

Chapter 7 - Hoosier Riverwatch Database

Note: Database password is now case sensitive. Also, please omit all apostrophes (proper names, waterbody names, addresses) as these are misinterpreted and problematic in the database. Lastly, this database is a work-in-progress. We welcome your suggestions and ask that you communicate any problems encountered to us as soon as possible.

Introduction

The Hoosier Riverwatch online database has been in operation since late 2001. Since then it has undergone several updates and improvements; including the latest upgrades completed in autumn 2015. Hoosier Riverwatch is interested not only in your monitoring results but also in having you share your findings with others in your area. Entering data online is a great way to begin doing so.

The database is accessible at www.HoosierRiverwatch.com. A key upgrade is that the database is now accessible via portable mobile devices in the field; assuming the internet is available at your location. Either way, it is a valuable tool allowing you to store, view, and retrieve tons of stream data. It also makes stream data available to the public, other volunteers, agencies, and anyone else interested in Indiana's water quality.

All are welcome to search, view, and download data from this database. However, only data collected by trained Riverwatch volunteers may be entered into the database. If you happen to have Indiana surface water data collected under another program, whether professionally or by volunteers, we invite you to enter and share it using the Secondary Data Portal at IDEM. This allows an even greater flexibility to store and share data with those working to assess and improve Indiana's watersheds.

Paper or Electronic: the Choice is Yours

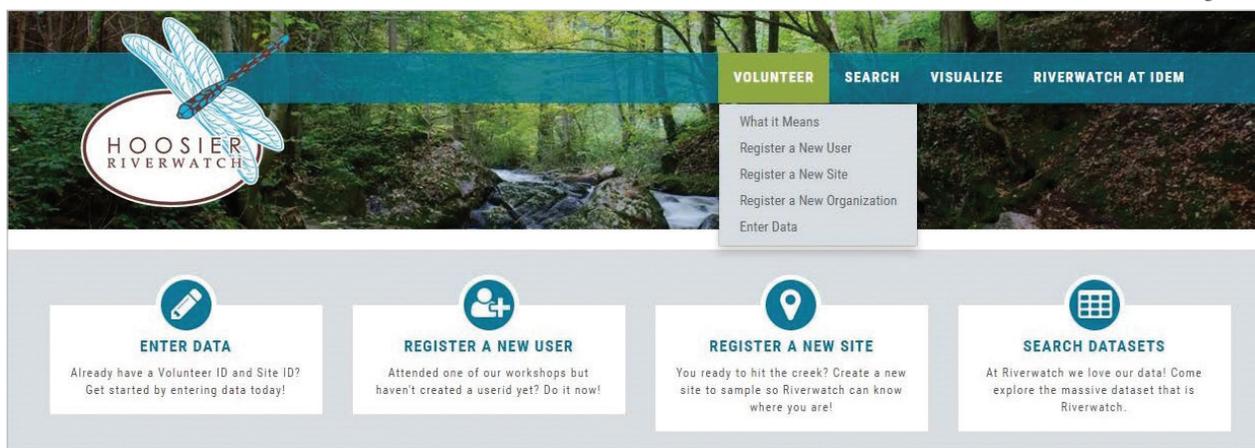
Many of you will prefer using paper data sheets in the field and, then, entering your data later. Others may opt to enter data directly into the database using a tablet or other handheld electronic device.

If paper sheets are used, please keep them handy for a while so you can refer to them again, in case someone in your group or at IDEM wishes to clarify an entry. HRW staff try to conduct quarterly checks on what is entered into the database.

Database Home Page (Figure 37)

Welcome to the newly designed database. We think you will find it handy to use. You may access the areas discussed in this chapter via either the front screen itself or one of the drop down menus above.

Figure 37

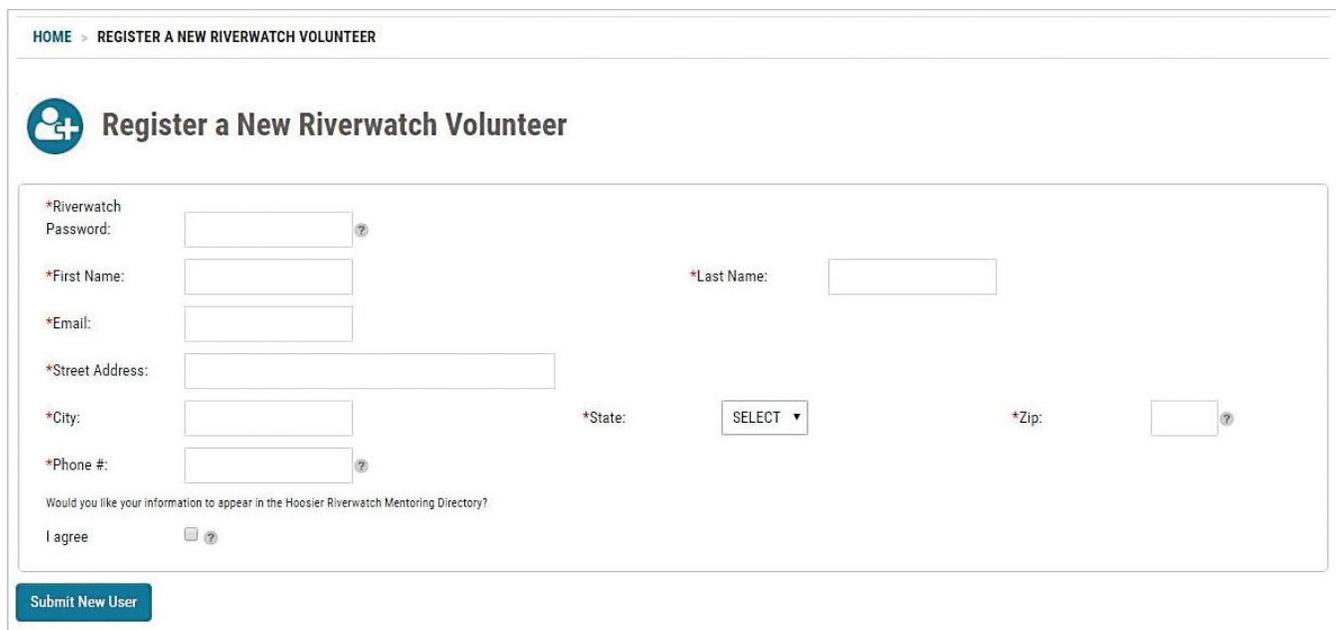


Registering A New User

To enter your stream data, you first need to register yourself and your sites into the database. If sampling for one or more organizations, you can add them to the database also, if they are not already registered. You will need the database password, given during the workshop, to register and submit data.

Creating a new user in the Hoosier Riverwatch database is simple. (Figure 38) Please be sure to fill out all of the required fields as noted by the red * in front of the title. Hovering over or clicking the small gray “?” to the right of some entry fields will help clarify the information or format that is needed here, such as indicated in Figures 39 and 40:

Figure 38



The screenshot shows a web form titled "Register a New Riverwatch Volunteer". At the top, there is a breadcrumb trail: "HOME > REGISTER A NEW RIVERWATCH VOLUNTEER". Below the title is a form with several input fields, each marked with a red asterisk to indicate it is required. The fields are: "Riverwatch Password:", "First Name:", "Last Name:", "Email:", "Street Address:", "City:", "State:" (a dropdown menu currently showing "SELECT"), and "Phone #:". There is also a "Zip:" field. Below the fields is a checkbox labeled "I agree" with the text "Would you like your information to appear in the Hoosier Riverwatch Mentoring Directory?". A blue "Submit New User" button is located at the bottom left of the form area.

You will only need to register as a user one time. The screen will momentarily affirm your registration and give you a User ID. You will get an e-mail confirmation of this as well and, if you forget to write it down, you can always look it up in the database itself, as you will see shortly.

Users may collect data for any number of organizations, as several do. You will be given the opportunity to include an organization at the time of data entry.

Register a Monitoring Site (Figure 41)

With nearly 2,000 sites recorded, it is possible that your site has been sampled already. Per the Instructions, please check the Current Sites tab on the right side of the registration page to find out (Figures 42 and 43). Zoom in to find your intended sampling location (Figure 44). If this location has been sampled before (as indicated by a blue pointer), simply record and use the same Site ID for your own monitoring efforts. If no Site ID exists for your location, use this page to create one.



Figure 39



Figure 40

Figure 41

HOME > REGISTER A NEW RIVERWATCH SITE

Instructions Current Sites Site Locator

Register a New Riverwatch Site

*Riverwatch Password: ? *Volunteer ID: ?

*River Name: ?

*Nearest City: *County:

*Site Type: ?

If you do not know your site's latitude and longitude, please use the Site Locator tool. Otherwise, please enter your Latitude and Longitude in decimal degrees.

*Latitude: ? *Longitude: ?

If you do not know your watershed, [click here](#) to see a state map of the watersheds!

Watershed: ?

Description of site: Please describe the location of your sampling site using road names and other obvious landmarks

Description:

Submit New Site

Please Review

1. Before you begin creating a new site, first check to see if the site is currently in the Riverwatch system by using the Current Sites tab. If it does exist, simply use the site's ID number when you enter your data.
2. If the site does NOT exist then create the new site by filling out the form on this page. Use the Locator tab on this page to pin point your longitude and latitude. Drag the pin on the map to fill in the needed material.
3. Please give a brief description of your location, noting any roadnames or other obvious landmarks.

Forgot your ValidID?

You may use the Site Locator tab (Figure 45) on the page to find the correct coordinates for your new site. Be sure to grab and drag the red pointer with you as you scroll around the map, especially when you zoom in, as it will not do so automatically. The coordinates for wherever the pointer is resting will populate the latitude/longitude fields for you on the site entry page. When the pointer is in the correct position, simply complete and submit the form to register a site.

