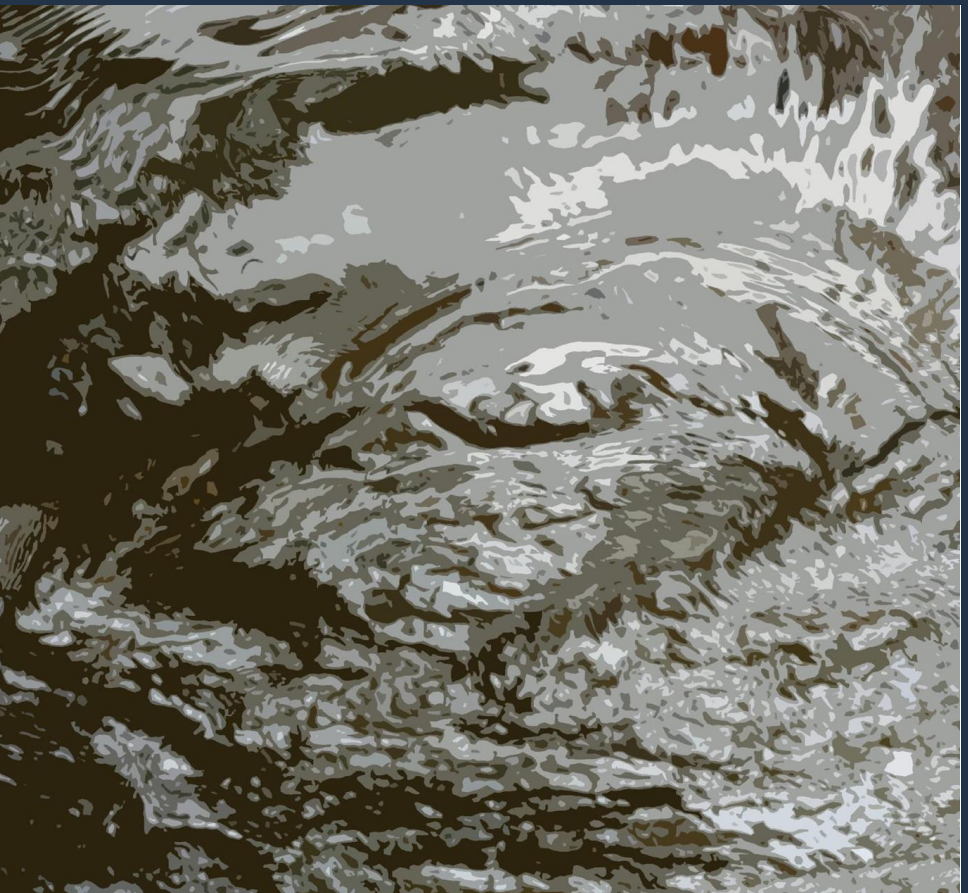
NSGIC 3D Hydrography Program for the Nation



3DHP FTN Interest Group

March 20, 2024

NSGIC

USGS
science for a changing world

NSGIC 3DHP FTN

Project News

Project Year

- Final Project Year (4 of 4 potential) ends Dec 31, 2024
- New project proposal in development

Interest Group Meetings

- Replace 3DHP Info Forums 2-3 times annually
- 3DHP Info Forums held 3rd Wed each month, 3:00-4:30 pm E
- Forums are 3DHP topic focused
- Interest Group meetings are project and participant activity information

- **Call for Presentations**
  If you are interested in presenting your 3D Hydrography work or have a specific topic you would like addressed, contact Lynda.Wayne@NSGIC.org

