User Guide for Elevation-derived Hydrography Evaluation Tools and Elevation-derived Hydrography Story Map

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May 4th, 2020

USGS science for a changing world

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File Configuration

The EDH_Evaluation_Tools directory is distributed as a zip file which should be extracted to a directory of the user's choice.

Figure 1 displays the subfolders of the extracted zip file.

The relative file structure of these folders is very important and should not be modified.

The EDH_Evaluation_DataDictionary folder contains feature class and attribute descriptions of all files created when running the EDH Evaluation Tools (figure 2).

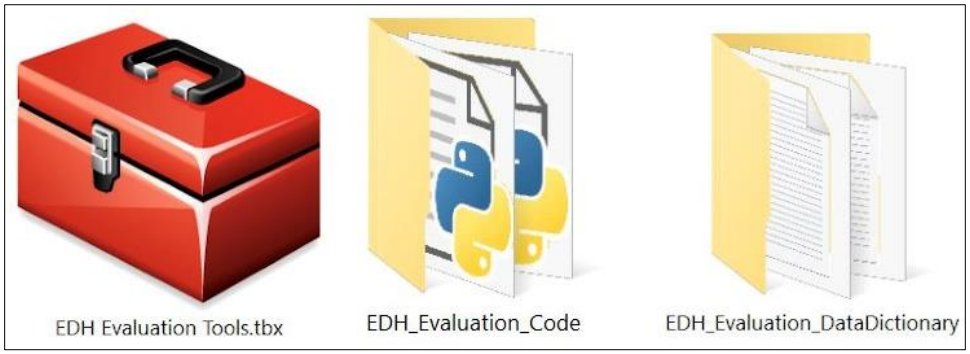

Figure 1: EDH Evaluation Tools Directory

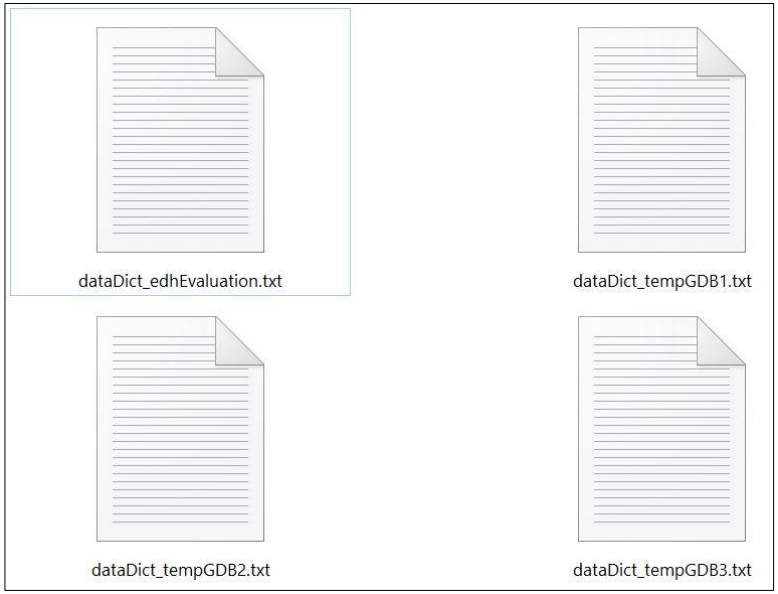

Figure 2: Data Dictionary Text Files

Tool Overview

The toolbox contains 9 total tools - 7 analysis tools and 2 configuration tools (figure 3).

Before running the analysis tools (2-7), the user must run “1 – Create EDH Evaluation Environment” which creates a standard file environment allowing for the analysis tools to run correctly on any given EDH/NHD dataset.

The analysis tools can then be run in any order. See Appendix for details regarding result datasets, reporting, and the standard review MXD.

Figure 3: EDH Evaluation Tools

Tool 1 – Create EDH Evaluation Environment

This tool generates an "EDH Evaluation" geodatabase in the "Workspace Parent Folder" provided by the user. It also generates a temporary directory to hold intermediate datasets in the analysis process.

It must be run prior to running any other analysis tool.

1) **Workspace Parent Folder:** The file location that will be populated by the EDH evaluation geodatabase and temporary analysis directory. The report summary text file, and presentation MXD will be populated in this directory following the run of the first analysis tool (see Appendix).

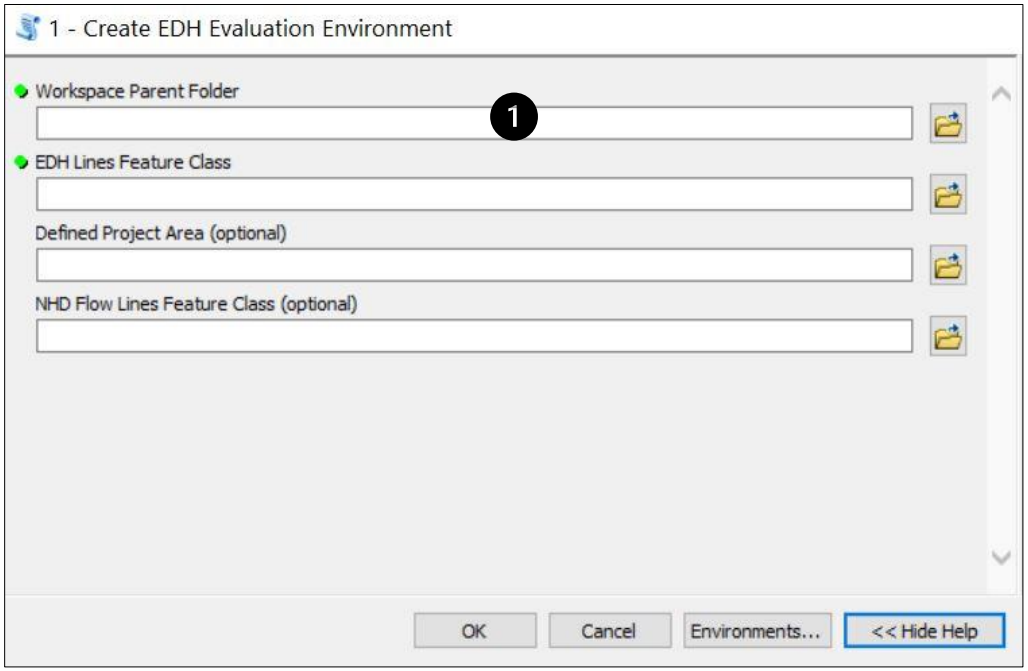

Figure 4: Create EDH Evaluation Environment GUI

Tool 1 – Create EDH Evaluation Environment

2) **EDH Lines Feature Class:** The layer, feature class, or shapefile containing the EDH lines to be analyzed. This data will be copied to the "EDH_Evaluation.gdb" and be named "EDH_Lines." A field named "OrigEDH_ID" will be appended to the original lines provided here so that analytical fields may be joined by the user at a later time.

