

## **DIGITAL WATERSHED HINTS**

### **1. What It Does**

Digital Watershed ( <http://www.iwr.msu.edu/dw/> ) allows the user to view the watershed tributary to any given point in the continental United States, on an 8-digit or (in parts of the Midwest) a 12-digit HUC code level of detail. Combined with this are a number of special tools:

- \* A very user-friendly adaptation of the EPA Basins tool, So that 13 different data layers can be selected. For many of these layers it is possible to identify tens of thousands of individual objects or locations for treatment plants, TRI sites, etc., as detailed below.
- \* An automatic tool demonstrating the deposition of sediment within any given 8-digit watershed. This uses the USPED modeling method described at: <http://skagit.meas.ncsu.edu/~helena/gmslab/erosion/usped.html>
- \* Within parts of the Midwest it is possible to scale up or down from 8-digit to 12-digit Watershed delineation. Scale is shown at the bottom of the map graphic.
- \* Direct linkage of the watersheds to rectified aerial photography.
- \* Automatic forwarding of a delineated watershed to the LTHIA tool to model Runoff, peak flow, and non-point source contamination.

### **2. General Operation**

Digital Watershed can be entered by drilling down through a series of maps, or by entering the street address of a location in the watershed you are interested in. The street address entry is very handy, but uses a third-party database itself may contain errors.

Both the map interface and the address entry cover the entire continental United States, but outside the Midwest it is only possible to drill down to 8-digit HUC watershed delineation

There are minor quirks observable on the interaction with certain PCs:

- \* Pop-up blockers on your PC may interfere with the appearance of some data layers
- \* Clicking on HELP will get you an explanation of the items in the toolbar: Sometimes these features stick and need to be repeatedly requested to change.

### **2. Toolbar Functions**

There are:

#### **-Zoom in**

8-digit watersheds come predefined and outlined in green, To view subwatersheds at the 8-digit watershed level, click on the zoom in icon, and then click on a location within the defined 8-digit watershed. If the watershed boundaries are obscured by data layers, use the small watershed outline map on the left of the screen.

**-Zoom out**

**-Return** to Original Screen

**-Pan Around** (mitt) This will allow you to move but does not allow change of watershed.

**-Scale Down** (or scale up; upward or downward pointing arrow)) from 8 to 12 digit WBD. (This does not always work, or works automatically) as you drill down. To zoom in below a certain level may be necessary to select this first.

To view watersheds at the 12/14-digit level, click on the downshift key (the downward-pointing arrow) and then click on the precise area you are interested in. The available sub-watersheds will be visible in the outline map on the left of the screen. Clicking within one of the sub-watersheds will bring that up with the entire sub-watershed area in green

**-Delineate Watershed** (Green blob; If you drill down via the MSU GIS zoom tool this may be done automatically) it sends you to the Purdue watershed delineation site for delineation via Dr. Choi's tool.

**Note:** It is as yet only possible to forward watersheds to LTHIA for land use delineation and LTHIA runs at the 8-digit level. The green watershed delineation key disappears after downshifting to 12/14 digits.

At the 8-digit watershed level, click on the green watershed delineation icon, and then click on a location within the defined 8-digit watershed. If the watershed boundaries are obscured by data layers, use the small watershed outline map on the left of the screen.

At the Purdue site initially you will receive an LTHIA spreadsheet screen for the entire watershed containing the BASIC-format land use acreages, broken down by four general soil association classifications (ABCD).

**-Identify** (letter **i** within square) ; this is to activate information about the data layer. The active link selection **only** works in conjunction with this. You must click this, then the data layer of interest, then the site, which calls up a supplementary screen. You need to click in the general area of a potential site.

**-Link** (lightning bolt) to Surf Your Watershed for information about the particular watershed you are in

**- Visualize Topography** (letter V in box) This creates a 3-D graphic visualization of the watershed topography.

- **USPED Erosion/Deposition Mode** (letter M in box) ; This measures projected erosion or deposition on a graduated scale in 1000ths of a ton (almost kilograms).per acre per year

-**Report** (12/14 digit **only**) identifies a subwatershed's particular areas for erosion risk. When called up this feature shows the subwatershed, but the erosion warning is "under construction". For some areas (such as downtown Muskegon) it will display a sample report format with no actual erosion problem areas designation.

### 3. **Using 12/14- Digit Data Layers:**

Only one active layer at a time can be selected!

The **identification** is made only on the active layer!

The 12-digit data layers are **streets, streams, water bodies, topographic lines, wetlands, elevation, photo access** and **HUC watershed delineation**>

**Streets:** As you drill down far enough, the names of individual roads will become clear. Streets are shown on the map and apparently linked with the **identification** key, but I have not been able to get any information other than "the street layer is not identifiable".

**Streams:** Using the **identification** key and clicking it will bring up a short table of the Fcc, Miris level, name, and number of the county (ies0 on each bank

**Water Bodies:** Using the **identification** key and clicking it will bring up a short table of: name(s), elevation, X and Y coordinates, and name source(s).

