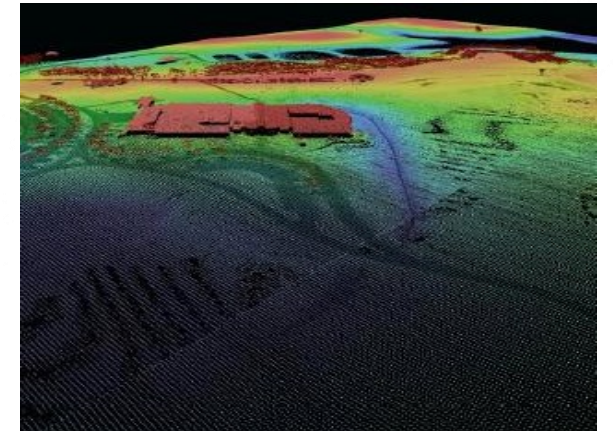
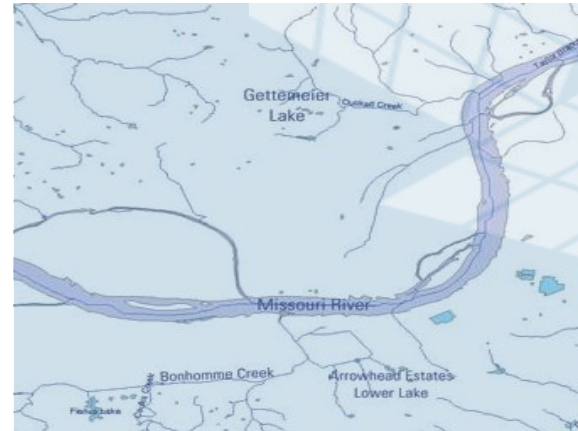
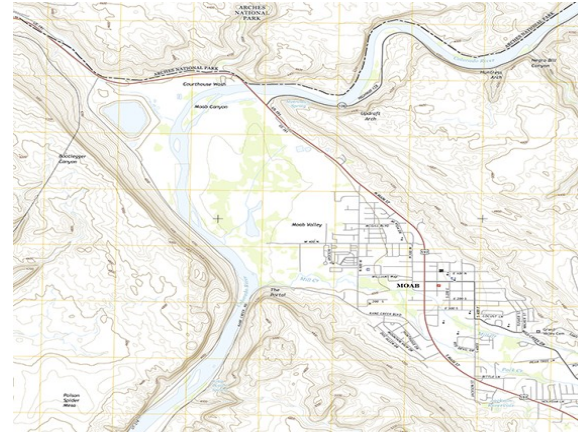




From Vision to Realization: The 3D Hydrography Program



Karen Adkins
Hydrography Products and Services Area Focus Lead
National Geospatial Program – User Engagement Office



Agenda

- Overview 3D Hydrography Program (3DHP)
- Acquiring and Building 3DHP
- Future Enhancements



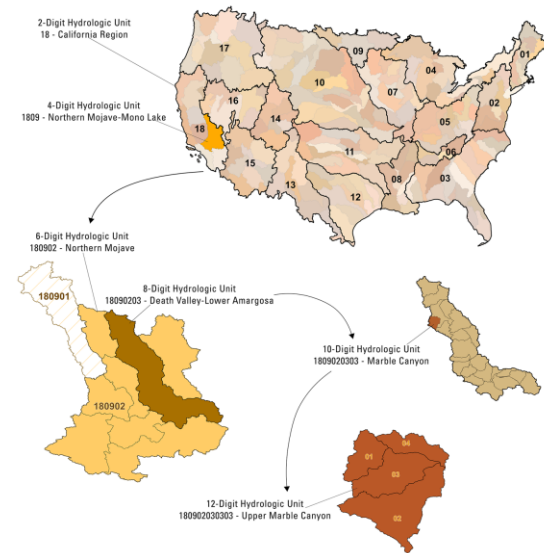
National Hydrography Datasets Portfolio

- For 25 years, the most comprehensive and current data of the Nation's surface waters
 - 9.4 million miles of stream network, including 8 million waterbodies and over 130,000 nested hydrologic units
- Leveraged local knowledge and updates
 - Stewardship program with participants from 41 states and Washington DC
- Updates through stewardship have not been uniform
 - Some areas updated, others untouched and sometimes based 40+ years old information
 - National consistency of data quality has decreased over time
 - NHD surface water features don't align well with highly accurate 3D Elevation Program data



National Hydrography Dataset

Watershed Boundary Dataset



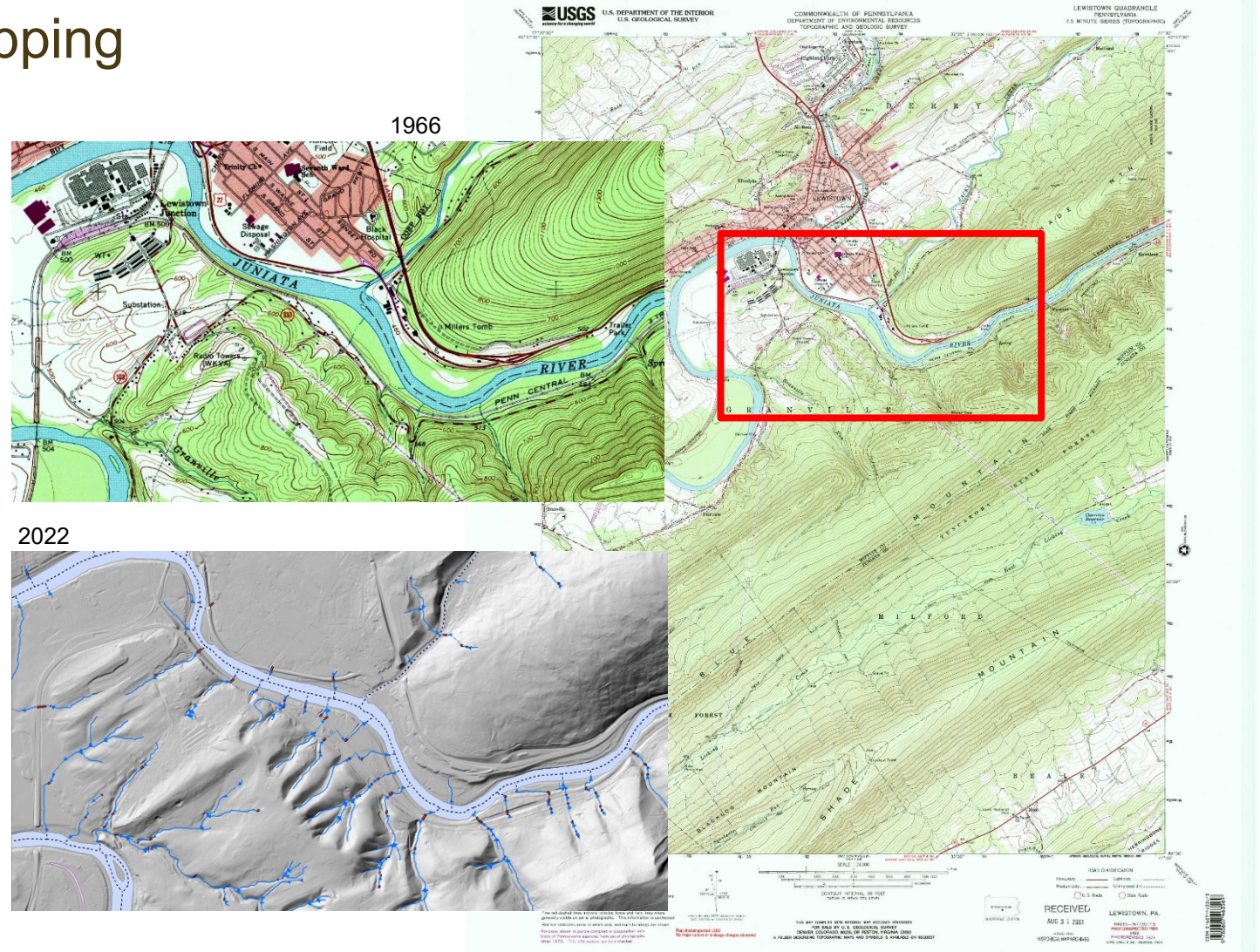
NHDPlus High Resolution

3D Hydrography Program (3DHP)

A new era for surface water mapping

3DHP is the first systematic remapping of the Nation's hydrography since the original USGS 24K topographic mapping program was active between 1947 and 1992

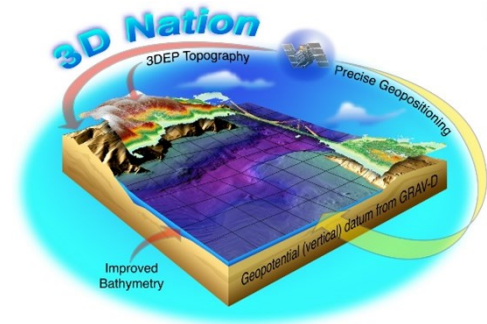
- New Data
- New Data Model
- New Data Delivery



+

3D National Topography Model (3DNTM)

Integrates elevation and hydrography datasets to model the Nation's topography in 3D



3D Hydrography Program (3DHP)