Otherwise, please use a GPS or other handy tool to determine the latitude and longitude of your site(s). Be sure to accurately convert these to decimal degrees and be very careful how you enter them. Reversing the order or forgetting a negative sign on the longitude field will make your site appear to be in another part of the world! Do the same for each site.

Please note that the HRW database is not georeferenced; meaning that selecting coordinates does not assign a county, watershed or even state to your sampling site. You must select each of these individually when registering a site (Figure 46). If selected incorrectly, it will make searching for and retrieving data for this site difficult. If you are unsure which watershed your site lies in, visit the Indiana Hydrologic Unit Code finder at: <http://in.gov/idem/cleanwater/pages/huc/>.

Figure 42

Instructions Current Sites Site Locator

Please Review

1. Before you begin creating a new site, first check to see if the site is currently in the Riverwatch system by using the Current Sites tab. If it does exist, simply use the site's ID number when you enter your data.
2. If the site does NOT exist then create the new site by filling out the form on this page. Use the Locator tab on this page to pin point your longitude and latitude. Drag the pin on the map to fill in the needed material.
3. Please give a brief description of your location, noting any roadnames or other obvious landmarks.

Forgot your ValidID?

Figure 43

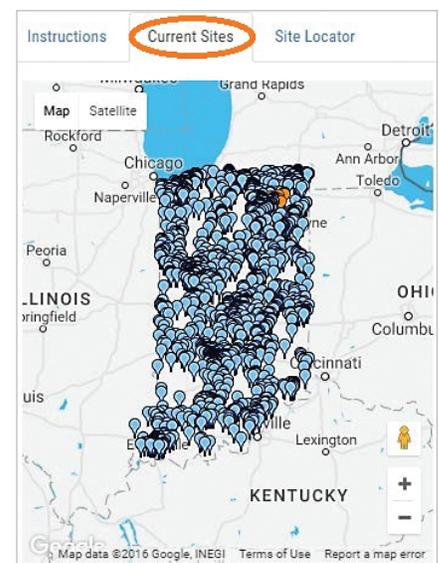
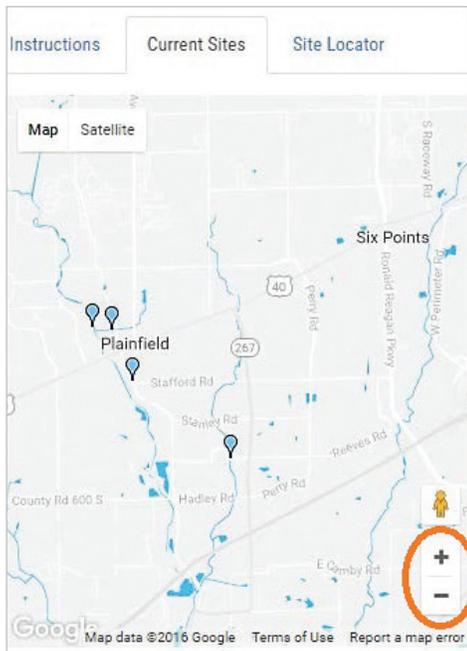


Figure 44



Before submitting, write a short description of the area around your site; referencing permanent structures (crossroads, bridges, parks) and distances /directions from these. This will aid in data retrieval and analysis, as well as allow for additional sampling by other volunteers at this location in the future. Please do not describe locally known or temporary information, such as Bob’s house or the Keller farm; as these things change over time and will not aid others in finding this sampling site or using its data. Another helpful tidbit is to mention if you sampled upstream (u/s) or downstream (d/s) of the location described.

Click the Submit New Site button to register your site into the system and generate a Site ID. Please record this number or print the page for your records. You will need it to enter data. You should also receive an e-mail confirming each site registration with their respective Site IDs.

Registering an Organization

With the most recent database upgrade, organizational information was separated from volunteer/user information and now exists on its own. You may select the organization for whom you are sampling while you are entering stream data. At that time, you will be prompted to check whether the organization exists in the database (Figure 47). You will also be able to register it, if it is not yet in the database (Figure 48), and will be aided by the formatting and other hints described earlier in this chapter.

Figure 45

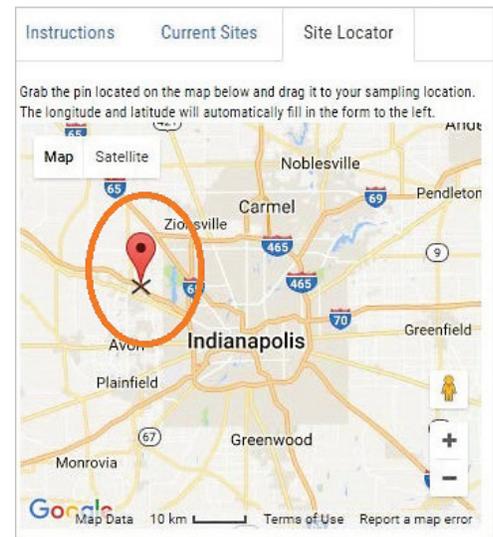


Figure 46

*Site Type: ?

If you do not know your site's latitude and longitude, please use the Site Locator tool. Otherwise, please enter your Latitude and Longitude in decimal degrees.

*Latitude: ? *Longitude: ?

If you do not know your watershed, [click here](#) to see a state map of the watersheds!

Watershed: ?

Use the link above to find your watershed on a map. Contact Hoosier Riverwatch if you still are not positive about your watershed

Description of site: Please describe the location of your sampling site using road names and other obvious landmarks

Description:

Figure 47

The screenshot shows the top navigation bar with links for VOLUNTEER, SEARCH, VISUALIZE, and RIVERWATCH AT IDEM. The Hoosier Riverwatch logo is on the left. The main content area is titled "REGISTER A NEW ORGANIZATION" and includes a "Regist" icon and a list of instructions. A dropdown menu is open, showing a list of organizations such as Adams Lake Conservation Club, Alexandria Community Schools, and Ball State University. The "Organization:" label and the dropdown menu are circled in orange. An orange arrow points to the dropdown menu. A "Submit New Organization" button is at the bottom left, and a "I don't see my organization" button is at the bottom right.

Figure 48

The screenshot shows the "Register a New Riverwatch Organization" form. It includes a "Regist" icon and a list of instructions. The form fields are: *Riverwatch Password, *Organization Name, *Name of Contact, *Street Address, *City, *State (dropdown menu), *Zip, *Phone #, and Organization Website #. A "Submit New Organization" button is at the bottom left. A "Let me see that list again" button is at the top right. A tooltip "Must start with http://" is visible over the Organization Website # field.

Entering Water Quality Data

Only those who have a valid Volunteer ID, Site ID and password may enter data into the Hoosier Riverwatch database. The data entry page (Figure 49) offers assistance in looking up these ID numbers via the tabs on the lower right side of the screen. Once entered, your first name and waterbody name will appear in the upper right corner of the screen (Figure 50). It will list the day of the week, date, hour of the day and time spent at the site. It will also graphically display the samplers and weather you entered for this event. If either of these are incorrect, you may have a typo in an ID number. If anything else is amiss you may see a pop up screen (Figure 51) advising you that something was entered incorrectly and should be double checked. Simply close that window, make the necessary corrections and carry on.

Figure 49

The screenshot shows the 'Enter New Data Sets' form on the Hoosier Riverwatch website. The form includes the following fields and options:

- Navigation:** HOME > ENTER NEW DATA SETS
- Header:** HOOSIER RIVERWATCH logo and navigation tabs: VOLUNTEER, SEARCH, VISUALIZE, RIVERWATCH AT IDEM
- Form Fields:**
 - *Riverwatch Password: ?
 - *Volunteer ID: ?
 - *Site ID: ?
 - Organization: ? (Dropdown menu: No specific organization)
 - *# Adults:
 - *# Students: (Input: 0)
 - *Sample Date:
 - *Time of Day: (Dropdown menu: Select)
 - *Time Spent: (Dropdown menu: Select)
 - *Weather at Sample Time: (Dropdown menu: Select)
 - *Worst Weather Past 48 hours: (Dropdown menu: Select)
- Buttons:** Start Data Collection
- Right Side:** Instructions, Current Sites, Vol ID Lookup tabs; Please Review section with 4 numbered instructions.

Figure 50

The summary card displays the following information:

- Name:** Carol Newhouse
- Location:** Little Brandywine Creek (Site # 2426)
- Date/Time:** Monday October 31, 2016 @ 12 pm for 1 hours
- Weather:** Event Weather and Recent Weather icons.

Figure 51

The error pop-up window contains the following text and elements:

- Message:** You did not enter the correct Hoosier Riverwatch password
- Button:** Close Window

You will also be asked to provide basic information about your sampling event; such as number of adults and children on the sampling team, current and recent weather conditions, hour of the day, time spent sampling, and so on. Take good field notes during your sampling event, especially if you plan to enter the data on a later date. Although easily overlooked, having this information may add to a greater understanding of possible impacts effecting stream water quality on the day that you sampled.

Once finished, click the “Start Data Collection” button in the lower left. This will take you to the Sampling Results page (Figure 52). This is your keystone for data entry. It contains the Welcome, Flow, Habitat, Chemical, Macros and Photos tabs; which will be discussed in some detail below. Four of these tabs correspond directly to the data sheets used in the Hoosier Riverwatch program. This page also shows the last time you, personally, sampled this site (left side of the Welcome tab), a map of the site (header bar at top of page), and sampling conditions for the data you are about to enter (see Figure 48, again).

Figure 52

Sampling Results

Welcome Carol Newhouse

LAST SAMPLES AT SITE

INSTRUCTIONS
Use the tabs below to enter relevant data collected during this sampling event. You may alter the entries under any tab until you hit the green 'Submit Data to Riverwatch' button to the right of this page. Any corrections needed after that can be e-mailed to the Riverwatch staff at IDEM.
If you have any questions please contact us via [email](#).