NSGIC 3DHP FTN

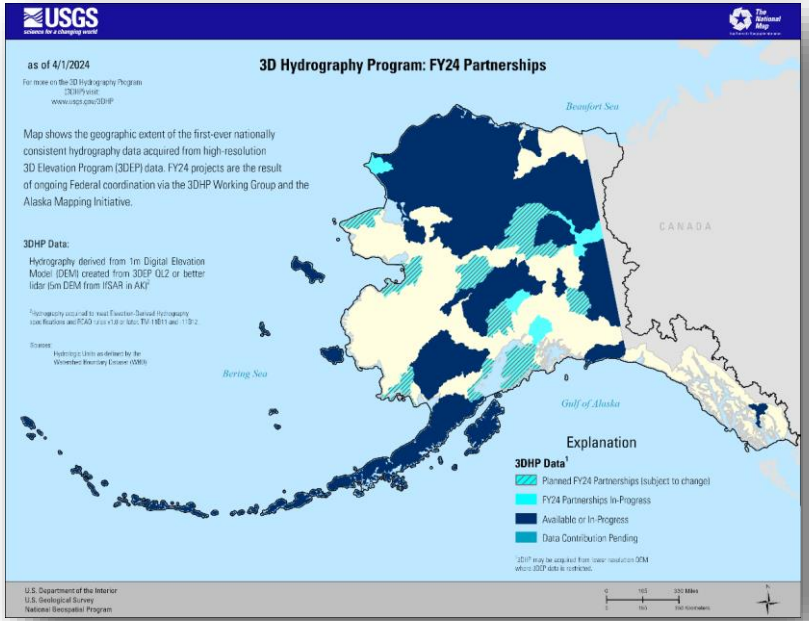
Agenda

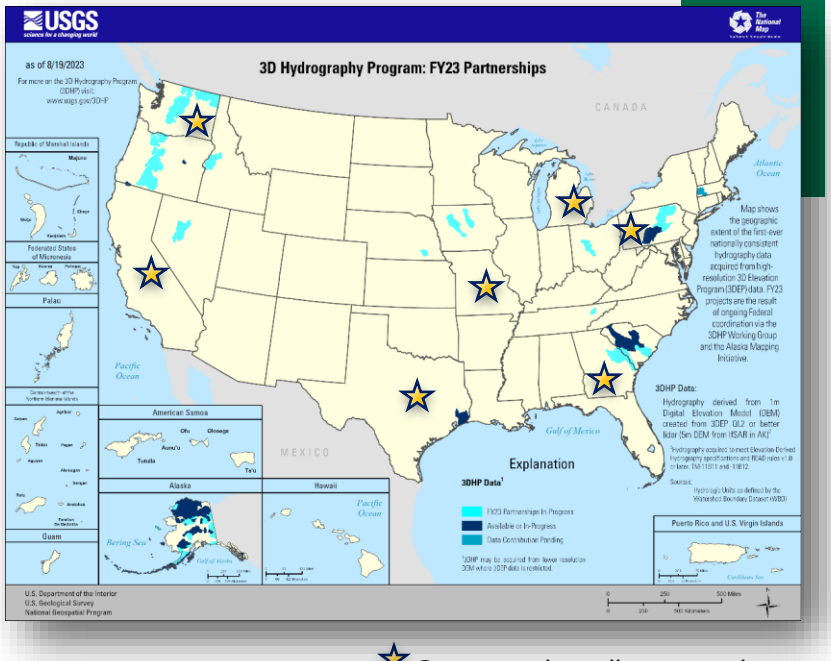
- USGS 3DHP Update
- 2024 3DHP FTN Workplan
- 3D National Topography Model (3DNTM) State Data Acquisition Planning Guide
- Engaging with the Culvert Mapping Good Practices Workspace
- NSGIC Midyear Meeting Data for the Nation Brekfast Meeting
- Discussion: Community 3DHP Activities

3DHP FY24 Data Acquisition

Alaska

- ~314K sq miles available or in progress through FY23
- ~72K sq miles currently planned for FY24



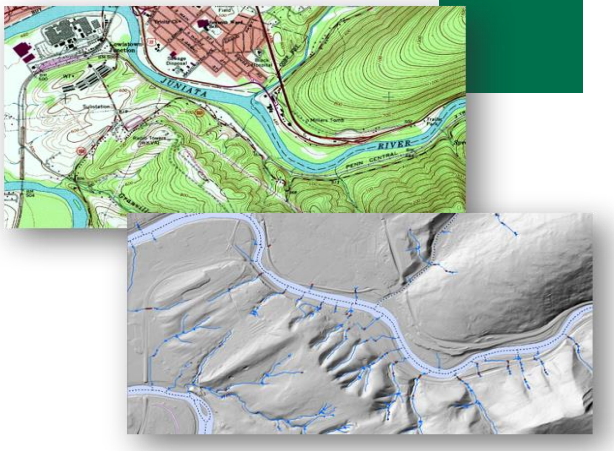


State or other pilots or projects

CONUS+

- 3DNTM funding did not change from FY23 so funding for DCA is less than anticipated
- Working to find additional funding sources for FY24 DCA projects – will have final information soon