**Topographic Lines:** Note that the topographic lines are initially dashes and look like a profusion of freckles. They do not become discernable as actual lines until you drill down quite a way. They are linked with the **Identification** key, but I have not been able to get any information other than "The information layer is not identifiable.

**Wetlands:** This calls up a legend for about ten color-code wetland types.

Using the **identification** key and clicking on the wetland will bring up a short table of the NWI code, acreage

**Elevation:** This data layer shows color-coded elevation, presumably in meters above sea level. Using the **identification** key and clicking on any location will bring up X and Y coordinates of the clicked location and the exact elevation in meters above sea level.

**Photo:** This data layer shows the zoomable rectified ortho quads for the area. Depending on the other layers selected, the photos may be wholly or partially obscured. The photos are linked with the **Identification** key, but I have not been able to get any information other than "The information layer is not identifiable.

**Hydrology Unit Code (HUC):** This data layer identifies the 8-digit watershed in green. Using the **identification** key and clicking within the watershed brings up a short table containing the hydrology unit code, the watershed ID number, drain to, name of watercourse, outlet location and area drain in square miles

#### **4. Using 8-Digit Data Layers**

As you upshift to 8-digit watersheds a different assortment of data layers appears.

These include **Streets, Permit Compliance System Sites, Industrial Facilities Discharge Sites, Toxic Release Inventory (TRI) Sites, Water Quality Stations, Bacteria Stations, Water Quality Observation Stations, WDM Weather Observation Stations, Rivers, State Soil Associations, County Boundaries, State Boundaries, EPA Region Boundaries, Agricultural Erosion, Elevation and Cataloging Unit Boundaries.**

Most of these offer much more information through use of the identification key.

It is quite extraordinary that at the 8-digit level the entire continental U.S. is covered by all these databases.

**Photo From Terraserver:** This may or may not call up photos for the area outside the selected watershed. When you downshift to 12-digits it becomes inactive; then you need to click the “photo” data layer

**Streets:** As you drill down an increasing number of streets will be named. These are shown by the map and apparently linked with the **identification** key, but I have not been able to get any information other than “the street layer is not identifiable”.

**Permit Compliance System Sites:** These are shown by small inverted magenta triangles. Clicking on the **identification** key and a site brings up a small table that contains the kind of discharge(ps/nps), NPDES ID number., facility name, ownership, new status, stream classification and new data,

**Industrial Facilities Discharge:** These are shown by small inverted green triangles. Clicking on the **identification** key and a site brings up a small table that contains the kind of discharge(ps/nps), shape, area, perimeter, NPDES ID number., facility name, address, city, ZIP, lat/long, stcofips.

**Toxic Release Inventory Sites.** These are shown by small inverted maroon triangles. Clicking on the **identification** key and a site brings up a small table that contains shape, area, perimeter, Ldip code., multiple Ids, facility name, and lat/long.

**Water Quality Stations:** These are shown by small scarlet squares. Clicking on the **identification** key and a site brings up a small table that contains shape, ID, station, location, Cu, segment, river miles, lat/long.and type.

**Bacteria Stations:** These are shown by small green squares. Clicking on the **identification** key and a site brings up a small table that contains shape, ID, station, agency, location, Cu, segment, river miles, lat/long.and type.

**National Sediment Inventory Stations:** These are indicated by small maroon squares. Clicking on the **identification** key and a site brings up a very long table that contains shape, NSI status, lat/long, receiving flowage name & ID, and a dozen other things.

**USGS Gaging Stations:** These are indicated by small light aqua squares. Clicking on the **identification** key and a site brings up a small table that contains shape, area, perimeter, gage and gage ID, Agency, lat/long, location and month-by-month average flows.

**Water Quality Observation Stations:** These are indicated by medium red squares. Clicking on the **identification** key and a site brings up a small table that contains shape, Agency, station number, type of observation, lat/long, location Cu, segment, river mile, bcu and bstatid.

**WDM Weather Data Stations:** These are indicated by purple circles centered purple dots. Clicking on the **identification** key and a site brings up a small table that contains shape, name, Coop and NWS IDs, lat/long, beginning & ending dates, and kinds of data compiled (precip, evap, wind, etc).

**Rivers;** This not only shows the various streams in dark blue. Clicking on the **identification** key and then on a stream will bring up a very long line of data that identifies the stream, its length and at least twenty obscure parameters

**State Soil Associations:** These are delineated by thin brown lines. Clicking on the **identification** key will bring us a short table containing the shape, area, perimeter and type designation of the soil area selected.

**Boundaries:** (State, County, EPA Region). These are indicated by gray to black lines of varying density. Clicking on the **identification** key and the boundary will bring up a short table of information on the unit (s) concerned.

**Elevation:** This will show the elevation by a color-code legend. Clicking on the **identification** key and any point location will bring up the coordinates and exact elevation of that site.

**Cataloging Unit Boundaries:** These are shown by a slightly more intense green at the margins of the delineated watershed, Clicking on the identification key and any point on the boundary will bring up a small table that contains shape, area, perimeter, Hydro UnitCode cat. id, cat number, name, cu and Bext.