- Hydrography derived from/integrated with 3D Elevation Program data
- Connections to groundwater, wetlands, and engineered hydrography
- 3DHP Infostructure for data sharing as part of the Internet of Water

Next Gen 3D Elevation Program (3DEP)

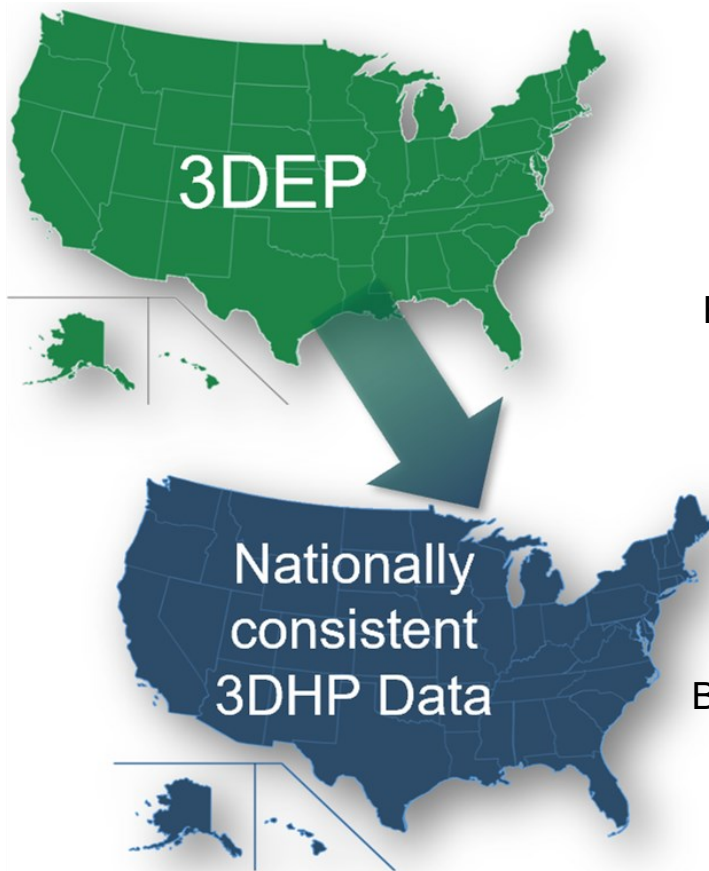
- New quality levels and refresh cycles
- Integration of inland bathymetry
- 3DEP Ecosystem for data and resource sharing
- Continual improvement with new technologies and approaches



Future Integrated 3D Model

- Research and develop a 3D data model to fully integrate 3DHP and next gen 3DEP
- Integrate other data from The National Map

+ 3DHP Program Goals

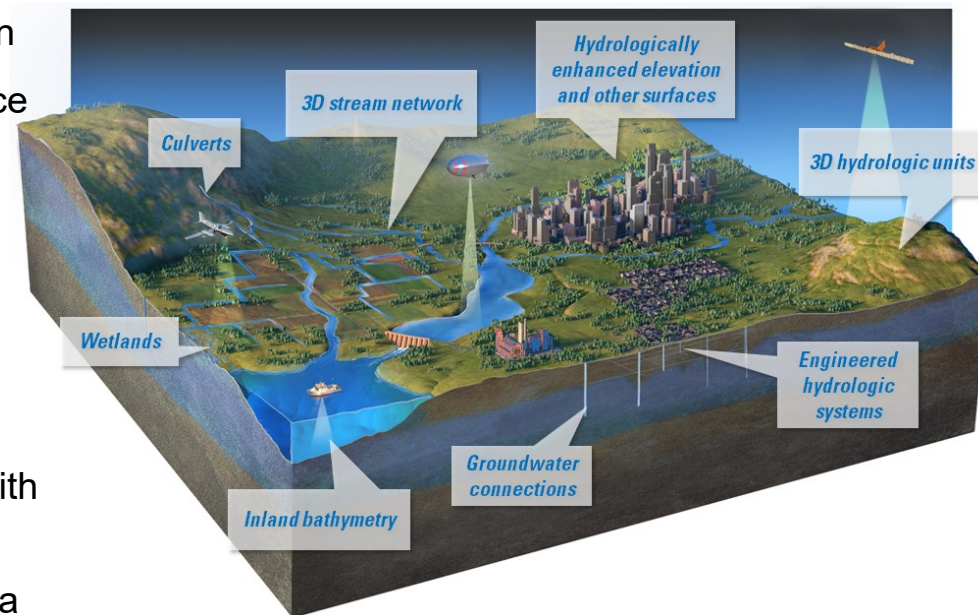


Replace older, inconsistent hydrography with higher accuracy data

Derive from and align with 3DEP elevation
Follow 3DEP Best Practices for governance and acquisition

Data and systems built for hydrologic applications

Better accounting of the hydrologic cycle with connections to water-related information
Interoperability with non-hydrographic data





Hydrography Data Acquisition

USGS-Partner Collaboration

- Cost sharing
- Acquisition through USGS Geospatial Products and Services Contracts (GPSC)
 - Work with multiple qualified contractors using different processes to provide compliant hydrography derived from elevation data
- Allows for cooperative agreements with state and local partners
- Data Collaboration Announcement (DCA) released September 2023

3D Hydrography Program
Learn More About 3DHP

HOME | COMPONENTS OF NGP | SUPPORTING THEMES | GEOGRAPHIC NAMES | SUPPORT | TOPOGRAPHIC MAPS | MEETINGS | DATA | MULTIMEDIA | FAQ | PUBLICATIONS | WEB TOOLS | NEWS | CONNECT | PARTNERS

The USGS National Geospatial Program (NGP) collaborates with a wide range of stakeholders to share costs of topographic data acquisition in support of collective mission and business requirements. The Fiscal Year (FY) 2024 3DNTM DCA has been released. The initial deadline for project submissions is October 20, 2023.

3D Elevation Program DCA
FY24 3DEP DCA

3D Hydrography Program DCA
FY24 3DHP DCA

DCA Frequently Asked Questions
FY24 FAQ

FY24 Collaboration Announcement (DCA)
The DCA provides a mechanism for partnering with the USGS and other Federal Agencies to acquire high-quality 3D Elevation or 3D Hydrography data to provide the Nation with high-resolution topographic products to support a broad array of applications. The FY2024 3DNTM DCA was released on September 7, 2023. The initial deadline for project submissions is October 20, 2023. Project submissions received after the deadline will be considered for review after initial project selections are made. See links above for detailed information on how to partner with the USGS and other Federal agencies to collect updated topographic information for 3DEP or 3DHP.

Contacts
Questions related to the 3DEP DCA
General Mailbox
3D Elevation Program
Email: 3dep_dca@usgs.gov

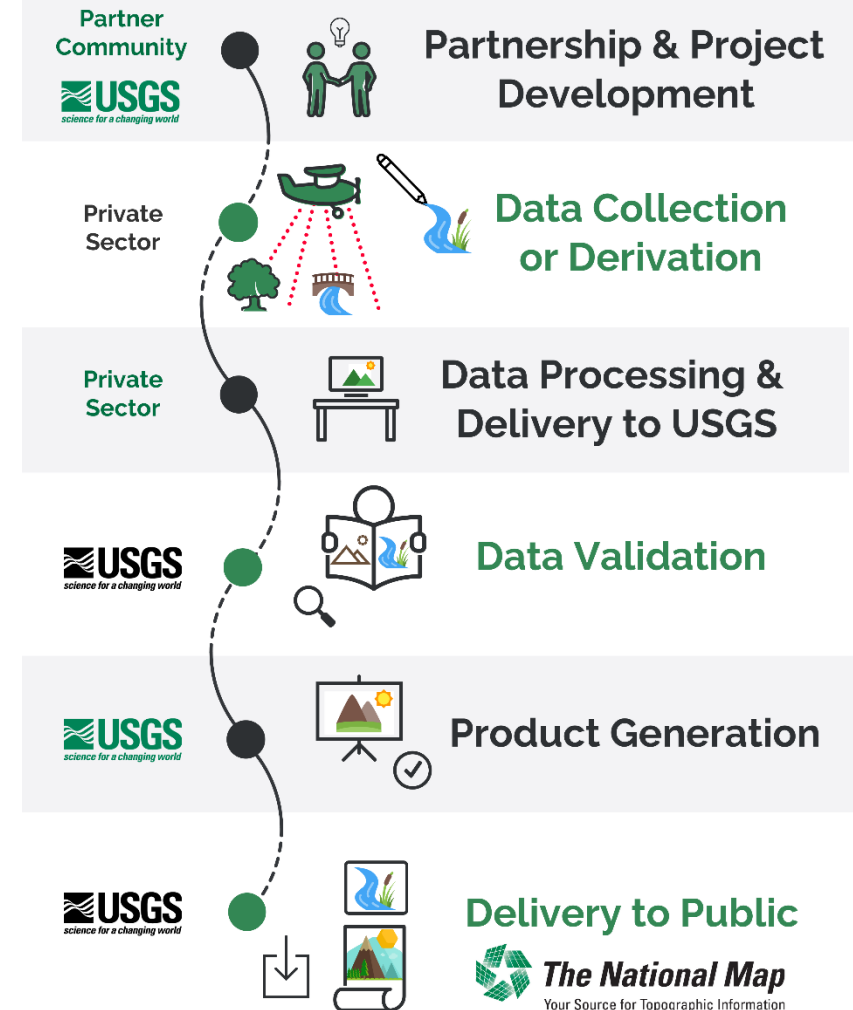
www.usgs.gov/3DNTM/DCA



Data Acquisition Best Practices

- USGS [Geospatial Products and Services Contracts \(GPSC\)](#)
 - The GPSC is a multiple award acquisition vehicle. Firms on the GPSC have been selected based on their qualifications and performance in providing the professional services needed.
 - The contracts include acquisition, processing, and quality assurance for mapping products (lidar and elevation derived hydrography). Managed by the USGS Commercial Partnerships Team (CPT).
 - USGS performs validation of the contracted data to ensure it conforms to specifications.
 - Consistent results
- Option for state and local partners to manage their own acquisition contracts through a financial assistance award or cooperative agreement. Data must be validated and meet specification.
- Contributed data