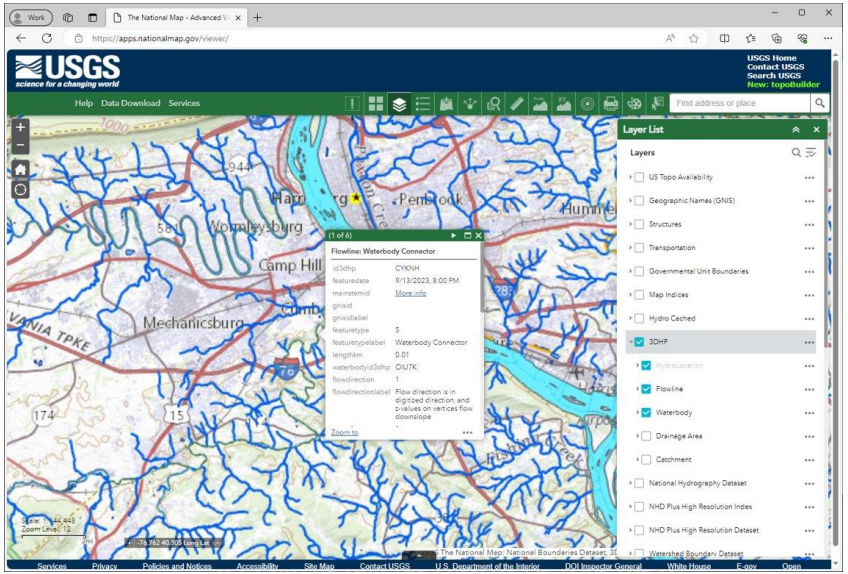
3DHP Accomplishments (so far)



- Publication of final NHD products and services
- Extending life of HydroAdd for NHD through FY25
- First published Hydrography specifications in decades
- First objective data validation process for hydrography
- Data Collaboration Announcement process
- Acceleration of data update – anticipating more with additional funding
- Simplification of the three data models (NHD, WBD, NHDPlus HR) into a single, hydrology-based system
- Conversion to Mainstems as the persistent (cross-dataset) identifier

3DHP Plans

- 2024 marks the first full year of 3DHP.
- 3DHP is initially available as a service layer based on NHD geometry. NHD geometry will be replaced as new data are collected.
- 3DHP_all as a Web Feature Service. More to come.
- HydroAdd3D release planned for Q4 FY24
- First set of Flow Network Derivatives Q4 FY24
- Continuous flow permanence values Q1 FY25
- First 3DHP staged products in Q1 FY25
- Reinstatement of Markup process



USGS science for a changing world

The National Map
Your Source for Topographic Information

AWRA 2024 Geospatial Water Technology Conference

DATA TO DECISIONS: MANAGING AND MODELING WATER CHALLENGES

March 25 - 27, 2024 | Orlando, FL | Embassy Suites Orlando - Lake Buena Vista South

IMPORTANT: In order to receive important communication from the AWRA Team about your conference participation, you must add events@awra.org, info@awra.org, and membership@awra.org to your safe sender list.

Conference Details

Participation Details

Registration & Rates

Conference App/Program

Presenters & Moderators

Student Activities

Workshops

Sponsors & Exhibitors

CONFERENCE KEYNOTES & SPEAKERS

KEYNOTES

Susan Buto
Hydrography Data Acquisition Lead
3D Hydrography Program

Susan (Sue) Buto started her 20+-year career with the USGS working for the Nevada and Utah Water Science Centers providing GIS and remote sensing support for hydrologic studies. In 2015, she took on the role of National Watershed Boundary Dataset Lead, working in a joint capacity for the USGS Water Mission Area and the National Geospatial Program. She moved into the acting role of 3D Elevation Program Data Acquisition Lead in 2019 and finally into her current role as the Hydrography Data Acquisition Lead for the 3D Hydrography Program (3DHP) where she coordinates partnerships and strategy for 3DHP data acquisition.

