

CAP 2000 PROJECT INFORMATION SUMMARY
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Framework Project Summary

Agreement Number	00HQAG0141
Project Title	Development of Spatial and Attribute crosswalks to National Hydrography Dataset (NHD) for West Virginia
Proposal Category	Category 5: Framework Demonstration Projects
Project Summary	This Framework Demonstration Project will develop the technical procedures, institutional relationships, and a business plan to develop and maintain Enhanced National Hydrography Dataset (NHD) for the Mid-Atlantic Highlands. NHD is enhanced by conflating the higher resolution hydrography features to NHD and developing interfaces to attach the existing and new attribute databases to this enhanced NHD. The proposed project will perform a pilot effort for an eight digit watershed area to fully develop the procedures for implementation. This project is undertaken as a joint effort by Canaan Valley Institute, ProLogic, Inc., and WV State GIS Coordinator with support and participation by US Geological Survey's National Mapping Division, US Geological Survey Water Resources Division, and WV Division of Natural Resources.
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Collaborating Organizations / Agencies	ProLogic, Inc. 1000 Technology Drive, Suite 3140 Fairmont, WV 26554 Office of WV GIS Coordinator 1124 Smith Street, Suite 201A Charleston, WV 25339
Geospatial Data Themes	Hydrography, Elevation
Geographic Extent	West Virginia
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Applicable Website(s)	http://www.canaanvi.org

Project Description

Task 1 - Conflation of hydrography features from 1:24000 scale Digital Line Graph (DLG) data and National Elevation Database-derived synthetic hydrography (NED-H) data to the National Hydrography Dataset (NHD) for Upper Monongahela USGS Cataloging Unit 05020003. This conflation process involves updating DLG and NED-H data products to assign unique and permanent feature IDs from the NHD. The DLG and NED-H contain many hydrography features that are not mapped in NHD (because of scale / resolution differences); these features will be assigned new feature IDs and the additional attributes and relationships to conform to the NHD data model. The goal of this task is develop, test, and document the issues related conflation of hydrography data, addition and deletion of NHD features, and the issues related to communicating these feature transactions to USGS and EPA who have the mandate to update and disseminate this data nationally. US Geological Survey National Mapping Division (USGS-NMD) will provide technical support and software to enhance and conflate NHD.

Task 2 - Integration of non-spatial (attribute) databases to this enhanced NHD for two large multi-decade stream-related attribute databases.

- a) WV Division of Natural Resources (WVDNR) (along with WV Department of Environmental Protection – Office of Water Resources) have developed a hierarchical stream coding system in the 1960s (Appendix D1 shows an example). Additionally, each stream has been given a name based on various local sources. This task will seek to develop a crosswalk between the NHD feature IDs and the WVDNR stream codes as well as Geographic Names Information System (GNIS) based stream names with the WVDNR stream names (GNIS is nation's official repository for domestic geographic names information). The goal of this sub-task is to provide WV DNR with an ability to transition to higher resolution hydrography themes while maintaining linkage to the years of stream-related information. This sub-task will also facilitate easy sharing of these attribute databases with other NHD users. Currently, the use of the data for geospatial applications and hydrologic modeling is severely restricted and constrained.
- b) US Geological Survey Water Resources Division (USGS-WRD) office in Charleston WV (in cooperation with State and Federal Agencies) has been collecting large amount of data pertaining to the water resources in WV. This is achieved through a network of hundreds of gaging stations that collect stream flow, ground water, and water quality data (Appendix D2 shows an example). Each of the gaging stations have a known latitude-longitude as well as descriptive information which relates it location to the stream and watershed. This large database will be integrated by developing a crosswalk between the gaging station and the corresponding NHD feature

Task 3 - Develop a website using ESRI ArcIMS 3 that provides a web-based mapping of NHD, GNIS, and conflated streams. The website will provide an ability to perform a stream-based query of all available attribute databases. This index map is used to inquire NHD feature IDs for a stream. It is our intention for this website to allow organizations (ie USGS-WRD) to expose availability of stream specific attribute information, cost of access (if any), and point of contact. This website will also provide interface for registered organizations to provide Internet-based access and linkage to share their attribute data. An end-user of hydrography data and visit this website and view the web-based maps showing streams and stream names. Additionally, the end-user can click on a stream and list the availability of all recorded attribute databases. Each attribute database will provide metadata information identifying the collection methods, points of contact, and whether this dataset is available for download. Organizations that collect stream related information visit this website to enter this metadata about their attribute databases and create a URL link to provide web-based access to their data. This website will also provide links to the two WV-based Clearinghouse nodes, FGDC Clearinghouse node, as well as specific links to access data and metadata developed / enhanced by this project.

Task 4 - Host a one-day workshop that involves Federal, State, Local, and Regional organizations with mandate and need to integrate and share spatial and non-spatial data related to surface water features in the Mid-Atlantic Highlands (includes WV and portions of PA, MD, and VA). The goal of this workshop is provide a forum for the hydrography constituency to discuss the preliminary results of this project and have a discussion to initiate a business plan to extend the project for the entire Mid-Atlantic Highlands area.

Task 5 - Each of the lead organizations involved in this project will make **educational presentations** at various venues throughout the region. The results of the proposed project will be **reported at national conferences**. The report describing the pilot effort and future developments will be disseminated over the Internet.

Task 6 - The project partners will develop a **business plan** to support and further the implementation of Enhanced NHD through the necessary crosswalks throughout the Mid-Atlantic Highlands. It is expected that a formal business plan for the enhancement and maintenance of NHD in West Virginia will be executed before the formal closure of this project. The outcomes of this project will be used to develop business plan for the other states in the Mid-Atlantic Highlands.

National Hydrography Dataset (NHD) provides a consistent, rich, and national feature-based dataset and a data model that will serve as a basemap for hydrographic and hydrologic applications. It provides permanent and unique feature identification for all streams nationwide. The objectives of this project are to take advantage of this just released NHD to develop procedures, partnerships, and information infrastructure to facilitate long-term maintenance, upgrade, and dissemination of NHD. The proposed developments will also allow for a somewhat easy and routine sharing of mapping and attribute databases.

The NHD for the Mid-Atlantic Highlands will be implemented with ESRI's ArcInfo 8's **Geodatabase technology**. The Internet-based access to hydrography mapping, metadata, and functionality to add new data or links to the data will be developed using ESRI's **ArcIMS 3**. ESRI **ArcSDE 8** will be spatial database engine with Oracle 8 as the database server. The conflation of DLGs and NED-H to NHD will be performed using GIS Trans' **GIS/T-Conflate** software and USGS's in-house developed conflation software. All project partners have a strong commitment to using and adopting national and international standards. FGDC's metadata standard is widely used in West Virginia and we will continue to use and help other organizations adopt this standard. West Virginia already has one Clearinghouse node at the WV State GIS Technical Center and an additional Clearinghouse node is expected at the WV Department of Environmental Protection. West Virginia also has broadly accepted several data format and content standards such as DLG, DRG, GNIS, DEM, DOQ, etc.

All project partners view the demonstration project as enhancing the already underway activities and the end of this project will further accelerate the development of Enhanced NHD. This project comes at a critical time in the development of data standards and GIS technologies where implementation is possible and within reach.