3) **Defined Project Area:** The layer, feature class, or shapefile containing the Defined Project Area (DPA). This data will be copied to the "EDH_Evaluation.gdb" and be named "DPA." It is highly recommended that the watershed boundary surrounding the EDH Lines be used for this polygonal area. If a DPA polygon feature class is not provided, one will be created using the bounding extent of the lines provided in the "EDH Lines Feature Class" parameter.

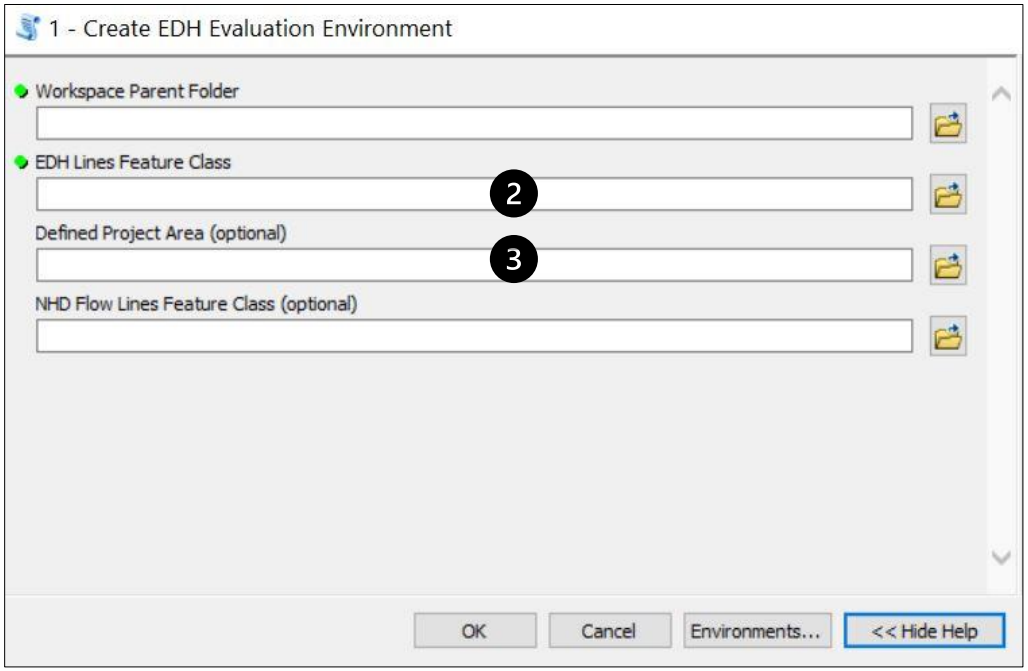

Figure 4: Create EDH Evaluation Environment GUI

Tool 1 – Create EDH Evaluation Environment

4**) NHD Flow Lines Feature Class:** The layer, feature class, or shapefile containing the National Hydrography Dataset Flowlines (NHDFlowline). This data will be copied to the "EDH_Evaluation.gdb" and be named "NHD_Lines." A field named "OrigNHD_ID" will be appended to the original lines provided here so that analytical fields may be joined by the user at a later time. If user opts to not provide NHD Flow Lines here, they may import them later using the "Import NHD Lines Post-Eval Environment Set-Up" tool.

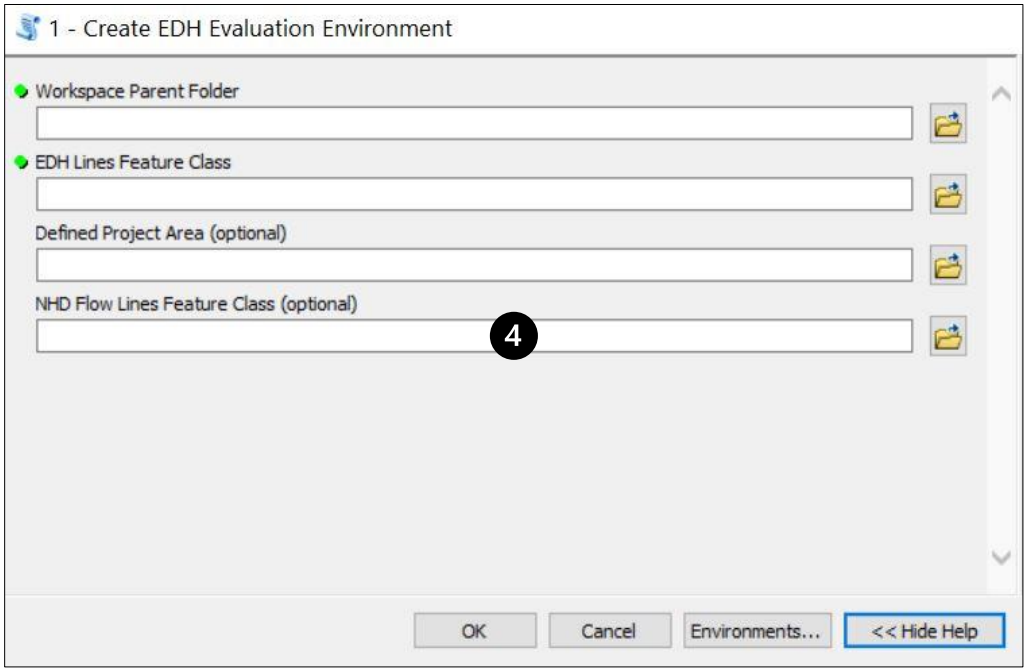

Figure 4: Create EDH Evaluation Environment GUI

Tool 1 – Create EDH Evaluation Environment Results

Following completion, the user's "Workspace Parent Folder" will contain the directories shown in figure 5.

The EDH_Assessment_TempDir will contain three temporary geodatabases that are utilized for intermediate data storage for subsequent processes.

EDH_Evaluation.gdb will contain all "final" analysis outputs of the subsequent evaluation tools. For now, it will contain at minimum, "EDH_Lines" and "DPA." If the user imported existing NHD flow lines, they will be stored here as "NHD_Lines." All datasets will be in the projection of the imported EDH lines feature class.

Figure 5: User Directory

Tool 2 – Match NHD Streams to EDH Counterparts

This tool utilizes proximity analysis tools (primarily, the "near" geoprocessing tool) to match NHD Flowlines to nearby EDH Line features. The user can customize the matching process by manipulating the "Candidate_NHD_Vertex_to_EDH_Line Distance" and "Qualified Vertex Count" parameters.

