Kentucky River Watershed Watch Data Portal Workshop

KRWW Annual Conference, February 6, 2016

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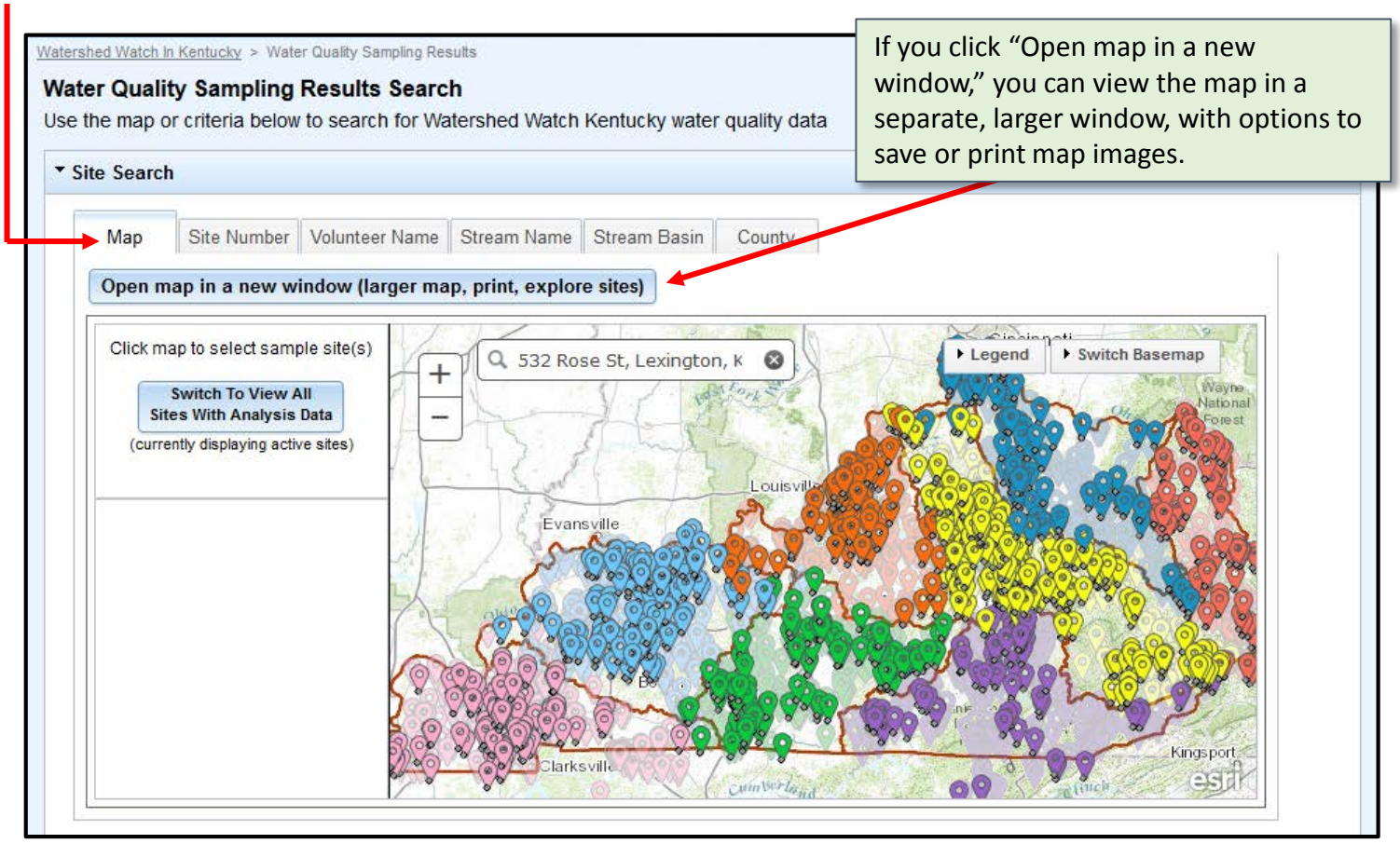
Lower Howard's Creek Tributary

Learn Your Way Around the Watershed Watch Database

Open the Watershed Watch Data Portal at http://kgs.uky.edu/wwky

Basic web layout:

The tabs along the top part of the map are the best way to navigate your search.



If you click "Open map in a new window," you can view the map in a separate, larger window, with options to save or print map images.

Map: Color-coded symbols display sampling sites by basin, with faded symbols showing inactive sampling sites. The yellow markers represent the sampling sites in the Kentucky River basin. You can zoom in and click on a site of interest for site details and sampling results.

Site Number: Enter the Watershed Watch Site ID# of interest for site-specific sampling results.

Volunteer Name: Enter your name and click "Search for Sampler" for all site and sampling details relating to a particular person.

Stream Name: Enter the name of the stream of interest for stream-specific sampling data. This option will pull up data from all sites and samplers collecting from the same stream.

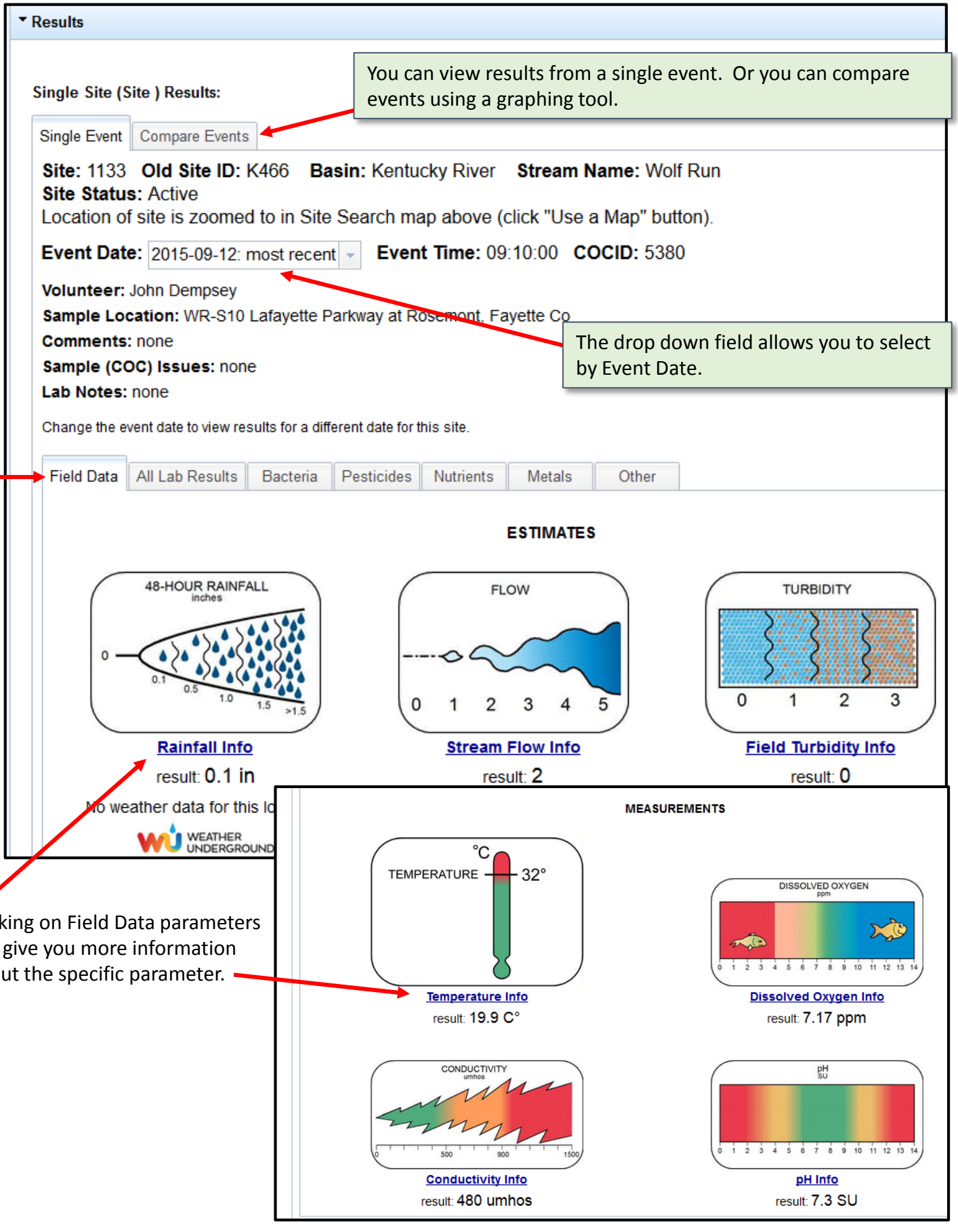
Stream Basin: Search by successively smaller watershed area, beginning with River Basin of interest. A HUC-11 is a smaller watershed area within the river basin, and a HUC-14 is an even more focused, smaller watershed.

Example: Major Watershed Basin: Kentucky River Basin
Select a watershed basin (HUC11): Benson Creek
Select a subwatershed (HUC14): South Benson Creek
Click "Search for Sites in Selected Basin." Finds 7 sites.

County: Select county of interest from drop-down list. Click "View County Sites to see listing of all sites located within the county.

Sampling Results from a Site Search (for example, site 1133), Field Data

Results are categorized by Tabs: Field Data, All Lab Results, Bacteria, Pesticides, Nutrients, Metals, and Other



Sampling Results from a Site Search (for example, site 1133), Lab Results

Single Event | Compare Events

Site: 1133 **Old Site ID:** K466 **Basin:** Kentucky River **Stream Name:** Wolf Run
Site Status: Active
Location of site is zoomed to in Site Search map above (click "Use a Map" button).

Event Date: 2014-09-12 **Event Time:** 13:59:00 **COCID:** 3453

Volunteer: Bethany Overfield
Sample Location: WR-S10 Lafayette Parkway at Rosemont, Fayette Co.
Comments: flow rate low to moderate.
Sample (COC) Issues: none
Lab Notes: none

Change the event date to view results for a different date for th

Lab results will depend on the selected event date.
Spring: Pesticides
Summer: E-coli
Fall: Nutrients and Metals

Field Data | All Lab Results | Bacteria | Pesticides | Nutrients | Metals | Other

Lab Results Found:

click a header to sort:

Fall

Analyte Group	Analyte Name	RL	Result	Modifier	Units	MDL	Method	Lab	Date	Time	Lab Comments	QA Flag
Nutrients	Nitrate		14.001		mg/L	0.443	SW846-905	KGS	2014-09-12		Calculated from Nitrate	
Nutrients	Nitrate (As N)		3.163		mg/L	0.1	SW846-905	KGS	2014-09-12		Calculated from Nitrate	
Nutrients	Phosphoru Total Recoverabl		0.21		mg/L	0.03	ASTM D 515	KGS	2014-10-01			
Nutrients	Total Nitrogen		3.33		mg/L	0.6	Hach 10208	KGS	2014-10-01			
Other	Alkalinity (as CaCO3)		193		mg/L	4	EPA-305.1	KGS	2014-09-16			

Field Data | All Lab Results | Bacteria | Pesticides | Nutrients | Metals | Other

Summer

Lab Results Found:

click a header to sort:

Analyte Group	Analyte Name	RL	Result	Modifier	Units	MDL	Method	Lab	Date	Time	Lab Comments	QA Flag
Bacteria	E. coli	1	1259		MPN/100m	1	Colilert	Microbac(L	2015-07-11	13:45:00		

Field Data | All Lab Results | Bacteria | Pesticides | Nutrients | Metals | Other

Spring

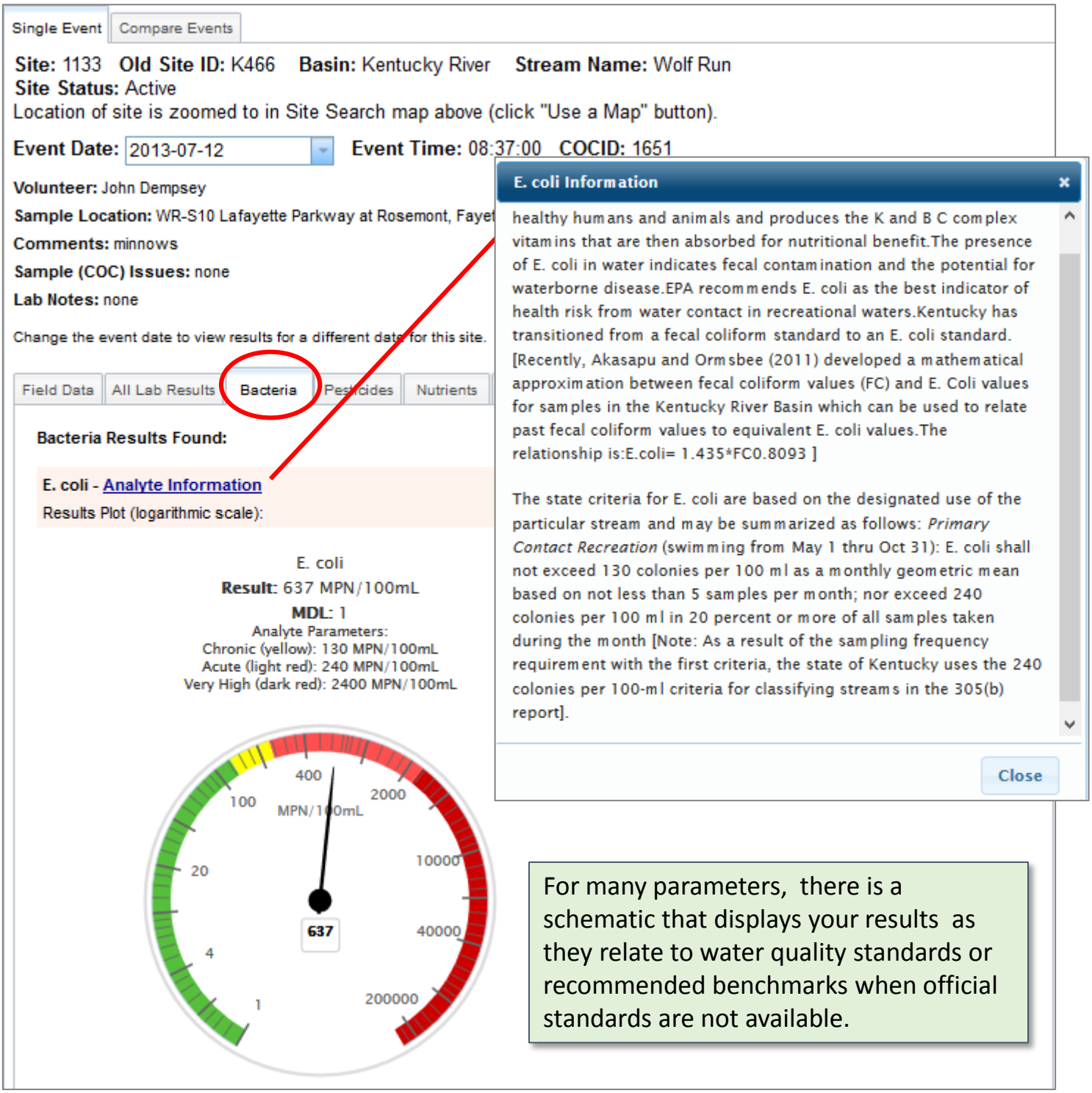
Lab Results Found:

Click a header to sort:

Analyte Group	Analyte Name	RL	Result	Modifier	Units	MDL	Method	Lab	Date	Time	Lab Comments	QA Flag
Pesticides	Triazines		0.06	<	ug/L	0.06	SW846-467	KGS	2012-05-23	15:20:10		
Pesticides	2,4-Dichlor acid (2,4-D)		2	<	ug/L	2	SW846-467	KGS	2012-05-25	11:55:46		

