

Watershed Modelling in Kentucky

The recently completed Kentucky Watershed Modeling Information Portal (KWMIP), funded through a 750,000USD Co-operative Agreement with the US Environmental Protection Agency (EPA), is an innovative, standards-based data provisioning portal for watershed modellers in the Commonwealth of Kentucky, USA. The portal is integrated with the Kentucky Division of Geographic Information (DGI) web mapping services - KYGeonet (<http://kygeonet.ky.gov>), KYRaster and KYVector, served over state government LAN, and the US Geological Survey (USGS) StreamStats (<http://streamstats.usgs.gov/html/idaho.html>). It uses data from the Kentucky Climate Data Generator portals and the EPA's Environmental Information Exchange Network (EIEN) and STORET (STORage and RETrieval) repository for water-quality, biological and physical databases.

The vision of KWMIP is to provide a one-stop digital geospatial data portal for any entity, public or private, performing watershed modelling (with models supported by KWMIP) over the geography of Kentucky. The KWMIP project also provides training for Kentucky personnel in watershed modelling and use of models in decision-making. The KWMIP significantly leverages spatial data and tools already available in Kentucky, particularly the KYGEONET, centralised repository of data and metadata.

The technologies developed for the KWMIP are consistent with technology resulting from a multi-million dollar NASA investment in Kentucky Landscape projects. One of the products from these projects, a higher accuracy, detailed National Land Cover Dataset (NLCD01) for Kentucky, serves as a baseline for temporal land-cover detection and for a land-cover change portal (<http://klcportal.ky.gov>), both of which are essential for more accurate watershed modelling.

Data provisioning by KWMIP operates by a modeller defining an area of interest from an on-screen map or by hydrologic unit, then choosing one of the supported models. Once the request is made the data necessary to run the model(s) is located, correctly formatted, clipped to the geographic extent of the area of interest and shipped, with notification enabling data to be downloaded to the computer providing the modelling service.

Interfaces implementing OGC specifications are used in this chain of activities, particularly an OpenGIS Web Feature Service (WFS) Specification implementation that supports interoperability with USGS StreamStats, STORET, Kentucky Climate Data Generator, and EIEN. Other OGC specifications used are the OpenGIS Web Map Service and OpenGIS Catalog Service, both Web implementation specifications.

KWMIP represents an unprecedented opportunity for the Kentucky community of watershed modellers. The KWMIP resides in the Kentucky Commonwealth Office of Technology (COT), which is responsible for enterprise information technology for the Commonwealth. COT, which was a Kentucky centre for geographic information prior to KWMIP, will continue to ensure that appropriate and usable data and tools are available for the programmatic needs of government and citizens of the Commonwealth.