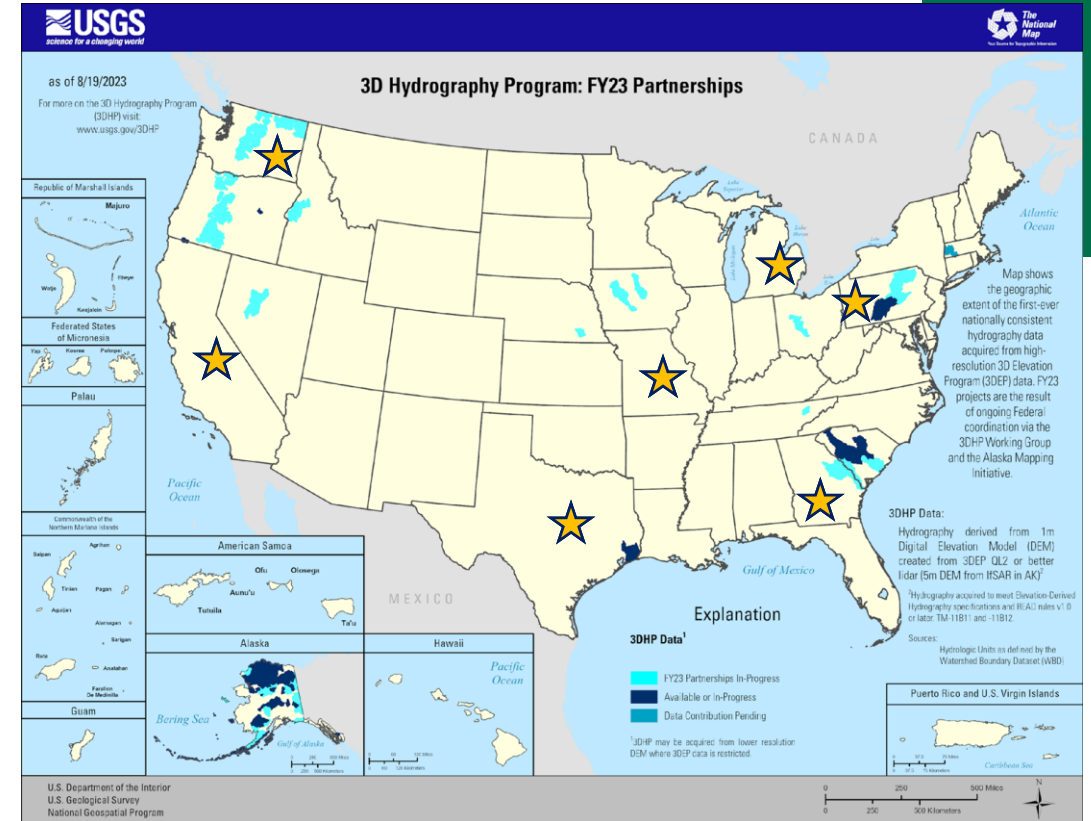
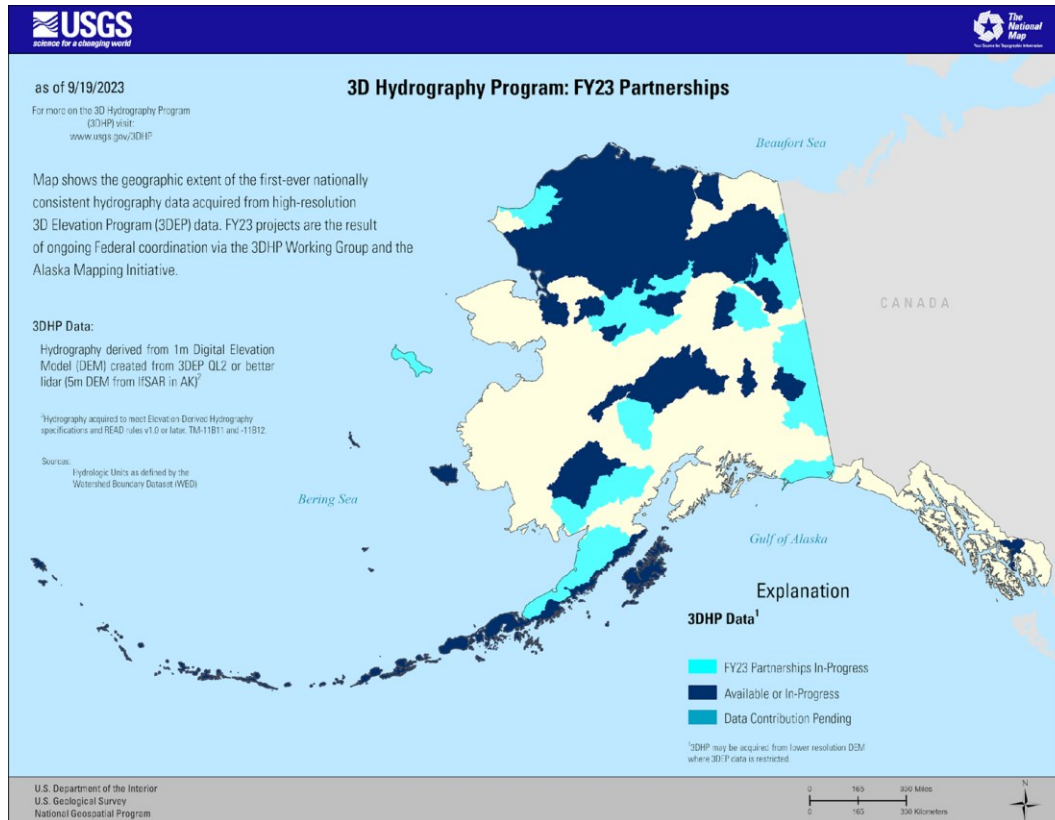
Data Acquisition



+ 3DHP FY23 Data Acquisition

Alaska

- ~230K sq miles available or in progress through FY22
- 88K sq miles added in FY23
- 63% of AK acquired or in process



CONUS+ ★ State or other pilots or projects

- 13K sq mi available or in progress through FY22
- 47K sq mi added in FY23
- Several states embarking on pilots or projects (CA, WA, PA, MO, MI, OH, GA, TX (FEMA))



as of 9/19/2023

FY24 3DHP Consolidated High Priority Federal Areas

For more on the 3D Hydrography Program (3DHP) visit: www.usgs.gov/3DHP

Republic of Marshall Islands



Federated States of Micronesia



Palau



Commonwealth of the Northern Mariana Islands



Guam



Map shows the geographic extent of the first-ever nationally consistent hydrography data acquired from high-resolution 3D Elevation Program (3DEP) data. FY23 projects are the result of ongoing Federal coordination via the 3DHP Working Group and the Alaska Mapping Initiative.

3DHP Data:

Hydrography derived from 1m Digital Elevation Model (DEM) created from 3DEP QL2 or better lidar (5m DEM from IfSAR in AK)²

²Hydrography acquired to meet Elevation-Derived Hydrography specifications and REAU rules v1.0 or later. TM-11B11 and -11B12.

Sources: Hydrologic Units as defined by the Watershed Boundary Dataset (WBD)

Explanation

3DHP Data¹

- High Priority Federal Agency Areas of Interest Seeking Partnerships
- Available or In-Progress
- Data Contribution Pending

¹3DHP may be acquired from lower resolution DEM where 3DEP data is restricted.