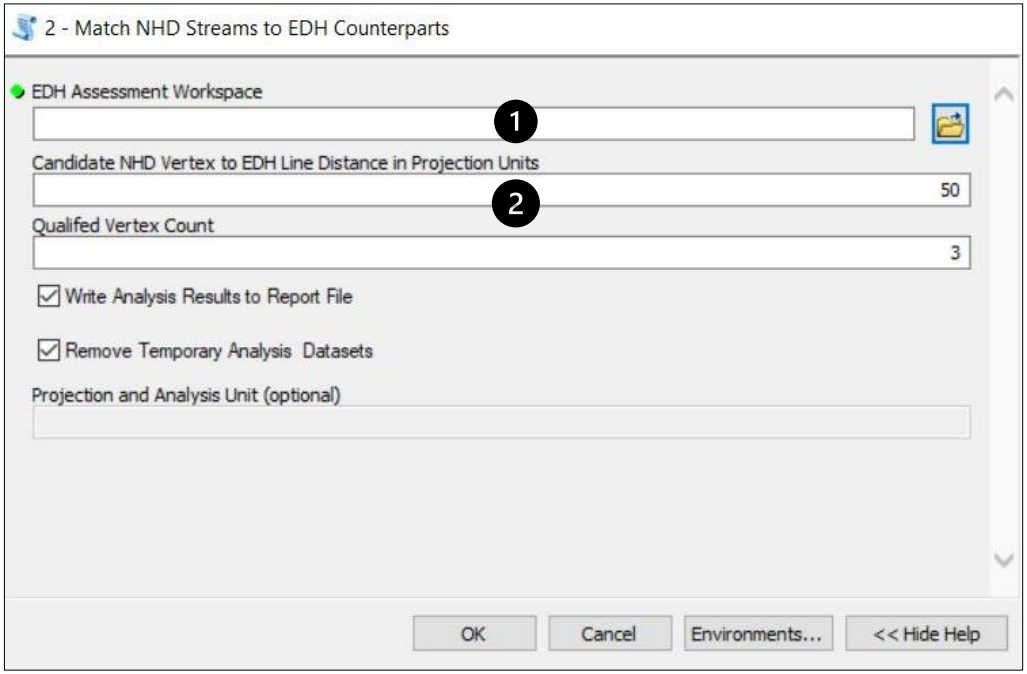

Figure 6: Match NHD Streams to EDH Counterparts

1) **EDH Assessment Workspace:** The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).
2) **Candidate NHD Vertex to EDH Line Distance in Projection Units:** The distance (in projection units) from NHD vertex points to EDH Lines that could be representing the same hydrologic feature.

Tool 2 – Match NHD Streams to EDH Counterparts

3) Qualifed_Vertex_Count: The count of NHD line vertices that locate the same EDH line to “qualify” a match. If this amount of NHD vertices detect the same EDH line within the searching radius, the match is qualified.

4) Write Analysis Results to Report File: If checked, the summary statistics of this operation will be written to "EDH_EvalReport.txt“

5) Remove Temporary Analysis Datasets: If checked, all intermediate datasets from the geodatabases in the "EDH_Assessment_TempDir“ will be deleted following completion of this tool.

6) Projection and Analysis Unit: The linear unit of “EDH_Lines” which is used as the unit in all distance calculations performed by the tool. This will be populated automatically once parameter 1 is provided.

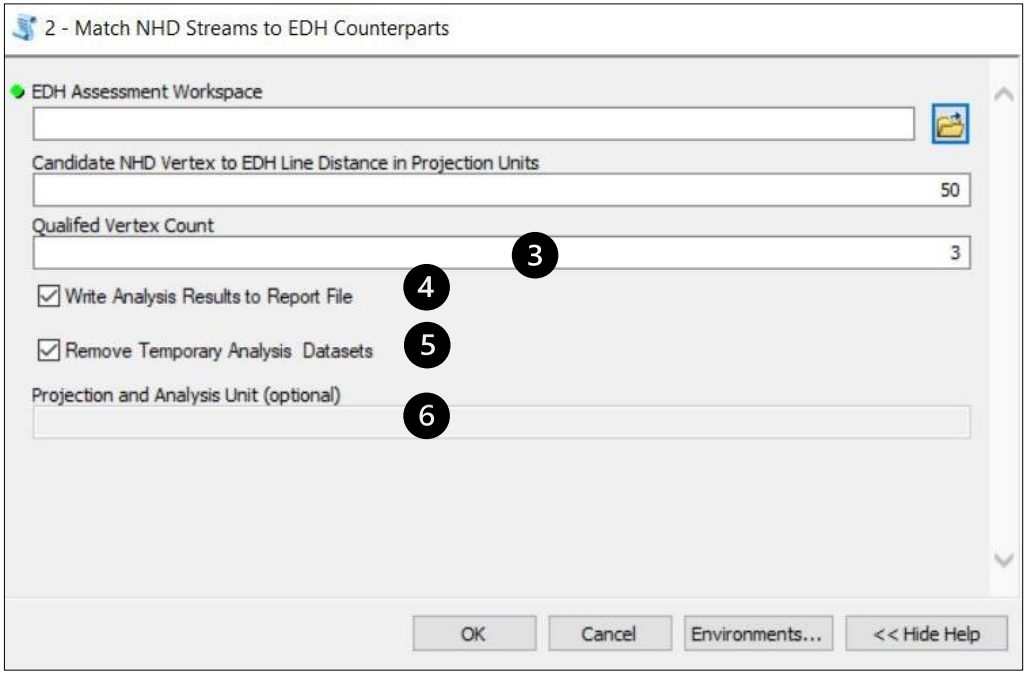

Figure 6: Match NHD Streams to EDH Counterparts

Tool 2 – Match NHD Streams to EDH Counterparts Results

“NHD_Lines” is appended the below fields:

EDH_LineIDs (String): The OBJECTIDs of the EDH_Lines that were "matched" to this NHD line per the parameters specified in "Match NHD Streams to EDH Counterparts.“

MatchFlag (SmallInteger): Populated with below codes to signify characteristics of the matching process.

- MatchFlag = 0: NHD Line matched with only EDH lines of the same FCode
- MatchFlag = 1: NHD Line was not able to find a match in the EDH at all
- MatchFlag = 2: NHD Line Artificial Path was matched with at least one EDH Non-Artificial Path
- MatchFlag = 3: NHD Line Non-Artificial Path was matched with at least one EDH Artificial Path

Tool 3a – Calculate Segmented Sinuosity

This tool divides EDH or NHD lines into segments broken at user specified distance and calculates the sinuosity of segments. It must be run on both EDH Lines and NHD lines in order to use tool 3b (Compare NHD/EDH Segmented Sinuosity within Grid).