Sampling Results from a Site Search (for example, site 1133), Bacteria

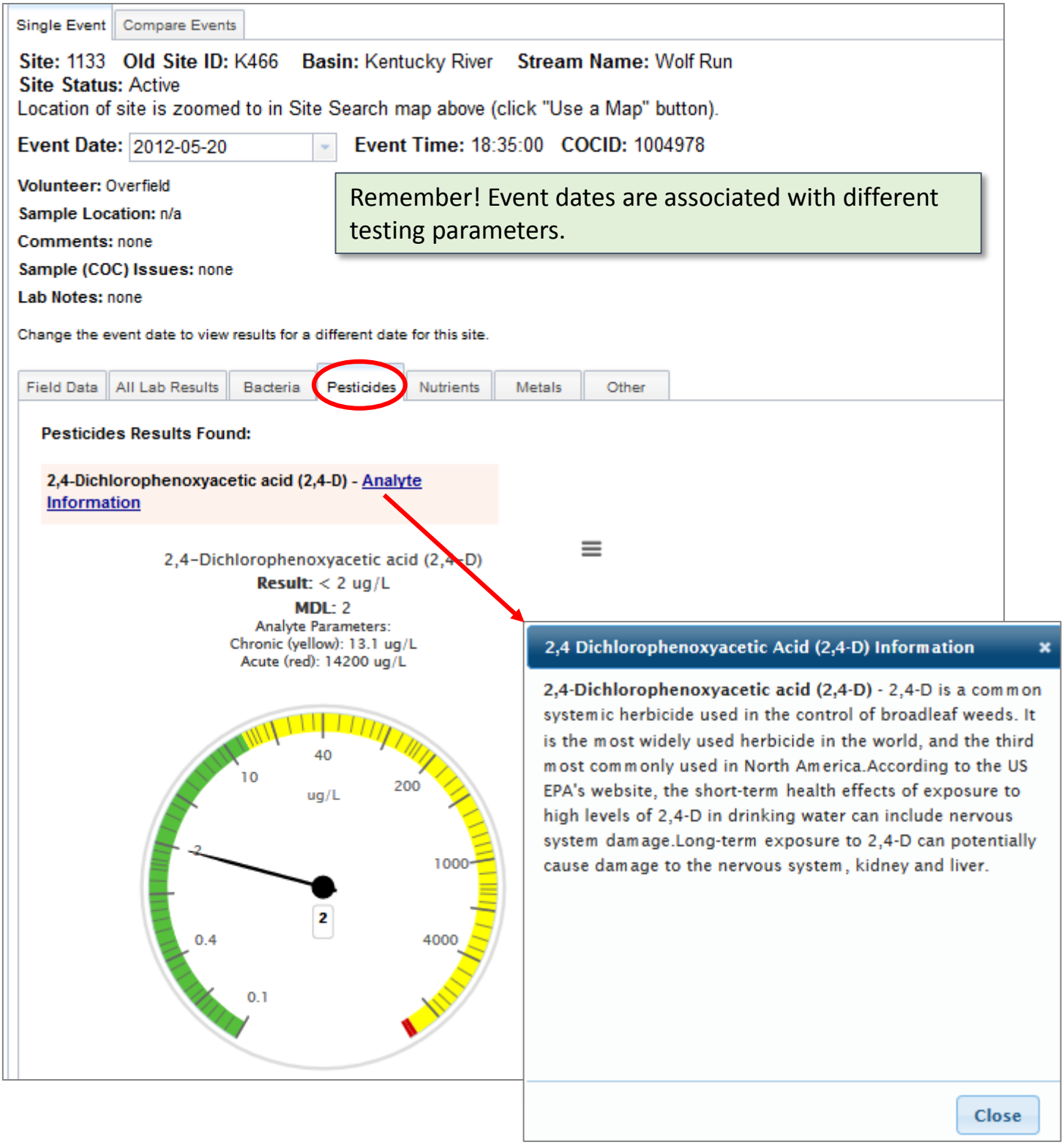
For every parameter, there is a link, “Analyte Information”, that will give you specific data about the parameter in a pop-up window.



For many parameters, there is a schematic that displays your results as they relate to water quality standards or recommended benchmarks when official standards are not available.

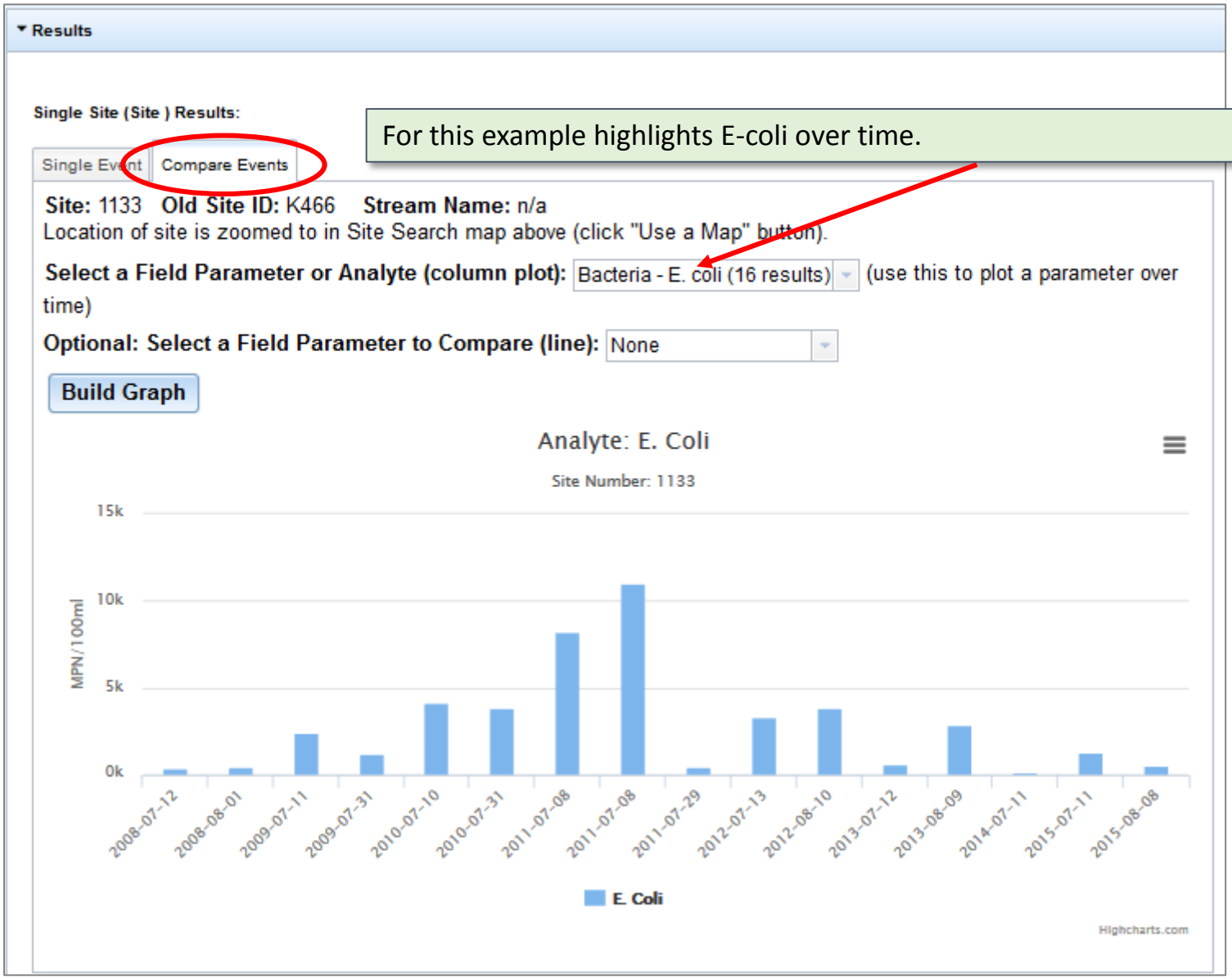
Sampling Results from a Site Search (for example, site 1133), Pesticides

The same format for results is used for Bacteria, Pesticides, Nutrients, and Metals.

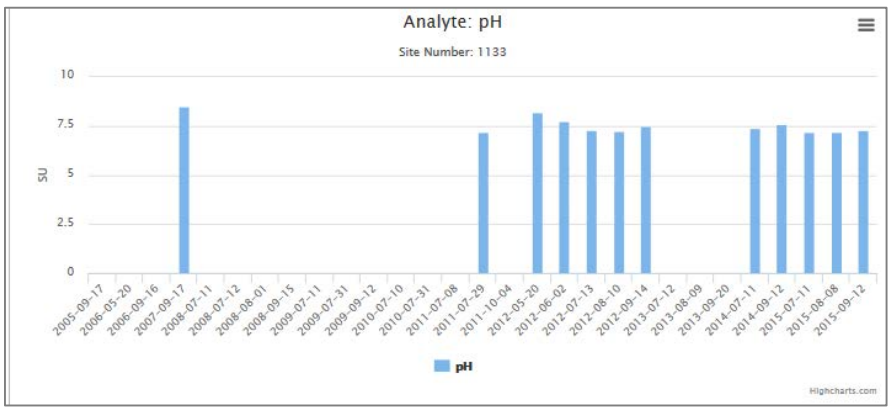


Sampling Results from a Site Search, Comparing Events over time

If you select the “Compare Events” tab, you can view a parameter of interest over time.

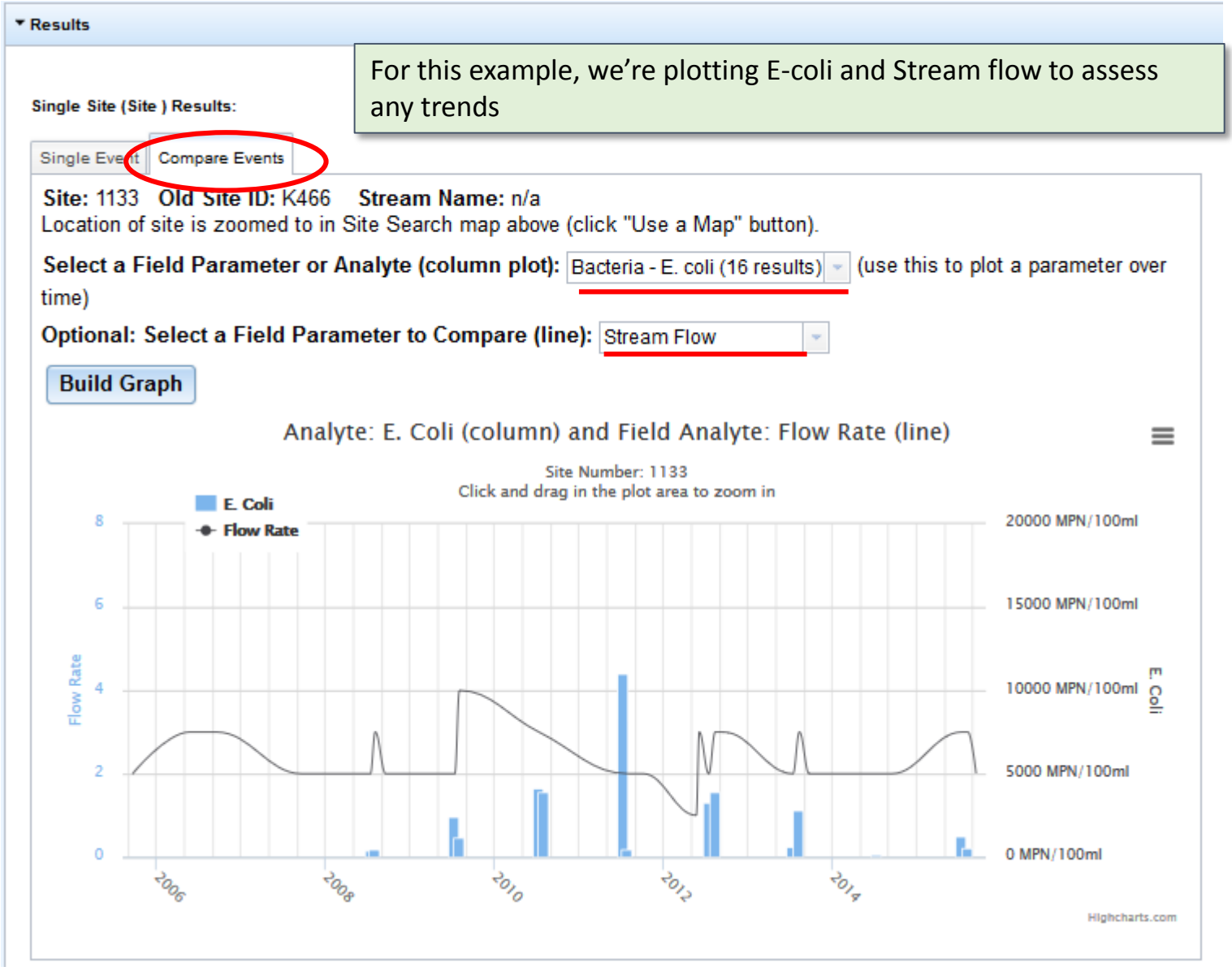


Note: The data will have holes in it. If a site was not sampled or a field measurement not taken, no data will appear. As shown looking at the pH over time.

