

# Watershed Boundary Dataset Tools

## Introduction to Tutorial Exercises

The **Watershed Boundary Dataset Tools** (WBD Tools) are a set of applications used to aid in the determination of watersheds (10-digit HUC) and subwatersheds (12-digit HUC) within a subbasin (8-digit HUC). The basic applications consist of the Batch Terrain Preprocessing toolbar, the Draft Lines Definition toolbar, and Final Boundary Determination toolbar.

The **Batch Terrain Preprocessing** toolbar is used to perform the initial analysis of the subbasin terrain, and delineate the draft catchments for the 5<sup>th</sup> level watersheds and 6<sup>th</sup> level subwatersheds.



The **Draft Lines Definition** toolbar is then used to aggregate the draft catchment polygons created with the Batch Terrain Preprocessing toolbar and define the 10-digit HUCs and 12-digit HUCs.



The **Final Boundary Determination** toolbar is used to generate the final HU Line and Polygon feature classes. The geometry and attributes of the 10-digit HU watersheds and the 12-digit HU subwatersheds are defined using this application.



## **User Requirements**

ArcGIS – The user will be expected to have a working knowledge of ArcGIS 8.3/9.x. They should be familiar with the ArcMap interface and be able to add data, modify symbols, create geodatabases, select features interactively by attributes and by location, and perform basic editing using the editor toolbar. The user will also need a working knowledge of map topology and be able to resolve topology errors.

WBD – The user will need to be familiar with the basic features and guidelines established by the watershed boundary dataset. This would include an understanding of stream networks, watershed specifications, coding, naming and the essential elements of the watershed boundary dataset attribute table. The user should possess the skill to define and map watershed boundaries from topographic maps and other source data.

## **Software Requirements**

Microsoft .NET Framework 1.1  
ArcGIS 8.3 or 9.0/9.1, depending on the version installed  
Spatial Analyst extension  
XML Parser version 4.0 (MSXML 4.0)  
Water Utilities Application Framework 8.3 or 9, depending on the version installed  
Arc Hydro Tools for ArcGIS 8.3 or 9

## **Install WBD Tutorial**

Copy the WBD folder from the DVD to C:\

After copying, C:\ should contain the folders below:

```
C:\WBD
  \Data
  \Doc and Exercises
  \Results
  \WA-17110017
  \WBTools9_20060123
```

Review the contents of WBD Workspace, then install the WBD Tools as directed.

## **WBD Workspace Contents**

### **Data**

Course Data – Data for the tutorial has been processed and is located at:

C:\WBD\data.

elevation – 10 meter national elevation data (ned10m\_17110017)  
geographic\_names – geographic names information system (gnis)  
huc\_boundaries – 8-digit hydrologic unit code (huc17110017)  
nhd – 1:24,000 national hydrography dataset (nhd24k\_area)  
ortho\_imagery – 1 meter resolution ortho imagery (ortho1-1\_s\_wa031.sid)  
state\_boundary – state political boundary shapefile (usstate\_geo83.shp)  
topographic\_images – 1:24,000 digital raster graphic county mosaic  
(drg\_s\_wa045.sid)

See attached appendix in Docs and Exercises for data acquisition and processing procedures.

### **Docs and Exercises**

This section contains introduction, tutorial exercises, ESRI Step by step tutorial, and Federal Standards for HU boundary delineation, and a folder with Data Processing Procedures.

Introduction

btp\_exercise.doc – Batch Terrain Preprocessing Toolbar Exercise

dld\_exercise.doc – Draft Lines Definition Toolbar Exercise

fbd\_exercise.doc – Final Boundary Determination Toolbar Exercise

WBDTools\_rev10042005.pdf – ESRI tutorial for the watershed boundary determination toolbars

HU\_standards\_v2\_fgdc.pdf – Federal Standards for Delineation of Hydrologic Unit Boundaries; Version 2.0

Data Preparation (folder) – Contains procedures for acquisition and processing of the NHD, DEM, Breach, DRG, DOQ, HUC, GNIS, State, and County layers.

### **Results**

This section contains interim map documents that may be referenced during the tutorial.

### **WA\_17110017**

Workspace for the WBD tutorial

## **Installing the WBD Tools**

The WBD tools are developed using .Net technology and to run need .Net assemblies for ArcGIS. The current set of WBD tools are located at WBD\WBTools9\_20060123.

- ArcGIS 8.3: the assemblies are installed with the ArcObject's Developers Kit in 8.3. (You can quickly check out if you have them by looking in c:\arcgis\arcgis83\ directory. In there you need to have the "ArcObjects Developer Kit" directory, and the Dotnet\Assemblies subdirectory with many entries. If .Net assemblies are not installed on your machine, make sure that you have the .Net Framework 1.1 (download from Microsoft) installed on your machine BEFORE you install the ArcObject's developer's kit (if .Net Framework is not installed, .Net components for ArcGIS will not be available for installation).
- ArcGIS 9: the assemblies are automatically installed with ArcGIS. If .Net assemblies are not installed on your machine, make sure that you have the .Net Framework 1.1 (available in WBTools directory – may be downloaded from Microsoft also).

## **How to install the applications**

- A. Uninstall your current WBD Tools, Arc Hydro and Water Utilities framework in the following order:
  1. WBD Tools
  2. Arc Hydro
  3. Water Utilities framework
- B. Install the WBD Tools in following order:
  1. Run the ApFramework setup
  2. Run the ArcHydro setup
  3. Run the WBTools setup