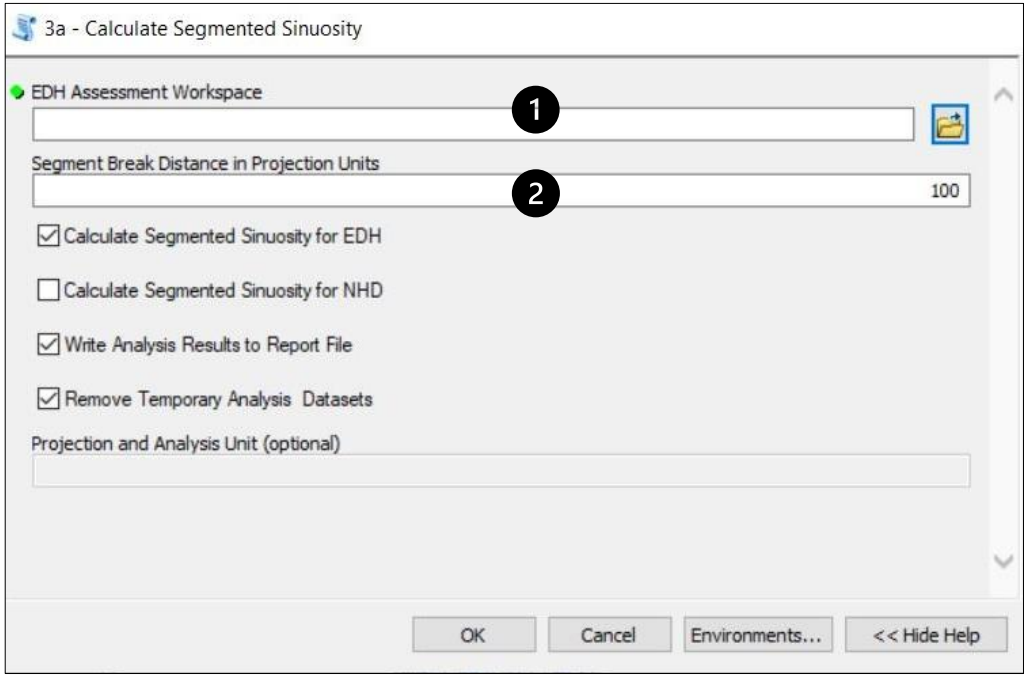

Figure 7: Calculate Segmented Sinuosity GUI

1) **EDH Assessment Workspace:** The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).

2) **Segment Break Distance in Projection Units:** Distance (in projection units) at which line segments will be divided for the segmented sinuosity calculation.

Tool 3a – Calculate Segmented Sinuosity

3) Calculate Segmented Sinuosity for EDH: If checked, segmented sinuosity will be calculated for "EDH_Lines."

4) Calculate Segmented Sinuosity for NHD: If checked, segmented sinuosity will be calculated for "NHD_Lines."

5) Write Analysis Results to Report File: If checked, the summary statistics of this operation will be written to "EDH_EvalReport.txt."

6) Remove Temporary Analysis Datasets: If checked, all intermediate datasets from the geodatabases in the "EDH_Assessment_TempDir" will be deleted following completion of this tool.

7) Projection and Analysis Unit: The linear unit of "EDH_Lines" which is used as the unit in all distance calculations performed by the tool. This will be populated automatically once parameter 1 is provided.

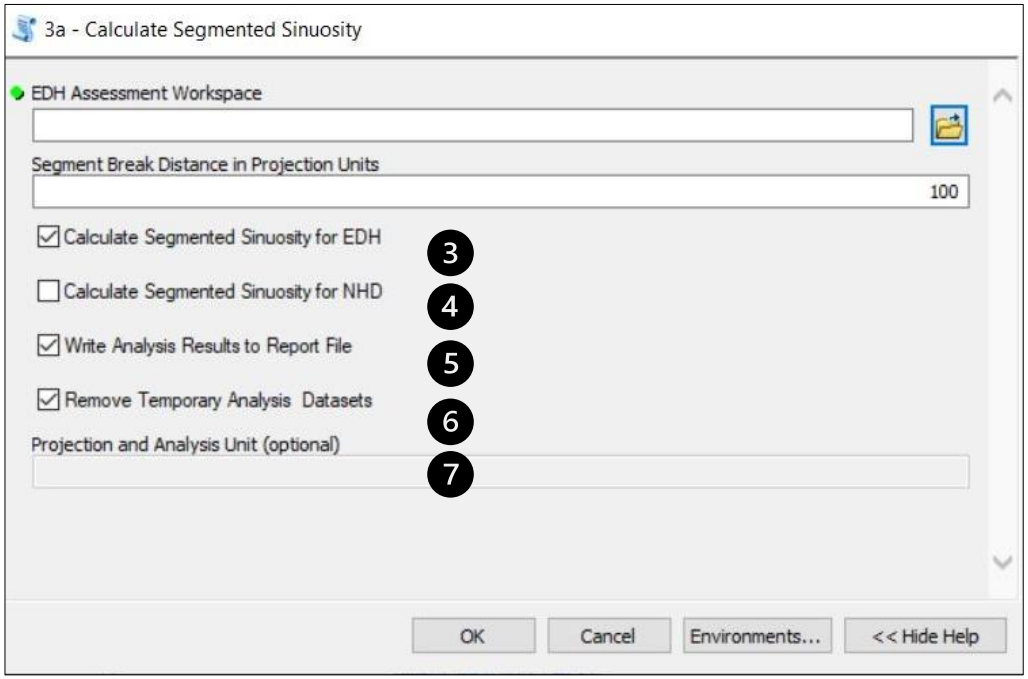

Figure 7: Calculate Segmented Sinuosity GUI

Tool 3a – Calculate Segmented Sinuosity Results

The below feature classes are built:

EDH(or NHD)_SS_Segments: Features created from EDH lines and broken at user-specified distances.

Fields:

OrigLineID (SmallInteger): The OBJECTID of the original EDH_Lines feature class provided by the user. Separated here for relation to original feature class
SegID (String): SegmentID number derived by concatenating the EDH_Line OBJECTID + "|" + sequential segment number (beginning at the start of the line)
SegLength (Double): Length of segment in spatial reference system units
StraightLength (Double): Length of corresponding straight line connecting beginning and ending points
SegSin (Double): Sinuosity of segment calculated by dividing SegLength by StraightLength

EDH(or NHD)_SS_Straights: Lines connecting feature start and end points corresponding with "EDH_SS_Segments.“

Fields:

OrigLineID (SmallInteger): The OBJECTID of the original EDH_Lines feature class provided by the user; separated here for relation to original feature class
SegID (String): SegmentID number derived by concatenating the EDH_Line OBJECTID + "|" + Sequential segment number (beginning at the start of the line)

Tool 3a – Calculate Segmented Sinuosity Results

“EDH_Lines” and/or “NHD_Lines” are appended the below fields:

WMEAN_SegSin (Double): Mean segmented sinuosity for the line feature segments as constructed per "Calculate Segmented Sinuosity." Mean is weighted based upon length of feature since segments at the end of a feature may be shorter than user-specified distance.

MIN_SegSin (Double): Minimum segmented sinuosity of the line feature segments as constructed per "Calculate Segmented Sinuosity“ excluding any segments that are shorter than 90% of the user-specified segment length.

