Vermont* and the *Connecticut River Basin* to understand the differences in functionality between the applications.

> You have zoomed in sufficiently to select a state or regional study area. Your selection will dictate the data used to perform basin delineation and flow statistics calculation.
>
> Select a State or Regional Study Area
>
> New Hampshire
>
> Massachusetts
>
> Vermont
>
> Connecticut River Basin
>
> Connecticut
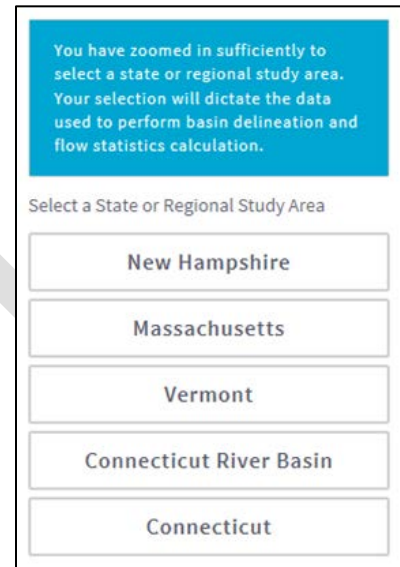
Identify a Study Area and Delineate a Basin

After a state or region has been selected, the *Select a State/Region* banner will turn gray and the name of the selected state or region will display in the banner. To the right of the state name is a black circle with an "i" in it ⓘ. Clicking on this symbol will open the About window, with the State/Regional Info tab showing the introductory page information for the selected state.

The *Identify a Study Area* banner will then turn dark blue. Its associated panel will open, with a medium blue text box at the top, indicating that the map needs to be at zoom level 15 or greater before the *Delineate* tool can be used, and below that will be the green *Delineate* tool button. After zooming to at least zoom level 15, a gridded representation of the stream network will appear on the map. Click on the Delineate button and then on a point on the stream grid. Initially, StreamStats will place a blue pointer at the selected location and a small pop-up window will appear above the point, providing the latitude and longitude of your selected point. Also, a series of notifications will appear and then disappear towards the bottom right of the
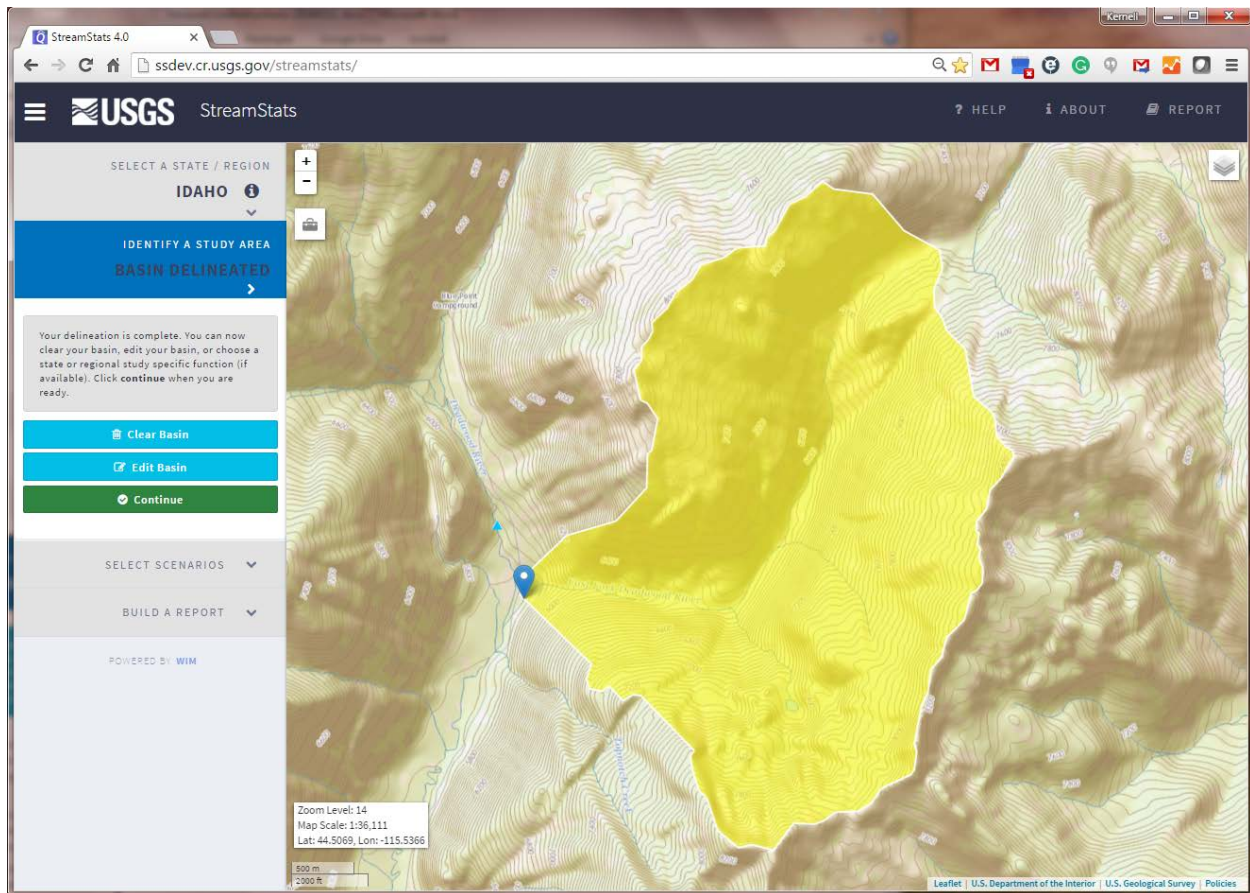
map giving feedback on the progress of the processing to determine the drainage-basin boundary for your selected site. Eventually, the screen will redraw, showing the blue pointer at the selected site and its drainage basin highlighted in yellow. On the sidebar, the *Identify A Study Area* banner will indicate "BASIN DELINEATED." Below the banner, the medium blue text box will indicate that the delineation is complete, and you can now clear the basin, edit it or continue. Buttons for each of these tasks will be displayed below the text box (see below). **It is good practice at this point to zoom in and pan around the basin boundary to assure that StreamStats has delineated it accurately.** Clicking on *Clear Basin* will cause the delineated basin disappear from the map. The *Identify A Study* Area banner will then turn blue again and the *Delineate* button will re-appear, allowing you to select a new location. Clicking on *Continue* will activate the *Select Scenarios* banner and open its panel. Editing a basin is explained below.