Comments about this sampling event (unusual weather or creek conditions, wildlife seen, etc.):

Flow

Habitat

Chemical

Macros

Photos

Carol Newhouse
Little Brandywine Creek (Site # 2426)
Monday October 31, 2016 @ 12 pm for 1 hours

Event Weather Recent Weather

Test	Result
Test	WQI
WQI Total	

Submit Data to Riverwatch

On the lower right hand side you will see scores and calculations occurring while you are entering data. Be advised that the database will no longer time you out. This allows ample time to complete your data entry. But it also warrants caution on your part to protect your work from unauthorized users.

The Welcome tab contains an area for comments. It is a handy place to record unusual things that occurred while sampling; who was there, animals, plants or unusual conditions that you observed, etc. There are also live links here to past sampling events, as well as e-mail contact for Hoosier Riverwatch staff.

Each of the data entry tabs opens with a Home tab, which contains basic descriptions or instructions for this portion of the data entry. Any one of the tabs listed here may contain charts with live data links to the database. Where pertinent, there will also be links to portions of the online training manual relevant to the topic you are in. There is also an orange bar (Figures 53 or 54) in the lower portion of each tab tracking calculations as you enter data. When finished, the scores for these may be seen on the right hand side of the Sampling Results page.

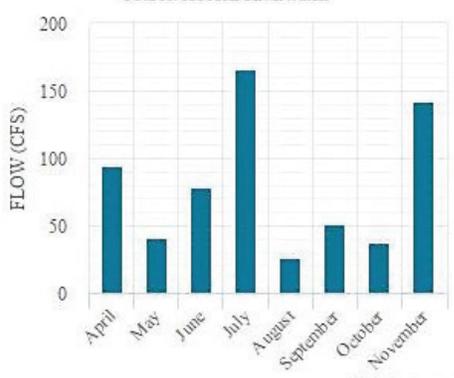
Figure 53

Flow

Home
Width
Depth
Velocity
Coefficient

AVERAGE FLOW

Source: Hoosier Riverwatch



Highcharts.com

Discharge is the amount (volume) of water flowing through or from a stream or watershed at any given moment in time. Stream discharge is commonly expressed in cubic feet per second or *cf/s* (sometimes *cfs*). This measurement is important because it influences other physical, chemical, and biological factors within a stream (i.e., all of our other tests!). A high discharge rate may indicate recent rainfall or snowmelt events. When a large amount of rain runs off the land, it often carries sediments and nutrients to the stream. Very low discharge rates may indicate drought conditions, which also affect water quality and aquatic life.

We calculate the discharge rate by multiplying the average width, depth and velocity of the stream. Length measurements are taken/entered, should be converted into feet. Speed or velocity, into feet/seconds.

Use the remaining four (4) tabs above to enter the measurements needed to calculate flow. The database will calculate flow for you using the following formula:
 Flow or Discharge (D) = Width (W) x Depth (Z) x Velocity (V) x Roughness Coefficient (n)

The orange box below will give you a running update on the values entered into the calculation and a small check mark will appear on the tabs which contain data.

For more details about measuring your first flow visit, download the Manual below.

Download Manual



Flow/Discharge (D) during this sampling event was: $W \times Z \times V \times n =$

Figure 54

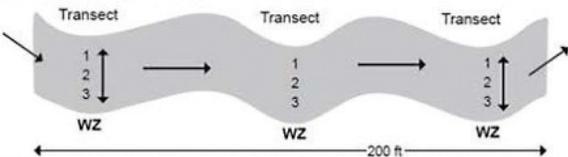
Flow

Home
Width
Depth
Velocity
Coefficient

Width

River Width

(one measurement at each transect)



Average Width (W) = Measure width of the stream (the water itself) taken from where it touches the stream bank on one side to where it touches the stream bank on the other side; take three measurements for width as indicated in the diagram; whenever possible, measure areas that appear most representative of your entire 200-foot sampling site section.

Input up to three (3) width measurements; one into each box below. Remember to convert centimeters and/or inches into feet.

First Transect

 ft ?

Second Transect

 ft ?

Third Transect

 ft ?

Average Width of Sampling Site

 ft

Flow/Discharge (D) during this sampling event was: $4.27 \times Z \times V \times n =$

You only need to open and use the tabs for the data collected for this sampling event. Close one tab before opening the next to make viewing easier when using a mobile device. Otherwise, just keep scrolling! Again, the database will no longer time you out. However, attempts to close the page without clicking Submit will result in a pop up asking you to confirm whether or not you wish to leave the page. If you are satisfied with your data entry and resulting calculations, you are done and may leave. The database will save any data you enter, regardless of whether it is complete or partial. To add missed data or fix a data error, contact Hoosier Riverwatch staff.

Where indicated in each tab, select the method or equipment you used during your sampling event (Figure 55). In most cases, units of measurement have been preselected. Just be sure you enter the correct data for the given units for each parameter.

The Flow tab (Figure 53, again) contains individual tabs (left to right) for entering the Width, Depth, Velocity and Coefficient for your stream. Entry fields are provided for triplicate measurements (Figure 54, again). As you learned in the training workshop there are times when multiple readings are important and times when they are optional. Width needs three readings, as shown in the River Width/Transect diagram (Figure 54) below and page 30 of this manual.

The Depth tab contains nine data entry fields, corresponding to three readings along each of the three stream transects. These are all in feet and tenths of a foot, as indicated by the preselected unit of measurement. As you enter data, you will see the average for each transect change, as will the overall average for the site in calculated (gray) fields and in the orange calculation bar lower down on the page. You will also note that a green check mark appears next to the name of each tab when data entry has been completed for that tab.

The same holds true for the Velocity and Coefficient tabs. When the last (or enough) of the data has been entered, the database will make the final calculation and display it on the right hand side bar on your screen (Figure 56).

Under the Habitat tab you will enter data collected for the Citizen's Quality Habitat Evaluation Index (CQHEI) score. The Home tab here shows the average for this site, as well as the watershed and the entire state. Subheadings under this category match the data sheet used and include Substrate, Fish Cover, Shape/Alterations, Forests/Wetlands, Depth/Velocity (descriptive data, rather than measurements collected for Flow above), and Riffles/Runs. Follow directions under each tab to know whether to pick only choice or multiple choices. While there is no orange calculation bar at the bottom of these tabs, there is an area which shows your CQHEI score adding up.

Under the Chemical tab you will again see tabs for all of the parameters covered during training and included on the field/data sheets. Follow the instructions included under each tab and described above. The database will automatically make and display calculations for you. If/When enough parameters have been entered to determine a Water Quality Index score for this event, it will display on the right hand side of your page again (Figure 54). Otherwise, the database will simply store and show the data collected without a WQI score. Either one is fine.

A new feature to the database is the ability for you to enter any (and as many) additional samples you may have collected during a sampling event. Using the last tab, labeled "Secondary", you can select any number of parameters with their respective methods and add results to the database for these.

Figure 55

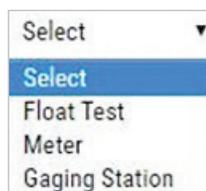
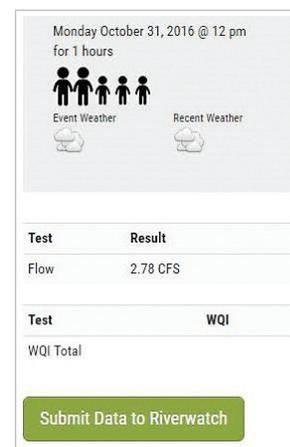


Figure 56



Data entry under the Macros tab works similar that for Habitat described above. The Photos tab is a new addition, allowing you to finally store that Site Map you drew or drop in a few key photographs of the site, unique plants or animals, and/or your sampling crew. When you are satisfied that your data entry is complete click the green Submit Data to Riverwatch button (also Figure 54) to finish. You may contact Hoosier Riverwatch staff to make any necessary corrections to your dataset, should it be needed.

Search the Database

With nearly 11,000 record sets in the Hoosier Riverwatch Database, finding data specific to your group, location or even to you as an individual can seem daunting. However, the Search and Visualize features will allow any user to find information quickly and easily.

Selecting Search in the title bar at the top of any page in the database will take you to the main Search page (Figure 57). Initially you will see three criteria boxes with which to begin your data search. Your first set of choices are Watershed, Waterbody Name and County. Clicking the blue More Search Criteria button at the lower left will toggle three additional criteria boxes on and off. These additional options include Site ID, Organization, and Volunteer/User ID.

Figure 57

Search Hoosier Riverwatch Database

Use the search boxes below to explore water monitoring results for Indiana waters collected by volunteers and organizations over the last 20 years.

1. Begin your search by selecting a Watershed, County or specific Waterbody of interest or any combination of the three. Note that a new set of results are returned after each search term is entered. Due to the large number of results in this database, you will need to give the system a moment or two to conclude its search before changing/adding search terms or filtering the data.
2. Open the "More Search Criteria " button to add selections by Site ID, Organization, or User ID.
3. If you want to start your search over, click on the "Clear Search" button below the search boxes.
4. Search results can be further filtered for a specific parameter and test method using the dropdown list located at the top of the results table.
5. In the results table, you can click on the Map button to see where each site found is located.
6. You can also download your results in MS Excel format by clicking on the "XLS Spreadsheet" button at the upper right corner of the results table.

Watershed:

Blue-Sinking (05140104)
▼

Select from one of the watersheds in the state of Indiana. Once you select a watershed, the name of the watershed the system is searching will appear next to the magnifying glass below.

🔍 05140104

Waterbody Name:

Begin by typing the name of your waterbody of interest into the search field to bring up a list of waterbodies to choose from. Note that if you have selected a watershed, only waterbodies in that watershed will appear on this list. When you find your waterbody of interest, click on "Add to Search" to begin the search.

🔍

County:

Select
▼

Select a county from the drop down list above. The number of counties that appear in this list depends on the other search fields you have chosen. Note: Due to some duplicative river names, the search might fail if a watershed AND river have been selected prior.