MAX_SegSin (Double): Maximum segmented sinuosity of the line feature segments as constructed per "Calculate Segmented Sinuosity” excluding any segments that are shorter than 90% of the user-specified segment length.

STD_SegSin (Double): Standard deviation of segmented sinuosity of the line feature segments as constructed per "Calculate Segmented Sinuosity“ excluding any segments that are shorter than 90% of the user-specified segment length.

Tool 3b – Compare NHD/EDH Segmented Sinuosity within Grid

This tool constructs a polygonal grid (of user specified grid tile size) encompassing the extent of the EDH lines and compares EDH and NHD segmented sinuosity within the grid cell.

1) EDH Assessment Workspace: The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).

2) Segment Break Distance in Projection Units: Grid cell polygon size in areal projection units.

3) Write Analysis Results to Report File: If checked, the summary statistics of this operation will be written to "EDH_EvalReport.txt."

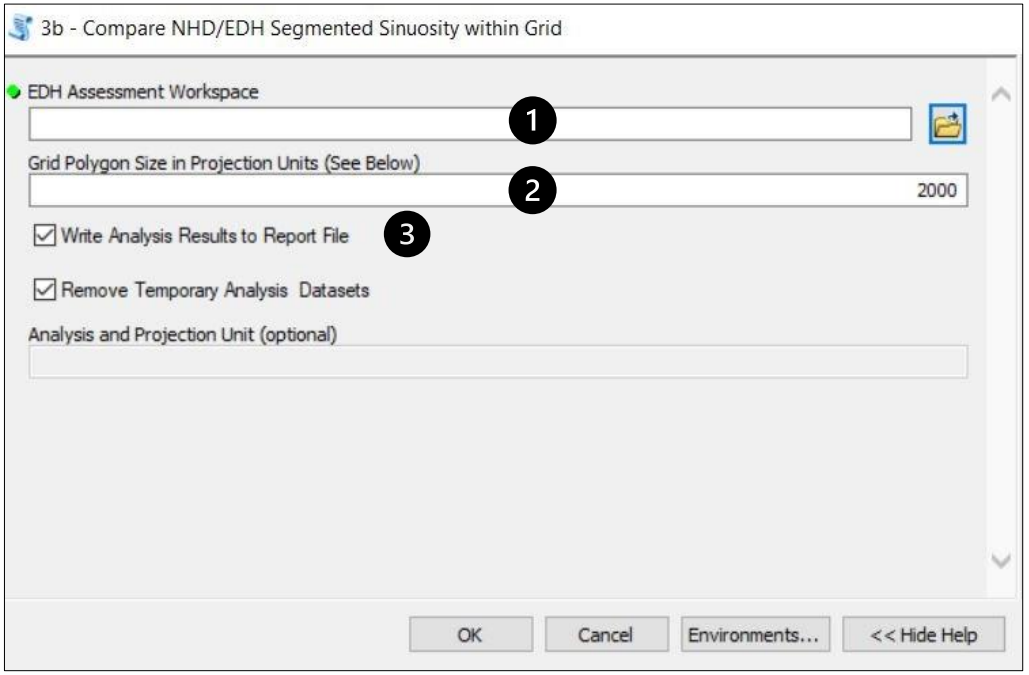

Figure 8: Compare NHD/EDH Segmented Sinuosity within Grid GUI

Tool 3b – Compare NHD/EDH Segmented Sinuosity within Grid

4) Remove Temporary Analysis Datasets: If checked, all intermediate datasets from the geodatabases in the "EDH_Assessment_TempDir“ will be deleted following completion of this tool.

5) Projection and Analysis Unit: The linear unit of “EDH_Lines” which is used as the unit in all distance calculations performed by the tool. This will be populated automatically once parameter 1 is provided.

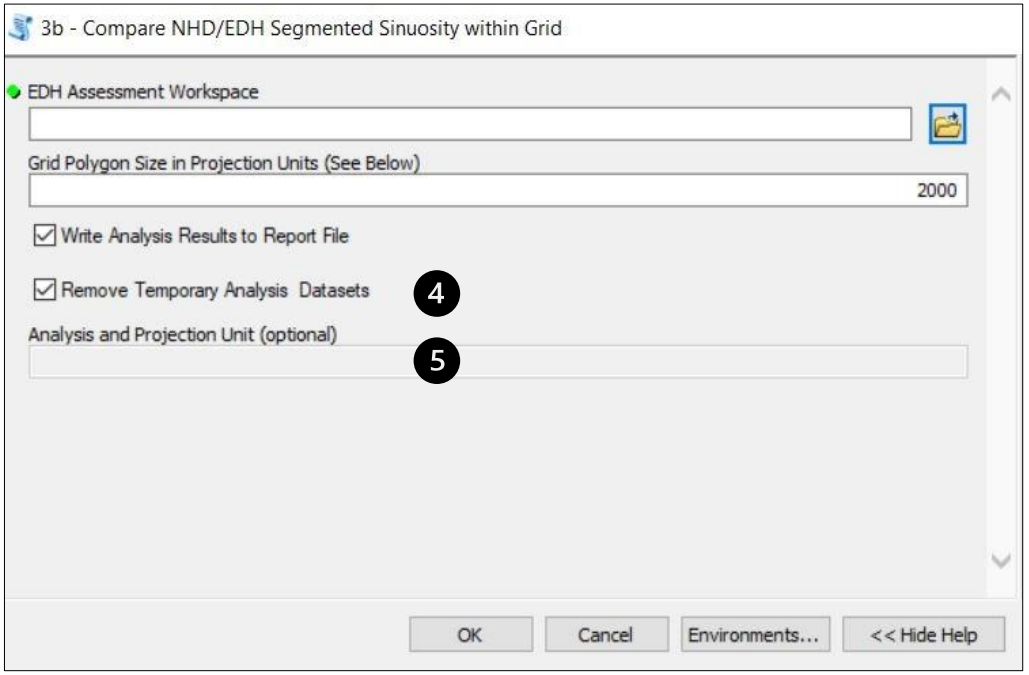

Figure 8: Compare NHD/EDH Segmented Sinuosity within Grid GUI

Tool 3b – Compare NHD/EDH Segmented Sinuosity within Grid Results

The below feature class is built:

DPA_Grid: Square polygonal grid generated within the extent of the EDH_Lines. Polygon size is the square linear distance and unit provided by user.

Fields:

EDH_grid_wmeanSegSin (Double): The length-weighted mean of EDH segmented sinuosity within grid polygon
EDH_segmentCount (Integer): The count of EDH segments within grid polygon
NHD_grid_wmeanSegSin (Double): The length-weighted mean of NHD segmented sinuosity within grid polygon
NHD_segmentCount (Integer): The count of NHD segments within grid polygon
WSegSin_Difference (Double): The difference in grid segmented sinuosity calculated by subtracting NHD_wmeanSegSin from EDH_wmeanSegSin

Tool 4 – Detect Straight EDH Flowline Segments

This tool is used to identify straight segments in the EDH flow lines. Regardless of intermediate vertices, this tool detects sections along the line that have no change in bearing within the flagging distance.

