GeoWEPP Tutorial Appendix

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Introduction

The Geo-spatial interface for the WEPP model (GeoWEPP) ArcX 2004.3 uses the Geographic Information System (GIS) ArcView software and its Spatial Analyst Extension - both developed by the Environmental Systems Research Institute (ESRI) - as a platform to apply the erosion prediction model (WEPP) and the Windows interface (WEPPWIN) with geospatial datasets for topography, land use and soils.

The interface accesses databases, organizes WEPP simulations, creates all necessary input files for WEPP including the climate files. The current version of GeoWEPP allows delineation of larger watersheds beyond the recommended watershed size for WEPP watershed simulations (<500 hectare). Note that only the dominant land use and soil is delineated for each representative hillslope of a contributing area (subcatchment) to a channel.

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Please note that this document is a draft version! - However, it gives you the most important steps to achieve a GeoWEPP run with an own DEM (ArcInfo GRID format required) or using USGS DEM and DRG from the NRCS Data Gateway.

Appendix 1: Using your own DEM and Images



Set default project directory. Then you proceed to import DEM (ArcInfo GRID). Image and coverage may be imported as overlay.

Reproject Work Directory - My DEM	×
Specify a project directory to work on a copy of my DEM data set	ОК
C:\geowepp\myDEM	Cancel
Add Theme Image	
Do you want to overlay a georeferenced image over the DEM Please make sure that image and DEM have same projection!	
Yes No	
Add Theme GRID	
Do you want to import a own Digital Elevation Model into the view? Please make sure that DEM is UTM Coordinates and in meters.	
Yes	
Add Theme Feature	
Do you want to overlay a feature map over the image Please make sure that image and DEM have same projection!	
Yes No	

After adding the DEM to 'View1' GeoWEPP will transform the DEM into a hill shade view.



Note: The hillshade view allows you to see some more details of the raw DEM data, such as aspect, smoothness of the terrain, terraces and other man made features, valley and drainage pattern. Please investigate your DEM for obvious errors you should take into account in proceeding with this data set.

Appendix 2: Importing Data from the Internet

Q GeoWEPP ArcX 2004.3		×		
$_{ m f}$ The GeoWEPP project is a collaboration of —				
	GeoWEPP	Open existing GeoWEPP project saved in a GeoWEPP project folder		
Use example data	Use NRCS Data Gateway zip file	s from CD or go online		
Use your own DEM	Use own DEM, Soils, and Land Use in ASCII Format or from CD			

The wizard allows you to connect to the internet, download, name and import USGS provided by NRCS.

Use NR	CS Data Gateway Data Downloads
?	Do you want to get online to download data from the internet? (This option requires an online internet connection!)
	Yes No

Note: Please following wizard screens allow you to import publicly available DEM data for any location in the US.

- Download a Digital Elevation Model (DEM) into your project directory
- import the downloaded data files into usable format
- import USGS Digital Elevation Model
- import USGS Digital Raster Graphic (topographical map)

Help: Clicking this button will connect you through your browser instantly to the latest version of the User Manual on the GeoWEPP homepage.

Step 1 allows you to specify area of interest by outlining an area on a map (U.S. only).



Note: For the current version of GeoWEPP, you can choose any area in the US only. A click on the map allow you to zoom in to this area.

Case study: The area of interest may be in this case located in Northwest Indiana near the Wabash River.

URL source: http://lighthouse.nrcs.usda.gov/gateway/NextPage.asp

Continuing Step 1 allows you to zoom into an area of interest and ordering the available data sets.



Note: A click on the map allow you to zoom in to a particular area of interest. Then select ordering button on lower right side of the screen and order data.

Case study: The area of interest may be in this case located around Lafayette, Indiana and the Wabash River.

Step 2 allows you to select data sets of interest (current version of GeoWEPP can handle USGS DEM and DRG only!)



Note: A click on the map allow you to zoom in to a particular area of interest by choosing a quad sheet name to access the available data sets. In some areas in the US there might be on data sets available for your area of interest.

Important Note: The current version of GeoWEPP can handle USGS DEM and DRG only!

