

# **BMP Database Phase I - User's Guide (Draft Document)**

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Ohio Department of Natural Resources  
University of Illinois  
University of Minnesota  
University of Wisconsin  
USEPA Region V

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## 1.0 Introduction

Several years ago, the Great Lakes Regional Water Program (GLRWP) recognized a need to better serve the stormwater community. To address this need the GLRWP provided funding to a group of researchers and extension agents to identify research, education, and outreach needs of stormwater managers in the region. In addition, the group - called the Stormwater Working Group – identified which needs could be addressed through multi-state collaborative projects which utilize expertise throughout the region.

Since the beginning of the initiative many listening sessions, focus groups, and even an online survey of stormwater managers were conducted to identify and prioritize needs of the stormwater community. One need identified as a high priority was to provide tools to stormwater managers to learn about and share information on new stormwater management techniques. To meet this need the Stormwater Working Group through funding from the GLRWP has developed and pilot tested a system of web-based tools called the Great Lakes BMP Database. The BMP Database is a multi-phase project and details regarding the initial phase (Phase I) are provided in this User's Guide.

The purpose of the BMP Database Phase I project was to develop a set of web-based tools to increase awareness of innovative stormwater management practices being implemented throughout the region. The Phase I project is not meant to be a comprehensive inventory of BMP's, but a meant to serve as a *sample* of innovative stormwater management practices in the region. The system currently consists of two tools. The first tool is an online form that allows early adopters of innovative stormwater practices to create a summary of their project to share with other stormwater managers. Information about the project including the projects purpose, any design criteria, tools used in design and many other types of information can be included in the project summary. The second tool allows users of the system to query the database of innovative stormwater BMP's through an interactive mapping application. Each project in the database is required to provide spatial information, such as an address or geographic coordinates, which allows the project to be spatially referenced (i.e. properly located in the interactive map). User's can then search for projects in the database by providing address information (e.g. full address, county name, or state), using the interactive mapping tools, or by selecting a watershed by name or from a list.

Details on how to use the system are provided in the following chapters. Chapter 2 provides information on how to submit a project to the database and the criteria that need to be meet for the project to be included. Chapter 3 provides guidance on how to query the database and view data.

## 2.0 Submitting a Project

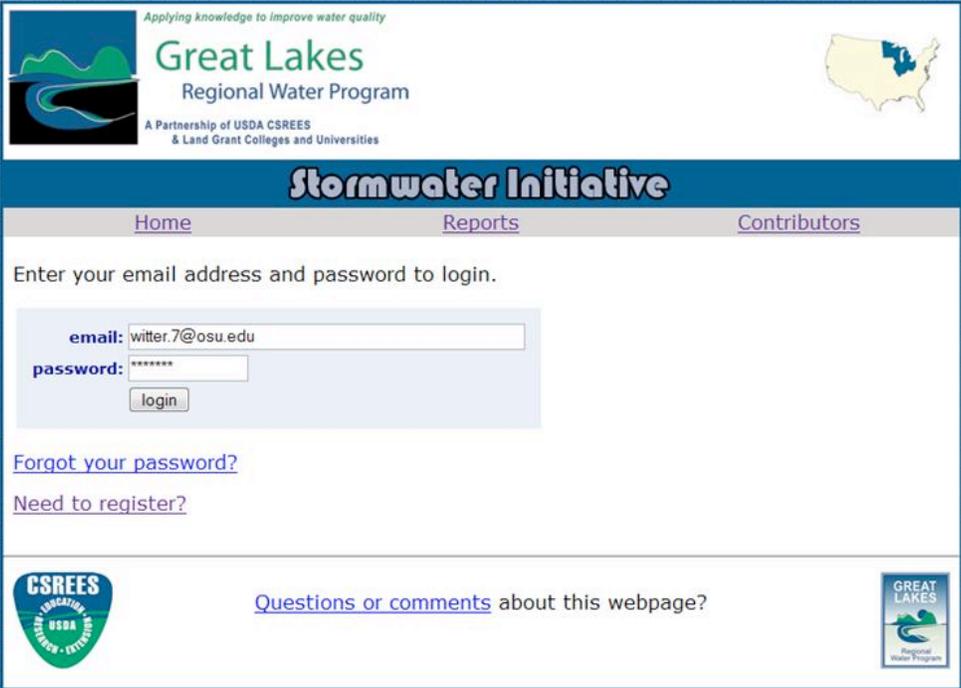
This section provides information on the minimum requirements that need to be met for a project to be entered into the database. In addition, a description of the online submission form and guidance on how to fill it out are provided.

### 2.1 Minimum Requirements

**This section has not yet been completed as the Stormwater Working Group continues to discuss minimum criteria for submissions.**

### 2.2 Online Submission Form

Projects can be submitted to the database through an online submission form that is available on the Stormwater Initiative (<http://www.uwex.edu/ces/regionalwaterquality/flagships/stormwater/>) page of the Great Lakes Regional Water Program website. The first step to submit a project is to register as a user. Registration is required so that: 1) other users can contact you, if needed, to find out more about the project (email contact information is required), and 2) you can manage (e.g. edit, delete, append new data and pictures, etc.) your project summaries as needed. When you elect to submit a project you will be directed to the login page seen in Figure 1. If you have already registered as a user you can simply login by providing your email address and password. If you have not registered previously you will need to click the “Need to register?” link at the bottom of the page (Figure 1).