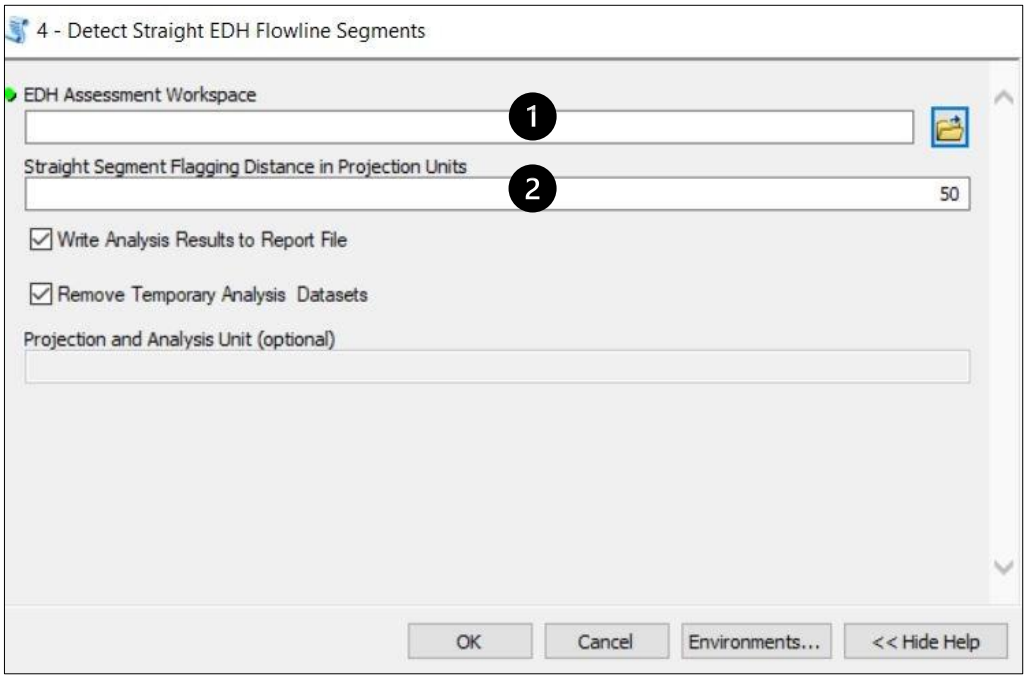

Figure 9: Detect Straight EDH Flowline Segments GUI

1) **EDH Assessment Workspace:** The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).

2) **Straight Segment Flagging Distance in Projection Units:** Distance (in projection units) at which straight segments will be flagged and constructed in the "EDH_StraightSegments" feature class.

Tool 4 – Detect Straight EDH Flowline Segments

3) Write Analysis Results to Report File: If checked, the summary statistics of this operation will be written to "EDH_EvalReport.txt“

4) Remove Temporary Analysis Datasets: If checked, all intermediate datasets from the geodatabases in the "EDH_Assessment_TempDir“ will be deleted following completion of this tool.

5) Projection and Analysis Unit: The linear unit of “EDH_Lines” which is used as the unit in all distance calculations performed by the tool. This will be populated automatically once parameter 1 is provided.

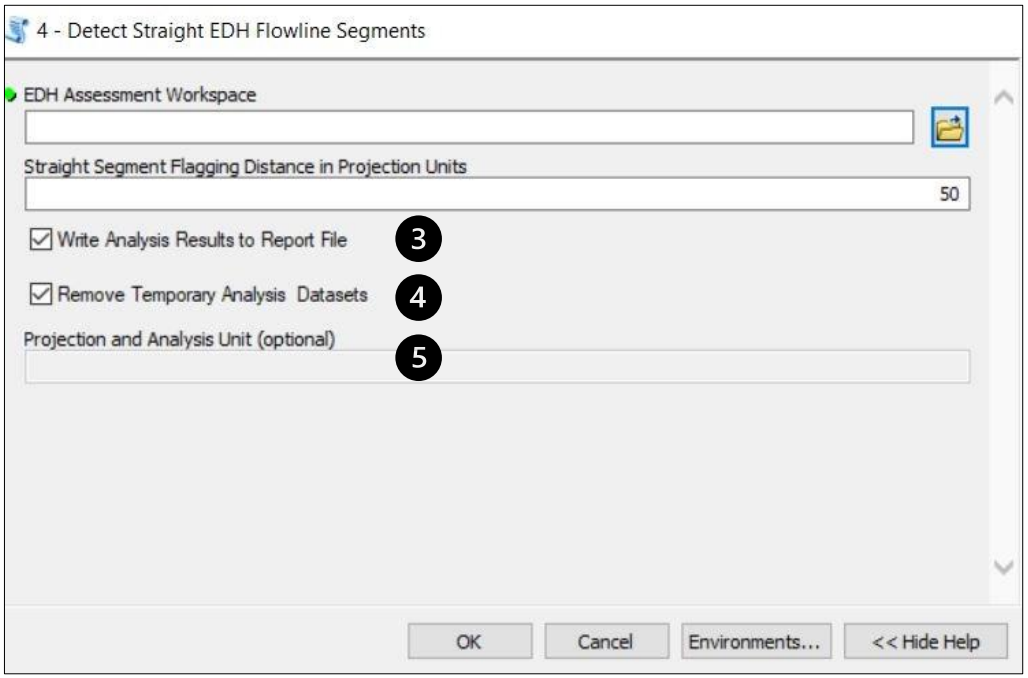

Figure 9: Detect Straight EDH Flowline Segments GUI

Tool 4 – Detect Straight EDH Flowline Segments Results

The below feature class is built:

EDH_StraightSegments: Line segments with no change in bearing for specified distance.

Fields:

EDH_LineID (Integer): The OBJECTID of the original EDH_Lines feature class provided by the user; separated here for relation to original feature class

“EDH_Lines” is appended with below fields:

StraightSegCount (LongInteger): Count of straight segments detected in "Detect Straight EDH Flowline Segments“

StraightSegSumLength (Double): Sum of length of straight segments detected in "Detect Straight EDH Flowline Segments"

Tool 5 – Flag Near Vertices

This tool performs proximity analysis on the EDH line vertices. It flags any vertices that are within the flagging distance provided by the user.

