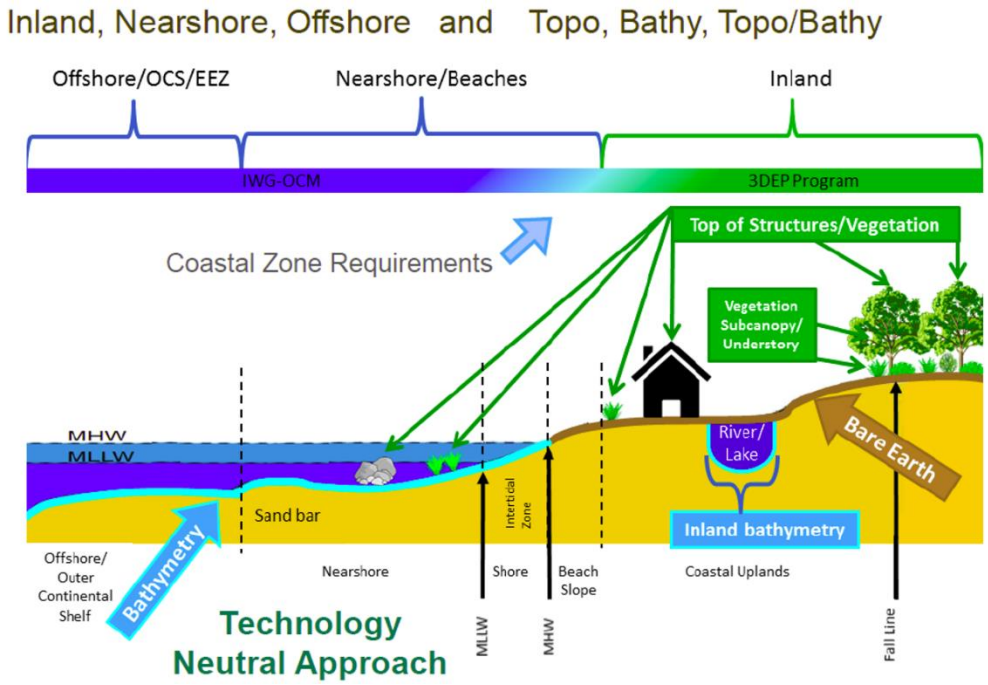
Overview of the 3DEP & 3DHP Components of the USGS 3D National Topographic Model Initiative (3DNTM), and why should Local Government GIS departments participate in these programs?

The 3D National Topography Model (3DNTM) is a USGS initiative to update and integrate new nationwide elevation and hydrography data into a 3D model to deliver high-quality data to meet the most demanding scientific requirements and enable improved data-driven decisions to support increased economic development, enhanced public safety, and improved environmental stewardship applications across all levels of government. The 3DNTM program components include USGS 3D Elevation Program (3DEP) for nationwide Lidar data acquisition, and the USGS 3D Hydrography Program (3DHP) for nationwide 3D hydrography data acquisition.

What is the USGS 3D Elevation Program (3DEP)?

The USGS 3D Elevation Program (3DEP) is a program managed by the U.S. Geological Survey (USGS) National Geospatial Program. The program aims to respond to growing needs for high-quality topographic and bathymetric data and for a wide range of other three-dimensional (3D) representations of the Nation's natural and constructed features. The program informs critical decisions that are made across our Nation every day that depend on elevation data, ranging from immediate safety of life, property, and environment to long term planning for infrastructure projects. The USGS was designated by the Office of Management and Budget (in 2002 through OMB Circular A–16) as the lead Federal agency for terrestrial elevation data. The 3DEP initiative is designed to fulfill that leadership responsibility and to ensure that the needs of the Nation for high-quality 3D elevation data are being met.