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Editing a Basin

Clicking on the Edit Basin button will cause the area in the *Identify A Study Area* panel to be replaced with a set of instructions for using the edit tool and buttons for adding an area, removing an area, undoing edits, and finishing the edits. This tool does not work for very large basins, usually exceeding more than 1,000 square miles. The *Edit Basin* button will not appear when a delineated basin is too large.

Adding an Area

Click on the *Add Area* button. Your cursor will change from a pointer to a set of cross-hairs. Click on at least 3 points on the map, at least one of which must be within the delineated basin boundary. StreamStats will draw lines between each point. Double-click on the last point to complete defining the area to be added. The map will then redraw showing the area added to the previously delineated boundary.

Deleting an Area

Click on the *Remove Area* button. Your cursor will change from a pointer to a set of cross-hairs. Click on at least 3 points on the map, at least one of which must be outside of the delineated basin boundary. StreamStats will draw lines between each point. Double-click on the last point to complete defining the area to be added. The map will then redraw showing the area removed from the previously delineated boundary.

Polygon drawn to remove area

Resulting edited basin

15
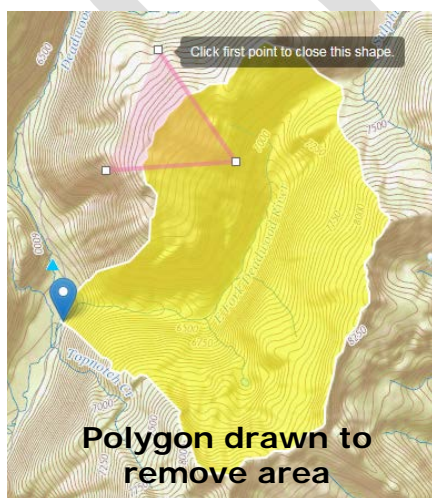
<u>Undo Edits</u>

Clicking on the *Undo Edits* button will cause any edits made to disappear and the the basin will revert to the original shape. The sidebar will then appear as it does in the screen capture that is just above the Editing a Basin section. Click on *Continue* to proceed with getting further information for the delienated basin.

<u>Finished</u>

Clicking on the *Finished* button also will cause any edits made to be retained and the sidebar to appear as it does in the screen capture that is just above the Editing a Basin section. Click on *Continue* to proceed with getting further information for the edited basin.

State/Region Specific Functions

Custom functionality has been created for some states. In these cases, the side bar will display these as optional functions after completing a delineation. For example, a special function that tests for the presence of upstream regulation from dams has been developed for Colorado and Montana. Also, a special function that provides a summary of water withdrawals and discharges within a delineated basin is available for the Delaware River Basin. These special functions must be used prior to selecting the Continue button within the Basin Delineation sub-panel, as the State/Region Specific Functions panel will disappear after clicking on Continue.

