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The National Map

The National Map's National Elevation Datasets' Collaborative Applications

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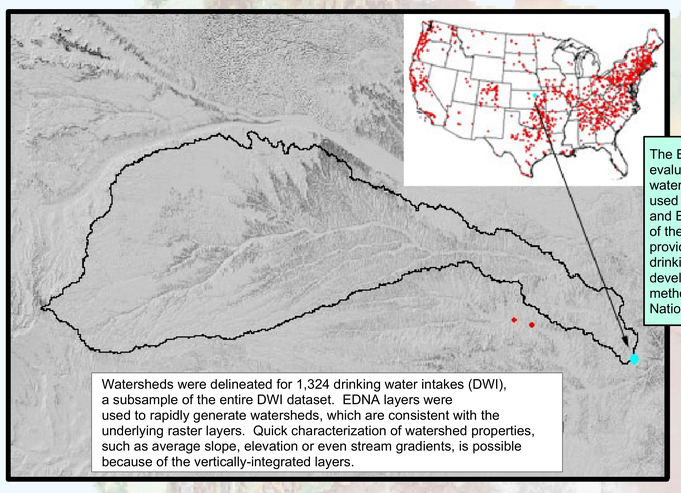
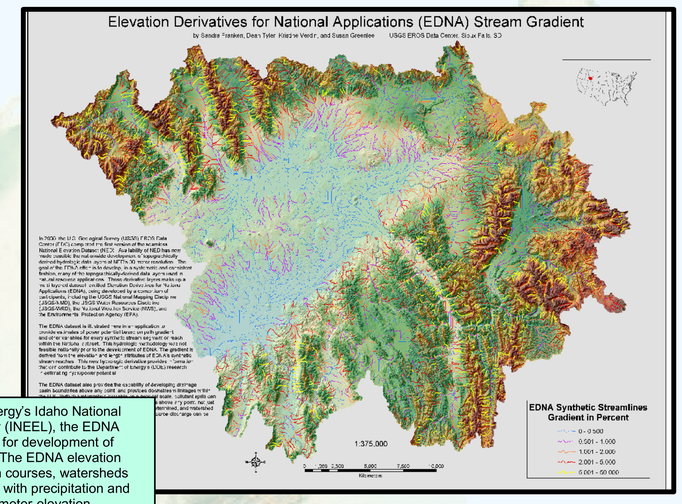
Highlights of the USGS/EROS Data Center's Collaborative Applications of the Elevation Derivatives for National Applications (EDNA) Database

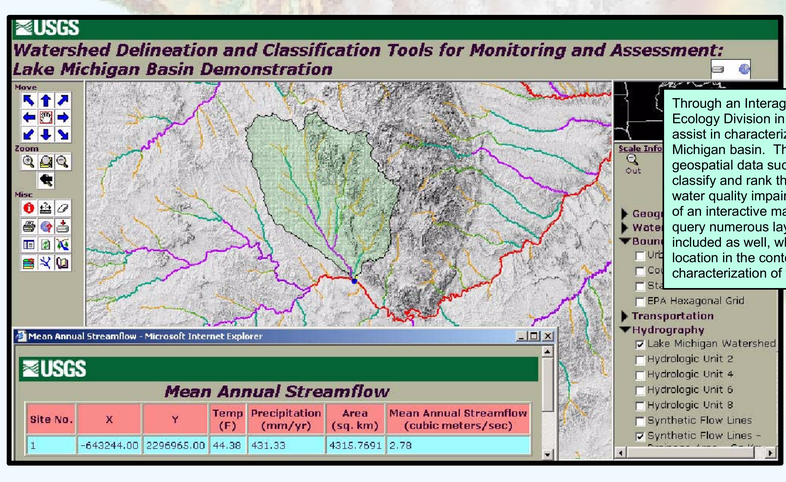


Watersheds were delineated for 1,324 drinking water intakes (DWI), a subsample of the entire DWI dataset. EDNA layers were used to rapidly generate watersheds, which are consistent with the underlying raster layers. Quick characterization of watershed properties, such as average slope, elevation or even stream gradients, is possible because of the vertically-integrated layers.

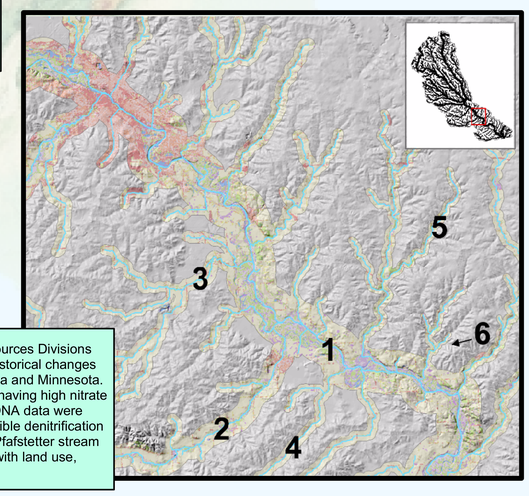
The Environmental Protection Agency (EPA) is tasked with the evaluation of the quality of and protection of the nation's drinking water supplies. To this end, USGS/EROS Data Center staff have used the EDNA layers, working with the EPA's Environmental Fates and Effects Division (EFED), to delineate watersheds for a subset of the nation's drinking water intakes. These watershed delineations provide the framework upon which evaluation of the quality of the drinking water supply can be made. Along with the work done to develop watersheds for the intakes, a comparison of the DEM-based methodology with one based on Theissen polygons derived from the National Hydrography Dataset (NHD) was completed.



In collaboration with the Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL), the EDNA database was used to assess the potential for development of new low-head/low-power for all 50 states. The EDNA elevation layers were used to define potential stream courses, watersheds and gradients. This information, combined with precipitation and temperature layers obtained from the Parameter-elevation Regressions on Independent Slopes Model (PRISM) dataset, was used to estimate average annual streamflow, head drop and power potential for the over 1,000,000 stream segments contained in the EDNA database.



Through an Interagency Agreement with the EPA's Mid-Continent Ecology Division in Duluth, Minnesota, EDNA has been used to assist in characterization of the watersheds within the Lake Michigan basin. The EDNA layers, combined with other geospatial data such as soils, climate and land-use, have been used to classify and rank the watersheds according to their relative probability of water quality impairment. A portion of this work has involved development of an interactive map service, which allows the partners to browse and query numerous layers. A web-enabled modeling capability has been included as well, which allows delineation of watersheds above any location in the conterminous U.S. as well as rapid (on-the-fly) characterization of the watershed.



The Geography, Biological Resources, and Water Resources Divisions of USGS collaborated on a study that focused on the historical changes of water quality in the Cedar River Basin, located in Iowa and Minnesota. A 57-mile reach above Cedar Rapids was identified as having high nitrate nitrogen and fecal coliform bacteria concentrations. EDNA data were used with other data sources to identify lands with possible denitrification potential. Buffer widths were assigned to streams by Pfafstetter stream codes, which are shown in the following graphic along with land use, EDNA-generated streams, and shaded relief.

U.S. Department of the Interior
U.S. Geological Survey