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Enter your email address and password to login.

email:

password:

[Forgot your password?](#)

[Need to register?](#)

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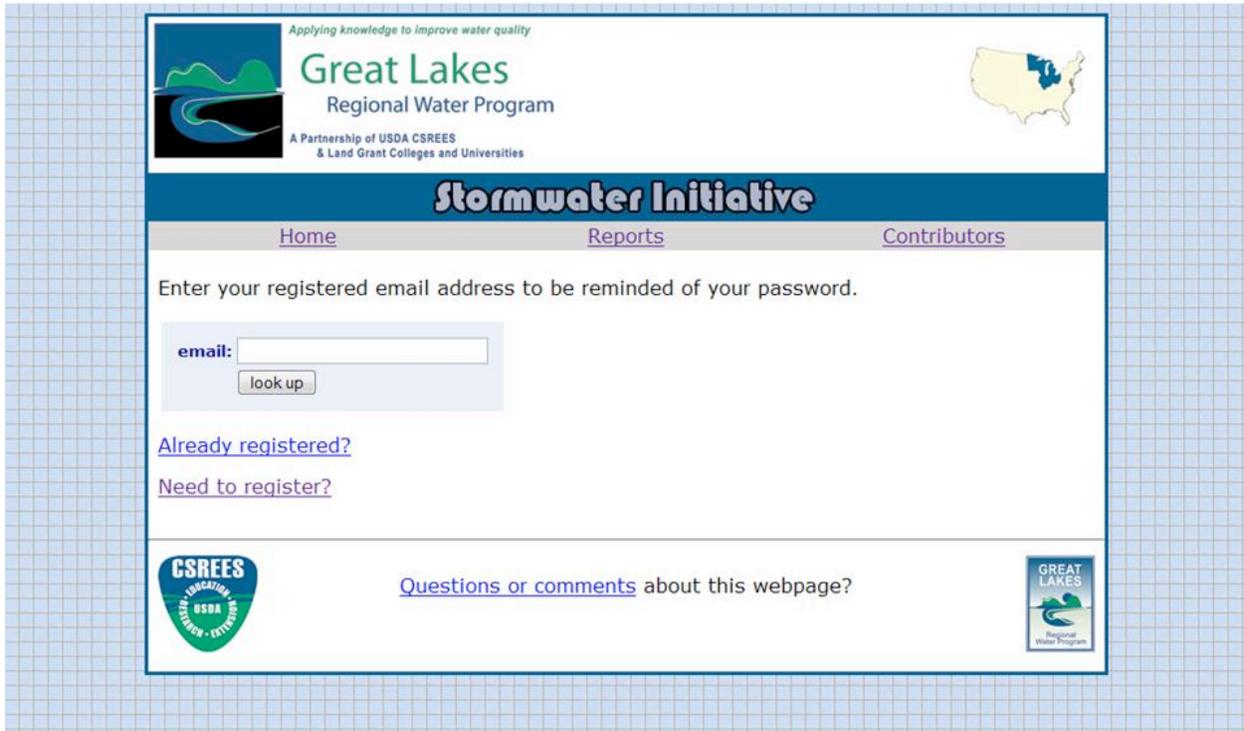
**Figure 1: Log in screen for the BMP Database online submission form.**

Once you click the “Need to Register?” link you will be taken to the registration page (Figure 2). Users are asked to submit first and last name, title, affiliation, address information, phone and email contact information, and a password to protect the account. Only the first and last names, an email address, and a password are required to register.

The screenshot shows a registration form for the Great Lakes Regional Water Program Stormwater Initiative. The page header includes the logo for the Great Lakes Regional Water Program, which is a partnership of USDA CSREES and Land Grant Colleges and Universities. The main heading is "Stormwater Initiative". Below the heading are navigation links for "Home", "Reports", and "Contributors". The form itself is titled "Please complete this short registration form to tell us a little about yourself before submitting your stormwater management Best Practice." and includes a note that an asterisk indicates a required field. The form fields are: First Name (required), Last Name (required), Title, Affiliation, Address 1, Address 2, City, State (a dropdown menu with "-- Select One --"), Zip, Phone, Email (required), Password (required), and Retype Password (required). A "Register" button is located at the bottom of the form. Below the form are links for "Already registered?" and "Forgot your password?". The footer contains the CSREES logo, a link for "Questions or comments about this webpage?", and the Great Lakes Regional Water Program logo.

**Figure 2: A screenshot of the registration page.**

If you have already registered, but lost or forgotten your password it can be mailed to you by clicking on the “Forgot Password” link (Figure 3). You will be directed to a web page asking you to enter your email address. After entering your email address press the “look it up” button and your password will be emailed immediately to your account.



**Figure 3: Web page to retrieve a lost or forgotten password.**

Once logged in you will be taken to your contributor page where you will be able to submit a project by clicking the “Create New Project” link (circled in red in Figure 4) or manage existing projects using the View and Edit capabilities in the “My Projects” table.

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[Admin](#)  
[Create New Project](#)

**My Projects**

Name	Date Entered	Status	View	Edit
Buchanan Pond	01/29/2008	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>
Eagle Ridge Detention Pond and Forebay	01/29/2008	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>
Muddy Creek - Preservation and Restoration	01/29/2008	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>
RWMWD New Office Stormwater Mgmt and Green Bldg	01/29/2008	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>
UW-Arboretum Marion-Dunn Pond	01/29/2008	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>
Washington County Fairgrounds - Raingardens	01/29/2008	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>
WDNR NE Region Headquarters - Detention Pond	01/29/2008	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>
Whetstone Prairie	12/31/2007	Approved	<a href="#">VIEW</a>	<a href="#">EDIT</a>

[Logout](#)

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**Submitted Projects**

**Figure 4: Contributor page where new projects can be added and existing projects can be edited.**

If you elect to submit a new project you will be taken to the “Add Project” page (Figure 5). In the “Add Project” page you will be asked to provide, at a minimum, the name of the project (Question 1), the type of BMP (Question 2), location information (either Question 3 or 4), a project contact (Question 5), the major design objective of the project (Question 8), and a short narrative describing the project (Question 13).

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## Add Project

\* indicates a required field

\*1. What is the name of the project?