🔍

Site ID:

If you wish to search for data collected at a specific site, you will need to have the Site ID. If you are the person that registered the site, this will have been provided to you via email with your registration confirmation. If you are looking for results for a site you found in a previous search, you can simply enter the Site ID from the results table from that search here.

🔍

Organization:

Select
▼

Use the dropdown menu above to search for data collected by a specific organization. If you don't see your organization of interest, check for alternate spellings or abbreviations of its name.

🔍

Volunteer/User ID:

If you wish to search for data you have entered into this system, you will need the User ID provided to you via email with your registration confirmation. If you are looking for results entered by a user identified in the results for a previous search, you can simply enter the User ID from the results table from that search here.

🔍

Select all test from riverwatch where code=05140104

WE ARE SEARCHING. PLEASE WAIT.....

You may search by any one of these criteria alone or sequentially. Give the database a moment to complete its search for the first criteria before adding the second and so on. While it is searching you will see the message (below the criteria boxes) which reads "We are searching. Please wait." You will also see the criteria you selected in orange text near the magnifying glass in each respective box.

When the search is completed the “Please wait” message will change to orange text and will state the numbers of individual test results and unique sampling trips found. The page will automatically scroll down to show the beginning of the data table below. There may be many pages in the data table, as the record for each parameter takes up its own row in the table (Figure 58).

Figure 58

Your search came back with 2785 test results in 200 unique sampling trips (Event ID). See the table below.

Select all test from riverwatch where code=05140104

More Search Criteria Clear Search

Show 50 entries Filter by Test: Select Test Filter by Date: Select Date XLS Spreadsheet

Narrow Your Search:

Map	Watershed	Stream	Site ID	Date	Test	Result	Unit	Macro	Macro Count	Event ID	Vol ID	Org
Unique Trip												
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			stonefly	2	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			mayfly	9	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			rifle	4	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			dobsonfly	2	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			damsel fly	2	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			sowbug	1	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			crawfish	4	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			leech	2	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Invert Sampling			maggot	2	1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Pollution Tolerance Index Rating	28	PTI			1691125610212016	1256	Salem High School
	Blue-Sinking	Brock Creek	1691	2016/10/21	Flow	12.04	CFS			1691125610212016	1256	Salem High School

You may wish to filter the data further by Test or Date (which use drop down menus) or type in your own criteria where it says “Narrow Your Search”. You can also sort the data from high to low, old to new, etc. by using the arrows in the column headers.

The blue pointer in the map column will show you the location of the sampling site. If a small blue icon appears in the Event ID column, clicking it will reveal any photos uploaded for this event.

You may also wish to download the data to your own computer/device using the “XLS Spreadsheet” button to the upper right of the table. This is a great way to work with and graph the data in the manner you choose for analysis or presentation to others. You can also use the Visualize tool to view preset graphs of the data you are interested in.

Visualize the Datasets

Visualize is a tool of the Hoosier Riverwatch database that allows a user to do some simple graphs and analysis of the data that has been entered. This tool begins at an entry screen (Figure 59) which asks the user if they wish to compare data from two different locations or look at data from a single location over time. Both options allow you to select and view the data by one or two: watersheds, counties, rivers or sites (Figures 60 and 61).

Figure 59

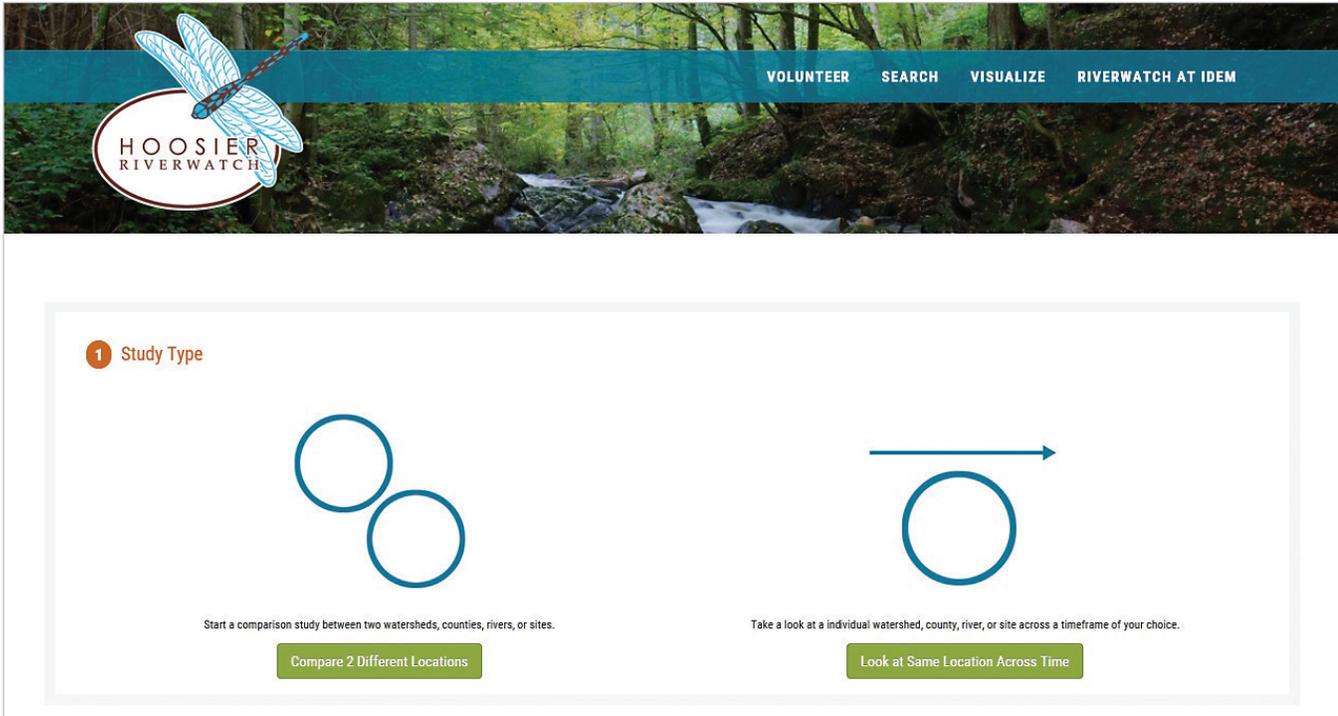


Figure 60

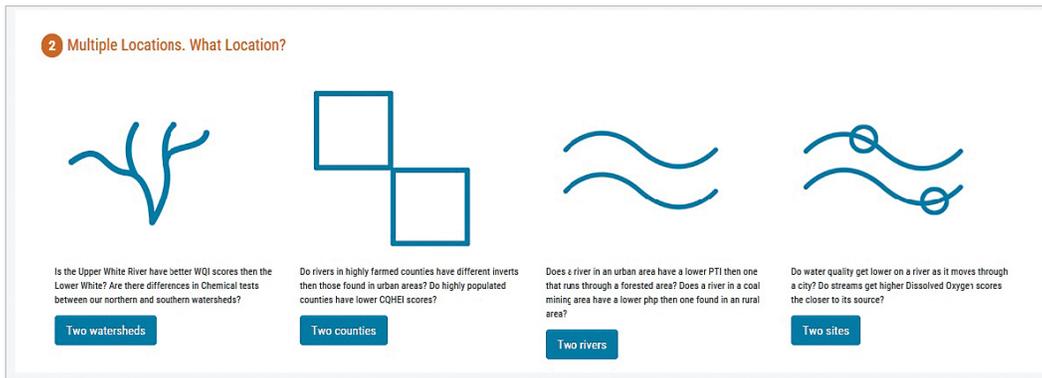
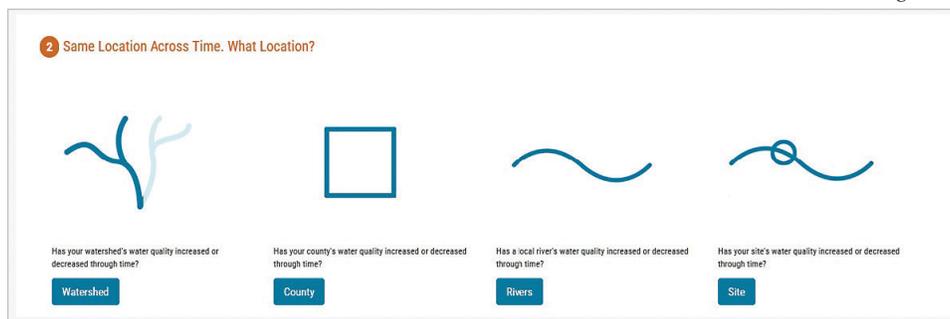


Figure 61



To view data by watershed you may click the correct watershed(s) on the map itself or select from one or two drop down menus (Figure 62). The same for making a county selection (Figure 63). After each selection click the teal button to confirm that “This is (or These are) your choice(s).”