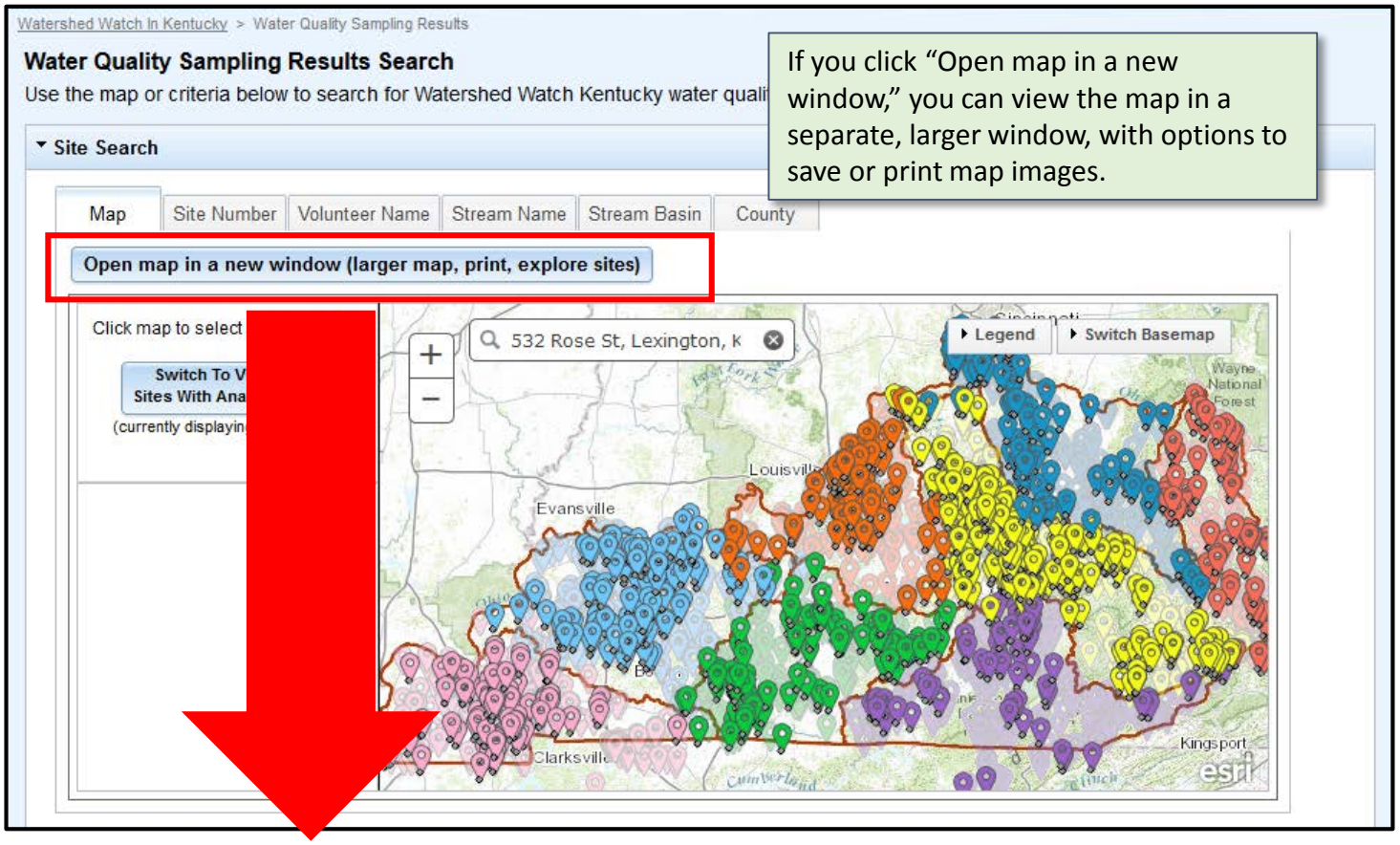


Sampling Results from a Site Search, Comparing Events over time

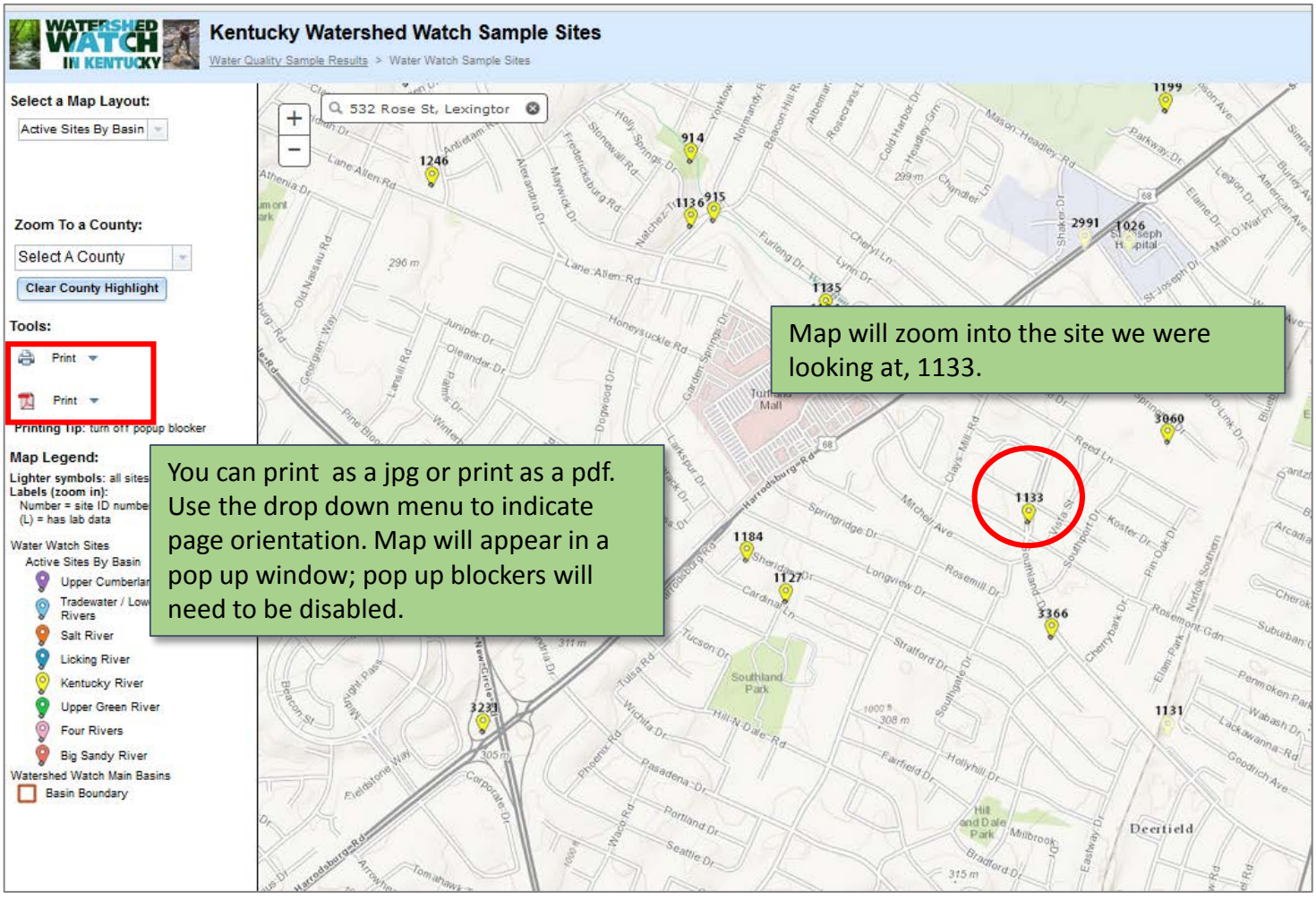
If you select the “Compare Events” tab, you can make a graph plotting an analyte and a field parameter in order to look for trends.



Manipulating the map to save and print



If you click "Open map in a new window," you can view the map in a separate, larger window, with options to save or print map images.



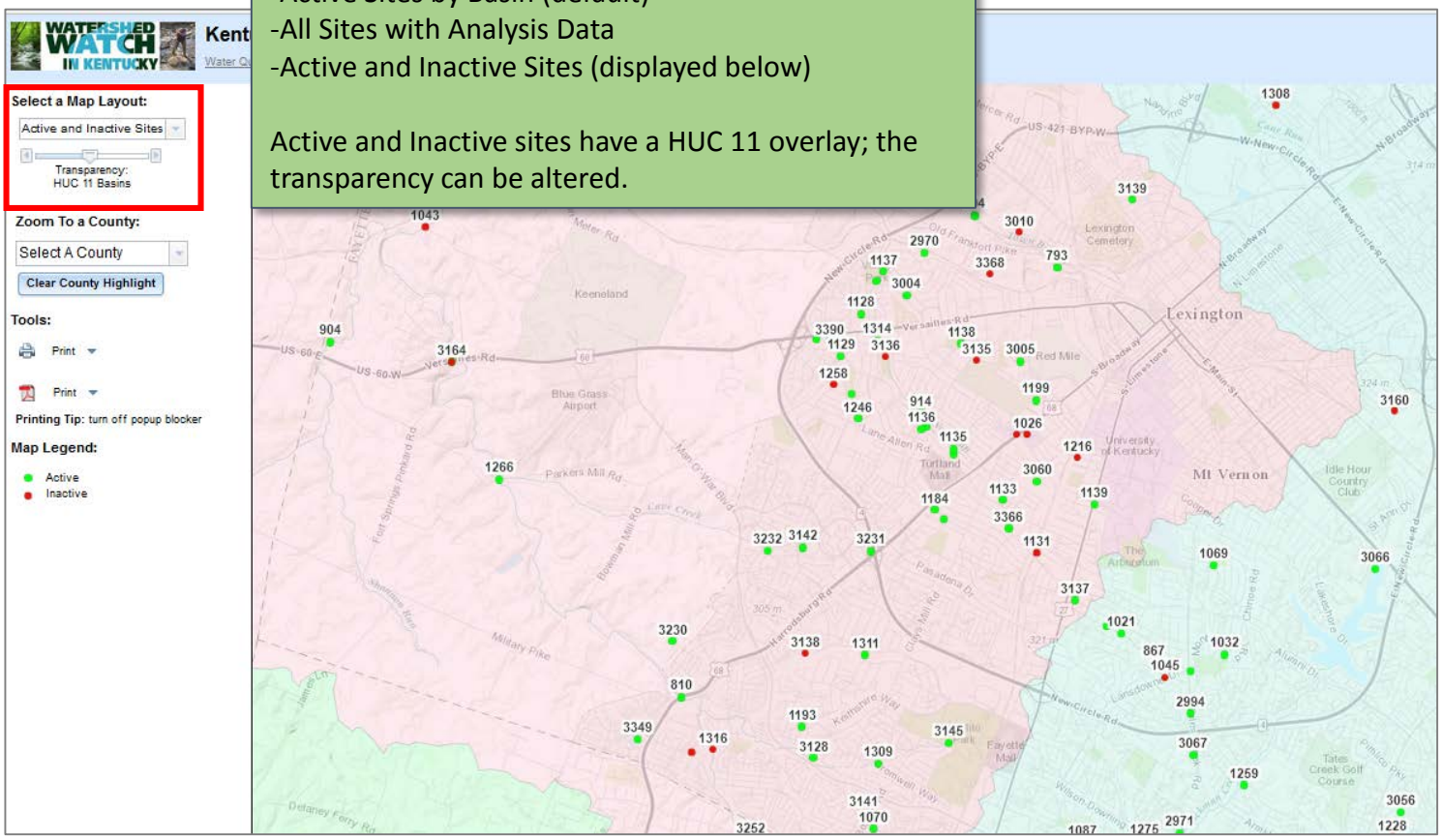
Map will zoom into the site we were looking at, 1133.

You can print as a jpg or print as a pdf. Use the drop down menu to indicate page orientation. Map will appear in a pop up window; pop up blockers will need to be disabled.

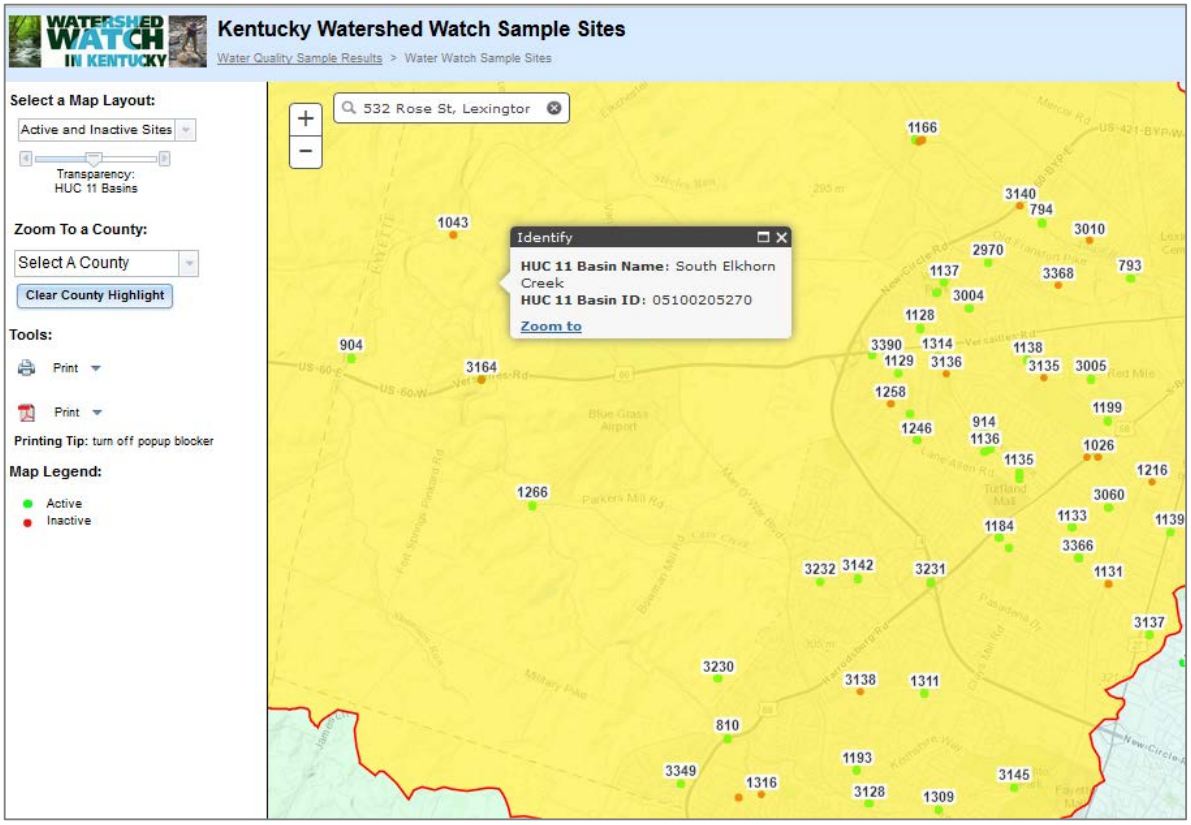
Displaying Active and Inactive sites by HUCs

You can change the map layout:
-Active Sites by Basin (default)
-All Sites with Analysis Data
-Active and Inactive Sites (displayed below)

Active and Inactive sites have a HUC 11 overlay; the transparency can be altered.

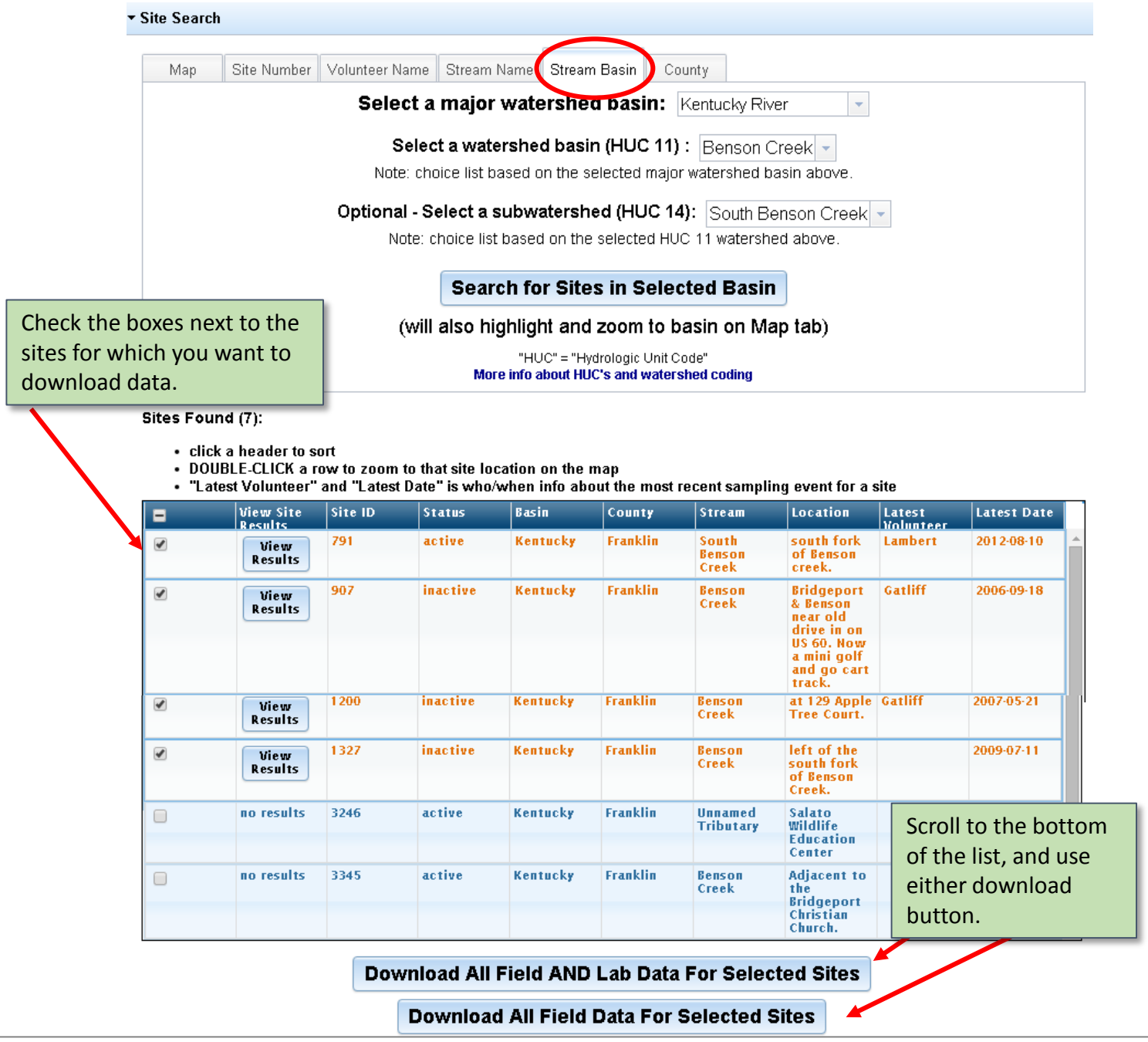


If you click on the HUC, a dialog box will open identifying the HUC. In this example, the South Elkhorn Creek.