If attending, let us know in the chat

Speaking of Conferences…

March 24 - 28, 2024

2024 NSGIC Midyear Meeting: *Geospatial Vision…with a Capitol View*

Hilton Arlington National Landing

The NSGIC Board of Directors, Conference Committee, and staff are looking forward to heading to Arlington, VA for the 2024 NSGIC Midyear Meeting to be held March 24–28.

If attending, let us know in the chat

Data for the Nation (3DHP/3DEP FTN joint) Breakfast Meeting
Phil Worrall, Dennis Pedersen, Jordan Regenie
Monday, March 25, 2024 7:30-8:30 am
Meeting room adjacent to Foyer (breakfast) and Plenary room

AIMLLLMGPT-GIS - It's an Awful Acronym, but Man is it Cool!
Phil Worrall
Monday, March 27, 2024 10:45-11:00 am
Plenary room

NSGIC 3DHP FTN 2024 Work Plan

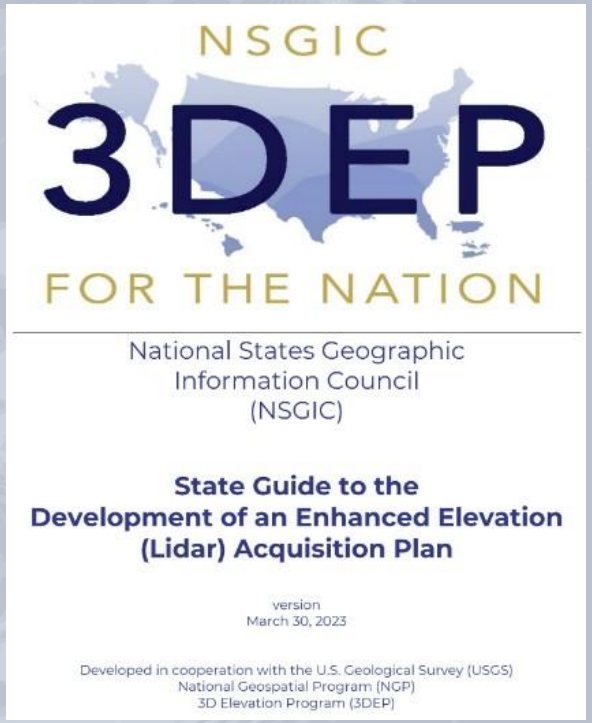
- **Project Management** – work planning, coordination, reporting
- **Communications and Outreach** – newsletters, leadership briefings, conferences
- **Stakeholder Engagement** – 3DHP FTN and State Hydrography Interest Groups
- **3DHP Info Forum** – enlist presenters and facilitate presentations
- **3DHP Info Hub** – manage, maintain, and update online information resource
- **Inventory 3D Hydrography Experiences** – populate, manage the NSGIC 3DHP Activities Dashboard
- **Support State Planning** – develop and publish the 3DNTM State Data Acquisition Planning Guide (w/3DEP FTN)
- **Develop Culvert Mapping Good Practices** – manage workspace and publish good practices
- **Provide 3DHP Development Feedback** – maintain 3DHP FTN Critical Factors workspace

3D National Topography Model (3DNTM) State Data Acquisition Planning Guide

Objective:
Expand and update the existing 3DEP *State Guide to the Development of an Enhanced Elevation (Lidar) Acquisition Plan* document to include 3DHP

