Hydrologic Engineering Centre (HEC) Software CD

Collection of programs, developed by the U.S. Army Corps of Engineers

Environmental Data Management Programs

Name:	**HEC-DSS Package**
Purpose:	Data Storage System (includes GSS graphic drivers)
Version:	07/2001
Type:	Full Version
Description:	The HEC Data Storage System (HEC-DSS or just DSS) stores data in a fashion convenient for inventory, retrieval, archiving and model use. The DSS was primarily designed for water resource applications. The user may interact with the data base through: • Utilities that allow entry, editing, and display of information. • Application programs that read from and write to the data base. • Library routines that can be incorporated in any program to access data base information. The DSS provides a means for: • storing and maintaining data in a centralized location, • providing input to and storing output from application programs, • transferring data between application programs, and • displaying the data in graphs or tables. The HEC-DSS Package contains programs DSPLAY, DSSITS, DSSPD, DSSTS, DSSTXT, DSSUTL, DSSMATH, DSSSHF, SHFDSS, NWSDSS, WATDSS, DWINDO and REPGEN.

Name:	**HEC-GeoRAS for ArcInfo**
Purpose:	ArcInfo Macros for Viewing and Manipulating Geospatial Data for HEC-RAS
Version:	1.0
Type:	Full Version
Description:	HEC-GeoRAS is a package of ARC/INFO macros specifically designed to view and manipulate geospatial data for use in the Hydrologic Engineering Center's River Analysis System (HEC-RAS). The graphical user interface allows users with minimal GIS experience to create a HEC-RAS import file containing geometric attribute data from an existing digital terrain model (DTM). Water surface profile data exported from HEC-RAS simulations may also be viewed using HEC-GeoRAS. The HEC-GeoRAS macros are written in the arc macro language (AML) and require the ARC/INFO program with the TIN extension.

Name:	**HEC-GeoRAS for ArcView**
Purpose:	ArcView Macros for Viewing and Manipulating Geospatial Data for HEC-RAS
Version:	3.0
Type:	Full Version

Description:	HEC-GeoRAS is an ArcView GIS extension specifically designed to process geospatial data for use with the Hydrologic Engineering Center River Analysis System (HEC-RAS). The extension allows users with limited GIS experience to create an HEC-RAS import file containing geometric attribute data from an existing digital terrain model (DTM) and complementary data sets. Results exported from HEC-RAS may also be processed. The current version of HEC-GeoRAS creates an import file containing river, reach and station identifiers; cross-sectional cut lines; cross-sectional surface lines; cross-sectional bank stations; downstream reach lengths for the left overbank, main channel, and right overbank; and cross-sectional roughness coefficients. Hydraulic structure data are not written to the import file. Water surface profile data and velocity data exported from HEC-RAS may be processed into GIS data sets.

Flow Hydraulics and Sediment Transport Programs

Name:	HEC-2
Purpose:	Calculation of Water Surface Profiles for Any Cross-Section
Version:	Version: 4.6
Type:	Full Version
Description:	The program is intended for calculating water surface profiles for steady gradually varied flow in natural or man-made channels. Both subcritical and supercritical flow profiles can be calculated. The effects of various obstructions such as bridges, culverts, weirs, and structures in the floodplain may be considered in the computations. The computational procedure is based on the solution of the one-dimensional energy equation with energy loss due to friction evaluated with Manning's equation. The computational procedure is generally known as the standard step method. The program is also designed for application in floodplain management and flood insurance studies to evaluate floodway encroachments. Also, capabilities are available for assessing the effects of channel improvements and levees on water surface profiles. Input and output may be either English or metric units.

Name:	HEC-5
Purpose:	Simulation of Flood Control and Conservation Systems
Version:	8.0
Type:	Full Version
Description:	The HEC-5 Program is designed to simulate the sequential operation of a reservoir-channel system with a branched network configuration. Time intervals ranging from one minute to one month can be used, and multiple time intervals can be used within a single simulation. Channel routing can be performed by any of seven (7) hydrologic routing techniques. Reservoirs operate to: • Minimize downstream flooding • Evacuate flood control storage as quickly as possible • Provide for low-flow requirements and diversions • Meet hydropower requirements

Name:	**HEC-6**
Purpose:	Scour and Deposition in Rivers and Reservoirs
Version:	4.1
Type:	Full Version
Description:	The HEC-6 Scour and Deposition in Rivers and Reservoirs is a one-dimensional sediment transport model. It calculates water surface and sediment bed surface profiles by computing the interaction between sediment material in the stream bed and the flowing water-sediment mixture.