Puerto Rico and U.S. Virgin Islands





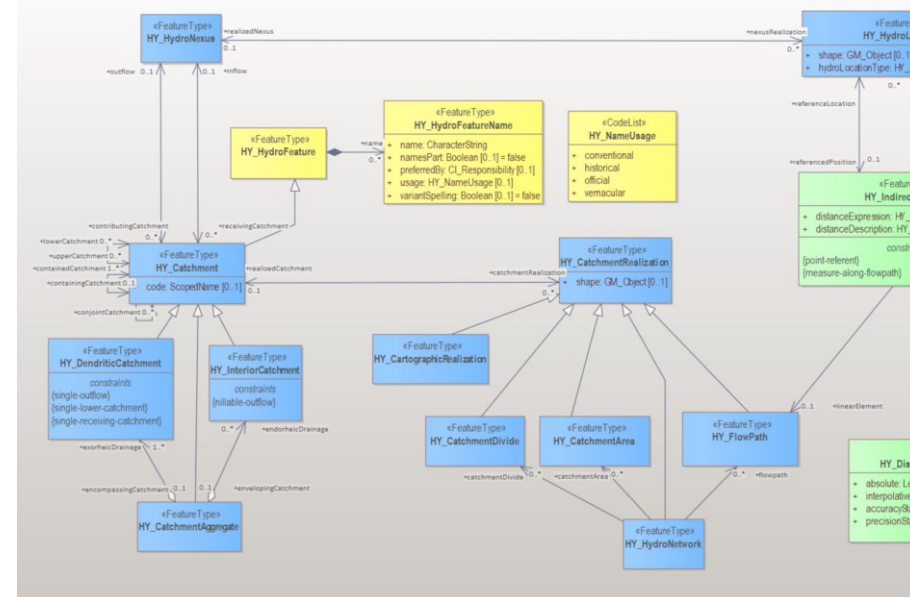
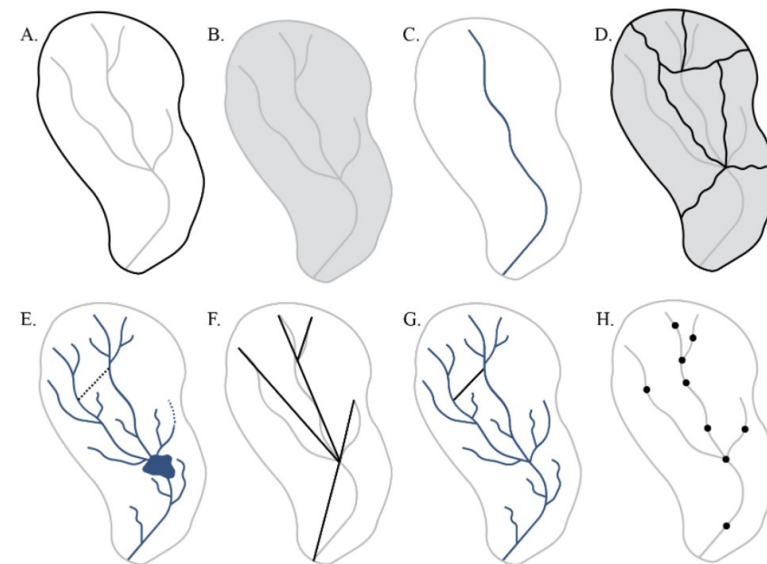
Populating 3DHP Data

- Migrate NHD to 3DHP schema to provide reference and connectivity
 - Limited attribution
 - Limited functionality
- Add data from Elevation-derived Hydrography projects
 - Elevation-derived Hydrography Specifications published 2020
 - Data validation prior to ingest
 - Primary path for data improvement
- Best available data all in one dataset

The collage features several key elements: a topographic map showing a blue stream network; a USGS document cover for 'Elevation-Derived Hydrography Acquisition Specifications' (Chapter 11 of Section B, U.S. Geological Survey Standards, of Book 11, Collection and Delineation of Spatial Data); another USGS document cover for 'Elevation-Derived Hydrography Representation, Extraction, Attribution, and Delineation Rules' (Chapter 12 of Section B, U.S. Geological Survey Standards, of Book 11, Collection and Delineation of Spatial Data); and a screenshot of a web interface titled 'Elevation-Derived Hydrography Specifications' by NGP Standards and Specifications. The web interface includes a 'Help Guides and Checklists Document Library' section with a 'Resource Library' button and a list of resources: 'Elevation-Derived Hydrography Acquisition Specifications' (with a 'Current Acquisition Specifications' button) and 'Elevation-Derived Hydrography – READ Rules' (with a 'View Document' button). A 'Resources' section lists 'Resource Library Including Help Guide', 'Topology and Network Error Examples', and 'Delineation and Attribution Error Examples'. The web interface also has a navigation menu with links for HOME, STANDARDS AND SPECIFICATIONS, PUBLICATIONS, NEWS, and ABOUT.

+ 3DHP Data model

- Base **3DHP data model** on international standards as directed by the Geospatial Data Act of 2018
- Open Geospatial Consortium (OGC) WaterML2 Part 3: Surface Hydrology Features (HY_Features) provides a conceptual model of hydrology features, especially catchments, and different realizations
 - Common vocabulary and terminology
 - Based on hydrologic features, as opposed to human features
- Promotes interoperability (NWM, Canada, USGS)
- Supports multi-scale data product similar to WBD
- Additional data about features can be carried as addressed data, indexed to the core dataset





3DHP Data Model

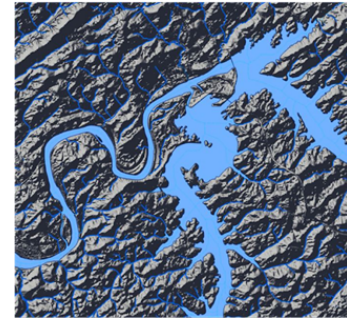
The USGS 3D Hydrography Program (3DHP) ArcGIS REST service (3DHP_all) from The National Map is the first of several data services that will be delivered by the 3D Hydrography Program. The 3DHP, all service comprises a national network of flowlines, hydrolocations, and water bodies, and will include catchments, drainage areas, and flow network derivatives as they are populated in the future. The 3DHP, all service will provide access to a 3D-enabled geospatial hydrography vector dataset built from 3DHP data and intended to provide the most comprehensive but general rendering of 3DHP data. 3DHP data is derived from elevation-derived hydrography (EDH) Elevation-Derived Hydrography Specifications here: <https://www.usgs.gov/ngp-standards-and-specifications/elevation-derived-hydrography-specifications>. Where EDH has not been collected, 3DHP data will be supplemented by data from the National Hydrography Dataset (NHD) National Hydrography Dataset here: <https://www.usgs.gov/ngp-standards-and-specifications/hydrography-standards-and-specifications/geospatial-science-support-page-related-to-science-support-page-related-con>. As further EDH data is collected, the EDH data will replace the NHD data in that data collection area. 3DHP data ingested from EDH sources will include catchments, drainage areas derived from catchments, and flowline network attribute derivatives. To view the 3DHP, all service please visit: https://hydro.nationalmap.gov/arcgis/rest/services/3DHP_all/MapServer. For additional information on the 3DHP, go to <https://www.usgs.gov/3dhp>. See <https://usgs.nationalmap.gov/help/> for assistance with The National Map viewer, download client, services, or metadata.