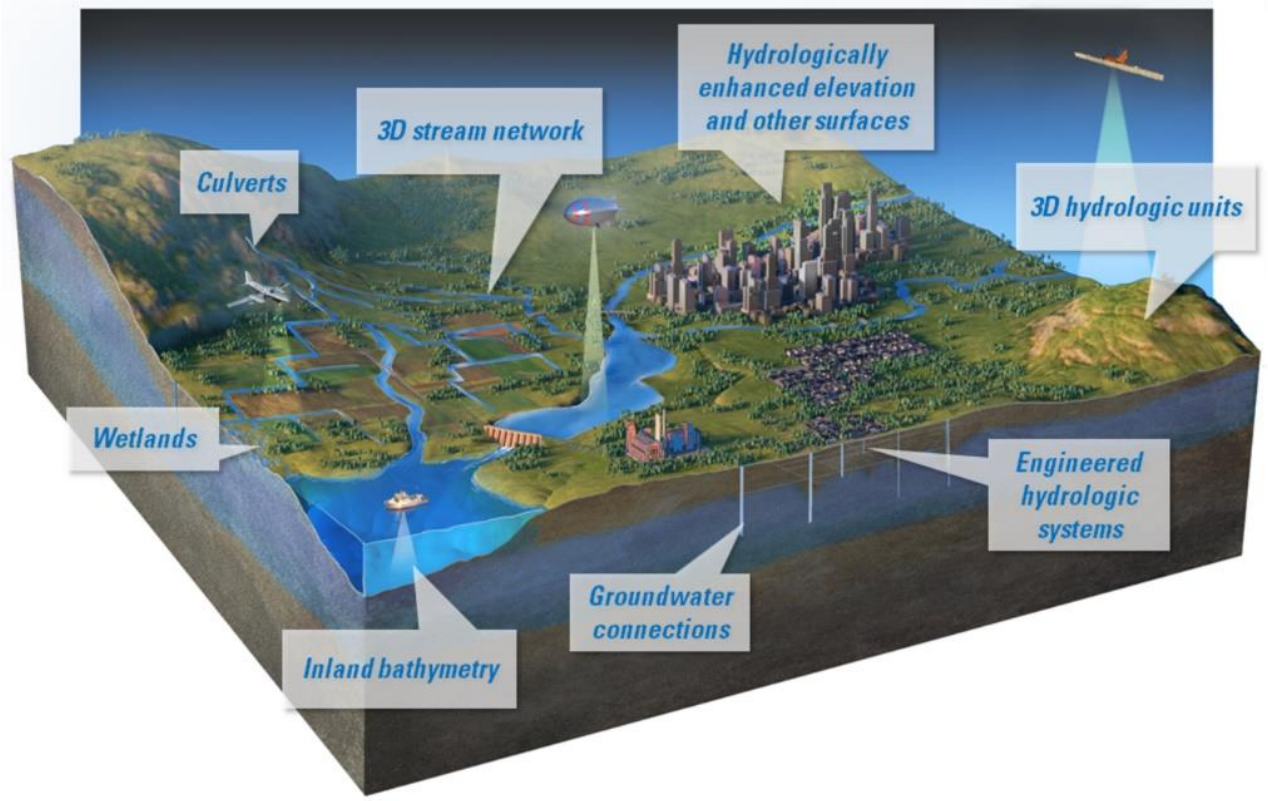
As the first nationwide 3DEP coverage nears completion, the USGS's next generation 3DEP Program is rolling out and includes a refresh / update of the baseline Lidar data that also improves the existing national baseline Lidar coverage from QL2 to QL1, as well as

expands the elevation data acquisition to include inland river/stream/lakes and near-shore bathymetry options.

What is the USGS 3D Hydrography Program (3DHP)?

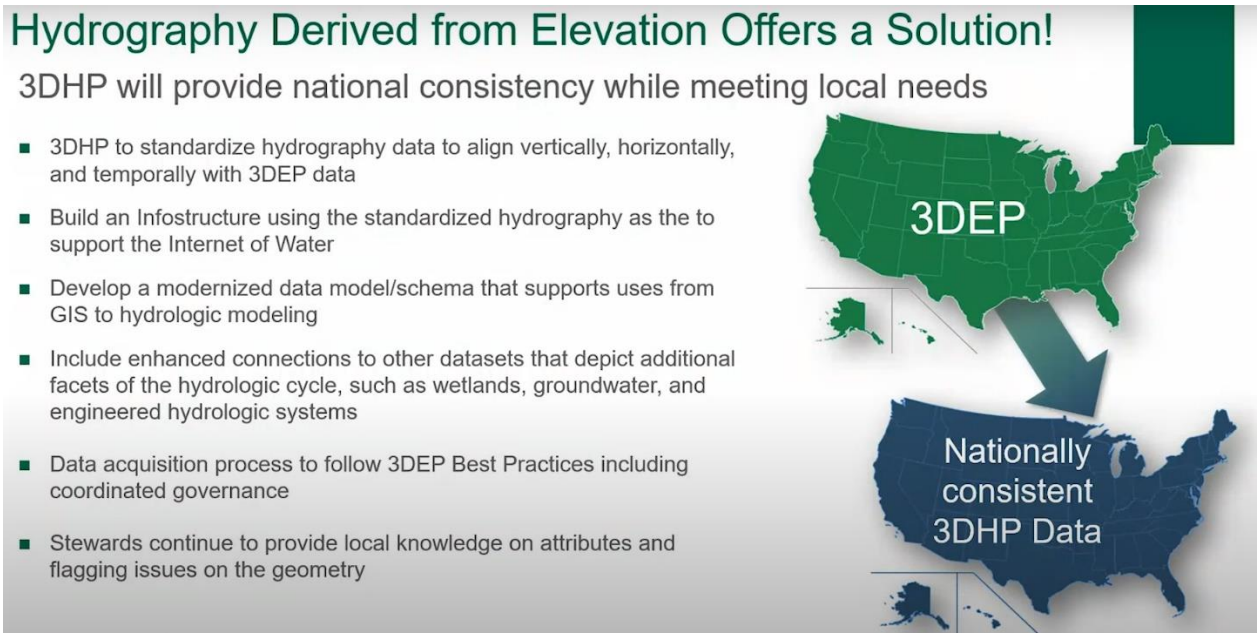
For more than 20 years, the USGS and partners have developed and maintained the National Hydrography Datasets consisting of the National Hydrography Dataset (NHD), the Watershed Boundary Dataset (WBD), and the NHDPlus High-Resolution (NHDPlus HR). These datasets represent the authoritative mapping of the Nation's surface water network and watersheds.