Name:	**HEC-FDA**
Purpose:	Flood Damage Analysis System
Version:	1.2
Type:	Full Version
Description:	The HEC-FDA program provides the capability to perform plan formulation and evaluation for flood damage reduction studies. It includes risk-based analysis methods that follow Federal and Corps of Engineers policy regulations (ER 1105-2-100 and ER 1105-2-101). Plans are compared to the without condition by computing expected annual damage (and equivalent annual damage) for each plan. Computations and display of results are consistent with technical procedures described in EM 1110-2-1619. HEC-FDA will only run on computers using Windows 95/98 or Windows NT.

Name:	**HEC-RAS**
Purpose:	River Analysis System
Version:	3.0
Type:	Full Version
Description:	HEC-RAS is an integrated system of software, designed for interactive use in a multi-tasking, multi-user environment. The system comprises of a graphical user interface (GUI), separate hydraulic analysis components, data storage and management capabilities, graphics and reporting facilities. The HEC-RAS system will ultimately contain three one-dimensional hydraulic analysis components for: 1. steady flow water surface profile computations, 2. unsteady flow computations, and 3. movable boundary sediment transport computations. A key element is that all three components will use a common geometric data representation and common geometric and hydraulic computation routines. In addition to these three hydraulic analysis components, the system contains several hydraulic design features that can be invoked once the basic water surface profiles are computed. The current version of HEC-RAS supports Steady and Unsteady flow water surface profile calculations. New features and additional capabilities will be added in future releases.

Hydrology and Drainage Programs

Name:	HEC-1
Purpose:	Watershed Analysis and Detention Design
Version:	4.1
Type:	Full Version
Description:	The HEC-1 Flood Hydrograph Package computes flood hydrographs using unit hydrograph, or kinematic wave methods. Various program options are provided for computing subbasin runoff, river routing and combining hydrographs to simulate catchment runoff response.

Name:	HEC-GeoHMS
Purpose:	Hydrologic Modeling System for use with ArcView GIS
Version:	1.0
Type:	Full Version
Description:	HEC-GeoHMS is intended to process watershed data after the initial compilation and preparation of terrain data is completed. The assembly of GIS data can be performed using standard GIS software packages that support ARC Grid format. When the assembly is complete, HEC-GeoHMS processes the terrain and spatial information to generate a number of hydrologic inputs. It is intended that these hydrologic inputs provide the user with an initial HMS model. The user can estimate hydrologic parameters from stream and watershed characteristics, gaged precipitation and streamflow data. In addition, the user has full control in HMS to modify the hydrologic elements and their connectivity to more accurately represent field conditions.

Name:	HEC-HMS
Purpose:	Hydrologic Modeling System
Version:	2.1
Type:	Full Version
Description:	For precipitation-runoff-routing simulation, HEC-HMS provides the following components: • Precipitation-specification options which can describe an observed (historical) precipitation event, a frequency-based hypothetical precipitation event, or a event that represents the upper limit of precipitation possible at a given location. • Loss models which can estimate the volume of runoff, given the precipitation and properties of the watershed. • Direct runoff models that can account for overland flow, storage and energy losses as water runs off a watershed and into the stream channels. • Hydrologic routing models that account for storage and energy flux as water moves through stream channels. • Models of naturally occurring confluences and bifurcations. • Models of water-control measures, including diversions and storage facilities. These models are similar to those included in HEC-1. In addition to these, HEC-HMS includes:

- A distributed runoff model for use with distributed precipitation data, such as the data available from weather radar.
- A continuous soil-moisture-accounting model used to simulate the long-term response of a watershed to wetting and drying.

HEC-HMS also includes:

- An automatic calibration package that can estimate certain model parameters and initial conditions, given observations of hydrometeorological conditions.
- Links to a database management system that permits data storage, retrieval and connectivity with other analysis tools available from HEC and other sources.