Make sure that you select image format (TIFF) and Projection UTM Zone with datum NAD27.



Note: Make sure that you select image format (TIFF) and Projection UTM Zone with datum NAD27 (in case NAD83 is offered you may experience a small shift of the DRG overlay of up to 300m in North-South Direction). For further information you may want to read the USGS Digital Elevation Model GLIS User Guide.

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Step 4 is to provide personal data and select method to receive data files.

Note: Provide personal data and select method to receive data files.

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A step 5 is for checking your order and continuing for data download.

Note: Check your order and continue. In case you are surprised about the amount of data to download: there seem to be an over estimation of download file size by three orders of magnitude (actual file is 1000 times smaller!).

Final Step is for Get order confirmation and download data through given link or ftp link on email.



Note: Get order confirmed and download data through given link or ftp link on email.

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Note: Select data set for download and make a note of your order number.

A click on the given link name initiate the download depending on the procedure set in your internet browser.



Note: Download data by saving file with suggested name in your current data directory, e.g. 'C:\geowepp2\MyArea'.



GeoWE	PP accepts ONLY data downloaded by the following steps:
?	Step S1: To avoid select areas < 10 square miles! Step S2: Order only Topo Images DRG 7.5*7.5 and USGS DEM! Step S3: Set projection format for all data to UTM Zone & NAD27! Step S4: Select method of data delivery download. Step S5: Place the order and wait for the email notice.
	Did you receive an e-mail and downloaded data in C:\geowepp\myDownload?
	Yes No

Note: Check all the steps in ordering the data and confirm with 'yes' after downloading data in your current working directory, e.g. 'C:\geowepp2\Myarea'.

After importing a DEM continuing the GeoWEPP wizard will transform the DEM into a hill shade view.



Note: The setting of the DEM theme in the view is 'active' and visualization setting is 'true' (tick mark). Please do not change any of these setting during the entire GeoWEPP procedure in this regard – changing active themes in View1 will cause errors.

Note: The hillshade view allows you to see some more details of the raw DEM data, such as aspect, smoothness of the terrain, terraces and other man made features, valley and drainage pattern. Please investigate your DEM for obvious errors you should take into account in proceeding with this data set.

Case Study: Since the hill shading in the eastern part of this map was derived from 30m-DEM with a vertical resolution of 1-meter steps the relief appears to be less smooth than the 30m-raster data in feet. The flat terrain of the terraces are represented differently in the merged DEM.



The imported DRGs are visualized as transparent overlays on hill shaded DEM.

Note: The overlay of the DRG on the hill shaded DEM allows you to locate yourself (tools will be provided after importing all DRGs).

Case Study: You can see the Wabash river (blue) following the valley between the elevated terraces in the Northwest and southern part of the DEM.

Appendix 3: Accuracy of DEMs



The hill shade view of several DEM quads allows you to quickly evaluate their accuracy

Note: The hills hade view is a simple tool for the user to quickly evaluate the DEM accuracy. Especially importing several DEMs next to each other allows you to evaluate the relative difference between the DEMs.

According to the USGS National Mapping Program Standards, the intend of DEM Production process is to produce DEM data sets that accurately represent slopes as well as elevation. Slope data is more critical for certain scientific applications than elevation. Due to the techniques used to derive DEMs, generally derived from contours (Level 2 and 3) DEMs represent slope more accurately than Level 1 DEMs (for more information see USGS National Mapping Program Standards at http://rockyweb.cr.usgs.gov/nmpstds/demstds.html).

However, it also depends on the vertical resolution of the information. In case the DEM is in feet, the resolution is three times better than it would be in meters. So incase there are two 30 m-DEMs available for a quad sheet you should chose the one in feet rather than the one in meters.

Appendix 4: GeoWEPP homepage

These capabilities, the delineation of larger watersheds and multiple soil-land use representative hillslope method are currently under development.

For the latest updates keep on checking the GeoWEPP homepage at:

http://www.geog.buffalo.edu/~rensch/geowepp/

For comments and bug report please send an email to Chris Renschler at

rensch@buffalo.edu

Thank you for your interest and support!