Figure 62

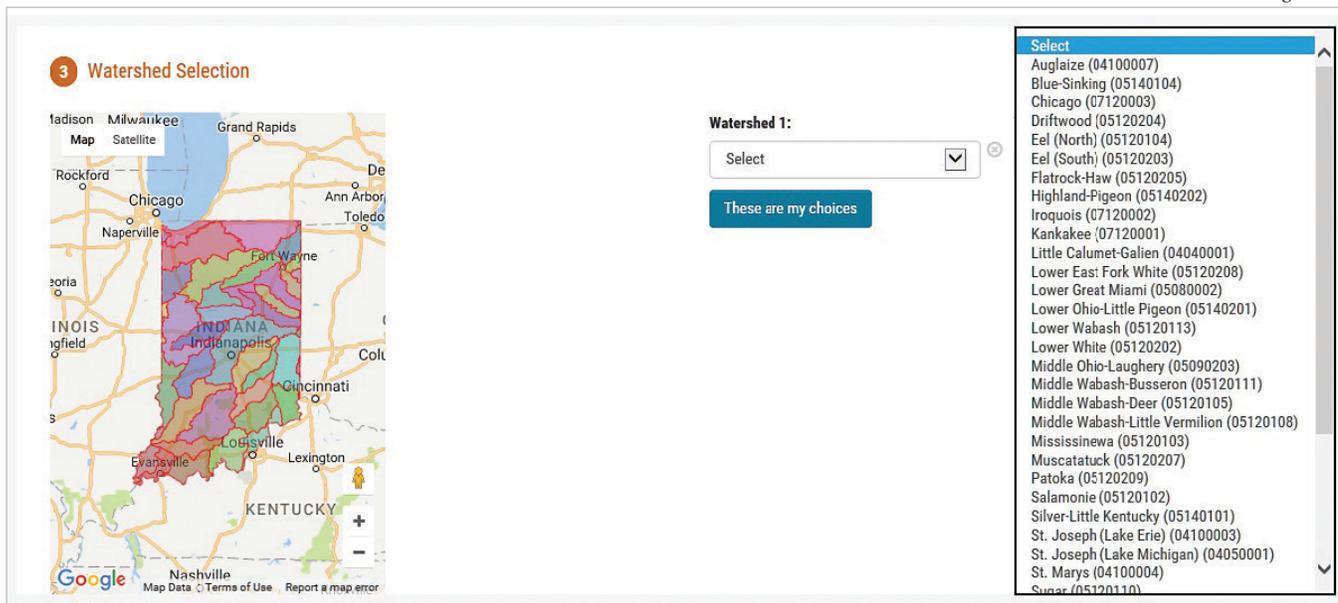
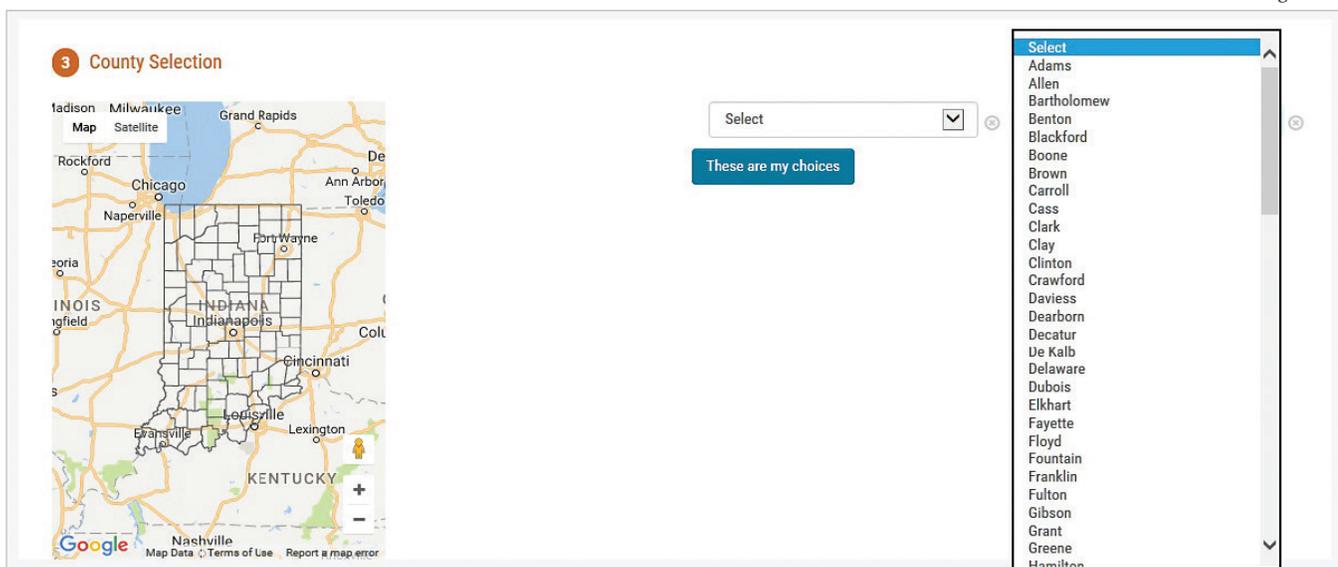


Figure 63



To view by river start by typing, where indicated, the name of the waterbody you are interested in. As you type, the list of possible entries in the database will appear. You may continue typing to narrow the possibilities or scroll down to make your selection (Figure 64).

To view by sampling site the database will present you with a map containing all sites (Figure 65). The light blue pins are Hoosier Riverwatch sites. (The orange pins are for other secondary data; collected outside of the IDEM Office of Water Quality’s Watershed and Assessment Branch.) You can simply enter a Site ID or zoom in to locate and select the sites of interest to you. Clicking on a particular site will reveal its ID number, waterbody name, site description and 12-digit HUC code (Figure 66). As for above, click to confirm that those sites are your choices.

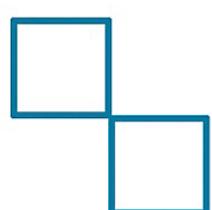
Figure 64

2 Multiple Locations. What Location?



Is the Upper White River have better WQI scores then the Lower White? Are there differences in Chemical tests between our northern and southern watersheds?

Two watersheds



Do rivers in highly farmed counties have different inverts then those found in urban areas? Do highly populated counties have lower CQHEI scores?

Two counties



Does a river in an urban area have a lower PTI then one that runs through a forested area? Does a river in a coal mining area have a lower php then one found in an rural area?

Two rivers



Do water quality get lower on a river as it moves through a city? Do streams get higher Dissolved Oxygen scores the closer to its source?

Two sites

3 River Selection

Waterbody 1:

These are my choices

Waterbody 2:

Quick Creek

West Branch Mosquito Creek

Marquette Park Lagoon

Quail Creek

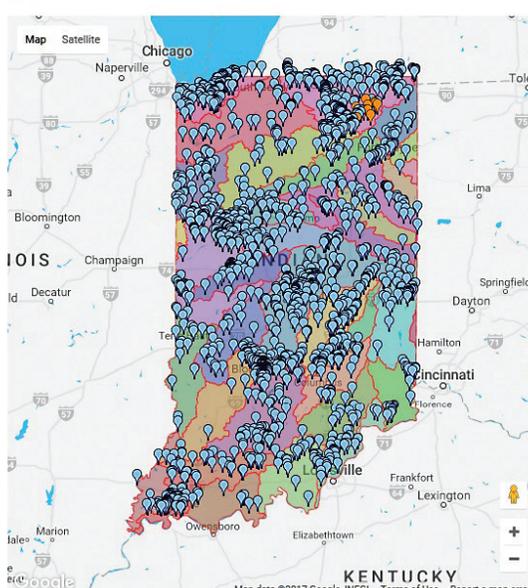
Iroquois River

Iroquois

Squirrel Creek

Figure 65

3 Site Selection



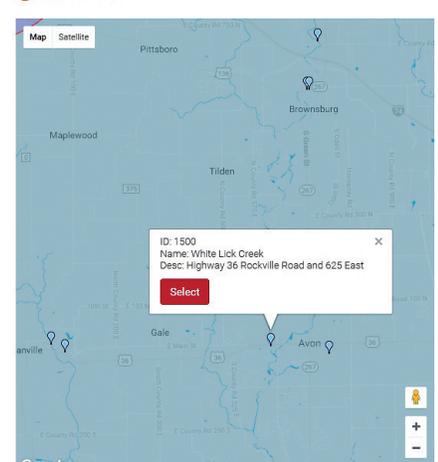
Site 1:

These are my choices

Site 2:

Figure 66

3 Site Selection



Pop-up box: ID: 1500, Name: White Lick Creek, Desc: Highway 36 Rockville Road and 625 East, [Select]

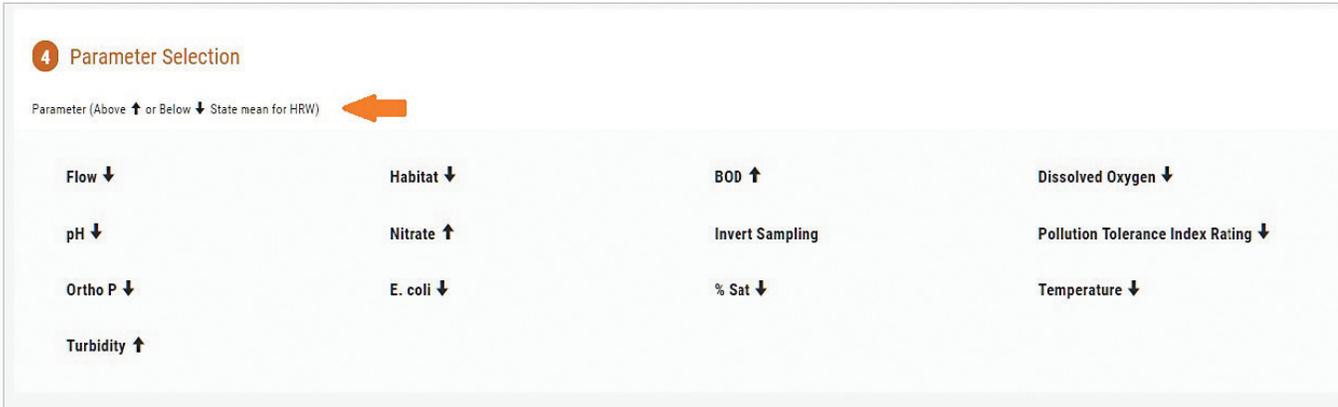
Site:

This is my choice

Parameter Selection

Once you make your selection above a window will open that says “Parameter Selection” (Figure 67). This may take a moment. Parameter names will appear where data exists. However, if no results appear below the header area, that means either the one or both datasets chosen contain no data. If that occurs, simply make another selection and try again. The arrows shown (as indicated in the key below the window name) are a general indication of whether the mean of the data appears to be higher or lower than the mean for the entire, statewide Riverwatch dataset.