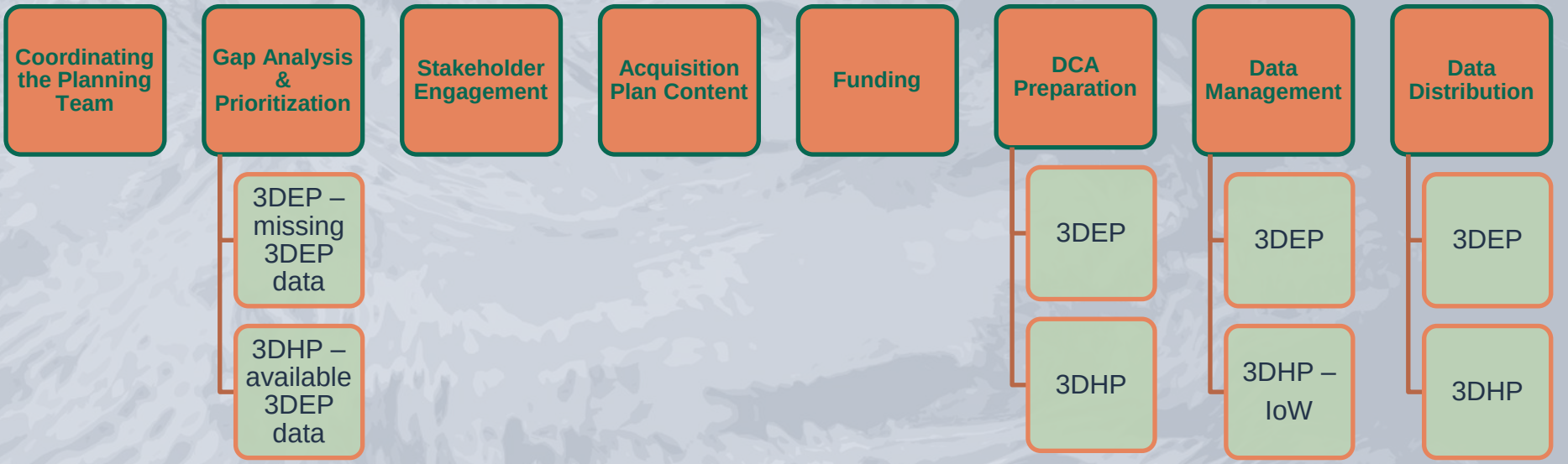
Approach:
- finalize outline and develop draft with 3DEP
- enlist stakeholder contributions
- vet with 3DHP and 3DEP FTN Interest Groups

Expected Outcomes:
- composite 3DNTM Planning Guide by August 2024
- 3DNTM Planning workshop at NSGIC 2024 Annual Conference



3D National Topography Model (3DNTM) State Data Acquisition Planning Guide

Current Outline:



Questions?

3DHP Culvert Mapping Good Practices

Background

Data about culverts and other 'elevation breaching connectors' is fundamental to effectively modeling the flow of water across the landscape

A recent 3DHP FTN survey found that state, regional, and local governments are active in the mapping of culvert data and that most of these efforts were managed at the state level with contributions from all levels of government.

There is need, therefore, to provide state, regional, local, and federal agencies guidance in mapping culverts in a manner that will support modeling across administrative boundaries.

Draft good practices were developed by NSGIC and USGS and posted in a community workspace.

NSGIC Culvert Mapping Good Practices Workspace
https://docs.google.com/document/d/1xwjaVuZMDlplZi9bA0UfvDPQFNz4SqK5ZylyObfVpg4/

Community Workspace
Culvert Mapping Good Practices in Support of Hydrologic and Hydraulic Modeling

***

Instructions

This document is intended to serve as a workspace where state, regional, federal, private sector, and other 3DHP Stakeholders can provide feedback on the NSGIC 3DHP FTN culvert mapping good practices initiative and recommendations. Each section of the document is followed by a discussion section where participants can add comments. Please limit document edits to the designate discussion sections *** highlighted in tan***.

Example:

***ADD *'Instruction'* COMMENTS BELOW ***

- Here is my comment about the 'instructions' (LDW)

If you add comments, please provide the following information to facilitate follow-up and clarification

Name	Organization	Email	Initials
Lynda Wayne	NSGIC	Lynda.Wayne@nsgic.org	LDW

Background

The national 3D Hydrography Program (3DHP) dataset integrates elevation and hydrographic data into a 3D stream network capable of supporting hydrologic and hydraulic modeling. Identifying and attributing culverts and other 'elevation breaching connectors' is fundamental to effectively modeling the flow of water across the landscape. The information is also valuable for fisheries management, invasive species prevention, asset management, and other applications.