Downloading Raw Data to Conduct Further Analyses

Benson Creek example



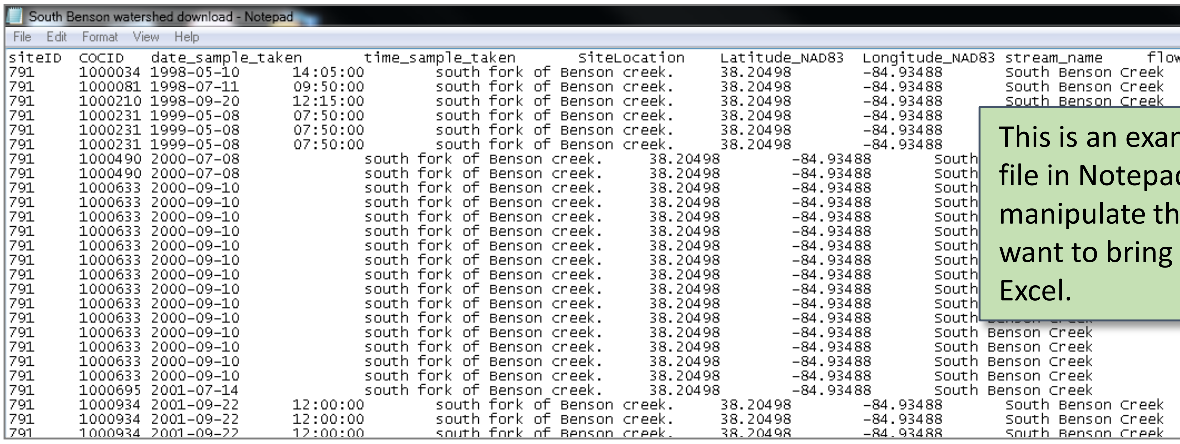
Internet Explorer Users! At this time, the data download functionality does not work with Internet Explorer. You will need to use Google Chrome or Firefox to download the data. This issue is being worked on.

About the data downloads: each download button produces a tab-delimited text (.txt) file. The files contain a header row with the same site and field data for each download type. For the "Field and Lab" download, field data is repeated for each lab result. **Field and lab results are connected by the COCID field.**

Once the download is complete, you will be prompted to save the file. Because the download file is a ".txt" extension, be sure to save the file instead of opening within your browser window. This file can be easily imported into Microsoft Excel, Google Docs, or any other spreadsheet program.

Downloading Raw Data, continued

Data will download as a tab-delimited (.txt) file.



South Benson watershed download - Notepad

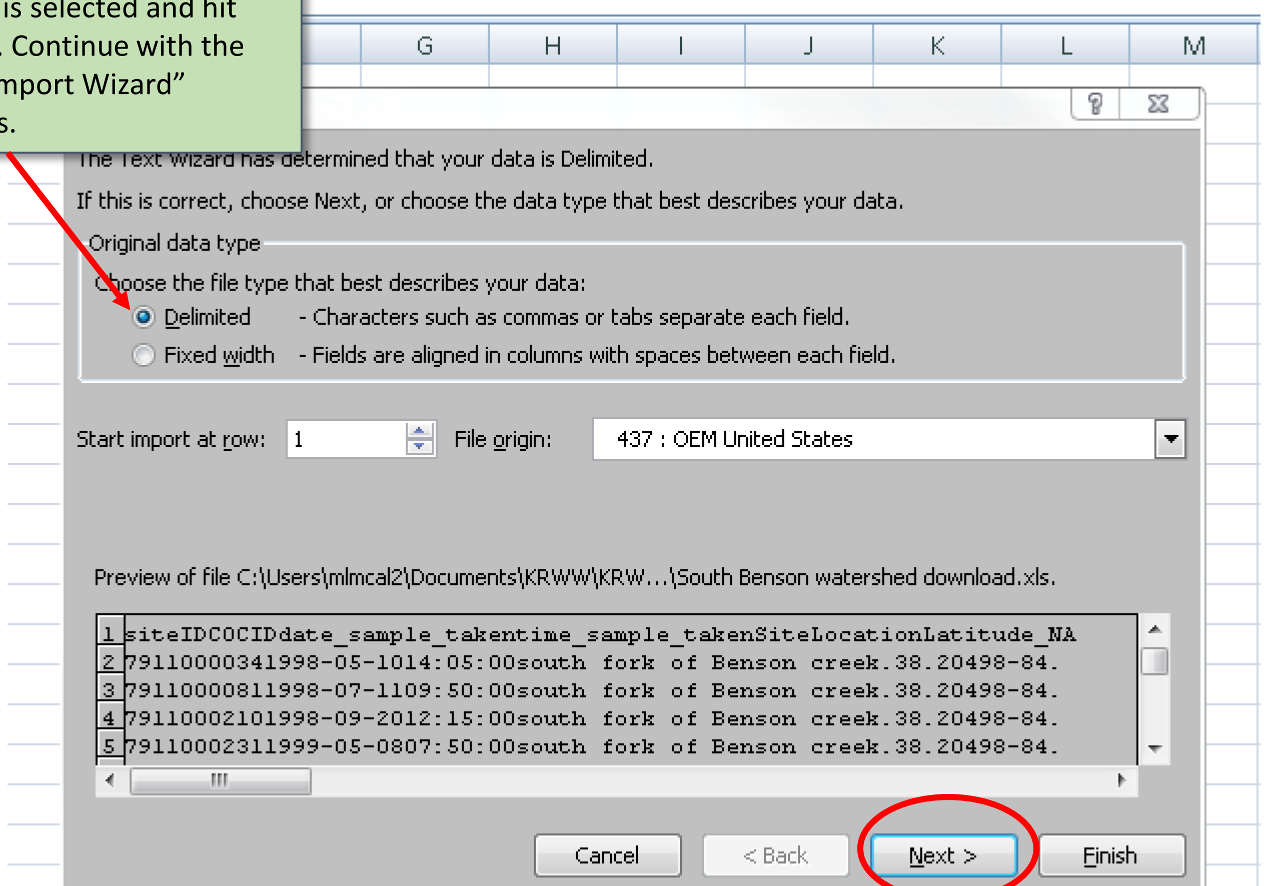
File Edit Format View Help

siteID	COCID	date_sample_taken	time_sample_taken	SiteLocation	Latitude_NAD83	Longitude_NAD83	stream_name	flow
791	1000034	1998-05-10	14:05:00	south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000081	1998-07-11	09:50:00	south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000210	1998-09-20	12:15:00	south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000231	1999-05-08	07:50:00	south fork of Benson creek.	38.20498	-84.93488		
791	1000231	1999-05-08	07:50:00	south fork of Benson creek.	38.20498	-84.93488		
791	1000231	1999-05-08	07:50:00	south fork of Benson creek.	38.20498	-84.93488		
791	1000490	2000-07-08		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000490	2000-07-08		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000633	2000-09-10		south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000695	2001-07-14		south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000934	2001-09-22	12:00:00	south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000934	2001-09-22	12:00:00	south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	
791	1000934	2001-09-22	12:00:00	south fork of Benson creek.	38.20498	-84.93488	South Benson Creek	

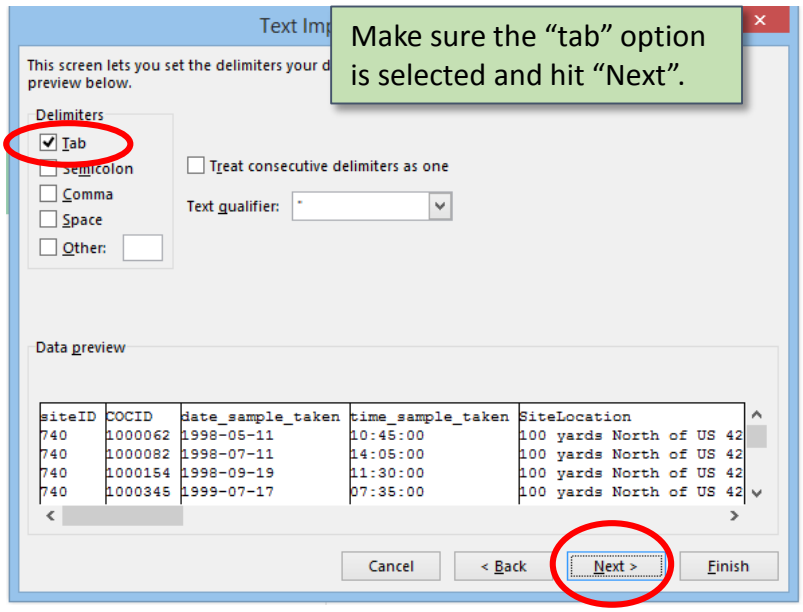
This is an example of the .txt file in Notepad. To manipulate the data, you'll want to bring it into MS Excel.

To manipulate the .txt file, open it in Microsoft Excel.
You will be prompted to convert the tab-delimited file into an .xls format.

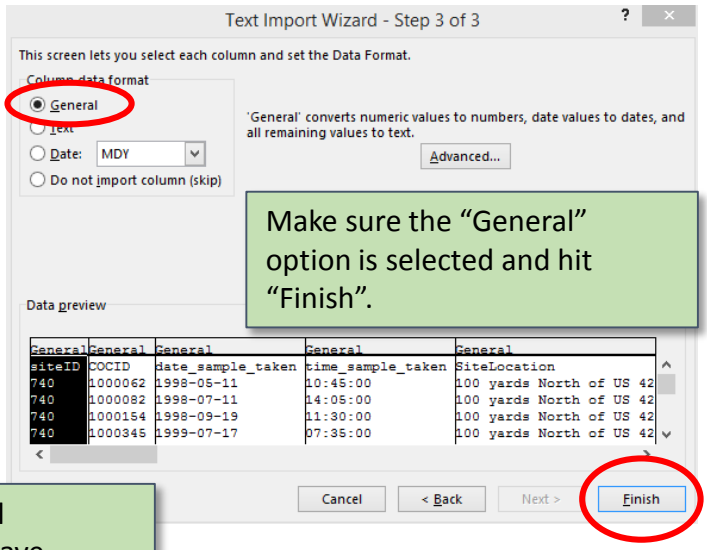
Make sure the "Delimited" option is selected and hit "Next". Continue with the "Text Import Wizard" process.



Downloading Raw Data, continued



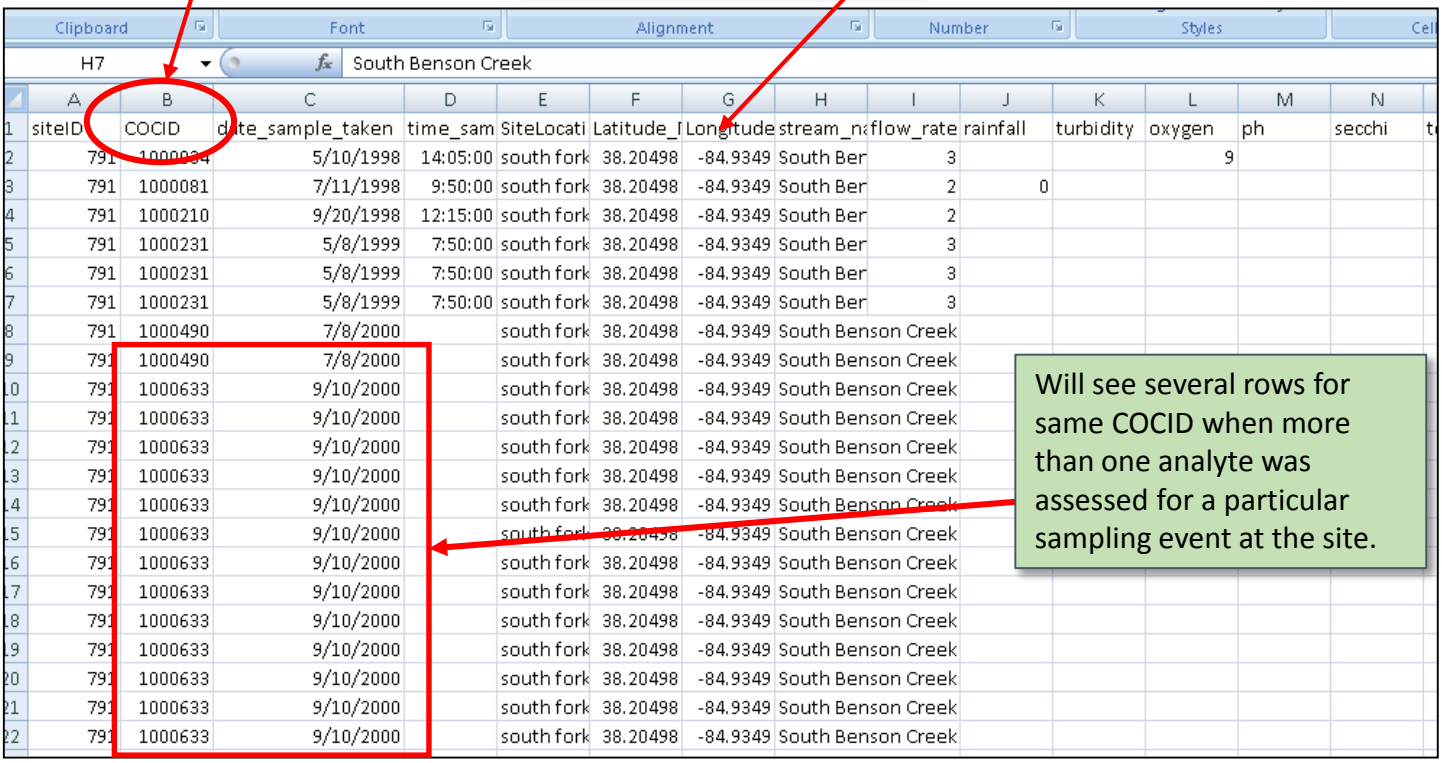
Make sure the "tab" option is selected and hit "Next".



Make sure the "General" option is selected and hit "Finish".

COCID is the UNIQUE IDENTIFIER that connects site/sampling events to lab data.

The resulting Excel spreadsheet will have several column titles (fields) across the top row.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	siteID	COCID	date_sample_taken	time_sam	SiteLocati	Latitude_[	Longitude	stream_na	flow_rate	rainfall	turbidity	oxygen	ph	secchi
2	791	1000034	5/10/1998	14:05:00	south fork	38.20498	-84.9349	South Ber	3			9		
3	791	1000081	7/11/1998	9:50:00	south fork	38.20498	-84.9349	South Ber	2	0				
4	791	1000210	9/20/1998	12:15:00	south fork	38.20498	-84.9349	South Ber	2					
5	791	1000231	5/8/1999	7:50:00	south fork	38.20498	-84.9349	South Ber	3					
6	791	1000231	5/8/1999	7:50:00	south fork	38.20498	-84.9349	South Ber	3					
7	791	1000231	5/8/1999	7:50:00	south fork	38.20498	-84.9349	South Ber	3					
8	791	1000490	7/8/2000		south fork	38.20498	-84.9349	South Benson Creek						
9	791	1000490	7/8/2000		south fork	38.20498	-84.9349	South Benson Creek						
10	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
11	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
12	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
13	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
14	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
15	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
16	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
17	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
18	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
19	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
20	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
21	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						
22	791	1000633	9/10/2000		south fork	38.20498	-84.9349	South Benson Creek						

Will see several rows for same COCID when more than one analyte was assessed for a particular sampling event at the site.