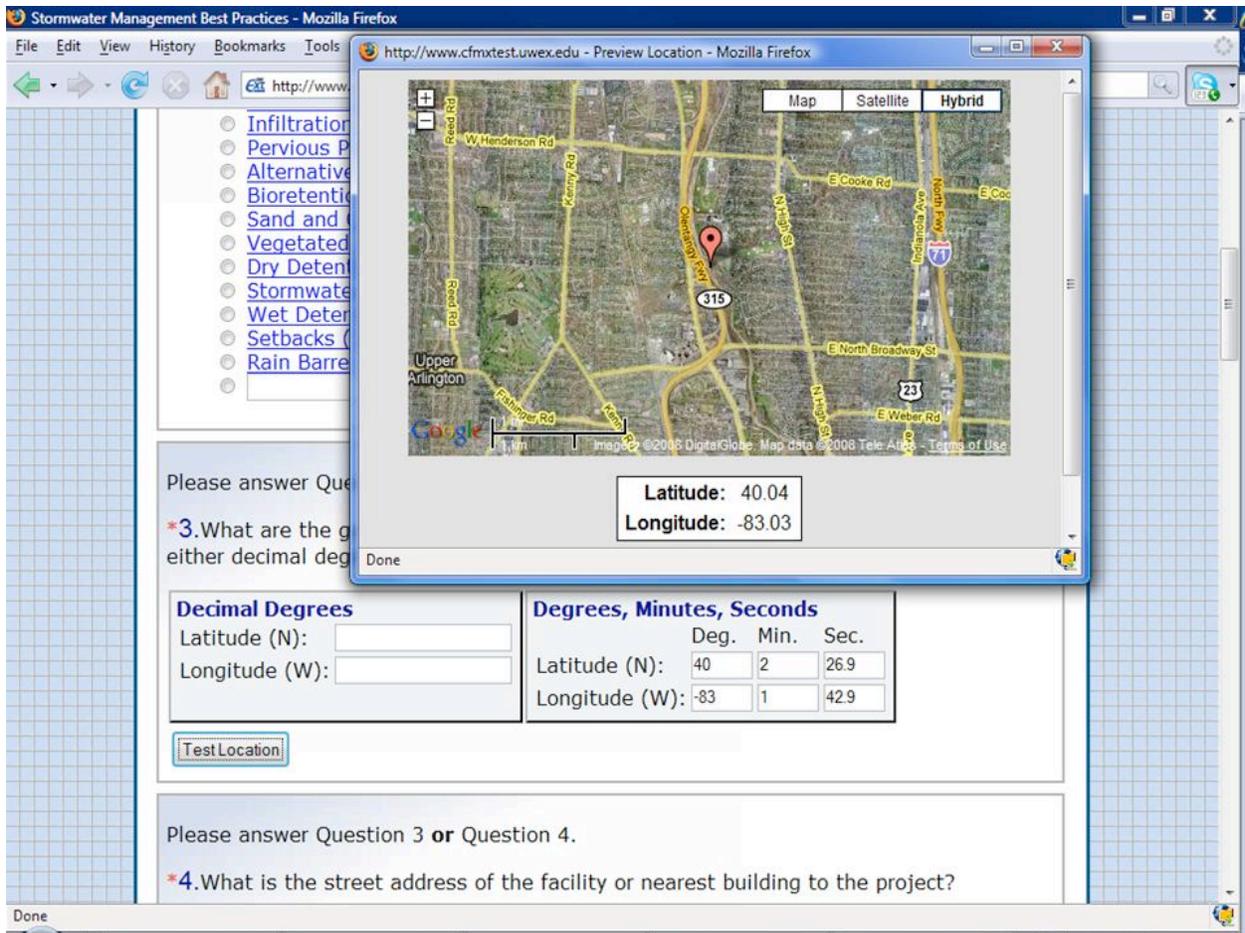
Example: Indian Run Falls Park - Pervious Pavement Parking Lot

\*2. What stormwater management practice was installed?

- [Conservation Easements](#)
- [Green Roofs](#)
- [Low Impact Development](#)
- [Open Space Design](#)
- [Grassed Swales](#)

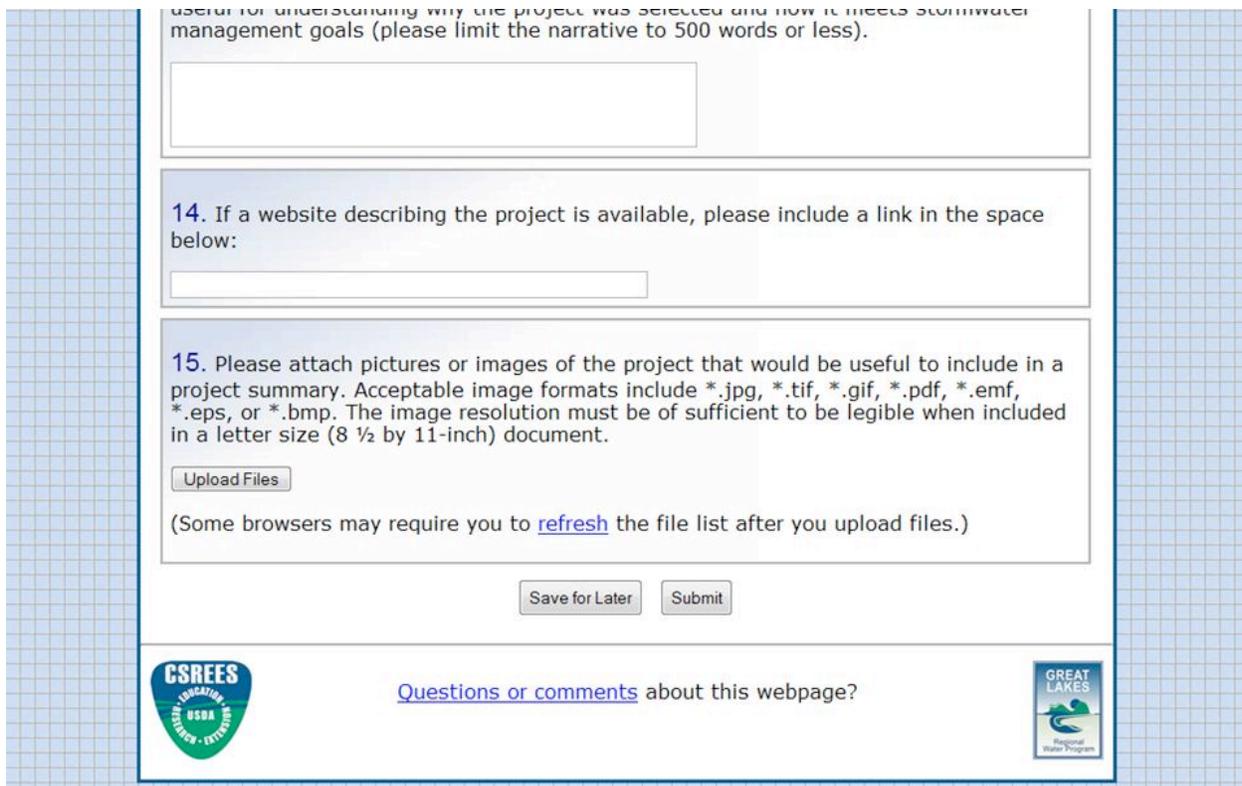
**Figure 5: A screenshot from the “Add Project” page.**