- 95 percent of the features from NHD, WBD, and NHDPlus

- 10 percent of the feature types

- Reduced repetition

- Focused on hydrologic content



Flowline (Line)	Name (Alias)	Definition	Type	Allow Nulls	Length	Domain	Default Values	Comments
id3dhp	id3dhp	Unique identifier for 3DHP features.	Text	Yes	7	-	-	This is a base-36 7-digit alphanumeric unique identifier that is not persistent. Applied to flowline features in this case.
featuredate	featuredate	Date the feature was loaded into the 3DHP core database.	Date	Yes	-	-	-	None.
mainstemid	mainstemid	A cross-dataset identifier for all flowlines that represent the headwater to outlet path of a river.	Text	Yes	200	-	-	A mainstem is equivalent to a feature with the same leavelastid in NHDPlus HR. The text field will be a "geonames.us*".
gridid	gridid	A permanent, unique number assigned by the Geographic Names Information System (GNIS)** to a geographic feature name for the sole purpose of uniquely identifying that name.	Long Integer	Yes	-	-	-	gridid = "null" if no name is associated with the feature. The gridid is conflated from points and assigned to features. The most recent name, and any historic names, can be retrieved from the GNIS data base using the gridid.
featuretype	featuretype	Feature type description.	Short Integer	Yes	-	flowlinefeaturetype	-	The featuretype may also indicate the flowline's relationship to elevation for the purpose of hydrologic categorization. The featuretype label is based on the coded value description in the featuretype field. Allow label display in non-ESRI datasets.
featuretypelabel	featuretypelabel	The name of the feature type.	Text	Yes	50	-	-	The featuretype label is based on the coded value description in the featuretype field. Allow label display in non-ESRI datasets.
lengthm	lengthm	Length of linear flowline feature. Value is computed based on regional spatial reference system.	Double	Yes	-	-	-	Computed in projections based on specific locations.
waterbodyid3dhp	waterbodyid3dhp	The id3dhp of the waterbody that a waterbody connector flows through.	Text	Yes	7	-	-	None.
flowdirection	flowdirection	Identifies the flow direction of a feature relative to the direction it was digitized.	Short Integer	No	-	flowdirectiontype	1	None.
onsurface	onsurface	Defines vertical relationship of flowline features.	Short Integer	No	-	onsurfacetyp	1	Indicates whether the flowline feature is on the land surface, below the surface, or elevated above the ground and another hydrography feature.
catchmentid3dhp	catchmentid3dhp	Unique identifier of catchment for catchment aggregation.	Text	No	7	-	-	All hydro-enhanced flowlines within an aggregate catchment will be identified as catchmentid3dhp.
flowpathid3dhp	flowpathid3dhp	Unique identifier of catchment for flowpath aggregation.	Text	Yes	7	-	-	Only flowlines along the main path through an aggregate catchment will be identified as flowpathid3dhp.
streamlevel	streamlevel	Streamlevel is a numeric code that traces main paths of water flow upstream through the stream network.	Long Integer	Yes	-	-	-	Streamlevel should be constant for a mainstem. Streamlevel increase from downstream to upstream.
startflag	startflag	Startflag is used to differentiate headwater features from non-headwater features.	Short Integer	Yes	0	logical	-	Set to true if the flowline feature is a headwater feature.
terminalflag	terminalflag	Terminalflag is used to differentiate terminal flow features from non-terminal flow features.	Short Integer	Yes	0	logical	-	Set to true if the flowline feature is a terminal feature (flows into ocean, Great Lakes, Canada, Mexico, or the ground) otherwise false.
streamorder	streamorder	Stable stream order number for the flowline feature.	Long Integer	Yes	-	-	-	Streamorder does not increment when a path branching from a diversion joins a main path.
streamcalculator	streamcalculator	Further modification of streamorder created to assist with tracking divergences and is computed with streamorder.	Long Integer	Yes	-	-	-	Streamcalculator is assigned the value 0 along diverted paths.
hydrosequence	hydrosequence	Nationally unique sequence number that places the reach in hydrologic sequence.	Double	Yes	-	-	-	If a path exists between two flowlines, the upstream flowline will have a larger hydrosequence value. If no path exists between the flowlines, hydrosequence has no significance. Hydrosequence is equivalent to a topological sort of the dendritic network.
dnhydrosequence	dnhydrosequence	Downstream mainstem hydrologic sequence number.	Double	Yes	-	-	-	None.
uphydrosequence	uphydrosequence	Hydrologic sequence number of upstream mainstem drain.	Double	Yes	-	-	-	None.
levelpath	levelpath	Hydrologic sequence number of the most downstream flowline feature that is on the same streamlevel path as the flowline feature according to the flownetwork table.	Long Integer	Yes	-	-	-	None.
uplevelpath	uplevelpath	Levelpath identifier of the feature on the main path immediately upstream.	Double	Yes	-	-	-	None.
downlevelpath	downlevelpath	Levelpath identifier of the feature on the main path immediately downstream.	Double	Yes	-	-	-	None.
pathlength	pathlength	Distance to terminal flowline feature downstream along main path in kilometers using an equal area projection.	Double	Yes	-	-	-	Computed in projections based on specific locations.
terminalpath	terminalpath	Hydrologic sequence number of terminal flowline of the basin the feature is in.	Double	Yes	-	-	-	None.
arbitrateam	arbitrateam	The sum of the lengths of every upstream feature in flownetwork, as well as the length of the current feature.	Double	Yes	-	-	-	None.
divergence	divergence	Indicates if a flowline feature is a diversion based on the divergencetype.	Short Integer	Yes	0	divergencetype	-	None.
returndivergence	returndivergence	Indicates that one or more of the paths contribute to a given flowline originates in a divergence that recombines with its main path at the current flowline.	Short Integer	Yes	0	logical	-	Set to true if flowline feature is a return divergence, otherwise false.

*More information about geonames, Network Linked Data Index (NLDI), and Internet of Water can be found here: <https://waterdata.usgs.gov/hydro/hls/geonames/>

**More information about GNISID can be found here: <https://www.usgs.gov/books/geographic-names-information-system-gnis>

The flowline derivatives attributes (flownetworkderivatives) in the 3DHP, all data services have not been populated in the 3DHP, all 2022. They are included in the service because they will be populated incrementally in future releases. The 3DHP, all 2023 products described on these pages are provisional and are subject to change. They are being provided to meet the need for timely best available information. While 3DHP, all products are nationally complete and many aspects of the data are stable, development of the data model and products is ongoing. Please reach out to contacts list on this page with questions and feedback.

Flowlinefeaturetype	Code	Description	Definition	Comments
1	River	Flowing body of water that receives inflow from upstream and surrounding catchment.	In elevation-derived hydrography a River is a feature that is delineated within elevation-surface characterization.	In elevation-derived hydrography a River is a feature that is delineated within elevation-surface characterization. Integrated with elevation but not thought to integrate with surrounding hydrology in most cases.
2	Canal	Flowing body of water that receives inflow from upstream but not the surrounding catchment.	Drainage pathway in a low drainage area setting (headwater) upstream of the onset of discernible channelization.	None.
3	Drainageway	Drainage pathway in a low drainage area setting (headwater) upstream of the onset of discernible channelization.	None.	None.
4	Surface Connector	Abstract surface or near surface path used to connect upstream channelized features with downstream channelized features.	None.	None.
5	Waterbody Connector	Abstract connector over a portion of the landscape covered by water.	None.	None.
6	Elevation Breaching Connector	A known or inferred connection that is used to breach values in the elevation surface that are blocking the natural downstream flow of a hydrologic feature.	None.	None.
7	Hydro Unlabeled Connector	Specific or abstract connector representing flow that is not determined by the surface, water hydrologic network.	None.	None.

Waterbodyfeaturetype	Code	Description	Definition
1	River	A body of flowing water.	A body of flowing water.
2	Canal	A body of flowing water that receives inflow from upstream but not the surrounding catchment.	A body of flowing water that receives inflow from upstream but not the surrounding catchment.
3	Lake	A body of standing water surrounded by land. Includes natural and manmade lakes, ponds, and reservoirs.	A body of standing water surrounded by land. Includes natural and manmade lakes, ponds, and reservoirs.
4	Ocean or Great Lake	A body of salt or fresh water that covers much of the earth. Serves as the terminus of network features and as the land/water boundary at oceans or great lakes.	A body of salt or fresh water that covers much of the earth. Serves as the terminus of network features and as the land/water boundary at oceans or great lakes.

Hydrolocationfeaturetype	Code	Description	Definition
1	Catchment Outlet	The location where water flows out of a catchment.	The location where water flows out of a catchment.
2	Confluence	The location where two flowpaths converge.	The location where two flowpaths converge.
3	Waterbody Outlet	The location where water flows out of a waterbody.	The location where water flows out of a waterbody.
4	Divergence	The location where flow splits into two or more downstream flowlines.	The location where flow splits into two or more downstream flowlines.
5	Terminus	The location where a network ends at the ocean or large lake.	The location where a network ends at the ocean or large lake.
6	Headwater	The location where a river is thought to begin.	The location where a river is thought to begin.
7	Spring	A place where water emerges naturally from the ground.	The location where a stream enters an underground conduit, terminates in an isolated sink or depression. Represents the low point to which water flows within a closed basin.
8	Sink	The location where a stream enters an underground conduit, terminates in an isolated sink or depression. Represents the low point to which water flows within a closed basin.	The location where a stream enters an underground conduit, terminates in an isolated sink or depression. Represents the low point to which water flows within a closed basin.
9	External Connection	The location where a stream enters a non-USGS authoritative source managed by another entity.	The location where a stream enters a non-USGS authoritative source managed by another entity.
10	Reachcode Start	The location where a legacy National Hydrography Dataset (NHD) reachcode starts.	The location where a legacy National Hydrography Dataset (NHD) reachcode starts.
11	Reachcode End	The location where a legacy National Hydrography Dataset (NHD) reachcode ends.	The location where a legacy National Hydrography Dataset (NHD) reachcode ends.

Waterbody (Polygon)	Name (Alias)	Definition	Type	Allow Nulls	Length	Domain	Default Values	Comments
id3dhp	id3dhp	Unique identifier for 3DHP features.	Text	Yes	7	-	-	This is a base-36 7-digit alphanumeric unique identifier that is not persistent. Applied to waterbody features in this case.
featuredate	featuredate	Date the feature was loaded into the 3DHP core database.	Date	Yes	-	-	-	None.
mainstemid	mainstemid	A cross-dataset identifier for all flowlines that represent the headwater to outlet path of a river.	Text	Yes	200	-	-	A mainstem is equivalent to a feature with the same leavelastid in NHDPlus HR. The text field will be a "geonames.us*".
gridid	gridid	A permanent, unique number assigned by the Geographic Names Information System (GNIS)** to a geographic feature name for the sole purpose of uniquely identifying that name.	Long Integer	Yes	-	-	-	gridid = "null" if no name is associated with the feature. The gridid is conflated from points and assigned to features. The most recent name, and any historic names, can be retrieved from the GNIS data base using the gridid.
featuretype	featuretype	Feature type description.	Short Integer	Yes	-	waterbodyfeaturetype	-	None.
featuretypelabel	featuretypelabel	The name of the feature type.	Text	Yes	50	-	-	The featuretype label is based on the coded value description in the featuretype field. Allow label display in non-ESRI datasets.
areainkm2	areainkm2	Area of feature in square kilometers based on regional spatial reference systems.	Double	Yes	-	-	-	Computed in projections based on specific locations.