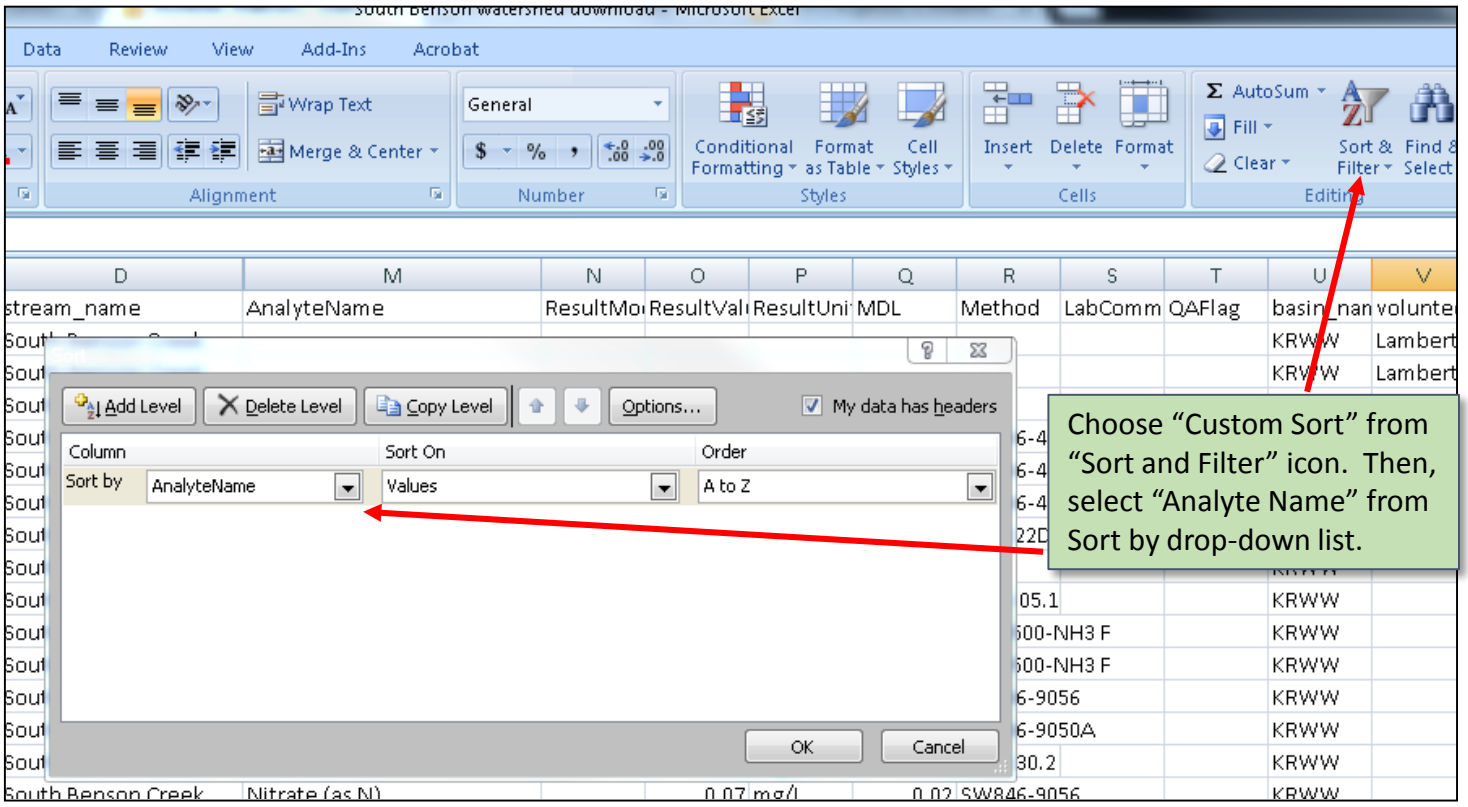
User will need to selectively remove unnecessary (or empty) columns to simplify spreadsheet for analysis.

Field (column) Names in WWKY Data Download Spreadsheet

Site ID -Assigned to each specific sampling site location
****COCID** - Assigned upon generation of Chain of Custody form, differs from Site ID#, tracks unique sample location and time – IT IS USED TO CONNECT LAB DATA TO FIELD / SITE DATA
Date_sample_taken
Time_sample_taken
SiteLocation – narrative description of sampling site
Latitude_NAD83 – latitudinal location of sampling site
Longitude_NAD83 – longitudinal location of sampling site
Stream_name
flow_rate – estimated flow rate, as recorded on Chain of Custody (COC) form
Rainfall – estimated rainfall for 48-hour period preceding sampling event, as recorded on COC form
Turbidity – estimated turbidity, as recorded on COC form
Oxygen – dissolved oxygen reading, assessed using field testing kit
pH- pH assessed using field kit
Secchi – measurement of water clarity in lakes, assessed using secchi disk
Temperature –assessed with thermometer
Conductivity –assessed with calibrated conductivity meter
Meter_date – Date that conductivity meter was calibrated
Lab_notes – notes that the lab makes regarding the condition of the incoming sample (i.e., sample temperature, broken lid, empty bottle)
Comments – comments recorded by the sampler on the COC form
COC_problem – notes on any concerns or issues with the proper completion of the COC form
Entered_date – date that COC information was entered into the database
AnalyteGroup – category of analyte being assessed (i.e., nitrogen is in Nutrient group)
AnalyteID – a numerical ID randomly assigned to each parameter for easier database handling
AnalyteName – standardized naming convention for the analyte, or sampling parameter, being assessed
Result Modifier – values that are less than (<) or greater than (>) a limit, such as a value less than the Method Detection Limit or Reporting Limit OR greater than the value that the lab can assess (i.e., E. coli)
ResultValue – level of analyte detection, usually as a concentration value
ResultUnits – units associated with the analyte result (i.e., mg/L, cfu/100 ml, etc.)
MDL – Method Detection Limit, or the lab equipment's reporting limit
Method - a code for the scientific method used to assess each analyte
LabComments – observations or comments recorded by the lab in relation to the sample analysis
QAFlag – letters used by the lab to signify quality control issues (J – estimated value, S – Insufficient Sample, I- Improper Container, U – Analyte Not Detected)
Basin name – river Basin associated with the result (i.e., KRWW)
Volunteers –name of volunteer who collected the sample

Using Raw Data to Conduct an E-coli Analysis

EXAMPLE: Look at E coli readings for all sites in the South Benson Creek Watershed
#1 – Eliminate or hide unnecessary columns
#2 – Sort by Analyte Name



Then, select the data rows of interest to you. Copy and paste them into a new worksheet. Be sure to copy the table heading too!

62	1200	9/18/2006	at 129 Apple Tree	Benson Creek	Conductivity		381	uS/cm	1	SW846-90
63	964	9/14/2002	On Ninevah Road	Little Benson Creek	Copper	<	0.009	mg/L	0.009	SW846-60
64	791	7/10/2006	south fork of Ber	South Benson Creek	E. Coli		183	MPN/100r	1	SM9223B
65	791	7/12/2008	south fork of Ber	South Benson Creek	E. Coli		41	MPN/100r	1	SM9223B
66	791	7/11/2009	south fork of Ber	South Benson Creek	E. coli	>	2420	MPN/100r	1	SM9223B
67	791	8/1/2009	south fork of Ber	South Benson Creek	E. coli		1330	MPN/100r	1	SM9223B
68	791	7/10/2010	south fork of Ber	South Benson Creek	E. coli		1550	MPN/100r	1	SM9223B
69	791	7/9/2011	south fork of Ber	South Benson Creek	E. coli		11000	MPN/100r	1	SM9223B
70	791	7/30/2011	south fork of Ber	South Benson Creek	E. coli		30	MPN/100r	1	SM9223B
71	791	7/13/2012	south fork of Ber	South Benson Creek	E. coli		60	MPN/100r	1	SM9223B
72	791	8/10/2012	south fork of Ber	South Benson Creek	E. coli		10	MPN/100r	1	SM9223B
73	964	7/8/2006	On Ninevah Road	Little Benson Creek	E. Coli		63	MPN/100r	1	SM9223B
74	964	6/29/2007	On Ninevah Road	Little Benson Creek	E. Coli		249	MPN/100r	1	SM9223B
75	964	6/29/2007	On Ninevah Road	Little Benson Creek	E. Coli		249	MPN/100r	1	SM9223B
76	964	7/12/2008	On Ninevah Road	Little Benson Creek	E. Coli		10	MPN/100r	1	SM9223B
77	1200	7/8/2006	at 129 Apple Tree	Benson Creek	E. Coli		128	MPN/100r	1	SM9223B
78	1327	7/11/2009	left of the south	Benson Creek	E. coli	>	2420	MPN/100r	1	SM9223B
79	791	7/8/2000	south fork of Ber	South Benson Creek	Fecal Coliform		10	cfu/100ml	1	SM9222D
80	791	7/14/2001	south fork of Ber	South Benson Creek	Fecal Coliform		160	cfu/100ml	1	SM9222D

Using Raw Data to Conduct an E-coli Analysis, cont'd

E-coli results narrowed down to 4 different sites--mainly Site 791. For Site #791, it is interesting to compare E. coli levels with flow and rainfall data. In this case, the higher values at Site 791 were detected during higher estimated flow and rainfall amounts. Was the E. coli pollution possibly stormwater runoff-related?

A	B	C	D	E	F	G	H	I	J	K	L	M
siteID	date_sample	SiteLocation	stream_name	flow_rate	rainfall	analyteGr	AnalyteNa	ResultM	ResultVal	ResultUni	MDL	Method
791	7/10/2006	south fork of Benson creek.	South Benson Creek			Bacteria	E. Coli		183	MPN/100r	1	SM9223B
791	7/12/2008	south fork of Benson creek.	South Benson Creel	2	0	Bacteria	E. Coli		41	MPN/100r	1	SM9223B
791	7/11/2009	south fork of Benson creek.	South Benson Creel	3	1	Bacteria	E. coli	>	2420	MPN/100r	1	SM9223B
791	8/1/2009	south fork of Benson creek.	South Benson Creel	4	1	Bacteria	E. coli		1330	MPN/100r	1	SM9223B
791	7/10/2010	south fork of Benson creek.	South Benson Creel	4	>1.5	Bacteria	E. coli		1550	MPN/100r	1	SM9223B
791	7/9/2011	south fork of Benson creek.	South Benson Creel	4	1	Bacteria	E. coli		11000	MPN/100r	1	SM9223B
791	7/30/2011	south fork of Benson creek.	South Benson Creel	2	0.1	Bacteria	E. coli		30	MPN/100r	1	SM9223B
791	7/13/2012	south fork of Benson creek.	South Benson Creel	1	0.1	Bacteria	E. coli		60	MPN/100r	1	SM9223B
791	8/10/2012	south fork of Benson creek.	South Benson Creel	2	0	Bacteria	E. coli		10	MPN/100r	1	SM9223B
964	7/8/2006	On Ninevah Road at the Frai	Little Benson Creek			Bacteria	E. Coli		63	MPN/100r	1	SM9223B
964	6/29/2007	On Ninevah Road at the Frai	Little Benson Creek			Bacteria	E. Coli		249	MPN/100r	1	SM9223B
964	6/29/2007	On Ninevah Road at the Frai	Little Benson Creek			Bacteria	E. Coli		249	MPN/100r	1	SM9223B
964	7/12/2008	On Ninevah Road at the Frai	Little Benson Creek	1	0.1	Bacteria	E. Coli		10	MPN/100r	1	SM9223B
1200	7/8/2006	at 129 Apple Tree Court.	Benson Creek			Bacteria	E. Coli		128	MPN/100r	1	SM9223B
1327	7/11/2009	left of the south fork of Ben	Benson Creek			Bacteria	E. coli	>	2420	MPN/100r	1	SM9223B

With adequate data, you can look at annual fluctuations in relation to other parameters, long-term trends, or calculate and compare site averages within the watershed.

Using Raw Data to assess batch data trends (county, watershed)

EXAMPLE: County Summary Reports are now available for several counties.
(could also be created for a specific watershed)

- Summarize Watershed Watch activity in the chosen area
- Serves as an informational and recruitment tool for Watershed Watch members to use in their communities
- Tool to help stimulate further sampling efforts and activities that improve water quality

Download historic sampling results from KGS/WWKY data portal (http://kgs.uky.edu/wwky/)
.

A. Under "Site Search" on homepage, select county of interest.
B. Click on "View County Sites."
C. Use checkboxes in left column to select sites of interest. If you select all first, you can uncheck any you don't want, such as those with "no results."
D. Click "Download all lab and field data for selected sites."
E. Open spreadsheet in Excel.
F. Revise spreadsheet format, with fields (columns) needed.
G. Sort and analyze data by analyte group or individual analytes.
H. Determine data range of interest, i.e., past 5 years, all available data, past year, etc.
I. Calculate averages or arithmetic geomeans (for pathogens), if possible.
J. Compare results with available water quality benchmarks or standards.
K. Compile results in spreadsheet, with analysis interpretation—possibly a column with good, fair poor rating, or color-coded results in green, yellow and red.

Using Raw Data to assess batch data trends (county, watershed), cont'd

Summary of water quality analysis and general findings

Results of Boyle County Sampling Efforts

From 1999 to 2014, trained volunteer samplers tested water quality in Boyle County streams. These results have allowed assessments of pesticides, bacteria, nutrients, metals and aquatic chemistry in the water. *A few issues have been found with bacteria and nutrients (nitrogen and phosphorus) in the streams.* Also, conductivity levels were higher than desired at a few sites, which can serve as a likely indication of these and other pollutants of concern. The following is a summary, based on the past 10 years of sampling results.

Site-by-site water quality findings (results from website)

Site Id	River Basin	Stream	Location	Water Quality Findings
753	Kentucky River	Clarks Run	Upstream bridge on Goggin Lane	Concern about conductivity, phosphorus, nitrogen and pathogens.
860	Kentucky River	Clarks Run	At KY34, 1 mile west of 127 bypass	Concern about pathogens
911	Kentucky River	Clarks Run	At confluence with Bee Creek next to Kentucky School for Deaf property	Concern about conductivity and pathogens
968	Kentucky River	Clarks Run	At end of Winterhawk Drive, at Goggin Lane.	Concern about conductivity, nitrogen, phosphorus and pathogens.
1304	Kentucky River	Clarks Run	At Stanford Road	Concern about conductivity and pathogens.
1929	Salt River	North Rolling Fork	Ellis picnic area on Hwy 37. 0.5 miles east of Hwy 243 intersection.	Concern about pathogens.
1930	Salt River	North Rolling Fork	Just downstream of Carpenter Creek Road bridge.	No concerns.
1966	Salt River	Chaplin River	At jct with Crawford Spring just off US 68, approximately 1 mile north of Perryville. 50-100 yds before the quarry.	Occasionally low dissolved oxygen levels, moderately high pathogen levels.