When entering the location information (Question 3 or 4) please utilize the test location feature (Figure 6) to confirm the location of the address or coordinates entered. If the project location is inaccurate here it will not be entered into the mapping application properly. If it does not map properly, please use a website, such as [www.earthtools.org](http://www.earthtools.org), to retrieve appropriate coordinates.



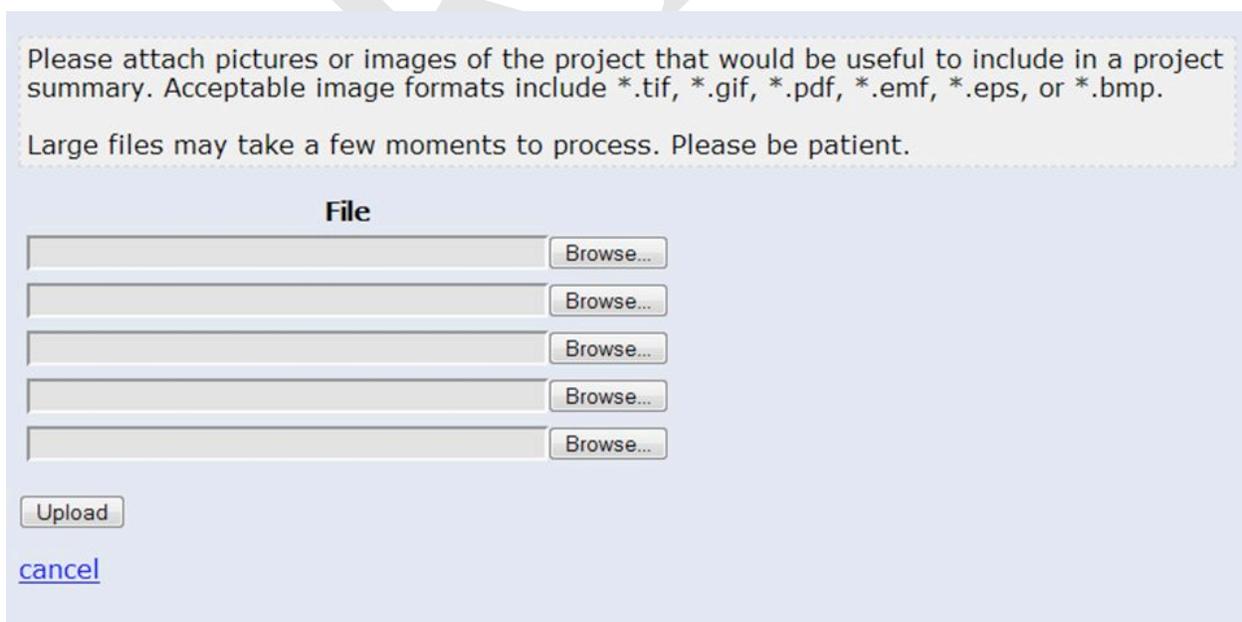
**Figure 6: A screenshot showing the Test Location feature.**

Other information that can be submitted as part of the project summary includes: contact information for the projects design firm (Question 6), contact information for the construction company that built the project (Question 7), any criteria used to design the project (Question 10), tools used in the design (Question 11), and any links to project brochures or websites (Question 14). In addition, pictures of the project can be uploaded using the “Upload Files” button in Question 15 (Figure 7).



**Figure 7: A screenshot of the upload file feature.**

After clicking the “Upload Files” button the user will be taken to the upload file browser page where files can be added (Figure 8). A maximum of five files can be uploaded.



**Figure 8: A screenshot of the “Add Files” web page.**

Finally, at any point the user can save the current page using the “Save for Later” button at the bottom of the page (Figure 9). To submit a finished project to the database the “Submit” button must be activated (Figure 9). Once a project is submitted the BMP Database Project Team will view and approve the project. If the submission doesn’t meet minimum requirements or the submission requires editing the author will be contacted via email. After approval the project summary will be entered into the database and added to the interactive mapping website. More information on how to query the database in the interactive mapping system is provided in Chapter 3.

useful for understanding why the project was selected and how it meets stormwater management goals (please limit the narrative to 500 words or less).

14. If a website describing the project is available, please include a link in the space below:

15. Please attach pictures or images of the project that would be useful to include in a project summary. Acceptable image formats include \*.jpg, \*.tif, \*.gif, \*.pdf, \*.emf, \*.eps, or \*.bmp. The image resolution must be of sufficient to be legible when included in a letter size (8 ½ by 11-inch) document.

Upload Files

(Some browsers may require you to [refresh](#) the file list after you upload files.)

Save for Later Submit

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USDA  
RESOURCES  
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Figure 9: A screenshot showing the “Save for Later” and “Submit” buttons.

### 3.0 Querying the Database

Stormwater managers interested in learning about innovative stormwater management projects in a particular area can query the BMP Database using the Digital Watersheds website. Digital Watersheds (Institute of Water Research; Michigan State University) is a nationwide web application tool designed to facilitate watershed management. The Digital Watersheds website is designed as an information repository and an online computing center. The site is based on the 8-digit watersheds for the entire United States. All of the BMP's submitted to the database can be viewed here. The database can be queried using the following methods: 1) an address search, 2) point-and-click navigation through the interactive mapping system, and 3) by selecting a specific watershed.