Hydrolocation (Point)	Name (Alias)	Definition	Type	Allow Nulls	Length	Domain	Default Values	Comments
id3dhp	id3dhp	Unique identifier for 3DHP features.	Text	Yes	7	-	-	This is a base-36 7-digit alphanumeric unique identifier that is not persistent. Applied to hydrolocation features in this case.
featuredate	featuredate	Date the feature was loaded into the 3DHP core database.	Date	Yes	-	-	-	None.
mainstemid	mainstemid	A cross-dataset identifier for all flowlines that represent the headwater to outlet path of a river.	Text	Yes	200	-	-	A mainstem is equivalent to a feature with the same leavelastid in NHDPlus HR. The text field will be a "geonames.us*".
universalreferenceno	universalreferenceno	Permanent identifier appropriate for the hydrologic location type.	Text	Yes	200	-	-	None.
gridid	gridid	A permanent, unique number assigned by the Geographic Names Information System (GNIS)** to a geographic feature name for the sole purpose of uniquely identifying that name.	Long Integer	Yes	-	-	-	gridid = "null" if no name is associated with the feature. The gridid is conflated from points and assigned to features. The most recent name, and any historic names, can be retrieved from the GNIS data base using the gridid.
featuretype	featuretype	Feature type description.	Short Integer	Yes	-	hydrolocationtype	-	None.
featuretypelabel	featuretypelabel	The name of the feature type.	Text	Yes	50	-	-	The featuretype label is based on the coded value description in the featuretype field. Allow label display in non-ESRI datasets.

Catchment (Polygon)	Name (Alias)	Definition	Type	Allow Nulls	Length	Domain	Default Values	Comments
id3dhp	id3dhp	Unique identifier for 3DHP features.	Text	Yes	7	-	-	This is a base-36 7-digit alphanumeric unique identifier that is not persistent. This identifier links to the catchmentid3dhp and flowpathid3dhp attributes in the derivatives table. Applied to catchment features in this case.
featuredate	featuredate	Date the feature was loaded into the 3DHP core database.	Date	Yes	-	-	-	None.
mainstemid	mainstemid	A cross-dataset identifier for all flowlines that represent the headwater to outlet path of a river.	Text	Yes	200	-	-	A mainstem is equivalent to a feature with the same leavelastid in NHDPlus HR. The text field will be a "geonames.us*".
areainkm2	areainkm2	Area of feature in square kilometers based on equal area projection.	Double	Yes	-	-	-	Computed in projections based on specific locations.
totaldrainageareainkm2	totaldrainageareainkm2	Total estimated drainage area of all upstream catchments measured in square kilometers based on regional spatial reference systems.	Double	Yes	-	-	-	Computed in projections based on specific locations.

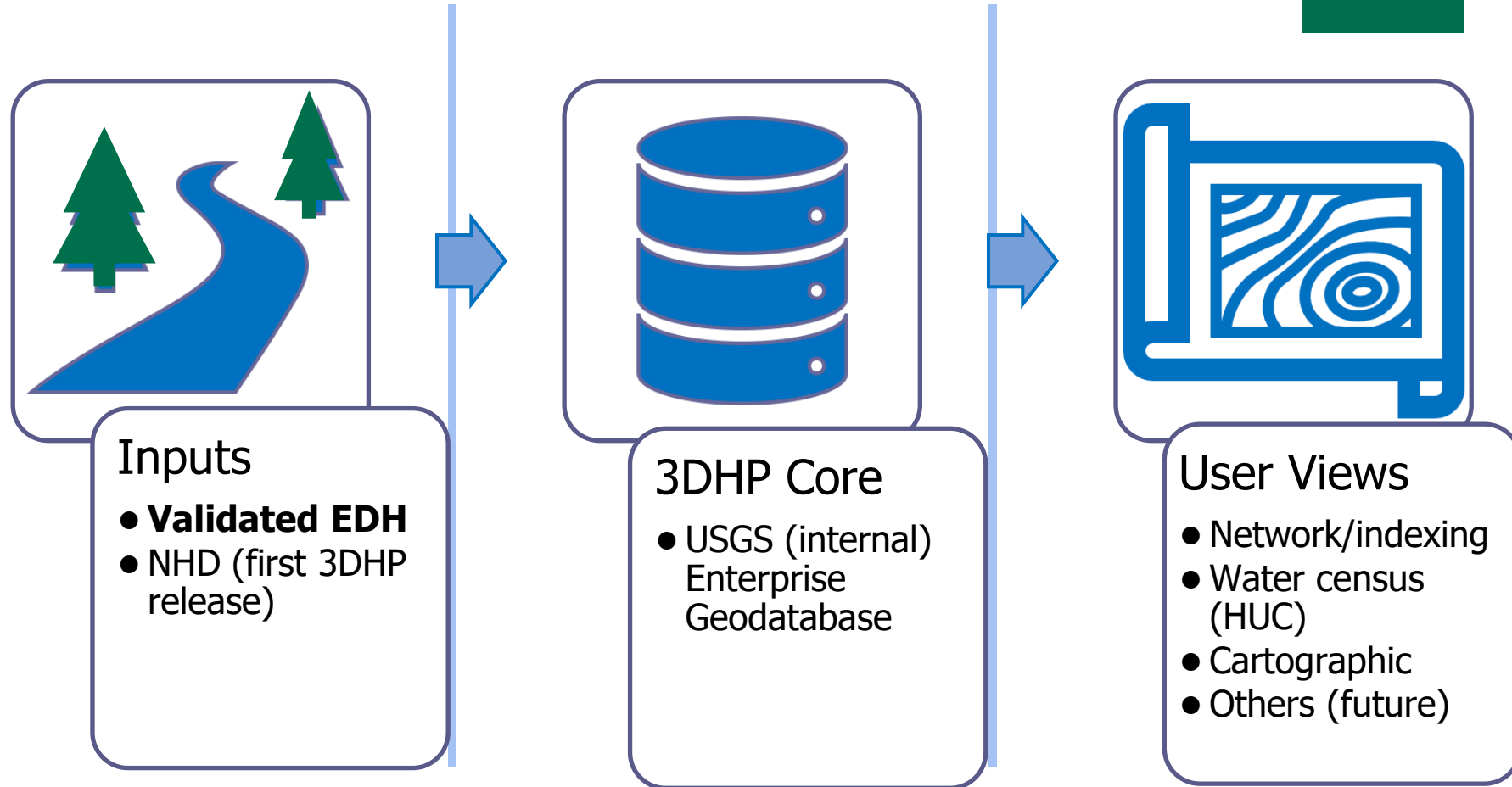
Drainagearea (Polygon)	Name (Alias)	Definition	Type	Allow Nulls	Length	Domain	Default Values	Comments
id3dhp	id3dhp	Unique identifier for 3DHP features.	Text	Yes	7	-	-	This is a base-36 7-digit alphanumeric unique identifier that is not persistent. Applied to drainagearea features in this case.
featuredate	featuredate	Date the feature was loaded into the 3DHP core database.	Date/Time	Yes	-	-	-	None.
hydrounitcode	hydrounitcode	Hydrologic unit code per Watershed Boundary Dataset (WBD) coding system.	Text	Yes	200	-	-	This is a "geonames.us*" attribute will be populated incrementally in future releases.
areainkm2	areainkm2	Area of feature in square kilometers based on regional spatial reference systems.	Double	Yes	-	-	-	Computed in projections based on specific locations.



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3DHP Services and Products

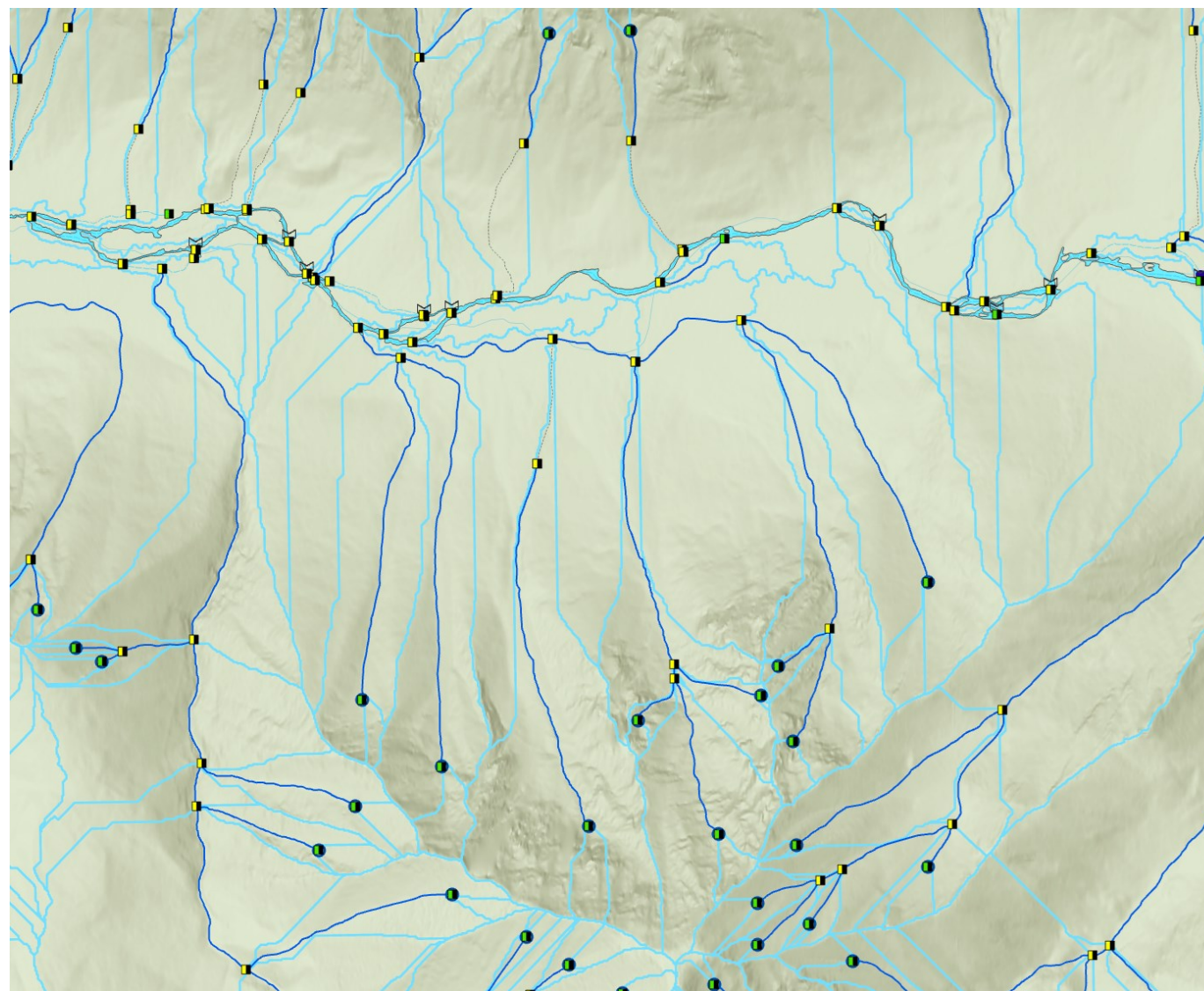
- Reduced effort, improved function:
 - Maintenance
 - Accessibility
 - Services - WFS
- Functionally based views
- Punctuated static releases



