

US Army and ESRI to Develop New GIS Technology

The U.S. Army Corps of Engineers' Hydrologic Engineering Center and ESRI will cooperate on developing a new generation of geographic information system (GIS) technology for hydrologic engineering and ecological analysis. The Hydrologic Engineering Center (HEC), based in Davis (CA, USA), and ESRI signed a three-year cooperative research and development agreement (CRADA) that will focus on adding a geospatial analysis component to HEC's software that analyzes how an ecosystem (i.e., plants, animals, and soil) reacts to water flow, developing terrain models and terrain representation for hydrologic and hydraulic analyses and publishing HEC's modeling techniques with ArcGIS Server.

HEC designed a successful family of hydrologic software including the River Analysis System (HEC-RAS) for modeling the hydraulics of water flow through channels and the Hydrologic Modeling System (HEC-HMS) for simulating precipitation and runoff in watersheds. In cooperation with ESRI over the past six years, HEC has added geospatial components, HEC-GeoRAS and HEC-GeoHMS, to the software. This successful application has enabled spatial and temporal processing and visualization of water flow. One complex problem HEC is working on is analyzing water's impact on ecosystems and land-use activities. ESRI and HEC plan to work together to develop an ArcGIS application for HEC's new Ecosystem Functions Model (EFM). EFM analyzes responses of the ecosystem to changes in water flow. GIS software will provide the spatial analysis, visually illustrating and quantifying the effects of flow changes on habitats within the watershed. This application will take advantage of the new capabilities of ESRI's ArcGIS 9.2, including managing large terrains, and the geoprocessing capabilities of ModelBuilder technology.

Publish HEC's hydrological and ecosystems modeling technology, with GIS data, in ArcGIS Server, opening opportunities to share the technology with many different agencies, natural resource managers, and the public. Users of the systems will then be able to build and run their own hydrologic models.

Implement models that use terrains, a new data type in ArcGIS 9.2 that permits the analysis of large, complex surface models—something that was not possible previously.

Explore the possibility of cooperating in areas such as geographic data structures for water resources modeling and analysis, flood damage analysis, and spatial hydrologic data products.

<https://www.hydro-international.com/content/news/hydrologic-engineering-center-and-esri-cooperative-research-and-development>