#### 3.1 Address Search

The address search allows the user to search for BMP's by entering a full street address, county name, or city name. The "address entry" must be selected (Figure 10). The search feature locates the watershed in which the address is located and directs the user to the interactive map area with the watershed boundary as the base layer.



**Figure 10: A screenshot of the Digital Watersheds search function. The address search option is circled in red.**

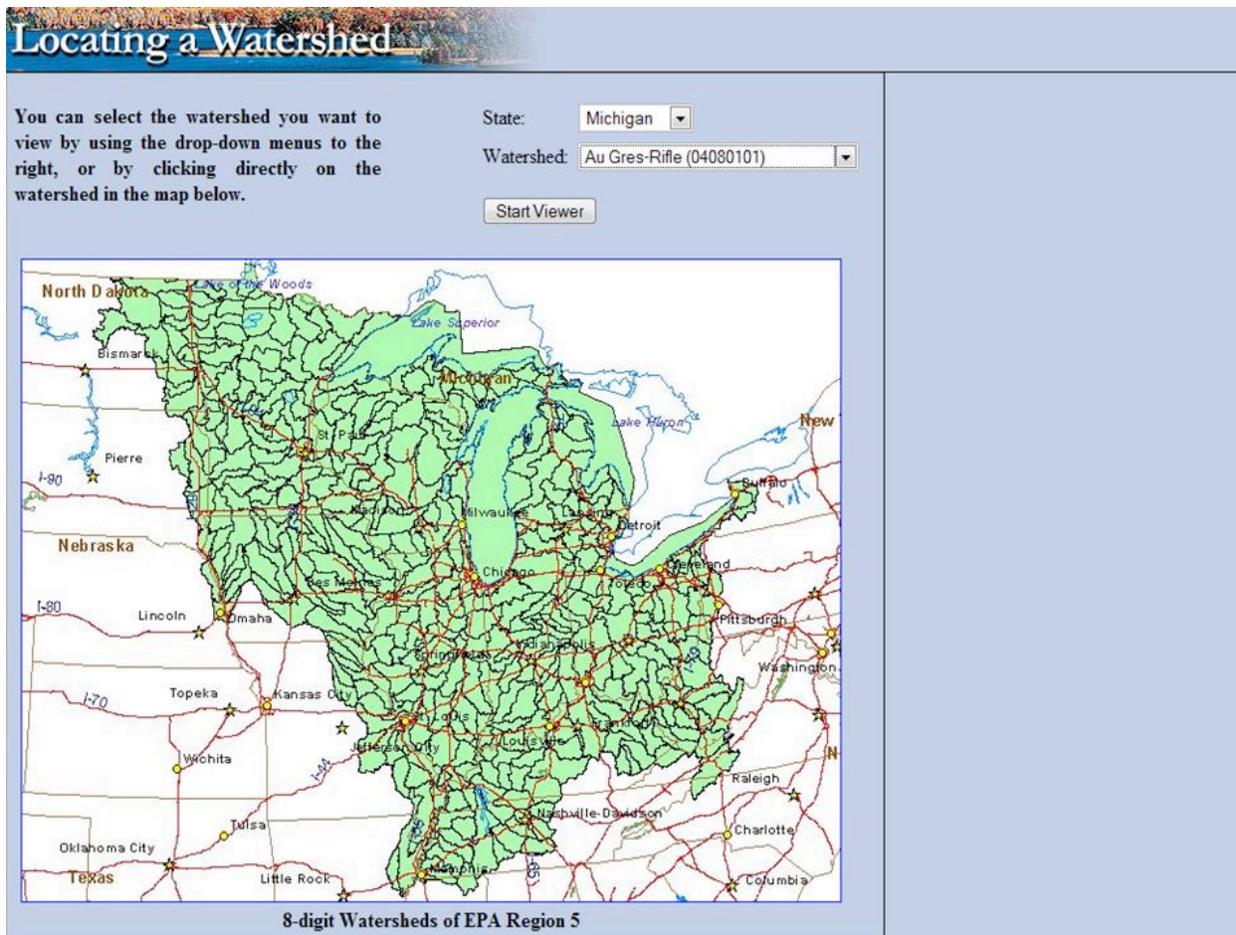
##### 3.1.1 Map Search

The database can also be queried using the point-and-click capability of the map area search function (Figure 11). First the user selects a region of the United States (USEPA Regions 1-10; Figure 11).



**Figure 11: A screenshot of the Digital Watersheds search function. The interactive map search option is circled in red.**

After selecting a region the user is directed to the regional watershed page (Figure 12). The user can once again point-and-click to select a watershed. Once a selection is made the user will be directed to the interactive map for the selected watershed.



**Figure 12: A screenshot of the regional watershed page for USEPA Region 5.**

### 3.1.2 Search by Watershed

The final method to query the database is to select a specific watershed (Figure 13). A watershed can be selected from lists of watersheds by state or by direct entry of the 8-digit Hydrologic Unit Code number or by the associated 8-digit Hydrologic Unit Code watershed name. After a selection is made the user will be directed to the interactive map for the selected watershed.



Figure 13: A screenshot of the watershed search feature of Digital Watersheds.

### 3.2 Navigating the Interactive Map

After a watershed has been selected by the user they will be directed to the interactive map for the chosen watershed (see Figure 14). The interactive map has four main areas: the Legend, the map area, the GIS Tools toolbar, and the Data Layer list.