Figure 67



Click on one or more of the parameters to view a bar chart (Figure 68), or modified pie chart in the case of macro-invertebrate samples (Figure 69), for the data associated with the watershed, county, river, or site that you chose earlier. The selected parameters will appear in a blue bar and charts will open below (Figure 68, again). Using the small ‘bars’ icon in the upper right of each graph will give you the option to print or download the chart (also, Figure 68). As before, hovering the cursor over an area of the chart will reveal a summary of the data behind that portion of the chart (Figure 69, right hand pie).

Figure 68

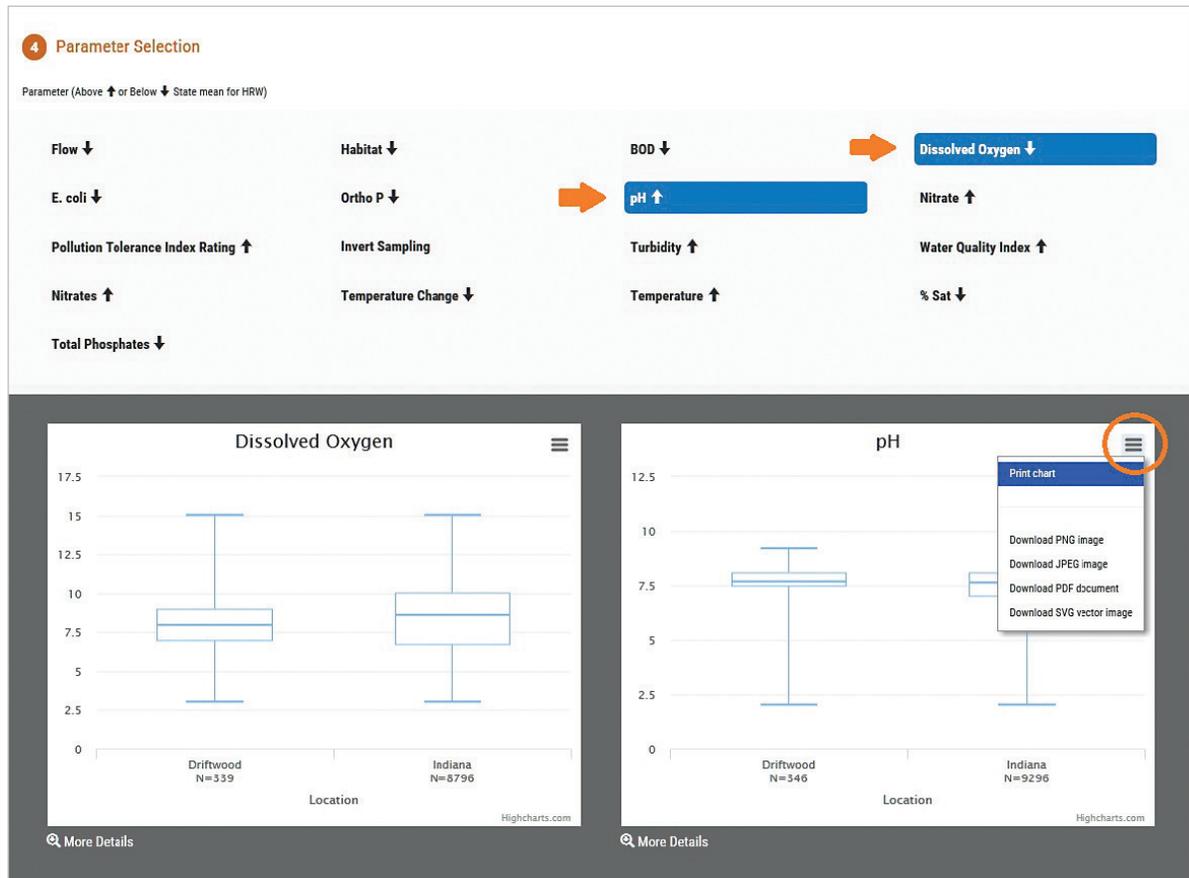
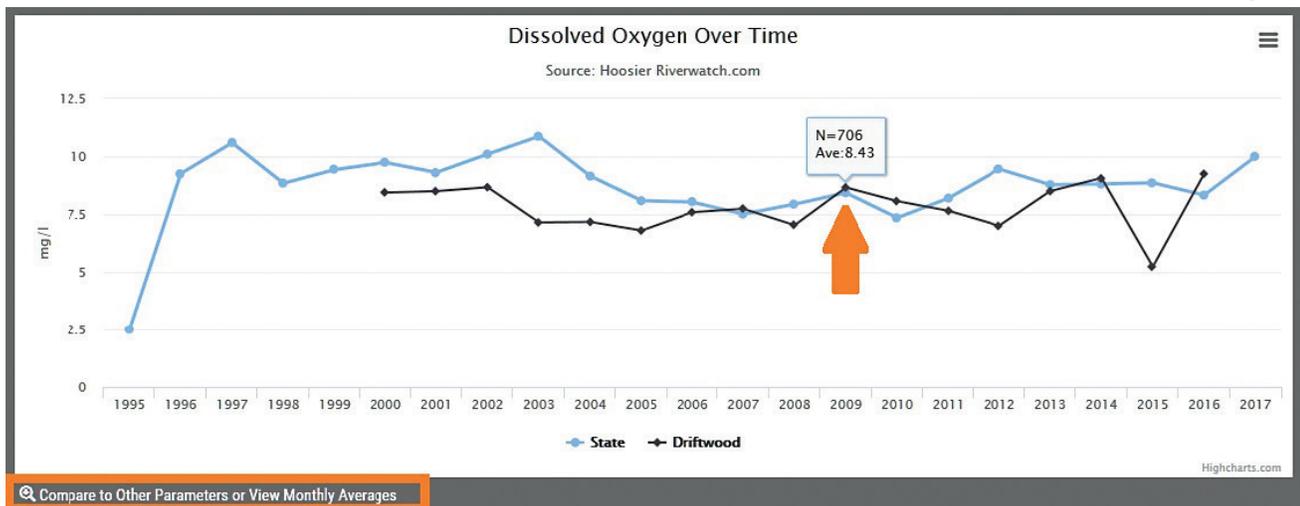


Figure 69



Clicking on “More Details” below the bottom left corner of each bar chart will open a line graph showing your selected data against the statewide average of all data for that parameter in the database (Figure 70). Again, hover the cursor over any data point on this graph to see the average value and sample size associated with a particular year.

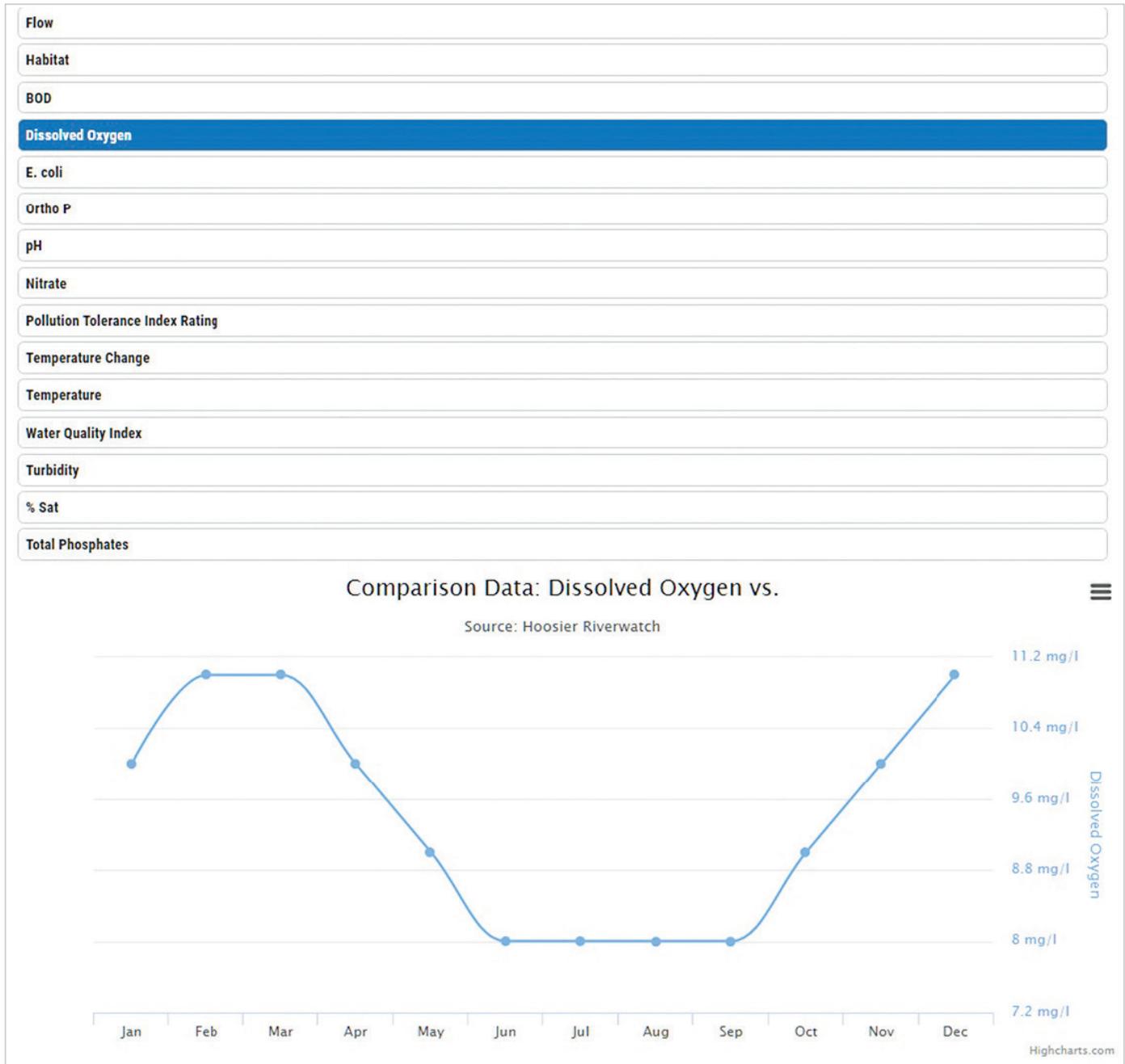
Figure 70



You can continue viewing the data in greater detail by clicking the “Compare to Other Parameters or View Monthly Averages” below the line chart (Figure 70, again). This will allow you to hone in on particulars about the data you are interested in. The monthly averages for only your selection (site, county, river or watershed) will appear, without a statewide average. From this point on, using Chrome or Firefox as your browser will often give you more satisfactory results.