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3DHP v2023

- Initial service deployed
 - All features in the data model represented
 - Networking, indexing view
- Cartographic view later in FY24



- 3DHP_all
- HydroLocation
- Sink
 - Spring
 - Catchment Outlet
 - Confluence
 - Waterbody Outlet
 - ⌘ Divergence
 - * Terminus
 - Headwater
 - External Connection
 - Reachcode Start
 - Reachcode End
- Flowline
- Canal
 - Drainageway
 - Hydro Unenforced Connector
 - River
 - Surface Connector
 - Waterbody Connector
- Waterbody
- Canal
 - Lake
 - Ocean/Great Lake
 - River
- Drainage Area
-
- Catchment
-



Future Web-Based Applications



Enable users to address data to 3DHP

Any type of hydrographic observation

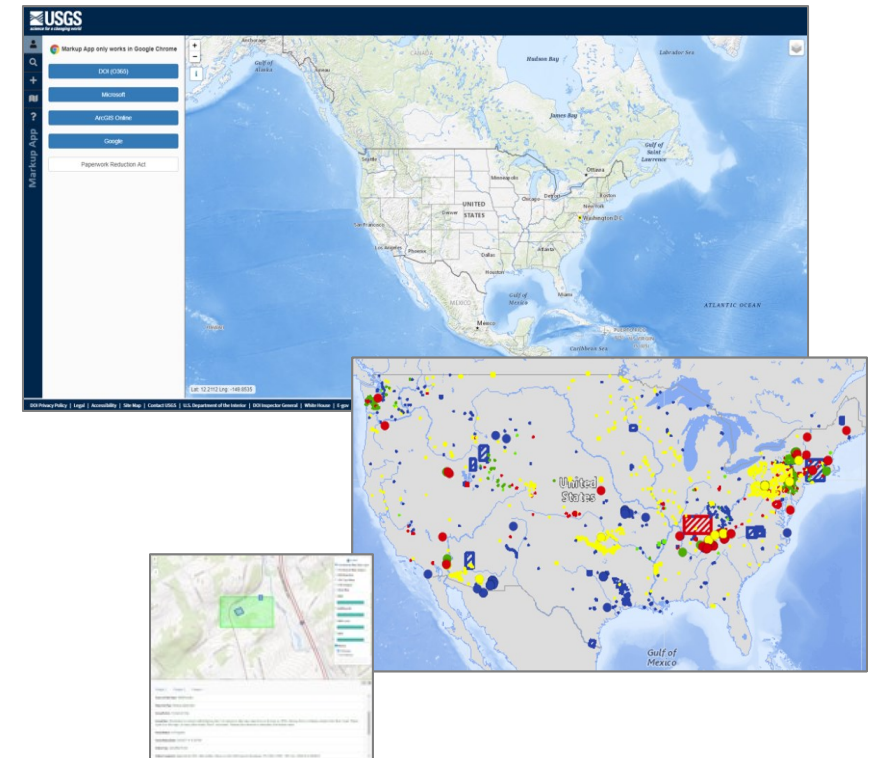
Multiple users can collaborate on shared projects

Engage users to provide feedback for 3DHP improvement

anyone to propose changes to 3DHP

Partners and USGS will review and validate submissions

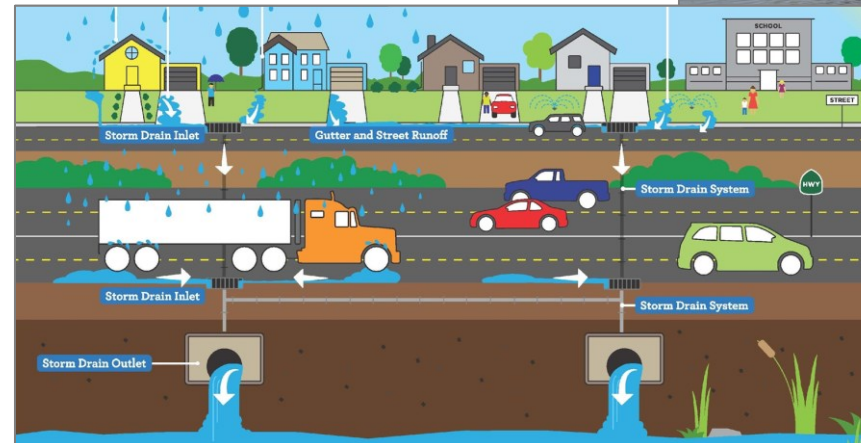
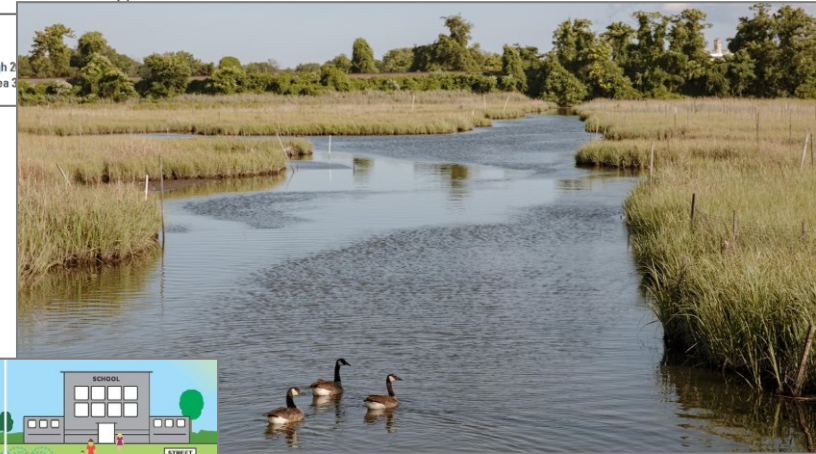
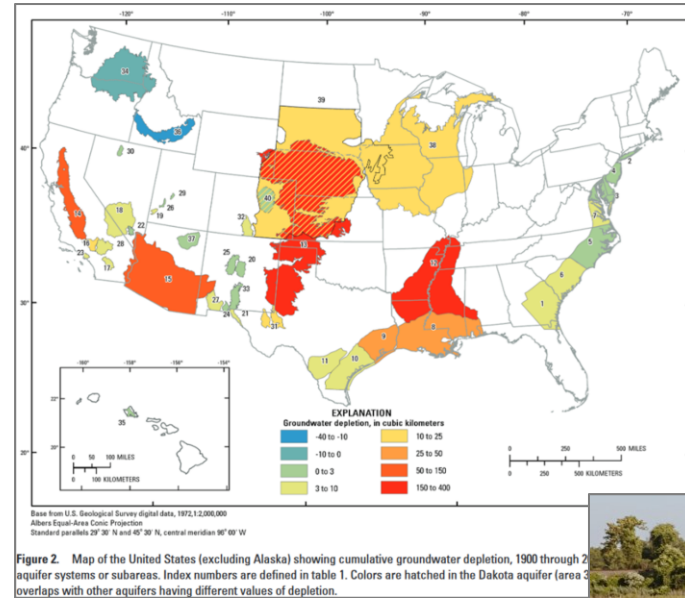
USGS will implement approved changes



