

Generalization for *The National Map* with emphasis on the National Hydrography Dataset

The purpose of this project is to develop a generalization strategy that can be implemented on subsets of the National Hydrography Dataset (NHD). The strategy should produce a dataset in the NHD model format that maintains: feature definitions, reach delineations, feature relationships, and flow connections between remaining generalized features – so that the extracted data will continue to function with pre-existing NHD applications but with less detail and subsequently with faster processing speed. Eventually, we hope to develop software tools that generalize NHD data to a user-specified level of detail, or to a level that is defined by the scale of a user's display. Furthermore, the generalization process should occur in real-time rather than storing several generalized layers at pre-defined scales. Subsequent to this development effort, a *National Map* data user could download generalized NHD data in a functionally equivalent form with potentially greater spatial integrity than similar scale data developed by alternative means. Consequently, automated generalization represents a significant enhancement to the analysis capabilities of the NHD.

The basic strategy for our NHD generalization approach entails feature pruning, line simplification, and feature simplification. Feature pruning, also referred to as spatial refinement, concerns removal of features that are too small for a desired generalized scale. Line simplification is the removal of vertices on the lines that comprise post-pruned features. And, feature simplification consists of converting features to a more generalized basic feature type, which entails collapsing area features to either lines, points, or merging features.