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1:30 PM – 3:00 PM

SESSION 37: NHD and NHD/WBD Integration

Harmonization of the National Hydrography Dataset (NHD) With Sister Datasets in Canada and Mexico Along the Common Borders - Pete Steeves, U.S. Geological Survey, Northborough, MA

The National Hydrography Dataset (NHD) is a digital dataset of surface-water features for the entire Nation. The dataset is managed by the U.S. Geological Survey (USGS); however, many of the edits, updates, and enhancements to the NHD are made through a multi-agency collaborative stewardship program on a state by state basis. The concept of NHD Stewardship has recently been expanded to include Canada and Mexico in an effort to harmonize hydrography data for a swath of watersheds overlapping the United States borders with these two countries. Two coordinated efforts, one focusing on watershed boundaries and the other on hydrography, are currently underway for each of these international collaborations. This discussion primarily focuses on the hydrography harmonization effort. Hydrography harmonization results in updates to two datasets for every watershed: NHD and either a sister dataset for features along the Canadian border (the National Hydrography Network (NHN) managed by National Resources Canada) or a sister dataset for features along the Mexican border (The Red Hidrografica Nacional managed by the Instituto Nacional de Estadística y Geografía). The harmonization effort for hydrography can be broken down into three stages. The first stage involves edge matching features at the international borders. The second stage involves transcribing ("cross walking") the features and attributes from one dataset to the other (for example, NHD to NHN). The third and final stage involves populating the new features with program-specific, unique-value attributes using internally-developed geodetic tools. The datasets resulting from this effort can be used for a suite of cartographic and scientific applications. One application now under discussion is StreamStats, a USGS World Wide Web application that computes regression-based streamflow statistics for user selected locations on streams and rivers. Other more basic applications include tools that enable searches for sites along stream networks (for example, dams or gage locations), watershed delineation and basin characteristic summation for user selected points, and map products.

Binational Hydrologic Unit Boundary Data Harmonization of the Watershed Boundary Dataset (WBD) with Canada and Mexico - Karen Hanson, U.S. Geological Survey, West Valley City, UT

The Watershed Boundary Dataset (WBD) is a consistent, seamless, and hierarchical (6 level) digital-spatial dataset of hydrologic units, derived from surface topographic and hydrologic features across the United States. The WBD is available as a seamless product at a 1:24,000 scale for the conterminous U.S. It is also available at a 1:24,000 scale for Hawaii, 1:25,000 for the Caribbean Islands, and 1:63:360 for Alaska. This dataset provides a consistent framework for local, regional, and national applications to manage, archive, exchange, and analyze data by hydrologic features. Over the past several years coordination meetings and workshops have been taking place between the U.S. Geological Survey and counterparts in both Canada and Mexico to complete and fully harmonize the boundaries of shared hydrologic drainage areas along the common border, and provide a cross-walk field for linking to attribution tables from either country. This paper primarily focuses on the bi-national effort to harmonize watersheds across the border. The end product from this harmonization will allow the US to coordinate with its neighbors on a wide range of applications that rely on quality physiographic spatial data. This effort is being made in parallel with another which is focused on the coordination of digital spatial surface hydrography datasets.

Progress Report on the Stewardship of the National Hydrography Dataset - Jeff Simley, U.S. Geological Survey, Denver, CO

The National Hydrography Dataset portrays the surface water of the United States using a particular standard and generally based on 1:24,000-scale mapping content. Several factors call for the continuous updating of this

dataset including landscape change, the need for more detail, evolving requirements, and quality corrections. The scope of this updating process is far beyond the capabilities of the U.S. Geological Survey. To provide a capable and properly focused updating process, a data stewardship operation is employed whereby local organizations, principally state water agencies, update the data for inclusion in the national database. Now that the stewardship program has been in operation for three years, several valuable lessons have been learned about the challenges of maintaining a national surface water database. There is a strong need for a knowledgeable support team to assist the stewards in developing a capability. Thorough and easy-to-use tools coupled with efficient processes are required. A working IT infrastructure is essential along with developmental support to quickly resolve technology problems. A good training program and good documentation will provide huge benefits. Motivation is a key factor and requires multiple strategies to implement and maintain a stewardship program. Financial support and other incentives may be needed to jump-start operations. The development, growth, and maintenance of a united stewardship community is important. The program must be receptive to and adopt change to keep up with evolving demands. Constant attention to a broad range of technical and management issues is needed to create a working stewardship program to provide the nation with a capable national hydrography dataset.

WBD/NHD Integration - Stephen Daw, U.S. Geological Survey, Denver, CO (co-author: Karen Hanson)

The National Hydrography Dataset and Watershed Boundary Dataset have become highly successful components of a framework for GIS in water resources. Integrating them into a common data model and linking characteristics of the two datasets will now unleash even more powerful capabilities for analysis. A highly functional data design taking advantage of geodatabase technology means an advanced dataset that will serve sophisticated analysis for years to come while at the same time being simple and easy to use to give users at all levels of expertise the ability to apply the data. The integration process will mean a single integrated data model, spatial integration, water program integration, and integration with other themes of data in The National Map. Developing the new dataset has demonstrated a strong inter-agency collaboration at all levels. This has helped facilitate a networking of many state and federal agencies into a better understanding of requirements and solutions for the role of such a dataset in water science. The result today is a new GIS dataset that is well on its way to providing useful new data to scientists and users for years to come. This is already apparent in examples of national, regional, and local applications showing how WBD improves management, exchange, and analysis of hydrologic data demonstrate the usefulness of the new integrated database. The usefulness of a nested hydrologic unit scheme based on natural surface conditions and combined with a water flow network cannot be underestimated for potentially invaluable analytical and statistical purposes and applications.