Explanations of pollutants of concern with what, why, source and benchmark details

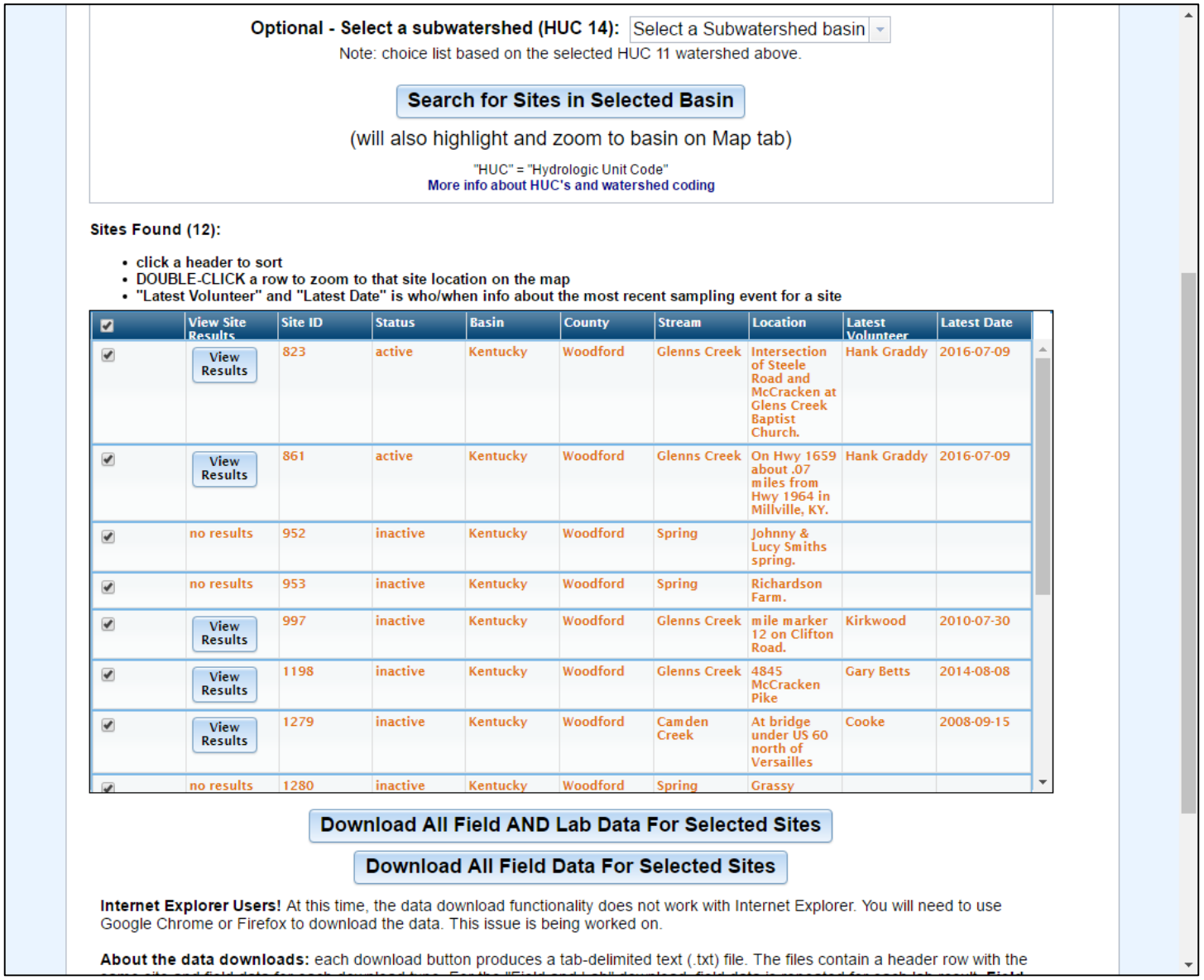
Bacteria or Pathogen levels are measured by testing for an indicator bacterium, E. coli. E. coli is commonly found in the intestines of humans and animals. The presence of this bacterium indicates fecal contamination and the potential for waterborne disease.
Sources may include failing septic systems, leaking sewer lines, livestock manure, and pet and wildlife wastes.
High pathogen levels can cause excessive nutrients in the stream and human health issues.
The regulated limit of E. coli levels for safe swimming is 240 cfu/100ml.

Nitrogen and phosphorus are major nutrients used by plants. However, when they are overly abundant, they can lead to increased algae growth. As the algae dies off, crucial oxygen supplies are consumed, making it difficult for fish and other aquatic animals to survive. Possible sources of nitrogen and phosphorus in streams include sewage, feed lot runoff, animal wastes (manure), runoff from fertilized agricultural fields and lawns, and discharges from car exhausts.
The recommended nitrogen limit for healthy aquatic life is 3.0 mg/L. The recommended phosphorus limit for aquatic life is 0.3 mg/L.

Conductivity is a water quality measurement that helps assess the amount of dissolved material in water, as shown by it's ability to carry an electrical current.
High conductivity values can indicate problematic levels of a variety of pollutants from a variety of sources, including sewage, oil and gas wells and mining.
High conductivity levels can make it very difficult for aquatic plants and animals to survive, and can affect the suitability of water for industrial, agricultural and domestic uses.
Conductivity levels between 300 and 800 have been shown to have negative impacts, but there is no official water quality standard for the state of Kentucky.

Visualize Water Watch Data in ArcGIS Online

This example: analyze data for one date, multiple sites



Optional - Select a subwatershed (HUC 14): Select a Subwatershed basin

Note: choice list based on the selected HUC 11 watershed above.

Search for Sites in Selected Basin

(will also highlight and zoom to basin on Map tab)

"HUC" = "Hydrologic Unit Code"
More info about HUC's and watershed coding

Sites Found (12):

- click a header to sort
- DOUBLE-CLICK a row to zoom to that site location on the map
- "Latest Volunteer" and "Latest Date" is who/when info about the most recent sampling event for a site

	View Site Results	Site ID	Status	Basin	County	Stream	Location	Latest Volunteer	Latest Date
☑	View Results	823	active	Kentucky	Woodford	Glenns Creek	Intersection of Steele Road and McCracken at Glens Creek Baptist Church.	Hank Graddy	2016-07-09
☑	View Results	861	active	Kentucky	Woodford	Glenns Creek	On Hwy 1659 about .07 miles from Hwy 1964 in Millville, KY.	Hank Graddy	2016-07-09
☑	no results	952	inactive	Kentucky	Woodford	Spring	Johnny & Lucy Smiths spring.		
☑	no results	953	inactive	Kentucky	Woodford	Spring	Richardson Farm.		
☑	View Results	997	inactive	Kentucky	Woodford	Glenns Creek	mile marker 12 on Clifton Road.	Kirkwood	2010-07-30
☑	View Results	1198	inactive	Kentucky	Woodford	Glenns Creek	4845 McCracken Pike	Gary Betts	2014-08-08
☑	View Results	1279	inactive	Kentucky	Woodford	Camden Creek	At bridge under US 60 north of Versailles	Cooke	2008-09-15
☑	no results	1280	inactive	Kentucky	Woodford	Spring	Grassy		

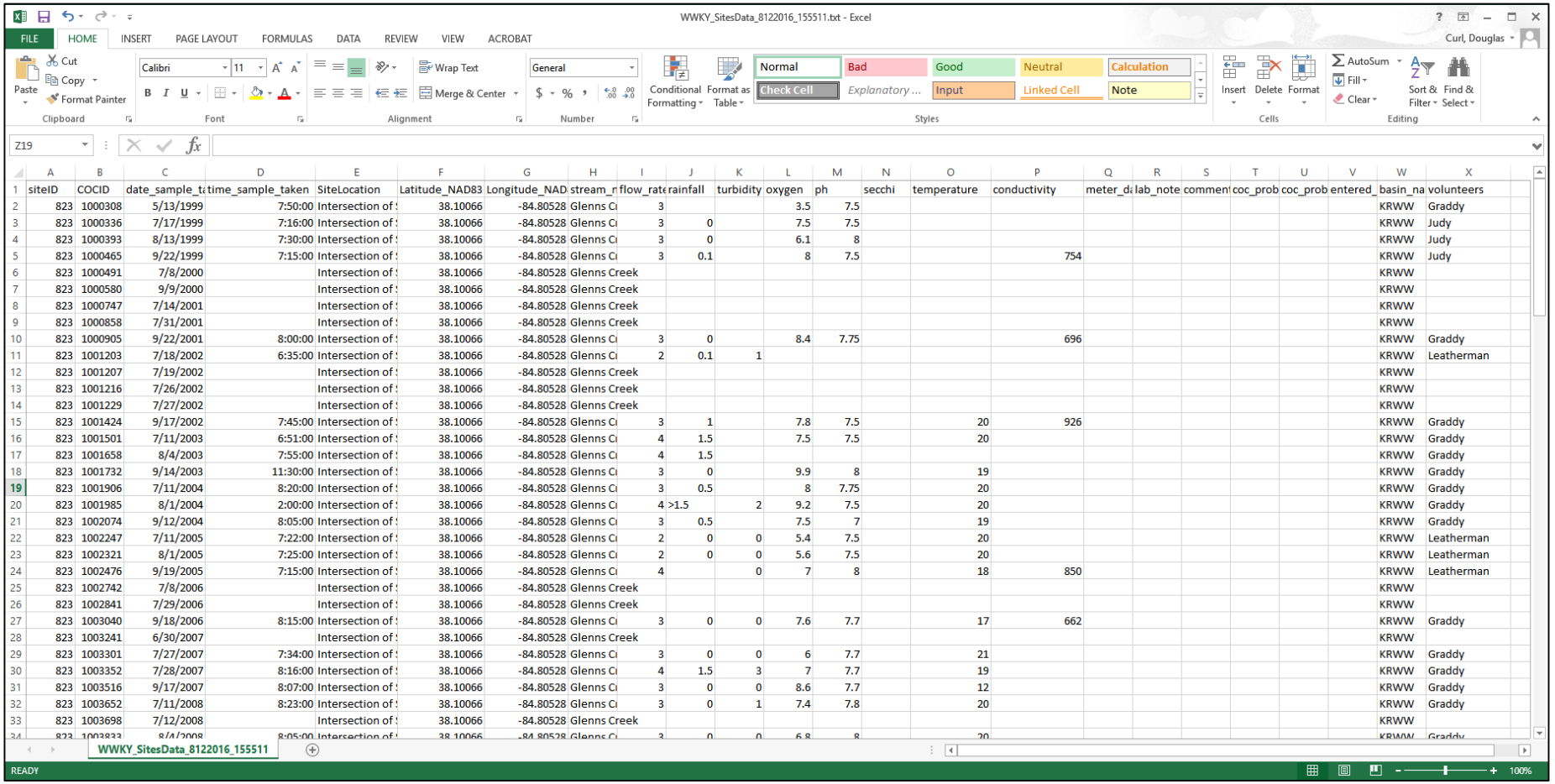
Download All Field AND Lab Data For Selected Sites

Download All Field Data For Selected Sites

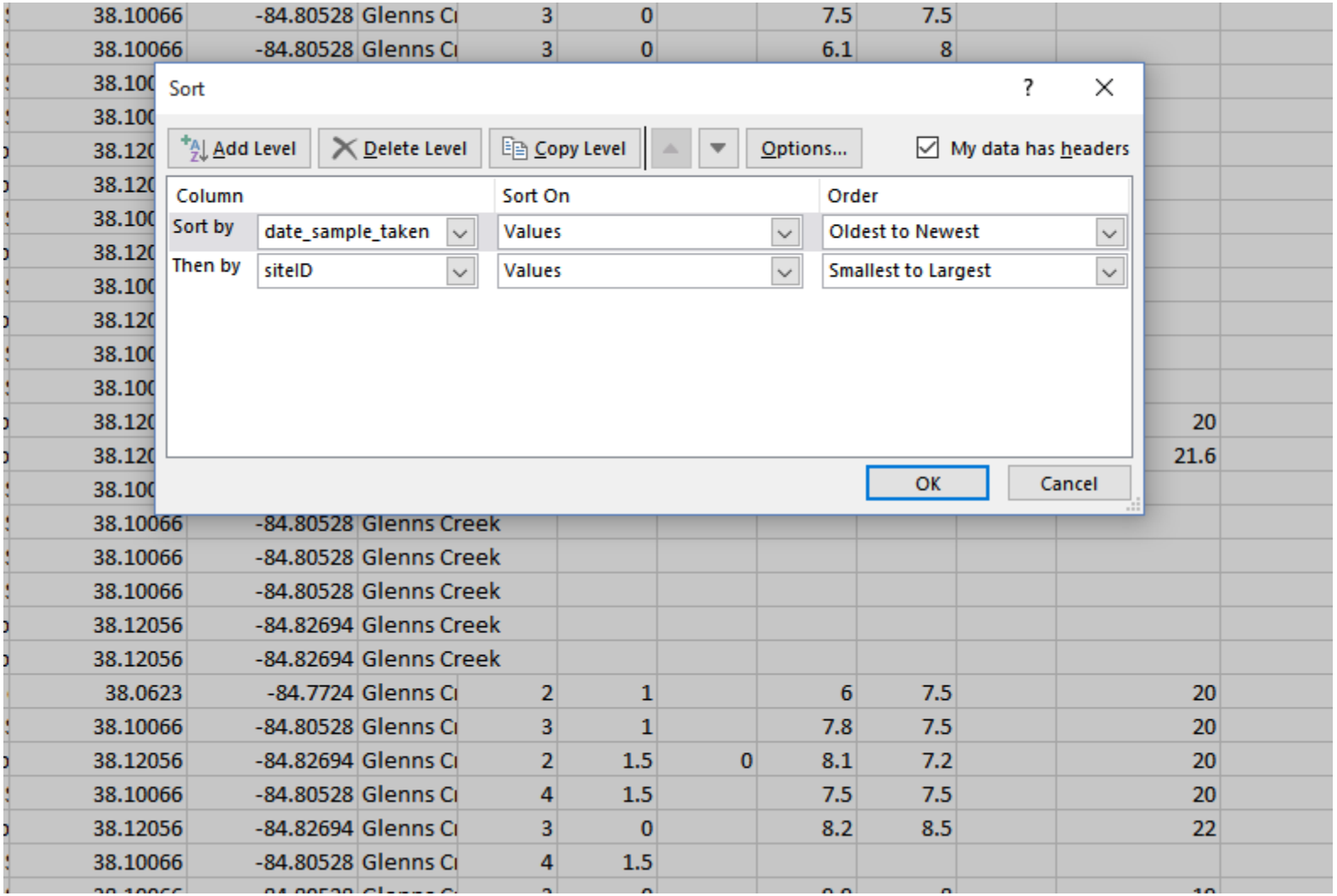
Internet Explorer Users! At this time, the data download functionality does not work with Internet Explorer. You will need to use Google Chrome or Firefox to download the data. This issue is being worked on.