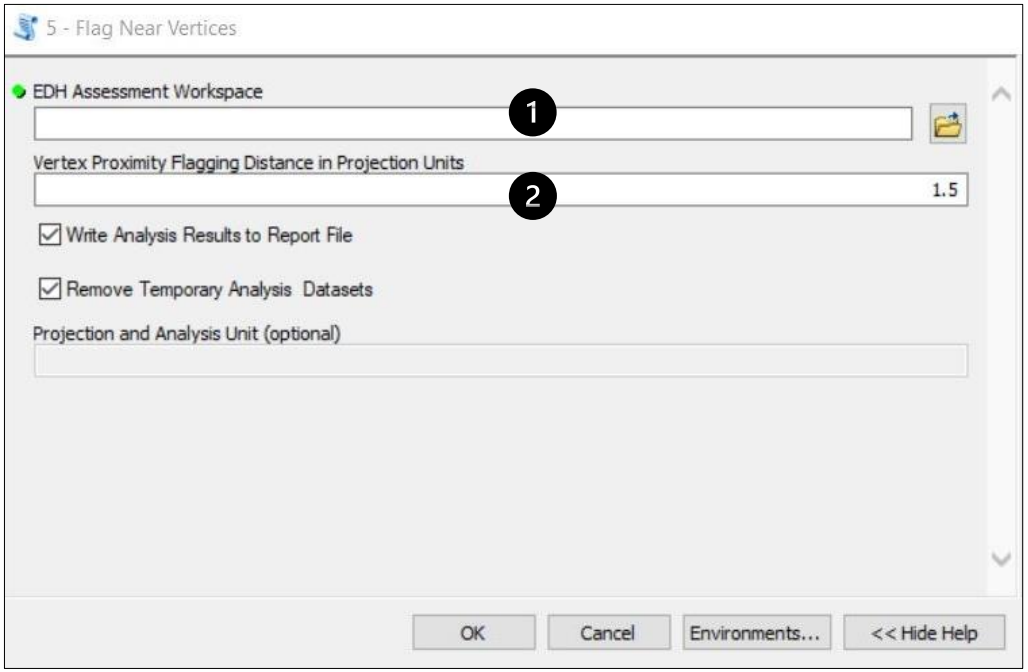

Figure 10: Flag Near Vertices GUI

1) **EDH Assessment Workspace:** The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).

2) **Vertex Proximity Flagging Distance in Projection Units:** The "near" distance (in projection units) at which vertices will be flagged.

Tool 5 – Flag Near Vertices

3) Write Analysis Results to Report File: If checked, the summary statistics of this operation will be written to "EDH_EvalReport.txt.“

4) Remove Temporary Analysis Datasets: If checked, all intermediate datasets from the geodatabases in the "EDH_Assessment_TempDir“ will be deleted following completion of this tool.

5) Projection and Analysis Unit: The linear unit of “EDH_Lines” which is used as the unit in all distance calculations performed by the tool. This will be populated automatically once parameter 1 is provided.

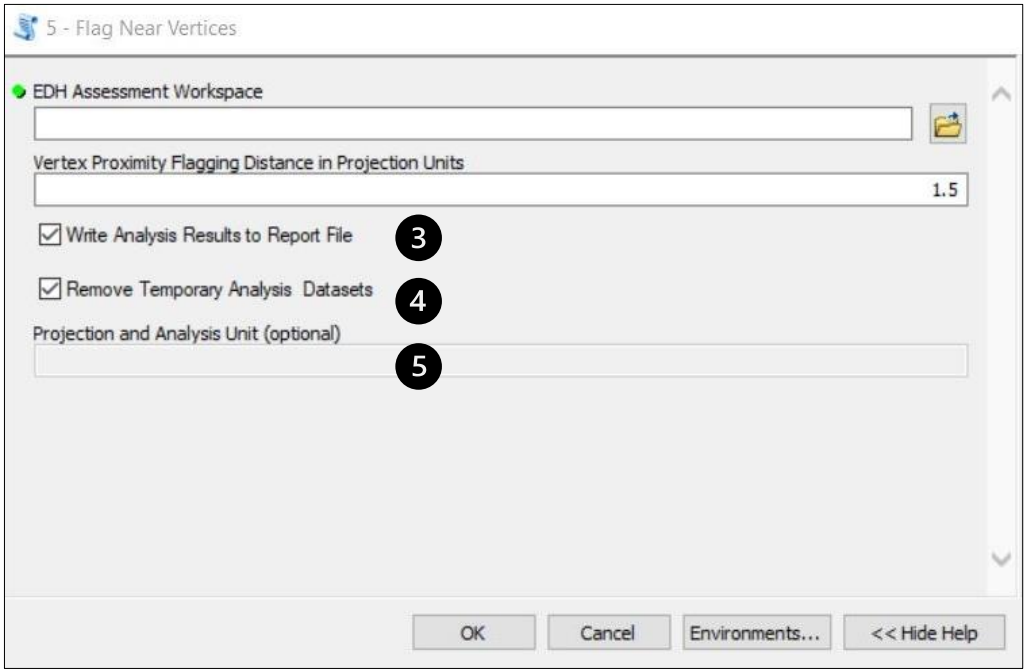

Figure 10: Flag Near Vertices GUI

Tool 5 – Flag Near Vertices - Results

The below feature class is built:

EDH_LineVertsTooClose: Vertices that are within specified flagging distance

Fields:

ORIG_FID (Integer): The OBJECTID of the original EDH_Lines feature class provided by the user; separated here for relation to original feature class

NEAR_FID (Integer): The OBJECTID of the vertex point that is within the flagging distance as specified in "Flag Near Vertices"

NEAR_DIST (Double): The distance in spatial reference system units to the vertex point that was detected within the flagging distance as specified in "Flag Near Vertices"

NEAR_X (Double): The X coordinate of the vertex point that was detected within the flagging distance as specified in "Flag Near Vertices"

NEAR_Y (Double): The Y coordinate of the vertex point that was detected within the flagging distance as specified in "Flag Near Vertices"

“EDH_Lines” is appended with below field:

VertsTooClose (Integer): Count of line vertices that were flagged per "Flag Near Vertices"

Tool 6 – Flag Unintegrated Vertices

This tool flags EDH line vertices that are outside of the z-value flagging threshold specified by the user. This identifies lines that are not vertically integrated with the elevation surface provided by the user.