+ Future Enhancements

Implement new connections

- Groundwater
- Wetlands
- Engineered hydrography

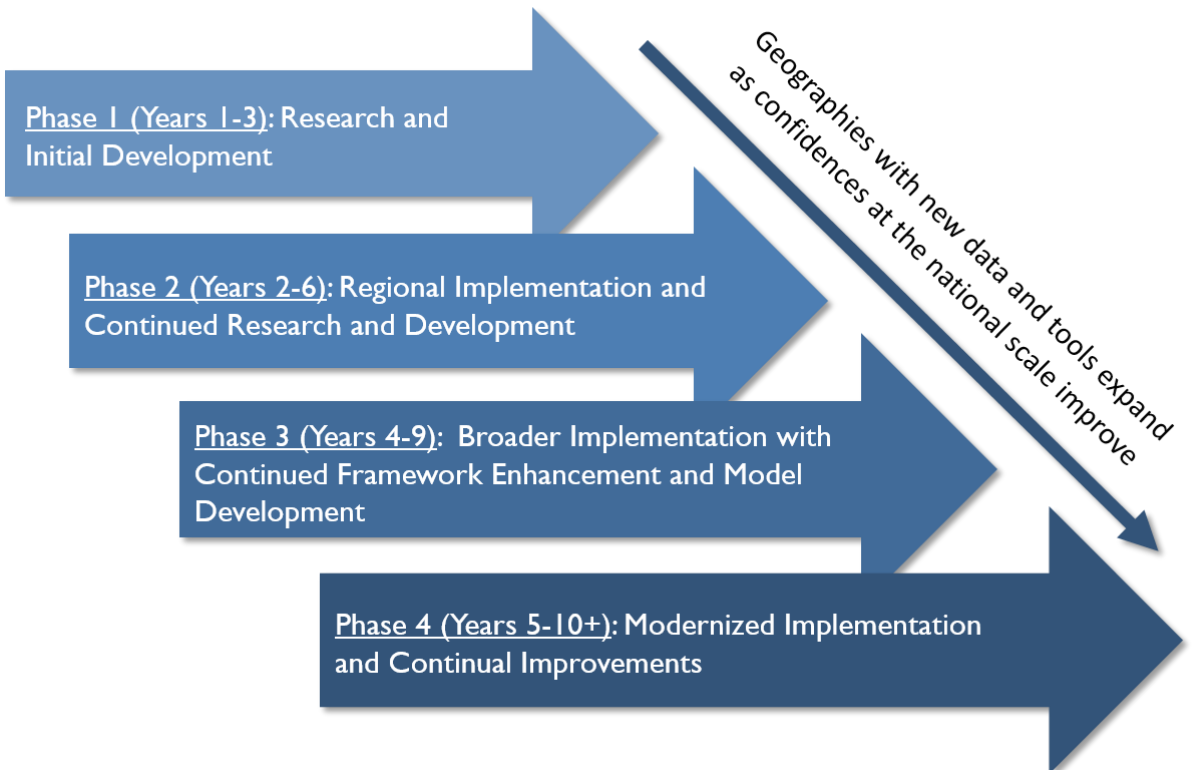


Advanced Water Mapping and Analytics Initiative

Accelerating Science for Improved Water Resource Management

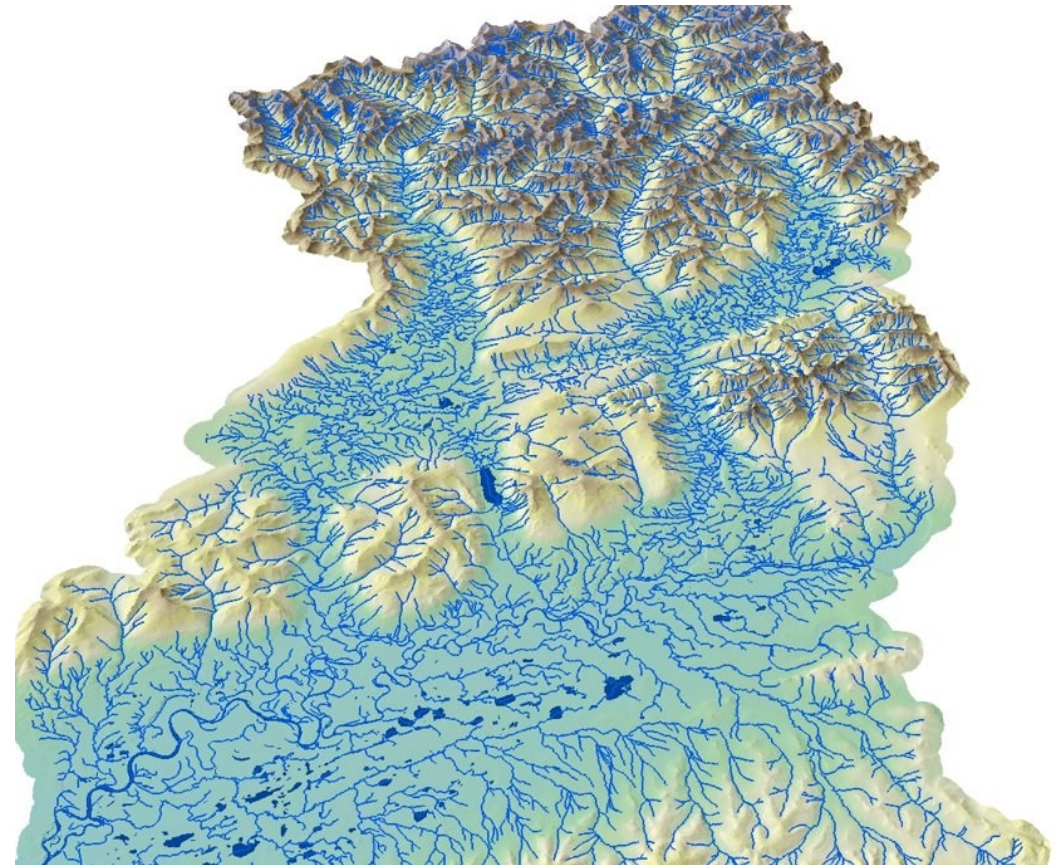
- Multi-agency initiative to improve mapping and analytics for the Nation's water, including supporting the Clean Water Act
- Key Components of AWMA
 - Accelerate Modernization of and Improve Interoperability between **3DHP** and NWI
 - Invest in implementing **3DHP** and modernizing the NWI to be more accurate, inclusive, and nationally consistent
 - Enhance Implementation of the Infostructure
 - Leverage Artificial Intelligence and Remote Sensing
 - Develop Next Generation Modeling Capability

Advanced Water Mapping and Analytics Story Map



+ NWI and 3DHP

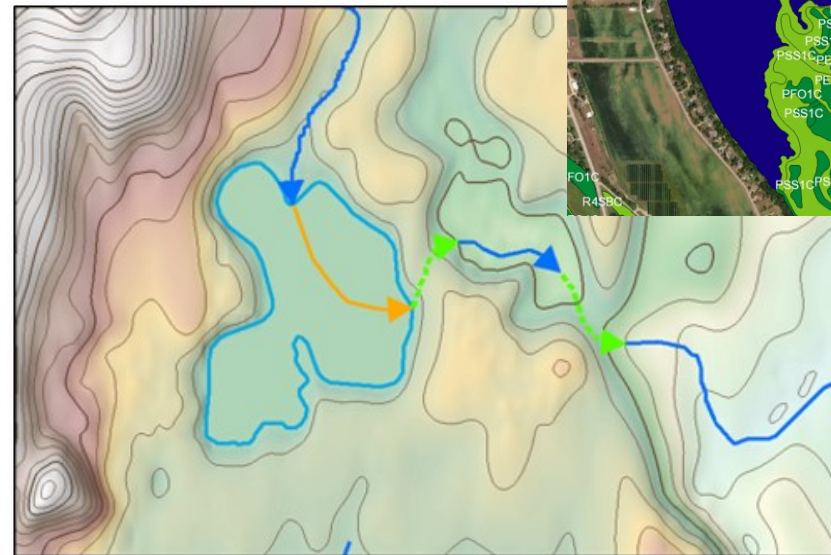
- OMB Circular A-16 – provides direction for federal agencies that produce, maintain, or use spatial data and identifies National Geospatial Data Asset (NGDA) organized by "theme"
- Goal to enhance the coordination of Federal geospatial data activities and investments
- FWS and USGS co-lead the Water – Inland theme which includes NWI, NHD, and WBD as NGDA
 - 3DHP will replace NHD
- 2018 Geospatial Data Act



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NWI and 3DHP

- Both datasets map surface-water information
 - Different ways for different purposes
 - NWI is more specialized – habitat
 - NHD/3DHP is more about routing water
- Overlapping feature types
 - NHD – Swamp-Marsh
 - NWI – Linear features (riparian zones)
- Each is an authoritative data source
- Mapping the same twice
 - Duplicated effort
 - Confusion – which one is "best"



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NWI and 3DHP

- Efficiency and ease of using the GPSC vehicle in AK
- Efficiency of dual-collection (funding and time)
- Contracting simultaneously will help develop, produce, and document new NWI workflows and specifications
- Helping to improve interoperability between datasets
- FWS is also contracting NWI after EDH for 3DHP was mapped (CONUS)
 - PA, OR, SETX





Questions?

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3D Hydrography Program - General Contact

Email: 3DHP@usgs.gov

Questions related to the 3DHP DCA - General Mailbox

Email 3dhp_dca@usgs.gov

Learn more about 3DHP: usgs.gov/3dhp