The USGS was designated by the Office of Management and Budget (in 2002 through OMB Circular A–16) as the co-lead Federal agency (with NOAA) for mapping surface water data.

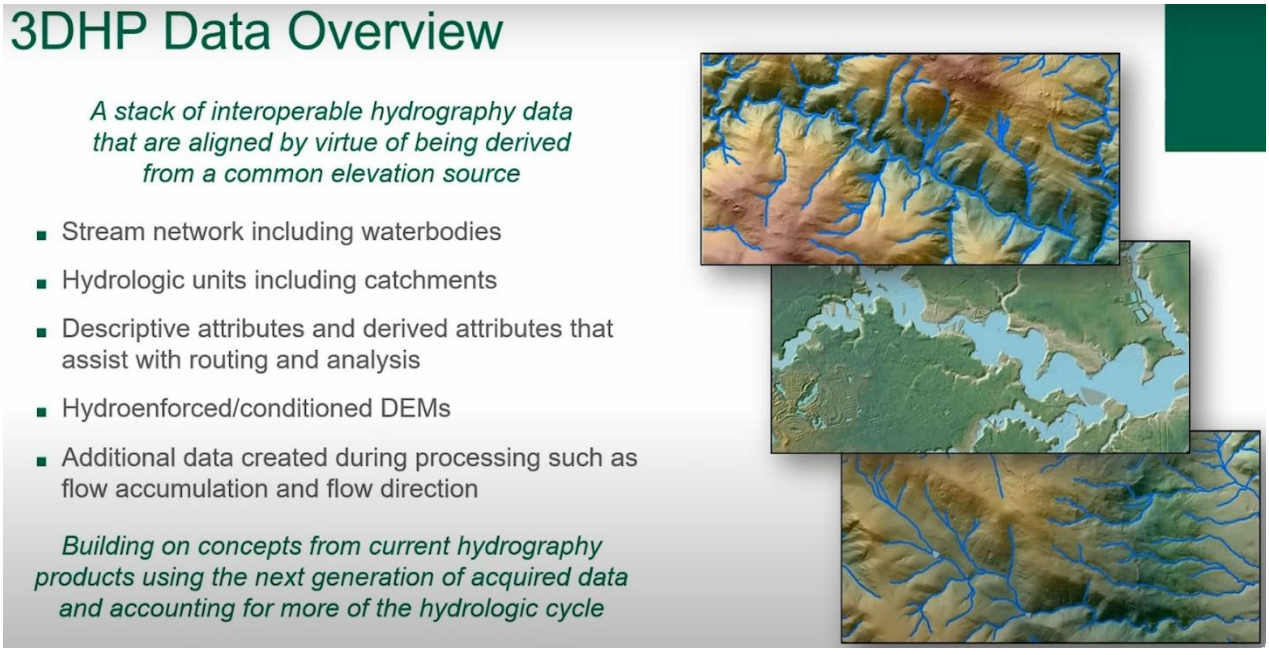


The 3DHP initiative is designed to fulfill that leadership responsibility and to ensure that the needs of the Nation for high-quality integrated 3D hydrography and 3D elevation data are being met.

The implementation of 3D National Hydrography Program (3DHP) marks the beginning of a new era of water data to completely refresh the Nation's hydrography data and improve discovery and sharing of water-related data.