That first click will open a parameter list different from the one you saw previously. It will also open a graph generated according to the parameter you originally keyed the open the comparison window (Figure 71). Clicking on or off any other parameter in this parameter list will generate an additional line on the graph comparing the two parameters from each other; such as in the Dissolved Oxygen vs. Temperature example shown (Figure 72). Note the differing scales (and their related line colors) on the left- and right-hand sides of the graph. You may toggle on any variety of two parameters to compare.

Figure 71



Pay attention to that previous statement. While it may seem easy to say “You may toggle on any variety of two parameters to compare”; the truth of the matter is, it is quite a powerful tool built into the database for your use. With this comparison window open, try turning on and off parameters alone or in pairs to look at the data. Simply graphing data to look for patterns is a great first step towards data analysis. You can see the relationship between water temperature and dissolved oxygen mentioned in Chapter 4 of this manual in Figure 72. Hovering the cursor over data points for a given month reveals both sets of data in this window.

Figure 73, for instance, shows that habitat scores are not always closely related to macroinvertebrate results. In fact the graph may be suggesting that simply finding and collecting aquatic insect samples during the winter months is a difficult task.

Figure 74, on the other hand, suggests that turbidity for any month might almost be predicted by the nitrate results from the previous month; perhaps owing to the time it takes algal growth to respond to the available nitrogen.

Figure 72

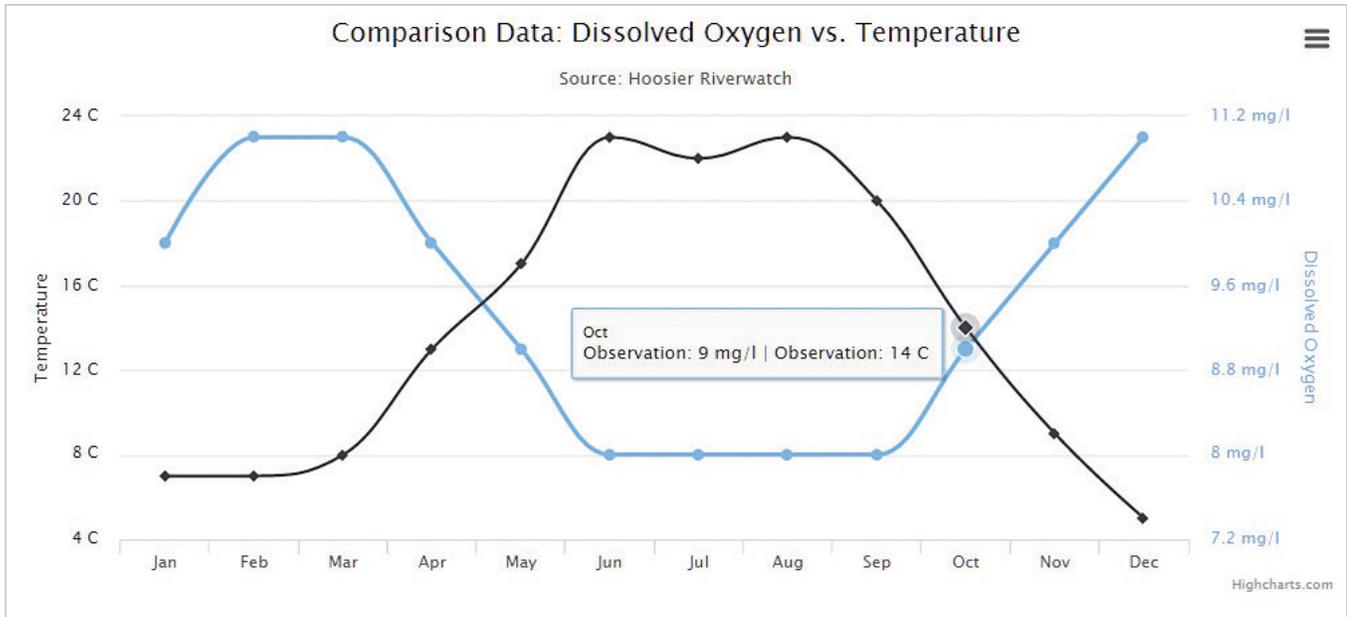


Figure 73

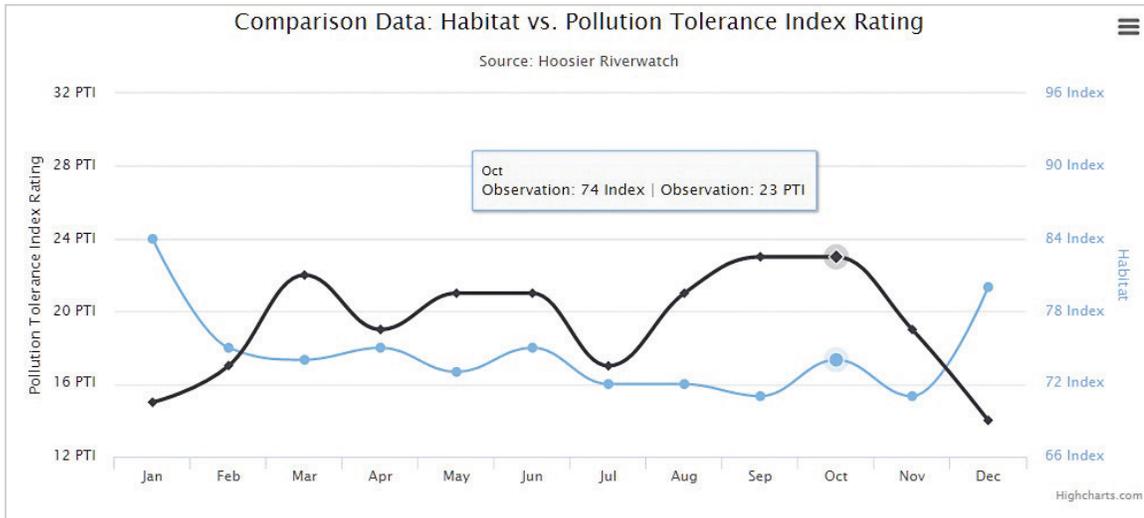
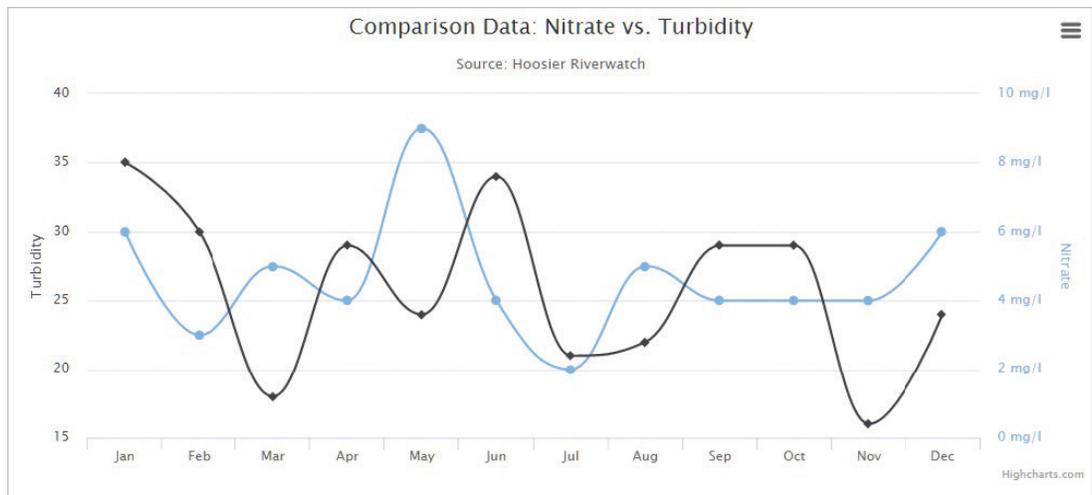
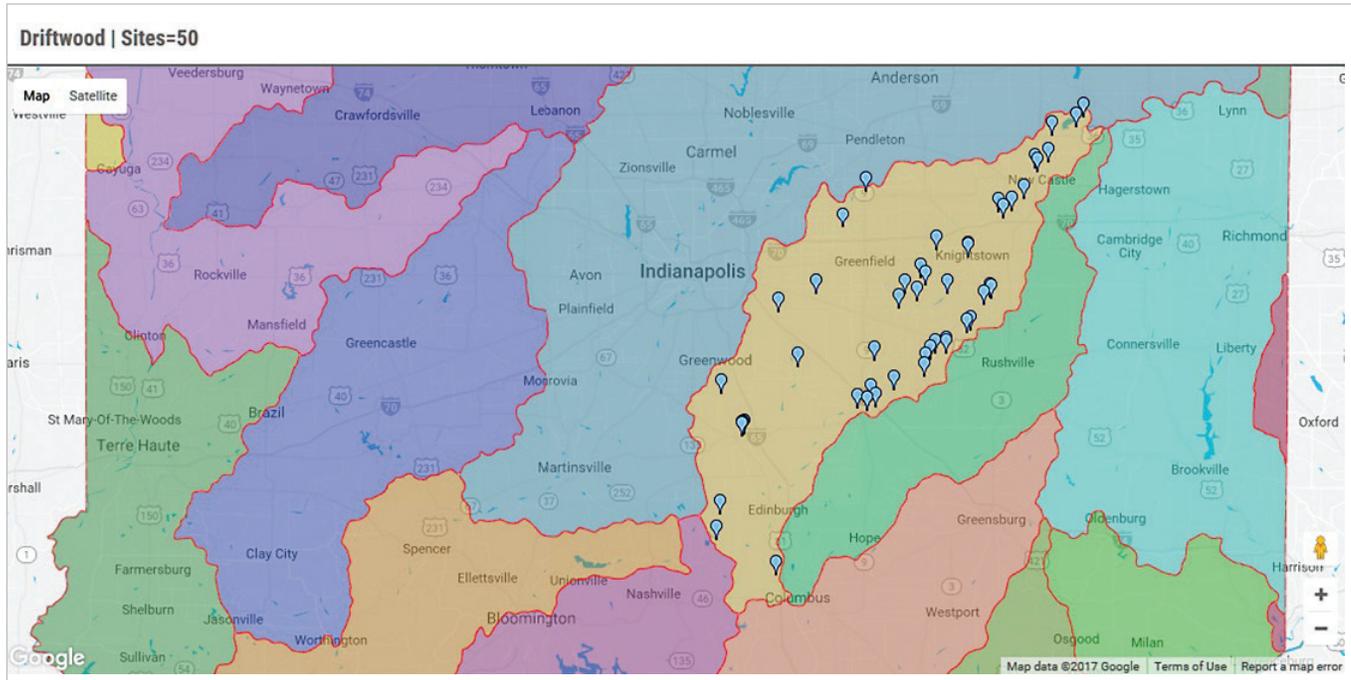