A recent National States GIS Council (NSGIC) 3DHP for the Nation (3DHP FTN) project survey found that state, regional, and local governments are active in the mapping of culvert data. As such, there is a need to identify culvert mapping practices that support data application and modeling efforts that cross administrative boundaries. The following good practices are expected to evolve with your input and the further development and application of 3DHP data.

ADD *Background* DISCUSSION COMMENTS BELOW

- Comment (initials)

Definition

Culvert definitions vary widely. For purposes of this guidance a culvert is a transverse drain that channels water past or under an obstacle. Culverts are engineered features often located at the intersection of a stream with a road, railroad, drive, or trail. In 3DHP, culverts are a subset of the 'elevation breaching connector' feature type. Additional elevation breaching connectors are required to allow surface EDH to flow through elevated obstacles in the DEM.

ADD *Definition* DISCUSSION COMMENTS BELOW

- Comment (initials)

Statewide Coordination

Culvert mapping is commonly mission, versus framework data, oriented, e.g., transportation infrastructure management, fisheries management, stormwater management. As a result, these efforts commonly initiate within specific agencies or organizations and information may not be shared among or applicable to other organizations. Statewide data managers are therefore encouraged to coordinate these efforts to maximize the access to and value of the data. Coordination can occur it several ways:

- initiate and lead a statewide culvert mapping project in support of EDH data development
- inventory existing culvert mapping efforts and compile, align, and distribute data as able
- develop and promote statewide culvert mapping practices.

ADD *Statewide Coordination* DISCUSSION COMMENTS BELOW

- Comment (initials)

Data Collection

Organizations are encouraged to collect culvert data using high-quality imagery, a lidar-derived elevation surface, or a digital mapping application that incorporates GPS and a field data mapping template. The capture of data in the field, in a digital format reduces the chance for introducing errors when the data is transferred from a hard copy form that isn't georeferenced. Entities are encouraged to map culverts using the method that best supports their needs and resources with the understanding that the data may not align with the 3DEP lidar data and that adjustments may be necessary to hydro-enforce the elevation data.

ADD *Data Collection* DISCUSSION COMMENTS BELOW

- Comment (initials)

3DHP Culvert Mapping Good Practices Workspace

Geographic Feature Type

Culverts are currently mapped using a variety of geographic feature types as points, lines, and polygons. Lines are of the greatest value as they can be integrated into the 3DHP mainstems model network and best support hydrologic and hydraulic modeling.

Culvert mapping initiatives are therefore encouraged to map culverts as lines with endpoints attributed as either inflow or outflow. If culverts are captured as polygons, a centerline representing a linear connection from upstream to downstream hydrography features is recommended.

ADD *Geographic Feature Type* DISCUSSION COMMENTS BELOW

- Comment (initials)

Attribute Name	Attribute Definition	Attribute Class
3DHP Mainstem Identifier	3DHP mainstem identifier network location. Provides a link to a Geoconnex feature or geojson definition of the river that the culvert is on.	character
add Mainstem ID comments below		
• comment (initials)	• comment (initials)	• comment (initials)
Maintenance Organization Name	Name of the organization responsible for maintenance of the culvert	character
add Maintenance Org Name comments below		
• comment (initials)	• comment (initials)	• comment (initials)
Maintenance Organization Email Address	Email address of the point of contact within organization responsible for maintenance of the culvert	character
add Maintenance Org Email comments below		

Attribute Name	Attribute Definition	Attribute Class
3DHP Mainstem Identifier	3DHP mainstem identifier network location. Provides a link to a Geoconnex feature or geojson definition of the river that the culvert is on.	character
add Mainstem ID comments below		
• comment (initials)	• comment (initials)	• comment (initials)
Maintenance Organization Name	Name of the organization responsible for maintenance of the culvert	character
add Maintenance Org Name comments below		
• comment (initials)	• comment (initials)	• comment (initials)
Maintenance Organization Email Address	Email address of the point of contact within organization responsible for maintenance of the culvert	character
add Maintenance Org Email comments below		

ADD *Additional Attributes or General Attribute* DISCUSSION COMMENTS BELOW

- Comment (initials)

Resources

The following guidance documents, data collection forms, and other resources are available to support culvert mapping

NSGIC 3DHP FTN Culvert Mapping Survey Results

Dashboard

https://experience.arcgis.com/experience/68ce50e1e31e4e5db688af7d5b815814/page/NSGIC-Culvert-Mapping-Activity-Dashboard/

A 2023 survey of the culvert mapping practices of state, regional, local, federal, and private sector organizations. Includes information about existing culvert mapping initiative purpose, geographic extent, data collection methods, data collection applications,etc.