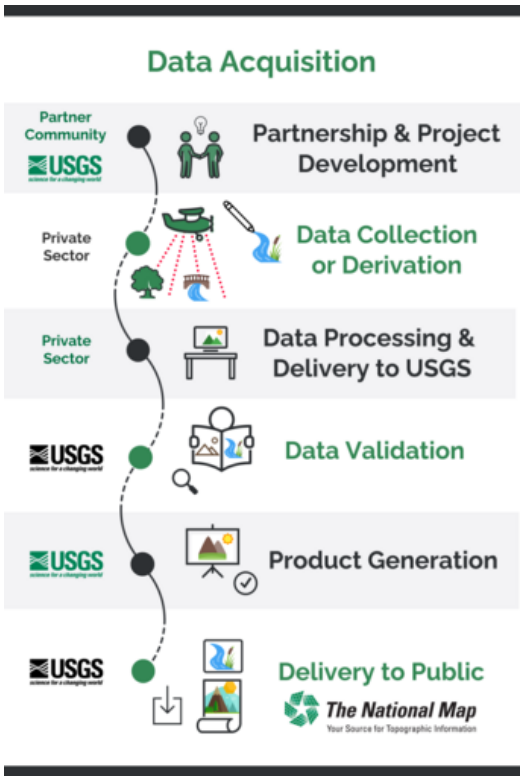


The 3DHP will significantly improve the level of detail, currency, and content of hydrography data by deriving 3D stream networks and watersheds from high-quality 3D Elevation Program (3DEP) data, as well as other elevation derivatives to support applications like hydrologic and hydraulic modeling.



3DHP will improve the ability to track information about water as it moves through the hydrologic cycle by connecting surface water features traditionally represented in the NHD to wetland, engineered hydrologic

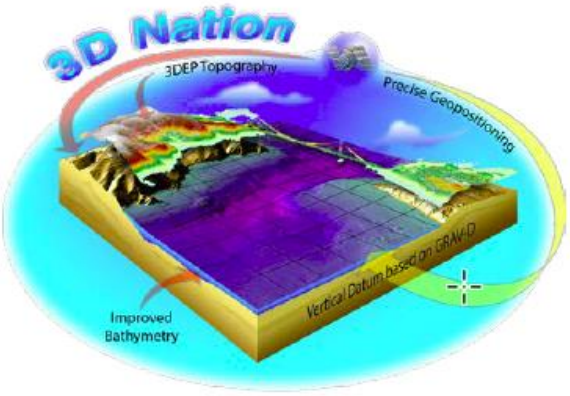
systems, and groundwater data; and improving attribution of important hydrologic characteristics like streamflow permanence.



The 3DHP program is also unique in that the final seamless national hydrography data products are published by the USGS from the Elevation Derived Hydrography (EDH) data products produced and delivered to the USGS through their DCA grant program from cooperative agreements between the acquiring authority (e.g. Hamilton County working with its Private Sector partner) and the USGS.

What are the benefits to GIS Departments County Government in participating in the USGS 3DEP & 3DHP DCA competitive grant process?

The 3DEP & 3DHP Data Collaboration Announcement (DCA) is a competitive grant program that provides a unique opportunity for federal and local government financial collaborations to leverage the services and expertise of private sector mapping firms to acquire these datasets, so that at all levels of government, the private sector, and citizens may have access to and derive the benefits of these integrated 3D elevation and hydrography data products.



The DCA is a competitive process, and proposals are evaluated based on several factors, including the technical merit of the proposal, the applicant's qualifications, and the potential impact of the project. Applicants to the DCA may contribute funds toward a USGS lidar and hydrography data acquisition via the Geospatial Products and Services Contracts (GPSC) or they may request DCA funds to cover some portion of their lidar and hydrography data acquisition (e.g. 15%-45%) via a Cooperative Agreement where they are the acquiring authority (prime contractor). When the local government is the prime contractor, they are then responsible, through their selected

contractors / vendors, for the acquisition, development, and delivery of the 3DEP and 3DHP data products to the USGS that meet each program's data specifications.

