

NRCS WinTR-20 and GEO-HYDRO – COMPUTER DEMONSTRATION

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Abstract The NRCS Geo-Hydro system will develop input for the Natural Resources Conservation Service (NRCS) WinTR-20 hydrologic model from GIS data. Required GIS layers which need to be developed by the user for import to the interface include elevation, land use, hydrologic soil group, and the stream location shapefile. The user may also import any other layers which would be useful in locating a watershed such as political boundaries, roads, etc. Elevation, land use, and stream location data are available for much of the United States from the United States Geological Survey (USGS) and other sources. Digital soil data are available from the NRCS Geospatial Data Gateway.

The WinTR-20 computer program is used to estimate peak discharge and runoff volume from watersheds for use in designing water control structures and in determining impacts of changing land use on the hydrologic system. WinTR-20 is a graphical user interface (GUI) which operates within Windows XP and Windows Vista operating systems. A version was recently released which has various enhancements. The major enhancement permits import of NOAA Atlas 14 rainfall text file. This imported data is used to develop storm analysis and rainfall distribution input data. The second major enhancement allows for development of design hydrographs for analysis of embankment and auxiliary spillway erosion and stability.

NRCS Geo-Hydro is based upon the ArcView GIS program from Environmental Systems Research Institute (ESRI). The following software requirements are necessary to operate NRCS Geo-Hydro: ArcView GIS Version 3.2 or 3.3, ArcView Spatial Analyst Extension version 1.1 or greater, NRCS Geo-Hydro ArcView project and databases. Even though the system is point-and-click, basic familiarity with GIS operations and hydrologic analysis is recommended. NRCS Geo-Hydro is organized to automate the process used in a typical watershed hydrologic analysis. Its operation is grouped into a series of menus, buttons, and tools which are designed to be used in a sequential manner. The WinTR-20 program may be executed within the ArcView framework. Further refining or use of advanced WinTR-20 options may then be accomplished through the use of the WinTR-20 Controller/Editor. NRCS Geo-Hydro and WinTR-20 systems have comprehensive user guides, training material, example data, and other technical documentation. The Geo-Hydro interface is also operational in ArcGIS 9x.

WinTR-20 and Geo-Hydro software, documentation, and training material are available at http://www.wsi.nrcs.usda.gov/products/W2Q/H&H/Tools_Models/tool_mod.html. A fact sheet, user guide, software, and sample GIS data may be downloaded. The User Guide has detailed instructions on setup and installation. NRCS Geo-Hydro is an ArcView project file (with .prj extension in the file name). The menus and tools are driven by ArcView Avenue scripts. The ArcGIS version is an extension. It uses certain capabilities of ESRI ArcHydro Tools and also includes standard NRCS hydrologic and hydraulic procedures.