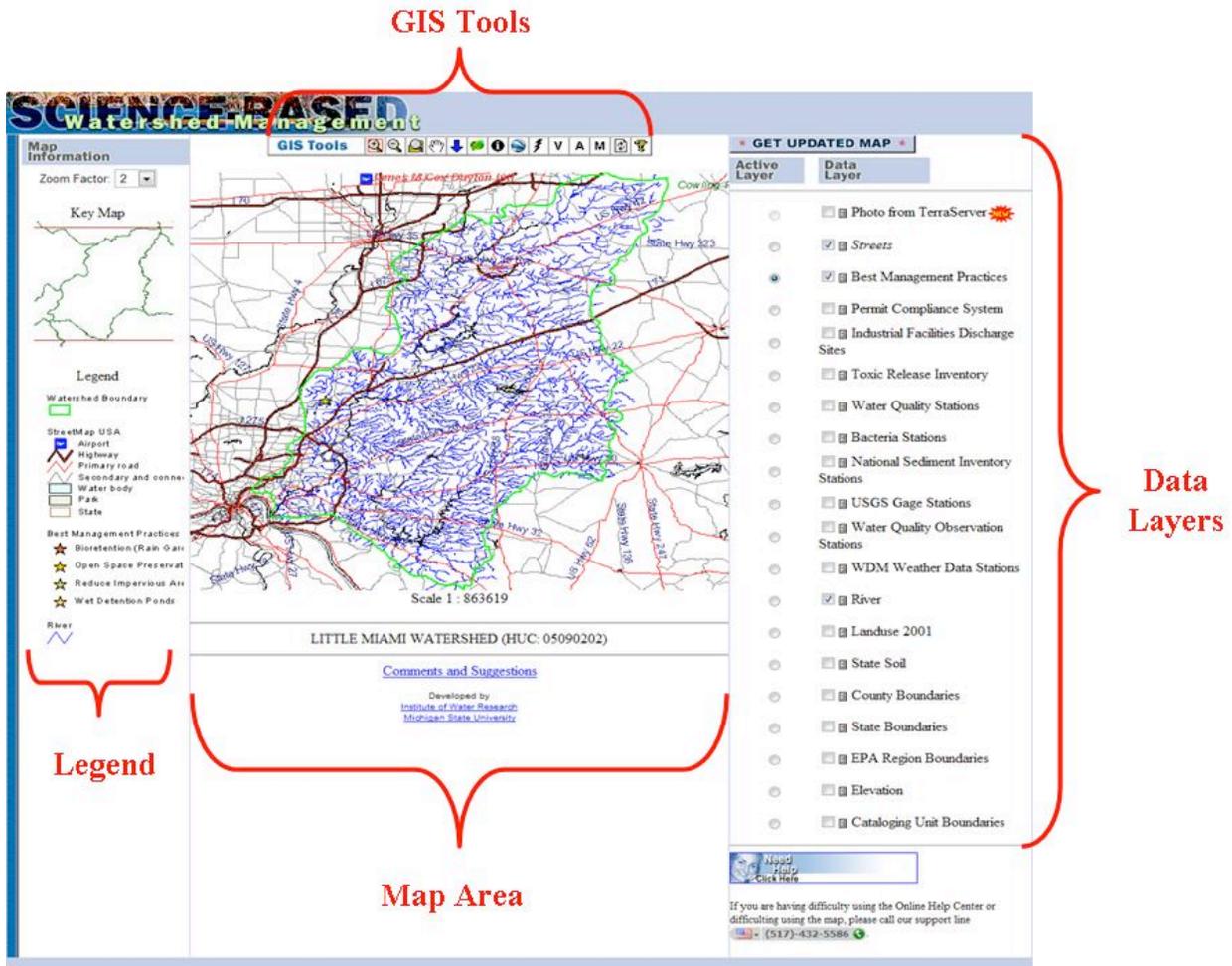
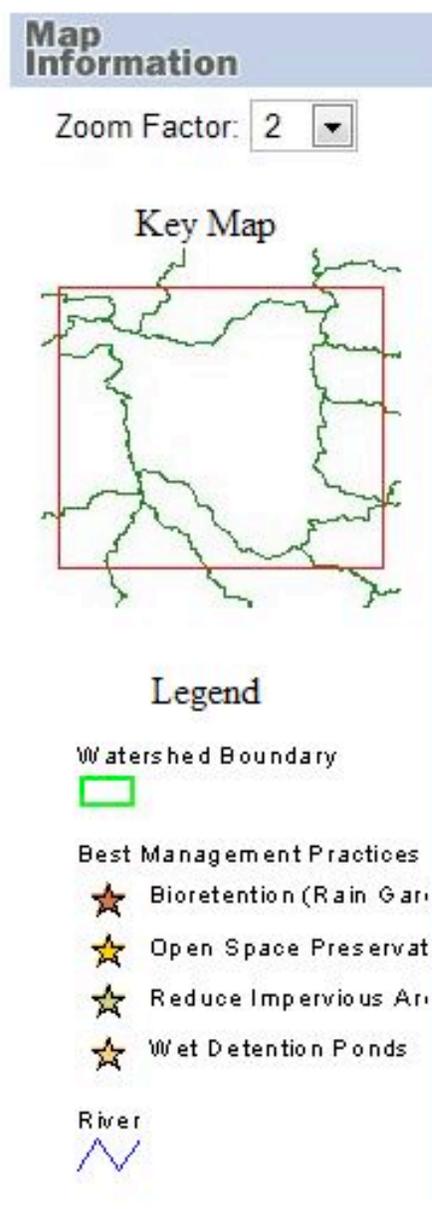