About the data downloads: each download button produces a tab-delimited text (.txt) file. The files contain a header row with the

1. Download some data for multiple sites



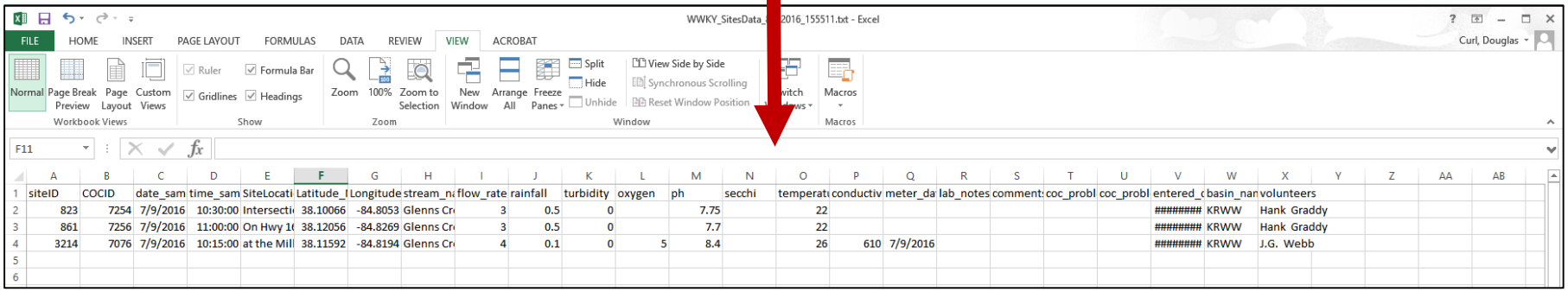
2. Open tab-delimited data in Excel to manipulate



3. Sort data by Date AND THEN SiteID – want to analyze data for one date (multiple sites)

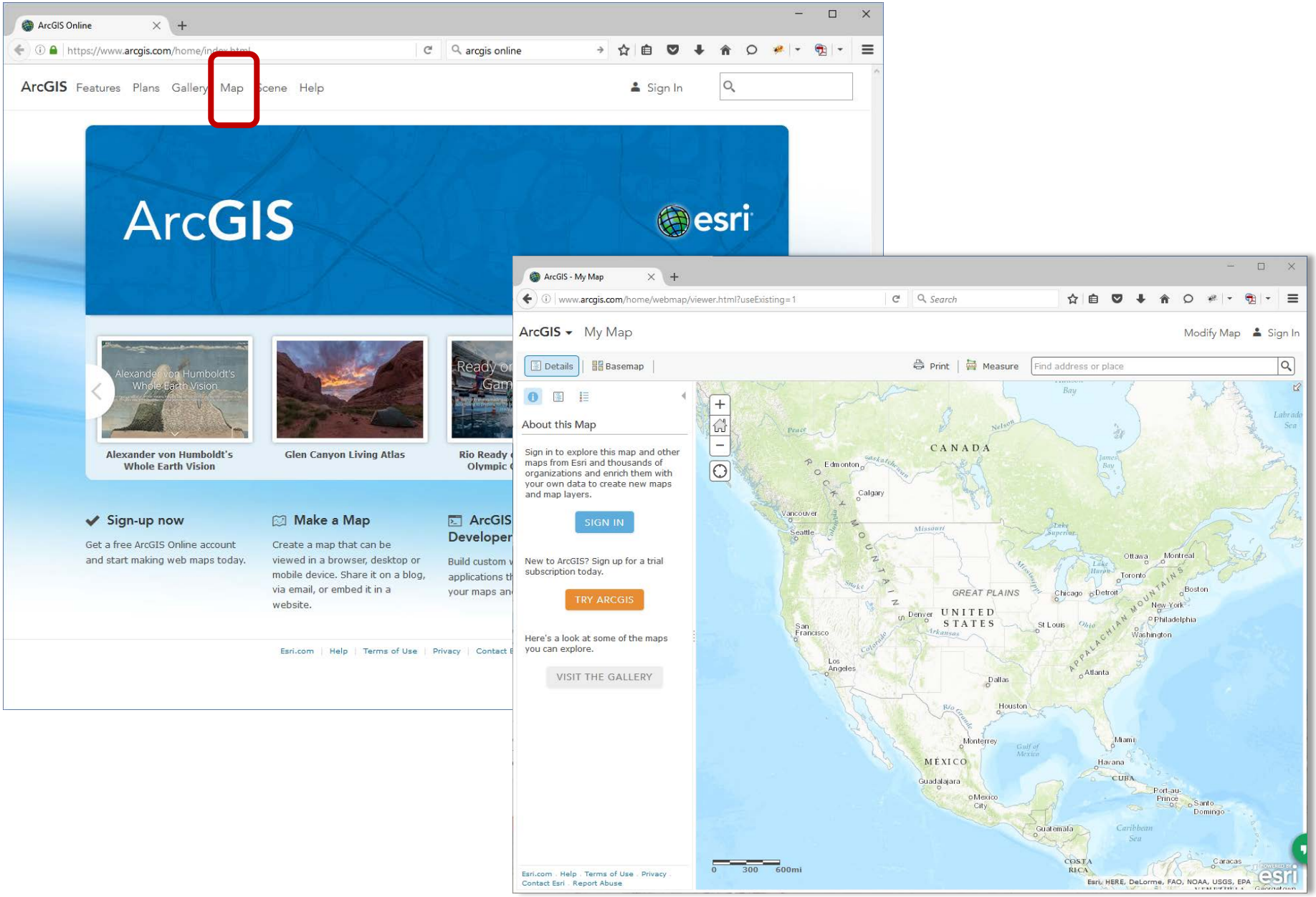
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	siteID	COCID	date_sample_t	time_sample_taken	SiteLocation	Latitude_NAD83	Longitude_NAD	stream_n	flow_rate	rainfall	turbidity	oxygen	ph	secchi	temperature	conductivity	meter_da	lab_note	comment	coc_prob	coc_prob	entered_	basin_na	volunteers
119	861	3482	9/18/2014	9:50:00	On Hwy 1659 ab	38.12056	-84.82694	Glenns Cr	4	zero	0	8.6	7.75		14	550						########	KRWW	Hank Graddy
120	3214	4722	7/11/2015		at the Millville (	38.11592	-84.81942	Glenns Cr	5										unable to sample due to hig			########	KRWW	J.G. Webb
121	823	4925	8/8/2015	9:30:00	Intersection of	38.10066	-84.80528	Glenns Cr	4		2	7.5	7.5		17	470			ne culvert at sampling site -			########	KRWW	Hank Graddy
122	861	4927	8/8/2015	10:05:00	On Hwy 1659 ab	38.12056	-84.82694	Glenns Cr	4		2	8.5	7.75		17.9	470						########	KRWW	Hank Graddy
123	823	5266	9/12/2015	9:09:00	Intersection of	38.10066	-84.80528	Glenns Cr	3	zero	0		7.5		14	850						########	KRWW	Hank Graddy
124	861	5651	9/12/2015	9:30:00	On Hwy 1659 ab	38.12056	-84.82694	Glenns Cr	3	zero	0		7.5		14	830						########	KRWW	Hank Graddy
125	3214	5352	9/14/2015	9:55:00	at the Millville (	38.11592	-84.81942	Glenns Cr	3	zero	0	8.4	7.4		15	690	########					########	KRWW	J.G. Webb
126	3214	6447	5/14/2016	11:00:00	at the Millville (	38.11592	-84.81942	Glenns Cr	4	0.1	1		7.8		15	520	########		Could not get proper colorat			########	KRWW	J.G. Webb
127	823	7254	7/9/2016	10:30:00	Intersection of	38.10066	-84.80528	Glenns Cr	3	0.5	0		7.75		22							########	KRWW	Hank Graddy
128	861	7256	7/9/2016	11:00:00	On Hwy 1659 ab	38.12056	-84.82694	Glenns Cr	3	0.5	0		7.7		22							########	KRWW	Hank Graddy
129	3214	7076	7/9/2016	10:15:00	at the Millville (	38.11592	-84.81942	Glenns Cr	4	0.1	0	5	8.4		26	610	7/9/2016					########	KRWW	J.G. Webb
130																								
131																								

Copy and paste into a new sheet.

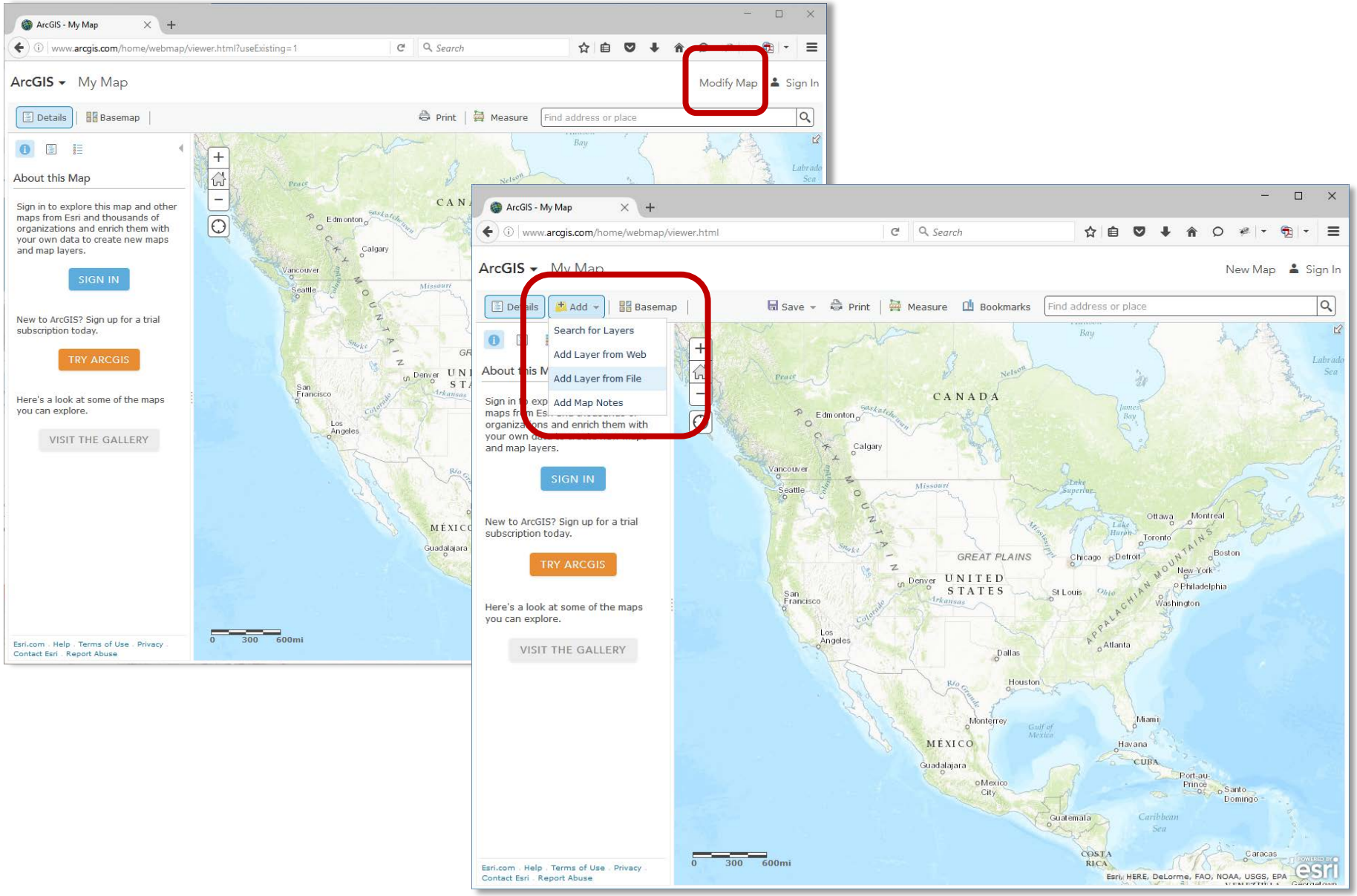


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
1	siteID	COCID	date_sam	time_sam	SiteLocati	Latitude_I	Longitude	stream_na	flow_rate	rainfall	turbidity	oxygen	ph	secchi	temperat	conductiv	meter_da	lab_notes	comment	coc_probl	coc_probl	entered_d	basin_nan	volunteers				
2	823	7254	7/9/2016	10:30:00	Intersecti	38.10066	-84.8053	Glenns Cr	3	0.5	0		7.75		22							########	KRWW	Hank Graddy				
3	861	7256	7/9/2016	11:00:00	On Hwy 16	38.12056	-84.8269	Glenns Cr	3	0.5	0		7.7		22							########	KRWW	Hank Graddy				
4	3214	7076	7/9/2016	10:15:00	at the Mill	38.11592	-84.8194	Glenns Cr	4	0.1	0	5	8.4		26	610	7/9/2016					########	KRWW	J.G. Webb				
5																												
6																												

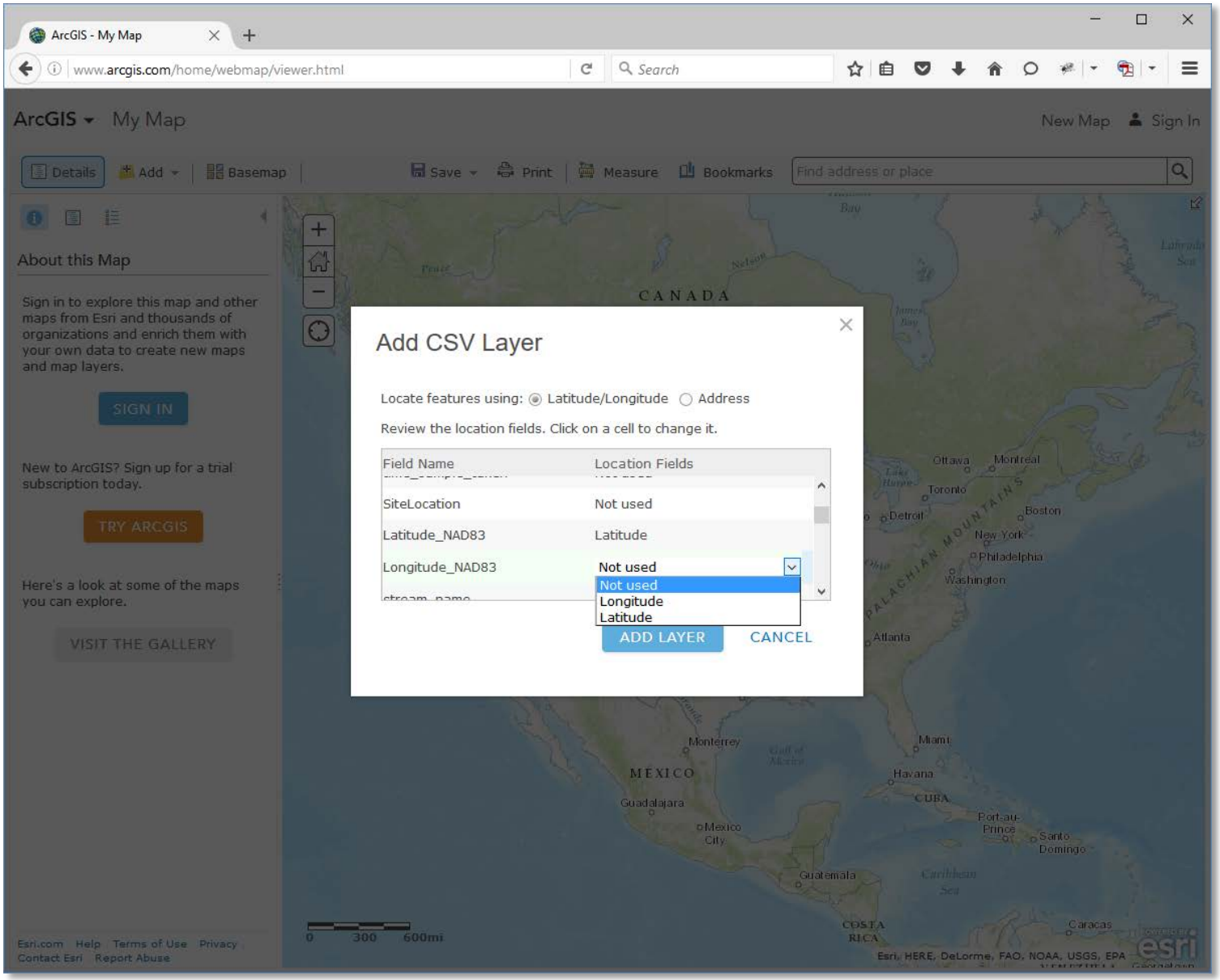
4. Isolate data of interest: select and copy an “event” (one date) and paste into a new sheet with headers. Save the new sheet as a delimited text file.