Figure 74



Another nifty item, displayed on the bottom of the Visualize page as soon as you select the “More Details” option above, is a map showing the sites from which the data is being pulled from (Figure 74). This is handy to have and gives you a relatively quick view of where in the state the data in the above charts and graphs was collected from. You will need to capture a screen shot of this, however, as downloading or otherwise saving it from the database is not an option. As in the Search and other screens, clicking on any site will reveal its ID, stream name and site description, as entered into the database.

Figure 75



A similar tool for viewing sample sites is available in the Search tool, as indicated by the blue Map and pin located in the leftmost column of the results table. However, clicking on this will show only one site at a time (Figure 75). Hovering your cursor over the brown magnifying glass next to the results for flow or habitat will reveal the average of the data entered as used to calculate the result (Figures 76 and 77).

Figure 76

Unique Trip												
	Whitewater	Whitewater River	1077	2006/09/08	Flow	39.89	CF/SEC			10777682006-09-08 00:00:00	768	Hagerstown Jr. Sr. High School
	Whitewater	Whitewater River	1077	2006/09/08	Habitat	71	Index			10777682006-09-08 00:00:00	768	Hagerstown Jr. Sr. High School
	Whitewater	Whitewater River	1077	2006/09/08	Invert Sampling			bloodmidge	1	10777682006-09-08 00:00:00	768	Hagerstown Jr. Sr. High School
	Whitewater	Whitewater River	1077	2006/09/08	Invert Sampling			aquaticworms	3	10777682006-09-08 00:00:00	768	Hagerstown Jr. Sr. High School
	Whitewater	Whitewater River	1077	2006/09/08	Invert Sampling			blackfly	5	10777682006-09-08 00:00:00	768	Hagerstown Jr. Sr. High School

Figure 77

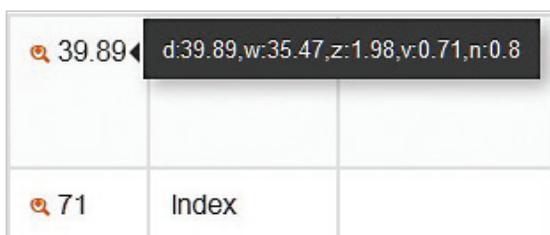
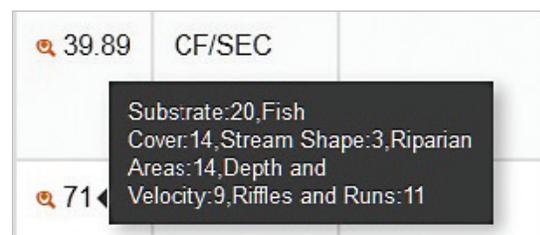


Figure 78



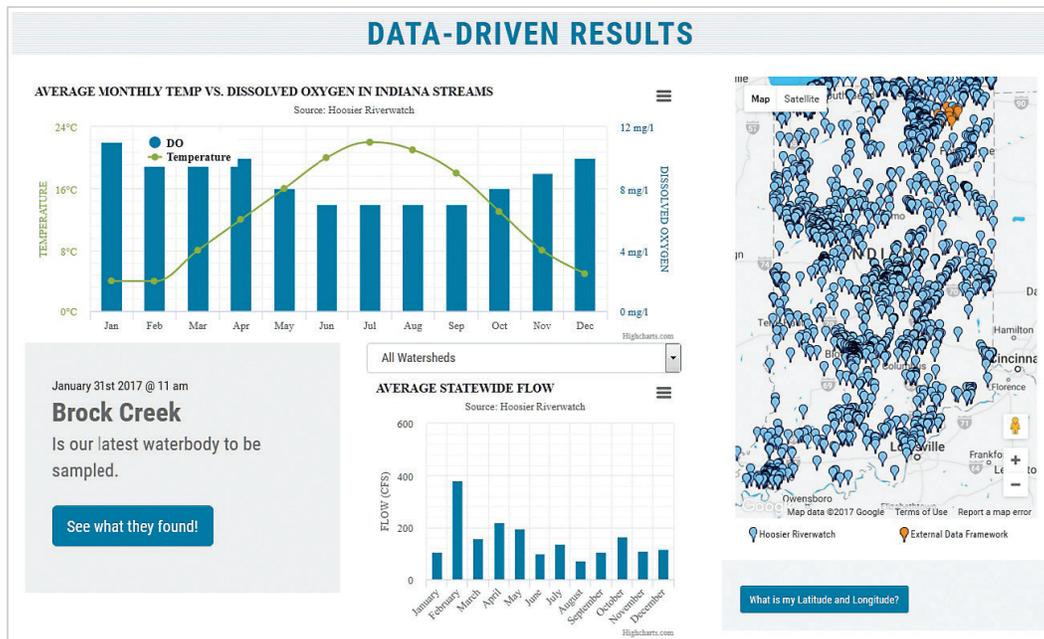
Test Your Database Skills

This database has been designed with you in mind. Hopefully you will use it often and find doing so enjoyable. Below are a few practice drills to show you how fun and easy it is to glean information from it. Perhaps they will help you think of similar questions you can ask to retrieve data useful to your own efforts. (Clues to finding the current answer are provided below each question in *italics*.)

- Where was the latest Hoosier Riverwatch sample taken from?

While it may or may not be the latest sample 'taken', the latest sample entered into the database is shown on the lower left corner of the home page under "Data-Driven Results" (Figure 79).

Figure 79



- What is the highest flow ever recorded in the Driftwood Watershed? On what date did this occur?

On the Search page, select Driftwood Watershed using first Search Criteria box. When results are returned (several thousand of them), use "Filter by Test" window and select Flow. When only Flow is shown on page, click arrows in the Result column header until the highest reading is at top. You can get the reading in Cubic Feet/Second and the Date from the top row of data.

- Which stream in the Patoka Watershed has the highest PTI (Pollution Tolerance Index) recorded? What Volunteer ID is associated with this sample?

On the Search page, select Patoka Watershed using first Search Criteria box. When results are returned (a couple thousand), use "Filter by Test" window and select Pollution Tolerance Index Rating. When only the PTI scores are shown, click arrows in the Result column header until the highest reading is at top. You can get the reading in waterbody/stream name and the Volunteer ID from this top row of data.

- Is the dissolved oxygen average score for the Kankakee Watershed ranked higher or lower than the State average? How many samples were taken to get this average?

On the Visualize page, select One/Same Location Across Time as the Study Type, Watershed as the Location, and Kankakee as the Selection. Click “This is my choice” button. When parameters appear below, the arrow beside the words “Dissolved Oxygen” will indicate if the average results for the watershed are higher or lower than the state average. Selecting the Dissolved Oxygen parameter will open a bar chart below. The “N=” number on the chart will tell you how many samples are included in this average.

- Does Bartholomew County have a higher percent of pollution intolerant macroinvertebrates compared to the State average? What is the difference?

On the Visualize page, select One/Same Location Across Time as the Study Type, County as the Location, and Bartholomew as the Selection. Click “This is my choice” button. When parameters appear below, select the Invert Sampling parameter. If the pie charts do not open below, select any other parameter as a second choice and the pie charts will open along with the new selection. You only need the pie charts to answer this question. Hover your cursor over the blue “Intolerant” portion of each pie chart (Bartholomew and Indiana) and note which one has the higher percentage. Subtract the lower from the higher to find the difference between the two.

- Which month historically has the highest recorded temperatures in Lake County?

From the last screen, go back up and select Lake County as the Selection under #3. Click “This is my choice” button. When parameters appear, select Temperature. When the bar chart opens, click More Details below the chart. When the yearly average line graph opens, click “Compare to Other Parameters or View Monthly Averages” below the graph. A monthly average temperature graph will open. Select the highest point on the graph to find the highest temperature. If more than one appears high, hover your cursor over these points to see the data behind them. Perhaps one is slightly higher or perhaps two or more months tie for the highest recorded temperature.

You can also view and sort temperature data for Lake County using the Search tool. However, even with only a hundred data points you would need to download this to your desktop so that you could manipulate and calculate monthly averages for yourself to answer this question. The Visualize tool does all this for you.

So, how did you do? Hopefully, great!