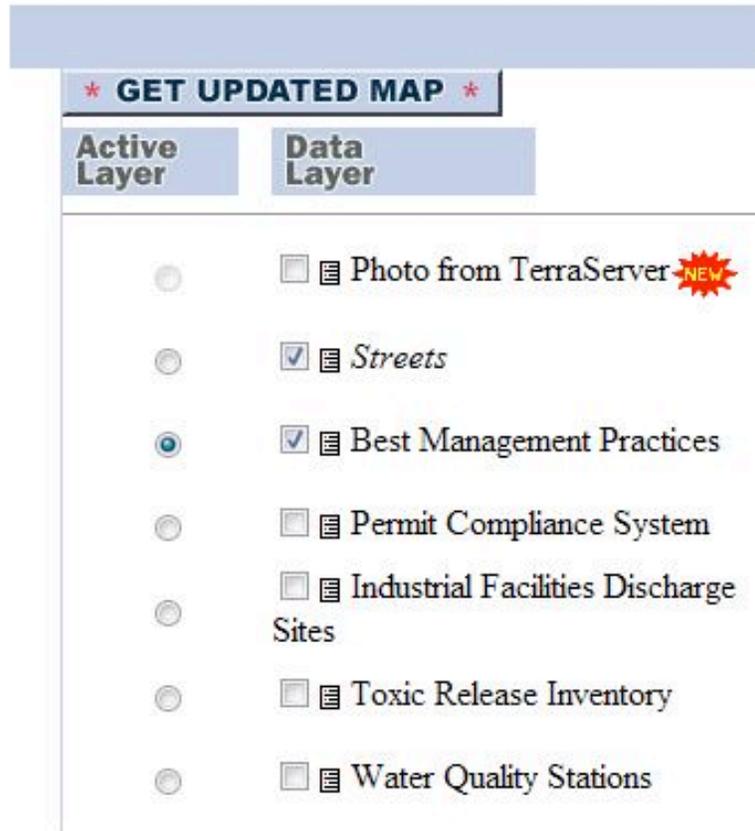
Figure 14: A screenshot of the interactive map viewer for the Little Miami Watershed.

The legend provides information needed to interpret the map. Symbols for features displayed in the map are displayed in the legend section. For example, Figure 15 shows the watershed boundaries in green, rivers are symbolized as blue lines, and each type of stormwater BMP is represented by a different color star. Above the legend is an inset map that shows the location of the map viewing area relative to the watershed boundary.



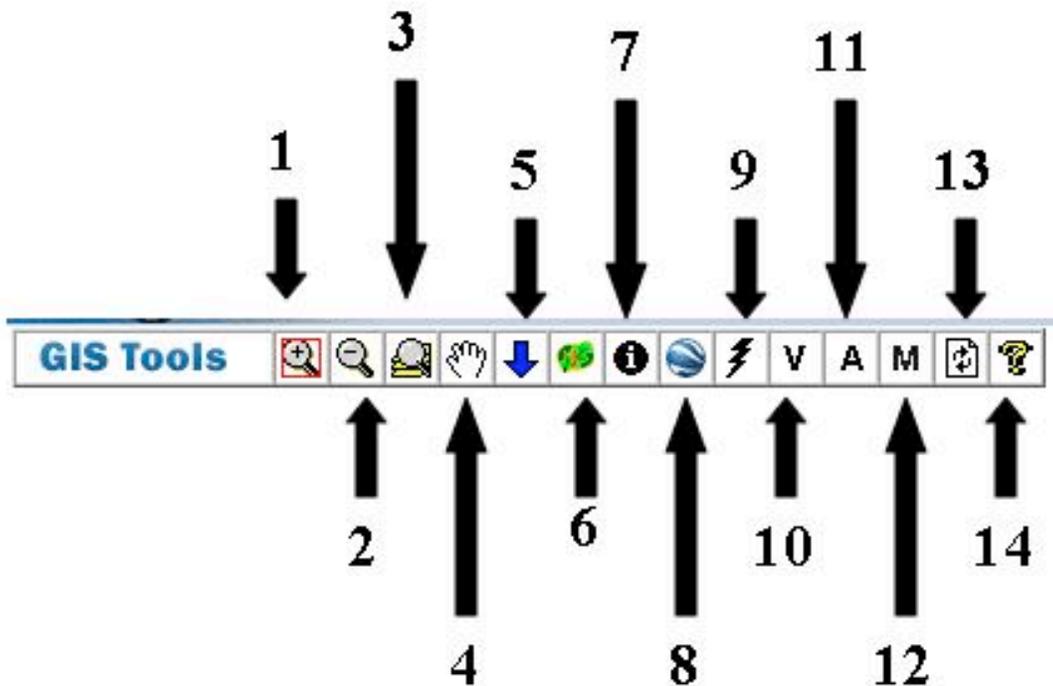
**Figure 15: A screenshot of the legend in the interactive map.**

The Data Layers list (Figure 16) shows which information is being displayed in the map area. A data layer is visible if the box next to the data layer name is checked. After data layers are turned on or off the map will need to be refreshed by clicking the “Get Updated Map” button at the top of the Data Layer list. To be able to query a data layer the layer must be made the “Active Layer”. For this application make the Best Management Practices data layer the “Active Layer”.



**Figure 16: A screenshot of the List of Data Layers.**

The GIS tools provide the user with a range of capabilities to navigate the map and query the data layers. The Digital Watershed GIS Tools buttons functions are described in the caption of Figure 17.



**Figure 17: The GIS toolbar. Descriptions of the GIS tools are as follows:**

- 1 - The **Zoom In** tool is used to zoom in to a larger scale on the map. To use this, tool click it once then click once on the map where you would like to zoom into. Click the map again if you would like to zoom closer.
- 2 - The **Zoom Out** tool is used to zoom out to a smaller scale on the map. To use this, tool click it once then click once on the map where you would like to zoom out. Click the map again if you would like to away further.
- 3 - The **Zoom to Full Extent** tool allows you to zoom back to the original scale which the map was first displayed.
- 4 - The **Pan** tool allows you to pan or move around to a different area of the map without changing the scale of the map. To use this tool, click it once then click one on the map. The place on the map that you clicked will be recentered on the display of your browser.
- 5 - This is the **Scale Down** Tool. It will transfer the map from an 8-digit watershed to the 12-digit subwatershed. To use this tool, click the arrow once and click the map.
- 6 - This tool allows the user to automatically delineate watersheds and determine percentages of land cover within the delineated watershed; also, generates input data needed to run the Long-term Hydrologic Impact Assessments Model (L-THIA) ([http://www.ecn.purdue.edu/runoff/lthia/lthia\\_index.htm](http://www.ecn.purdue.edu/runoff/lthia/lthia_index.htm)).
- 7 - The **Identify** tools is used to display information about particular features on the map. To use this tool, first select the feature or map layer you would like to activate to get information about, next click the Identify tool and click once on the feature in the map you would like to get information about, such as one of the BMP's.
- 8 - This tool allows the user to link to Google Maps and Google Earth.
- 9 - This tool allows the user to link to the USEPA "Surf Your Watershed" web page which provides information about the health of the watershed and links to other scientific data.