Survey Results

Includes all information above as well as attribute reporting

https://docs.google.com/spreadsheets/d/1LsX6FgV3M0JLCiVBj-JnJ0B53Q4wazyM/edit?usp=sharing&ouid=117136658898741047433&rtpof=true&sd=true

Culverts Spatial Data Standard - Oregon/Washington Bureau of Land Management

https://www.blm.gov/sites/default/files/policies/OR-IB-2021-005-att1.pdf

An actively maintained list of culvert mapping dataset attributes, definitions, and values.

Southeast Aquatic Resources Partnership (SARP) Culvert Field Data Collection

Manual:

https://southeastaquatics.net/sarps-programs/southeast-aquatic-connectivity-assessment-program-seacap/culvert-assessments/sarp-culvert-assessment-manual/at_download/file

Data Collection Form:

https://southeastaquatics.net/sarps-programs/southeast-aquatic-connectivity-assessment-program-seacap/culvert-assessments/sarp-culvert-assessment-datasheet/at_download/file

ADD *Additional Resources or General Resource* DISCUSSION COMMENTS BELOW

- Comment (initials)

3DHP Culvert Mapping Good Practices

Your Input Is Needed

We'd like to publish this guidance so that it can be presented at the NSGIC 2024 Annual Meeting in September

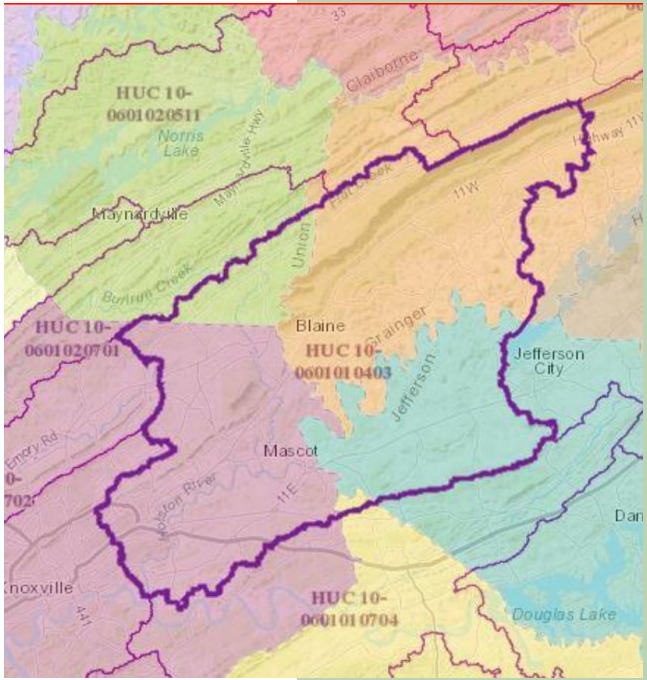
Timeline:

- Comment Period Closes: July 18, 2024
- Final Draft: August 15, 2024
- Presentation: NSGIC Annual Conference, Sep 25-28, 2024
- Final Document Published to the 3DHP FTN Info Hub: Oct 16, 2024

Questions?

Disussion: Community 3DHP-related Activities

Share your 3DHP-related activities, plans, or questions



Lynda Wayne, Project Manager
Lynda.Wayne@nsgic.org
Phil Worrall, Project Engineer
Phil.Worrall@nsgic.org

NSGIC 3DHP Forum

third Wednesday of the month, 3-4:30 PM (E)

watch 3DHP FTN Interest Group and NSGIC Calendar for registration information

Next Forum:

Have a state project or activity to share?

April 17, 2023