



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

Product

Gage Analyst and Storm Transform: ArcGIS Tools for Hydrologic Modeling

Technology

Gage Analyst is a GIS tool based on ESRI ArcGIS 8.3 that enables development of distributed data for hydrologic models in a rational, consistent manner. The tool allows users to accurately interpolate gridded meteorological parameters based on point measurements. The interpolation easily includes orographic, elevation, terrain effects, and other known influences via inverse distance weighting (IDW) or bias grid methods.

Storm Transform is also based on ESRI ArcGIS 8.3 and allows the user to investigate hypothetical-design storms by combining gridded precipitation from historic storm events with a storm track translated in space and time.

Gage Analyst and Storm Transform interact with the Hydrologic Engineering Center's Data Storage System (HEC-DSS) database, ASCII output, and ORACLE, and can provide input to HEC's Hydrologic Modeling System (HMS), which is widely used by Corps Districts and their customers to simulate precipitation runoff.

Problem

Hydrologic modeling often requires gridded input of meteorological parameters. However, gridded input is usually developed from point estimates of varying quality and length of record. Existing interpolation schemes have not been straightforward, consistent, or rationally based. With limited data sets, what-if scenario development for flood frequency analyses, water control, and emergency management need the capability to transform existing storm data sets in space and time.

Expected Cost To Implement

Implementation cost is low. Gage Analyst and Storm Transform require the user to have ESRI's ArcGIS software with the Spatial Analyst extension. Cost assumes data are available and that the user is familiar with ArcGIS. These tools are free to Corps Districts via an ftp site: http://gis.usace.army.mil/gis.aspx?p=USACE_Software.

Benefits/Savings

Corps Districts and their customers now can easily develop accurate distributed input data for hydrologic models based on point estimates and knowledge of terrain and other influences. Runoff scenarios based on permutations of historic storms are now possible. These capabilities support the Corps Civil Works and Military missions in water resources management. Gage Analyst and Storm Transform have been used in several studies for the Corps of Engineers, including the Sacramento and San Joaquin River Basins Comprehensive Study.

Status

Gage Analyst and Storm Transform were released in beta version in May 2003. District experiences will be used to develop the final version.

ERDC POC(s)

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Distribution Sources

Gage Analyst and Storm Transform are distributed free to Corps Districts via an ftp site: http://gis.usace.army.mil/gis.aspx?p=USACE_Software.

Available Documentation

Documentation for Gage Analyst and Storm Transform is available in the form of a user's manual that installs automatically from the file on the ftp site.

Available Training

A user's manual is provided. Formal training is planned in the future when the final version is released.

Available Support

The Corps' Remote Sensing/Geographic Information Systems Center of Expertise <http://www.crrel.usace.army.mil/rsgisc/> provides technical support to Corps Districts for Corps RS/GIS applications. Water control, hydropower, and water quality technical support may be obtained through the Water Operations Technical Support Program (WOTS, <http://www.wes.army.mil/el/wots/dtar.html>). The ERDC POC can advise on technical issues associated with application of Gage Analyst and Storm Transform.