- 10 - This tool is called the *Visualize Topography* tool. It will show a 3D render of the watershed topography. To use this tool, click the “V” button once.
- 11 - This tool runs the Analytical Tools Interface for Landscape Assessments (ATtILA) (<http://www.epa.gov/esd/land-sci/attila/>)
- 12 – This tool is called the *USPED Model*. It provides a cell-based map showing sediment deposition based for the USPED Model. To use this tool, click the “M” button once.
- 13 – The *Refresh* tool refreshes the map. It performs the same function as clicking the Get Updated Map button located above your data layers.
- 14 – This button provides a link to the help menu and describes the GIS tools available to the user.

To query the database to find out more about a particular BMP in the watershed use the Identify tool: **i**. First activate the tool in the GIS toolbar. Then mouse over the BMP feature in the map area and click on it. A browser will pop-up with the project ID number (a unique number assigned to each project), the title or type of the BMP, the geographic coordinates of the project (latitude and longitude), and a link to the url with the summary information. The url is hyperlinked, so simply click on it to access the project summary (Figure 19).

http://35.8.121.101 - Identify Results - Mozilla Firefox

The feature you clicked on has these attributes:

Shape	Form_id	Title	Practice	Latitude	Longitude	Link
Point	251	Whetstone Prairie	Open Space Preservation	40.04080	-83.02860	<a href="http://www.cfmxtest.uwex.edu/ces/regionalwaterquality/flagships/stormwater/view.cfm?fid=251">http://www.cfmxtest.uwex.edu/ces/regionalwaterquality/flagships/stormwater/view.cfm?fid=251</a>

http://www.cfmxtest.uwex.edu/ces/regionalwaterquality/flagships/stormwater/view.cfm?fid=251

The screenshot displays a web browser window with a map application. The browser's address bar shows the URL: <http://www.cfmxtest.uwex.edu/ces/regionalwaterquality/flagships/stormwater/view.cfm?fid=251>. Below the browser window, a table lists the attributes of the selected feature. The table has columns for Shape, Form\_id, Title, Practice, Latitude, Longitude, and Link. The selected feature is a Point with Form\_id 251, Title 'Whetstone Prairie', Practice 'Open Space Preservation', Latitude 40.04080, Longitude -83.02860, and a link to a view page. The map interface below the browser shows a green outline of a watershed boundary and a yellow star marking the location of the Whetstone Prairie Open Space Project. A legend on the left side of the map identifies the symbols used. A list of features on the right side of the map includes 'Photo from Terr', 'Streets', 'Best Management' (checked), 'Permit Compliar', 'Industrial Facilit Sites', 'Toxic Release I', 'Water Quality S', 'Bacteria Station', 'National Sedime Stations', 'USGS Gage Sta', 'Water Quality C Stations', and 'WDM Weather'.

**Figure 18: A screenshot of the database being queried by the identify tool. Information about the Whetstone Prairie Open Space Project (yellow star) is provided in the browser with the light purple-blue background.**



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### Project Details

**Project Name:** Whetstone Prairie

**Stormwater management practice installed:** Not specified

**Geographical Coordinates:**  
Latitude: 40.0408  
Longitude: -83.0286

**Nearest Facility:**

**Best Project Contact:**  
Ann Kemble  
President  
Columbus Wild Ones  
kemble.3@osu.edu

**Designing Engineering Firm:**

**Building Construction Company:**

**Design Objectives**

- Habitat improvement
- Recreation

**Designed to Regulations:** No

**Criteria:**

**Tools:**  
this report was edited by Jason. 1/16/2008

**Narrative:**  
The Whetstone Prairie and Native Habitat project was installed with the objective of turning 5.1 acres of lowland along the Olentangy River into a native Ohio prairie with vernal pools and a woodland buffer. It is a joint project between Columbus Wild Ones; Native Plants, Natural Landscapes and Columbus Recreation and Parks. Funding for the project was received from Keeping Franklin County Beautiful, Columbus Metroparks, and ODNR Wildlife Diversity and Endangered Species program. While the project was not intended for storm water management it provides significant storm water benefits. The objective of storm water best management practices are to retain water for a period of time, to reduce flooding downstream, and improve water quality. Native plants within the prairie have deep root systems which can be up to 10 feet deep and dense canopies allowing them to improve water infiltration into the soil and intercept large amounts of precipitation. This results in an increase in water storage and reduction of runoff from the acreage. The vernal pools created on the site have significant water storage capacity and reduce runoff from the site during storm events. They also increase habitat for amphibians and beneficial insects. Because this site is located adjacent to the Olentangy River and the Adena Brook there was a ready source of species to populate the area. Many of the benefits of the prairie and vernal pools on water storage and water quality are immeasurable although research has shown that a meadow produces 15 times less runoff than a parking lot in the same storm event (Schueler, 1994). In designing storm water management systems some benefits of incorporating native plants have the following benefits:

1. Native plants require little maintenance.
2. Their deep root systems increase water infiltration into the soil.
3. Their deep root systems also reduce soil erosion and stream bank stabilization.

In considering using vernal pools in storm water management systems the following benefits can be expected:

1. Vernal pools can provide significant water storage.
2. Vernal pools can improve water quality but plant uptake of nutrients and reduction in sediment.
3. Vernal pools can also reduce downstream flooding by providing water storage during large storm events.
4. Vernal pools can also provide habitat for amphibians and beneficial insects.

In addition to providing storm water management these areas can provide a seed source to increase biodiversity and habitat for wildlife that is more natural than storm water retention basins.

Schueler, T. 1994. The importance of imperviousness. Watershed protection techniques. 2(4):100-111.

**Website:** <http://www.for-wild.org/chapters/columbus/>

This project was submitted by Jonathan Witter ([witter.7@osu.edu](mailto:witter.7@osu.edu))



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**Figure 19: The Whetstone Prairie project summary.**