The test for upstream dams for Colorado is illustrated below. In this case, after the basin delineation is completed a button labeled *Check for upstream regulation* appears within the *State/Region Specific Functions* sub-panel. Clicking on this button will run a process that identifies the locations of any upstream dams, computes the drainage area upstream from the dams and the drainage area downstream from the dams. Finally, it displays the areas upstream from the dams in orange on the map and lists the percentage of the watershed that is affected by dam regulations in a green text box in the sub-panel.
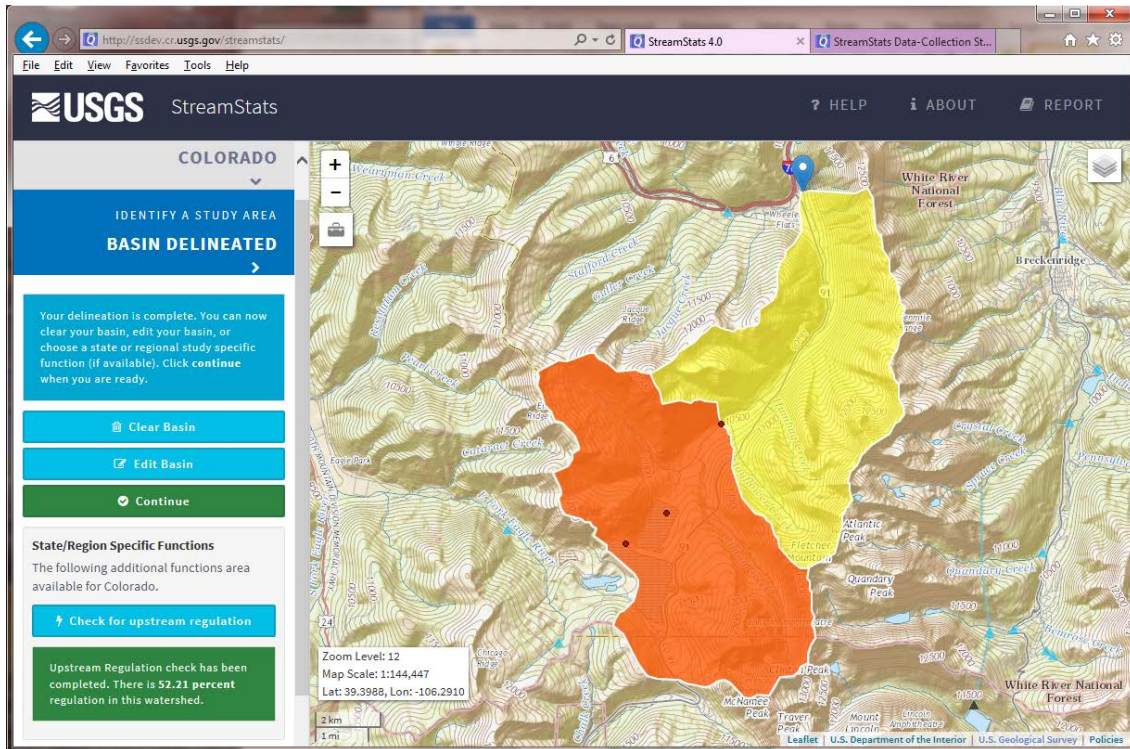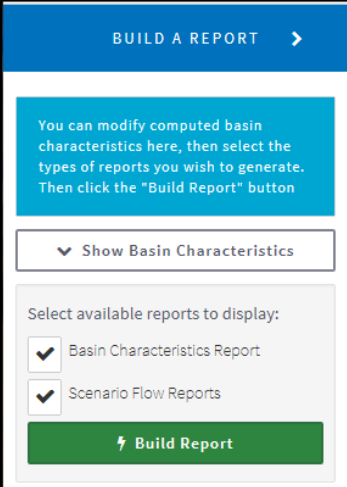
Select Scenarios
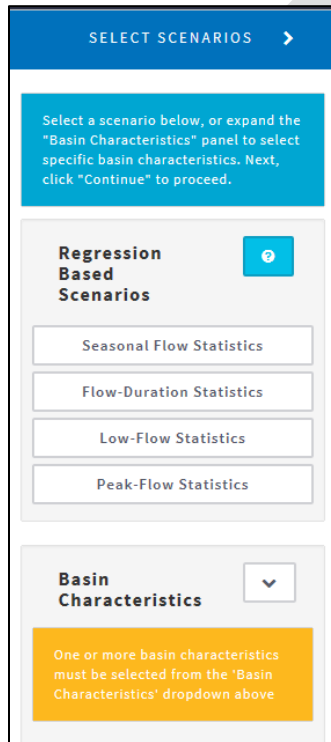
After clicking on the *Continue* button in the *Identify A Study Area* panel, its banner will go gray, and the *Select Scenarios* banner will become dark blue. In the panel under it will be a medium blue message box, followed by panels for regression-based scenarios and basin characteristics. The regression-based scenarios panel provides buttons labeled with the types of streamflow statistics for which regression equations are available to estimate the statistics for the delineated basin. The basin characteristics panel has an arrow button in the top right corner. Clicking on the arrow button will reveal a list of basin characteristics that can be computed with check boxes to allow selecting which ones you want computed. Select the scenarios and basin characteristics of interest to you. The scenarios and the basin characteristics that are available vary widely among the states, and sometimes among regions within the states. Refer to the introductory page for the state in which your selected site is located and use the links provided to view the reports that are cited on that page for more information.