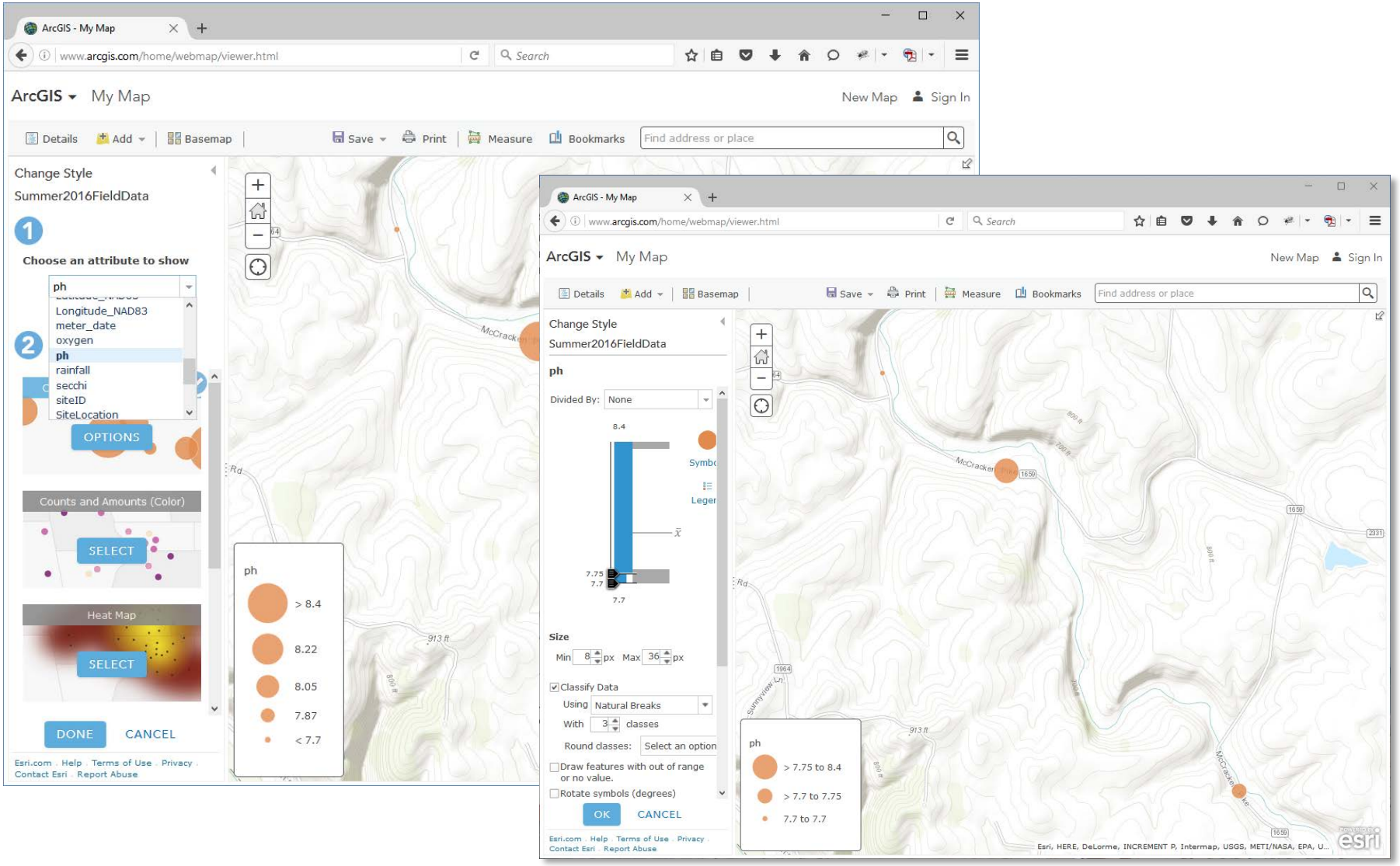
5. Open ArcGIS Online in your browser: https://www.arcgis.com/home/index.html
Login if you have an account (you don't need one). Click on the Map button at the top.



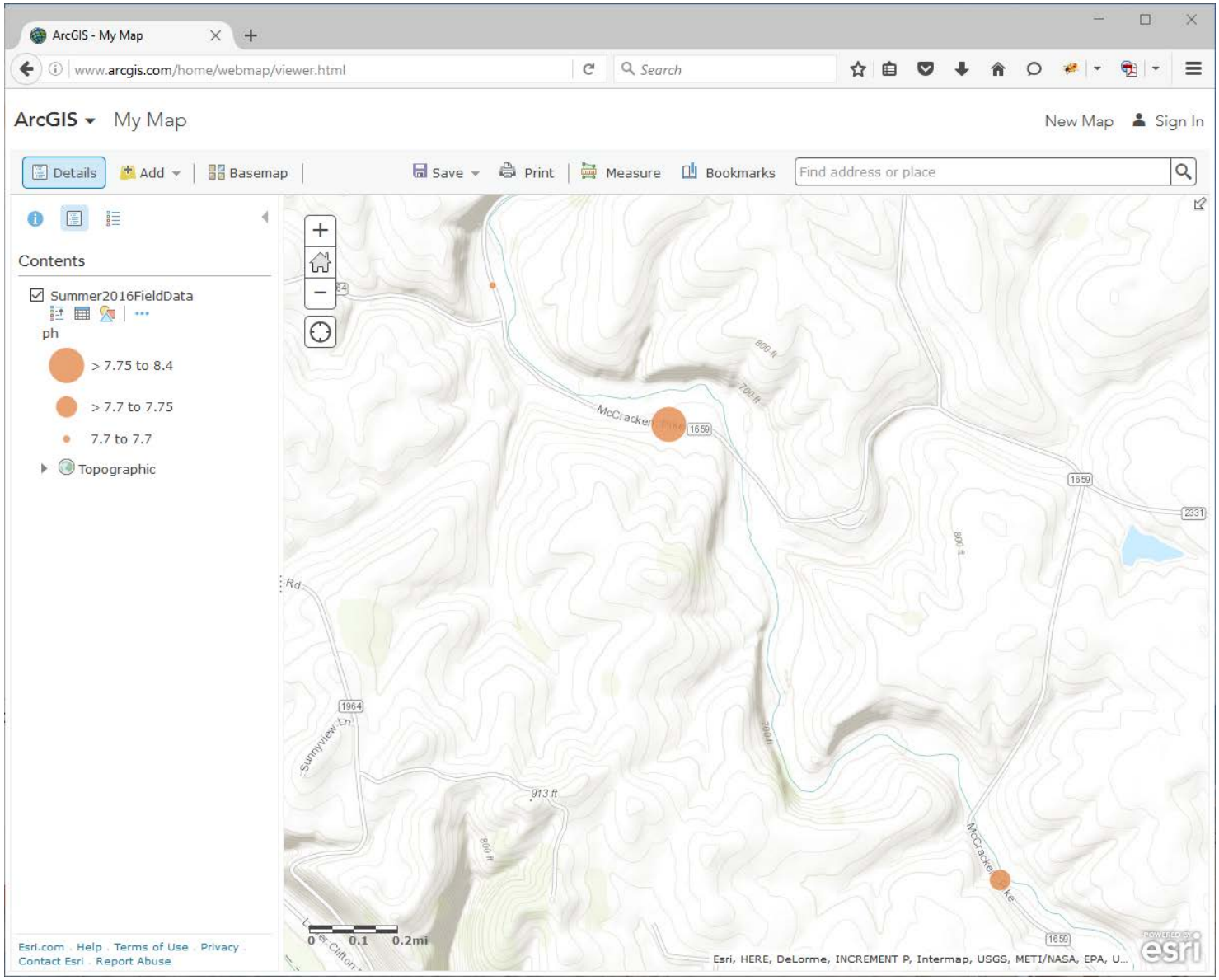
6. Drag-drop the created delimited text file into the opened map in browser or click “Modify Map” at top right and “Add Layer From File”



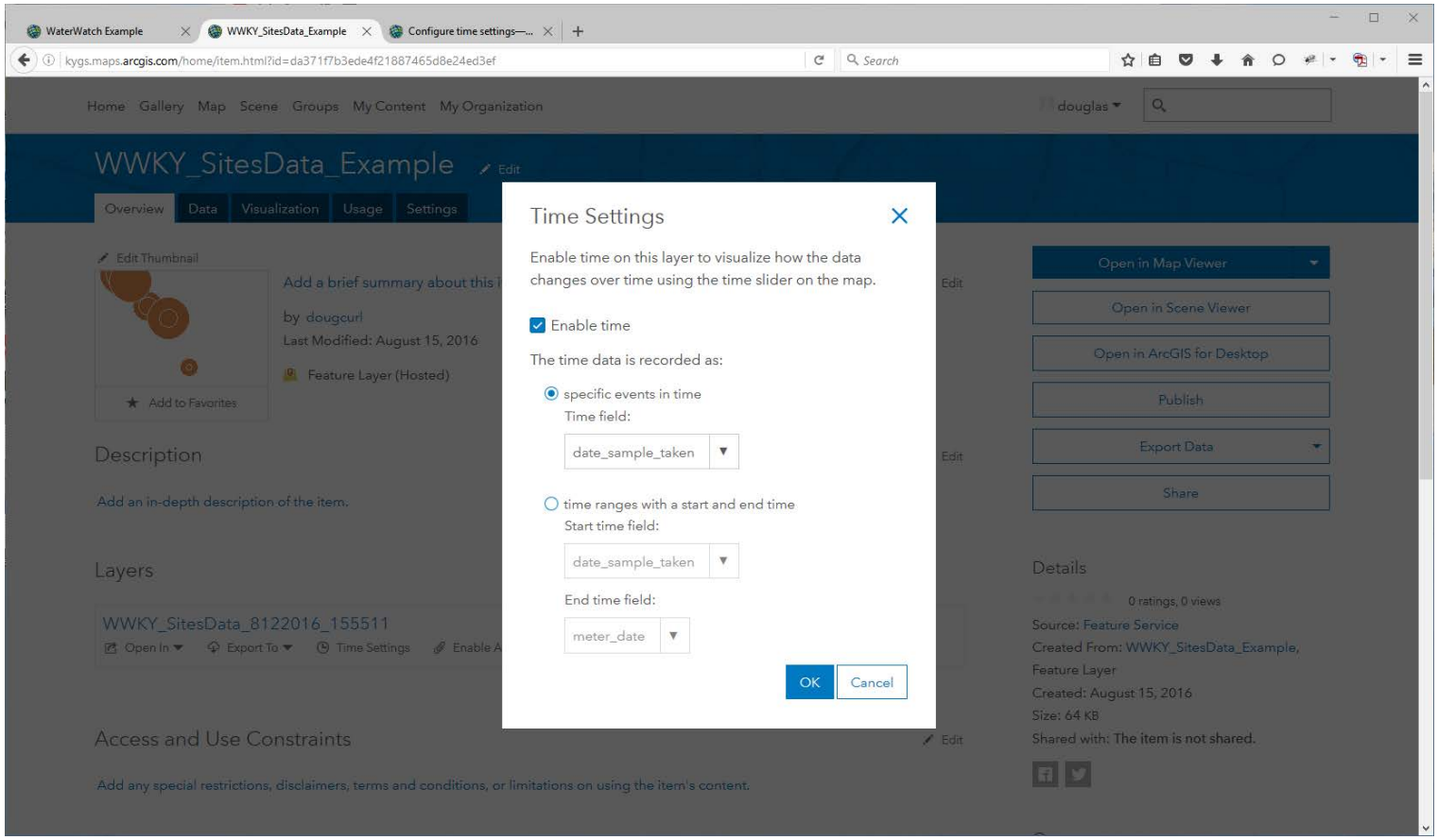
7. Add CSV Layer: select the location field for Latitude and Longitude (named: Latitude_NAD83 and Longitude_NAD83). Click “Add Layer”



8. Points should plot onto the map, and map will zoom to that area. Now you can symbolize the points to show relative values. One left select “Choose an attribute to show”. The drawing style “Counts and Amounts (Size)” will display automatically – click options to alter the display or use Color or Heat Map. Play around with it to get a desired map.

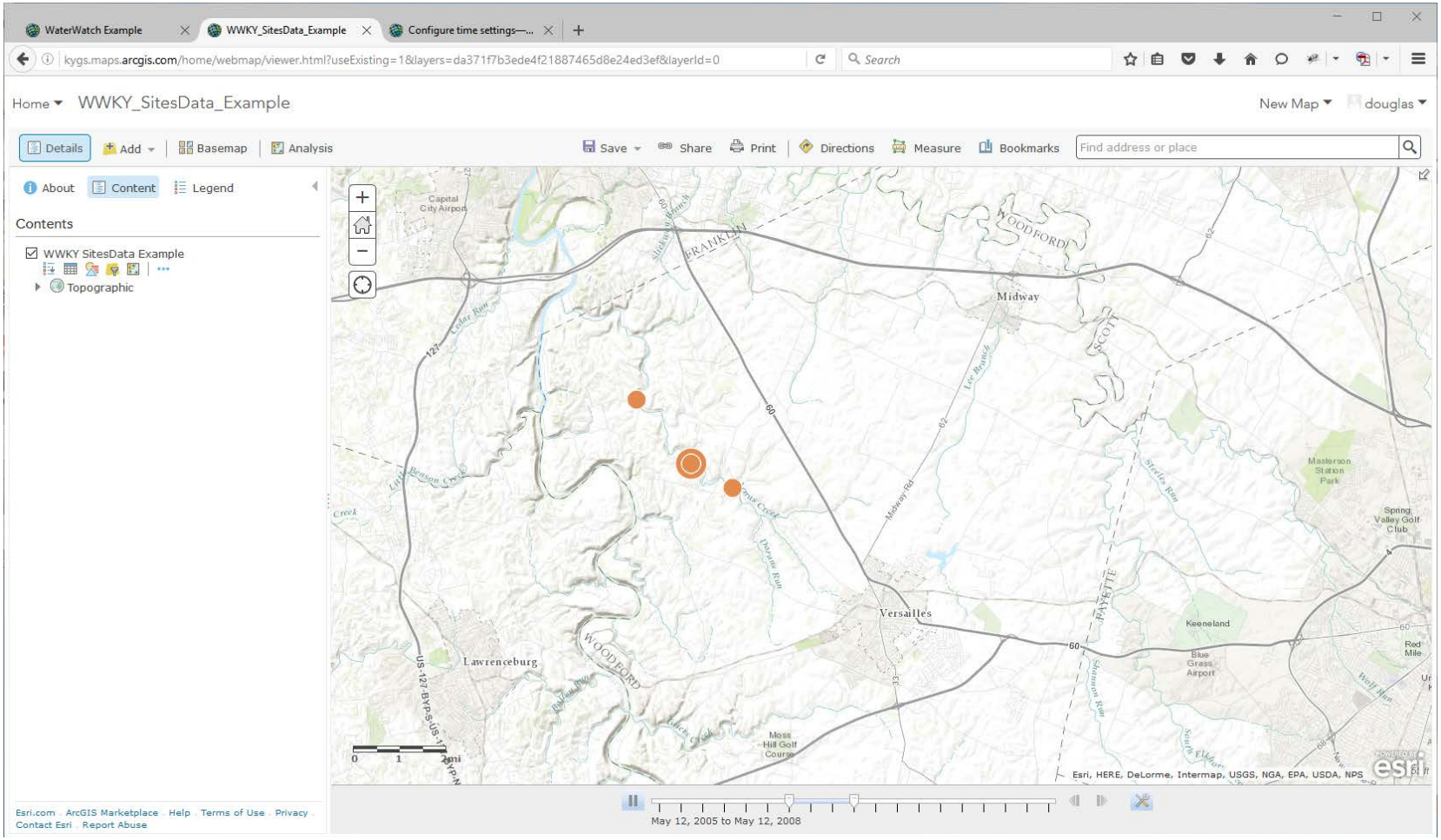


9. You can print the map, or login to ArcGIS Online and you can save and easily share the map as an interactive map with other people.



10. If you login and save the map – you can do other things, such as show all the data with a time-slider:

1. Create an account (if needed) and login
2. Add entire dataset CSV into map
3. Save Layer to your account
4. On Layer details – “Publish Layer” as a hosted layer (right side menu)
5. Open hosted layer details
6. Under layers: click “time settings” – click “enable time” in the popup
7. Open layer in map viewer…



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2. Add entire dataset CSV into map
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4. On Layer details – “Publish Layer” as a hosted layer (right side menu)
5. Open hosted layer details
6. Under layers: click “time settings” – click “enable time” in the popup
7. Open layer in map viewer…
8. And you should see a time slider at the bottom – will need to play with the settings to get desired map.