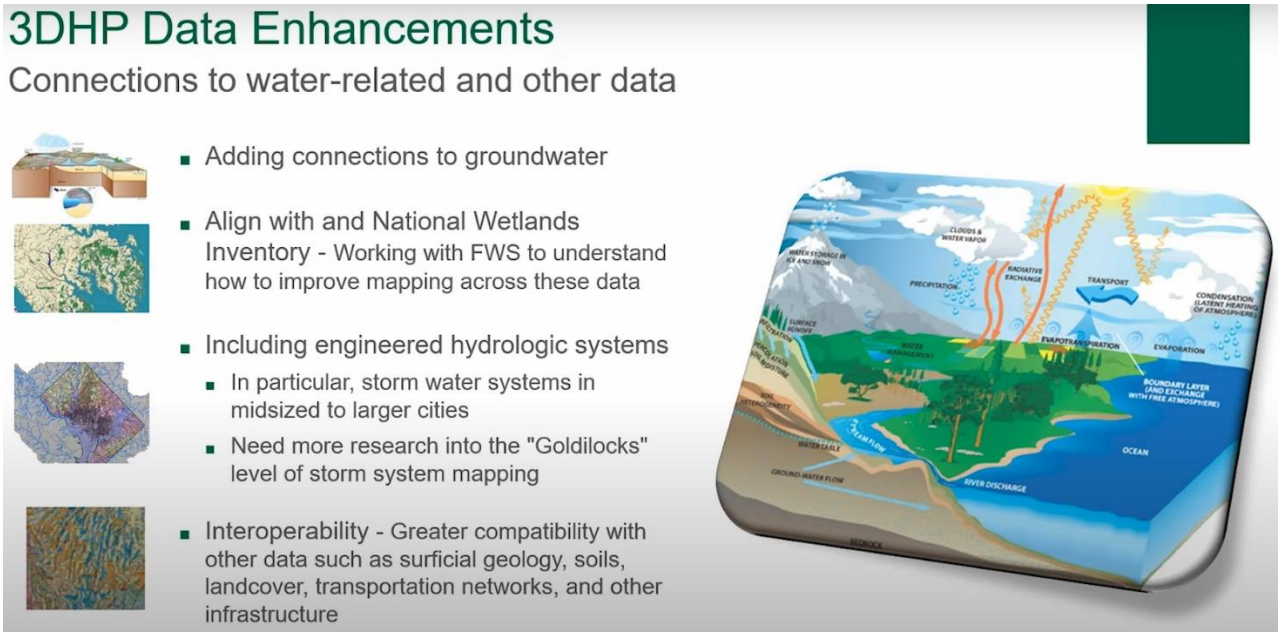
County Benefits to 3DEP & 3DHP Participation: By participating in these programs, county governments can improve their communities and make them safer, more resilient, and more prosperous. The County benefits from adopting these established national 3D elevation and hydrography data standards that are also adopted by the State of Indiana Geographic Information Office (IGIO) to: take advantage of new and emerging photogrammetry, remote sensing, and geospatial data, software, and data capture/update methods; share in data development costs through the DCA grant program; expand data sharing opportunities and data maintenance responsibilities; expand opportunities to benefit from new applications developed using these national standard layers; and support the development of additional (optional) geospatial data layers or data services that are derived from these nationally standard elevation and hydrography basemap products. Some additional benefits specific to each program are:

Participating in the 3DEP Program provides numerous additional benefits for county governments, including:

- Improved decision-making: Accurate elevation data can help county governments make better decisions about a variety of issues, such as land use planning, emergency management, and infrastructure development.
- Increased economic development: Accurate elevation data can help county governments attract new businesses and investment.
- Enhanced public safety: Accurate elevation data can help county governments improve public safety by providing better information about flood risks, nearest evacuation route in the event of a disaster, landslide risks, and other hazards.
- Improved environmental stewardship: Accurate elevation data can help county governments better manage natural resources and protect the environment.

Participating in the 3DHP Program provides numerous additional benefits for county governments, including:

- The Elevation Derived Hydrography (EDH) developed by the county and delivered to the USGS will be validated and used to produce seamless national 3DHP stream networks, hydrologic units, and associated hydrography attributes to directly support better hydrologic modeling and decision-making. When fully implemented, 3DHP is estimated to provide more than $1 billion in benefits to Federal, State, Local, Tribal, Private, and Non-profit organizations every year, in addition to a myriad of societal benefits.
- Support modeling the effects of climate change on water resources, improving water resource management, more accurate monitoring of environmental conditions, and helping protect public health and safety.
- Provide connections to other local water-related data and systems (e.g. legal drains, wellhead protection areas, farm tile drains, etc…).
- See the figure below for some additional examples:



For more information about the USGS 3DEP & 3DHP programs see:

What is 3DEP? https://www.usgs.gov/3d-elevation-program/what-3dep

What is 3DHP? https://www.usgs.gov/national-hydrography/3d-national-topography-model-call-action-part-1-3d-hydrography-program

USGS Data Collaboration Announcement Site: https://www.usgs.gov/programs/national-geospatial-program/data-collaboration-announcement-portal