Users may now select one, more, or all of available scenarios by clicking on the buttons in the regression-based scenarios panel. Selecting a scenario causes the button to change from white to blue. Users may also expand the basin characteristics panel and select all or individual basin characteristics to be computed. Users may choose to get only regression-based scenarios or only basin characteristics, or both. After the selections have been made, click on the green *Continue* button below the basin characteristics panel to proceed.

Build A Report

After clicking on *Continue* on the *Select Scenarios* panel, the banner for that panel will turn gray and the banner for the *Build A Report* will turn dark blue. The *Build A Report* panel, like other panels, will have a medium blue message box, which indicates that you can modify the basin characteristics that were computed by StreamStats before building a report. The *Show Basin Characteristics* button within the panel has an arrow on the left. Clicking on the arrow will reveal a list of the basin characteristics needed to solve the regression equations for the scenarios that you selected and their computed values. You may change any of the computed values before building a report. This functionality is useful for testing the sensitivity of the regression equations to changes in one or more variables, and can also be used if conditions in the basin have changed since the geospatial data used to compute the basin characteristics in StreamStats were processed. Also, check boxes allow selecting whether the report should contain just a basin characteristics report, just a scenario flow report, or both. After making your selections, click on Build Report to generate a report in a pop-up window that contains your desired information.

StreamStats Reports

For Data-Collection Stations

Outputs produced by the StreamStats Query Streamgages tool are described on the *Data-Collection Stations Reports page*.

For User-Selected Sites

The reports for user-selected sites contain text entry boxes that allow users to enter a report title and comments that will display on the printed reports. Below these, the reports identify the state or regional application name, the workspace ID, the latitude and longitude of the user-selected point, and the time the report was created. If there are any problems with the report, then the workspace ID should be provided to the StreamStats development team, along with a description of the problem, by filling out the provided form after clicking on the *Help* button above the map on the user interface.

The reports also now contain maps showing the user-selected points and their drainage areas. Users can pan and zoom within the map before printing it. Buttons at the bottom of the reports allow users to (1) download the basin as either a shapefile or an ESRI geodatabase file; (2) download the output report as a .csv file, which can be input into various spreadsheet, GIS, and database programs; (3) print the report; and (4) close it.

If it was chosen to compute basin characteristics, then a table of the computed basin characteristics will be displayed in the report just below the map. The first column in the table contains the label used for the basin characteristic internally within StreamStats. The following three columns contain a description of the basin characteristic, the computed value, and its units of measure, respectively (see the example below).

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	213.31	square miles
BSLDEM30M	Mean basin slope computed from 30 m DEM	17.321	percent
ELEVMAX	Maximum basin elevation	4814.228	feet
TEMP	Mean Annual Temperature	42.569	degrees F
TEMP_06_10	Basinwide average temperature for June to October summer period	58.929	degrees F
CONIF	Percentage of land surface covered by coniferous forest	14.1138	percent
MIXFOR	Percentage of land area covered by mixed deciduous and coniferous forest	35.378	percent
PREBC0103	Mean annual precipitation of basin centroid for January 1 to March 15 winter period	6.93	inches
PREG_06_10	Mean precipitation at gaging station location for June to October summer period	17.7	inches

StreamStats will display the warning below if the watershed boundary was edited before running flow statistics scenarios or computing basin characteristics. This warning will appear just below the Basin Characteristics section in the report.
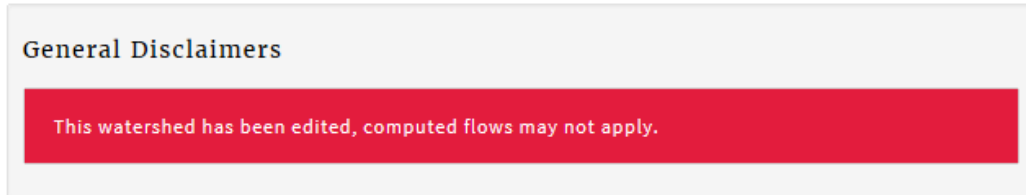
Below the basin characteristics tables, the reports contain separate sections for each selected scenario. Within each scenario's section is a table of the basin characteristics (parameters) used as explanatory variables in the regression equations used to estimate the flow statistics and a table of the estimated flow statistics. Headings for each of the tables begin with names of the scenarios that were selected. As an example, the screen capture below shows the report section that corresponds to the Flow-Duration Statistics scenario that was shown above in the Select Scenarios section of this users' manual, thus the table names are Flow-Duration Statistics Parameters and Flow-Duration Statistics Flow Report. To the right of the headings, in smaller lettering, is the percentage of the basin that is within the noted hydrologic region and the hydrologic region name. In the provided example, the basin is 100 percent within the Low Flow Statewide region.

The columns in the parameters tables in the reports list the names of the parameters, their computed values, and then the minimum (Min) and maximum (Max) limit values, respectively. Definitions for the parameters can be found on the *Version 3 Basin Characteristic Definitions page*. The Min and Max limit values provide the range of the values of the basin characteristics that were measured for the streamgages that were used to develop the regression equations. Estimates of streamflow statistics for sites with basin characteristics that are not within the given Min and Max values have errors that are of unknown magnitude. When this occurs, the output will have the computed value highlighted in red, and a warning message will be displayed at the bottom of the section.

The columns in the flow report tables list the names of the statistics, their values, and their units of measure, respectively, followed by any indicators that are available of the errors that are associated with the estimates. No error indicators will be displayed when any of the parameters are outside the indicated Min and Max ranges. Explanations of the error indicators are provided on the *Ungaged Sites Reports page*. Definitions for the statistics can be found on the *Version 3 Streamflow Statistics Definitions page*.

Regression equations for estimating streamflow statistics usually are developed as part of studies for an entire state. As part of the studies, the states very often are divided geographically or on some other basis into regions of similar hydrology. In most cases, delineated drainage areas for user-selected sites will fall within a single hydrologic region within a state. However, in some cases the drainage areas will span multiple regions. When this occurs, StreamStats reports will present flow estimates based on the regression equations for each hydrologic region and also area-averaged estimates that are determined by weighting the flow estimates for each region by the percentage of the drainage area that is within the region.

Flow-Duration Statistics Parameters 100 Percent Low Flow Statewide

Parameter	Value	Min Limit	Max Limit
Drainage Area	213.31	3.26	689.00
Jun to Oct Gage Precipitation	17.7	16.50	23.10
Mean Annual Temperature	42.569	36.00	48.70

Flow-Duration Statistics Flow Report

Statistic	Value	Unit	Prediction Error
60 Percent Duration [100 Percent Low Flow Statewide]	150	ft^3/s	18
70 Percent Duration [100 Percent Low Flow Statewide]	110	ft^3/s	20.6
80 Percent Duration [100 Percent Low Flow Statewide]	78	ft^3/s	28
90 Percent Duration [100 Percent Low Flow Statewide]	51	ft^3/s	37.5
95 Percent Duration [100 Percent Low Flow Statewide]	38	ft^3/s	44.1
98 Percent Duration [100 Percent Low Flow Statewide]	29	ft^3/s	54.3

Flow-Duration Statistics Citations

Flynn, R.H. and Tasker, G.D., 2002, Development of Regression Equations to Estimate Flow Durations and Low-Flow-Frequency Statistics in New Hampshire Streams: U.S.Geological Survey Scientific Investigations Report 02-4298, 66 p.

If any of the basin characteristics used as parameters in the regression equations were edited before creating a report, the report will contain a warning message above the scenario sections, such as the one below. Messages also will be provided if the basin boundary has been edited, or the selected point was in an exclusion area. For Colorado, when applicable, a disclaimer also will be provided to warn that the flow at the selected site is

affected by dam regulations. In addition, if any of the basin characteristics used as explanatory variables in the regression equations are outside of the given min limit or max limit, then the value of the basin characteristic will be highlighted in orange and an orange disclaimer will be provided.

General Disclaimers

Parameter values have been edited, computed flows may not apply.