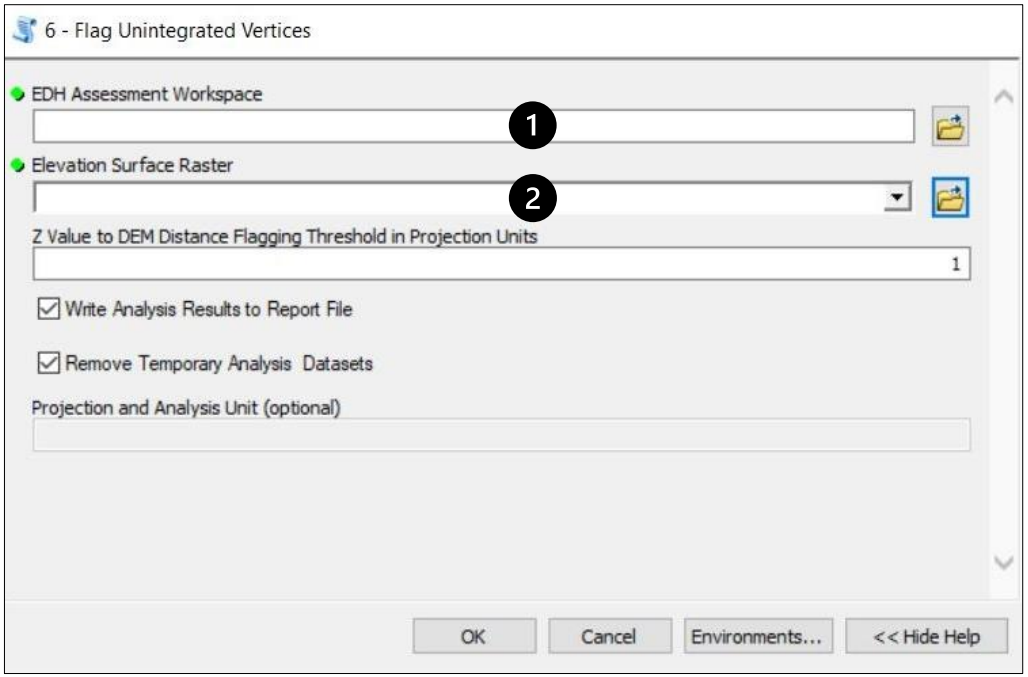

Figure 11: Flag Unintegrated Vertices GUI

1) **EDH Assessment Workspace:** The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).

2) **Elevation Surface Raster:** The 3DEP elevation surface dataset from which the EDH lines were derived.

Tool 6 – Flag Unintegrated Vertices

3) Z Value to DEM Distance Flagging Threshold in Projection_Units: Vertices with difference values greater than or equal to this distance (in projection units) will be flagged.

4) Write Analysis Results to Report File: If checked, the summary statistics of this operation will be written to "EDH_EvalReport.txt.“

5) Remove Temporary Analysis Datasets: If checked, all intermediate datasets from the geodatabases in the "EDH_Assessment_TempDir“ will be deleted following completion of this tool.

6) Projection and Analysis Unit: The linear unit of “EDH_Lines” which is used as the unit in all distance calculations performed by the tool. This will be populated automatically once parameter 1 is provided.

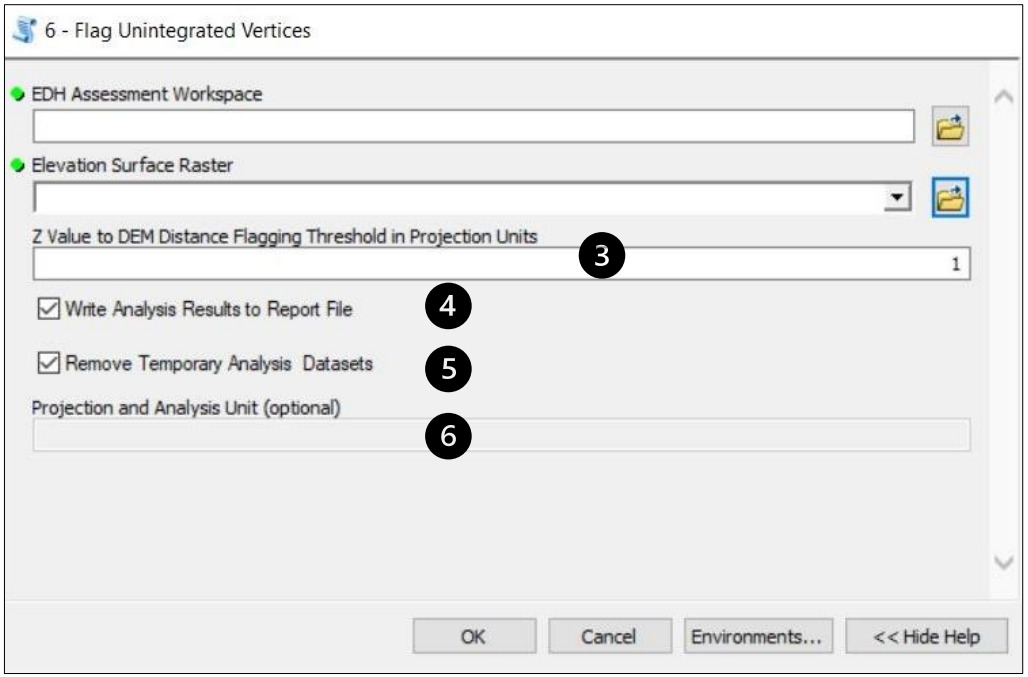

Figure 11: Flag Unintegrated Vertices GUI

Tool 6 – Flag Unintegrated Vertices Results

The below feature classes are built:

EDH_Lines_VertZ_Outliers: line segments that have at least 1 vertex that is greater than 1 meter from surface.

Fields:

MAX_z_diff (Double): Maximum difference of vertex Z value from corresponding DEM value
MIN_z_diff (Double): Minimum difference of vertex Z value from corresponding DEM value
MEAN_z_diff (Double): Mean difference of vertex Z values from corresponding DEM value
STD_z_diff (Double): Standard deviation of vertex Z values from corresponding DEM value
MEAN_z_diff_abs (Double): Absolute value of "MEAN_z_diff"
STD_z_diff_abs (Double): Absolute value of "STD_z_diff"
vert_z_flag (SmallInteger): Count of vertices that were flagged along the line feature in "Flag Unintegrated Vertices“

EDH_Lines_SegZ_Outliers: line segments whose vertices are on average greater than 1 meter from surface.

Fields:

MAX_z_diff (Double): Maximum difference of vertex Z value from corresponding DEM value
MIN_z_diff (Double): Minimum difference of vertex Z value from corresponding DEM value
MEAN_z_diff (Double): Mean difference of vertex Z values from corresponding DEM value
STD_z_diff (Double): Standard deviation of vertex Z values from corresponding DEM value
MEAN_z_diff_abs (Double): Absolute value of "MEAN_z_diff"
STD_z_diff_abs (Double): Absolute value of "STD_z_diff"
vert_z_flag (SmallInteger): Count of vertices that were flagged along the line feature in "Flag Unintegrated Vertices"

Tool 6 – Flag Unintegrated Vertices Results

The below feature classes are built (continued):

EDH_UnintegratedVerts: Vertices with a Z value that is above or below beyond flagging specified threshold from the DEM value upon which they lie.

Fields:

POINT_Z (Double): Z value of point feature
z_diff (Double): Difference in z value between POINT_Z and RASTERVALU
z_diff_abs (Double): Absolute value of z_diff
RASTERVALU (Single): Elevation value of DEM at point XY; DEM specified in "Flag Unintegrated Vertices"

Tool 6 – Flag Unintegrated Vertices Results

“EDH_Lines” is appended with the below fields:

MAX_z_diff (Double): Maximum difference of vertex Z value from corresponding DEM value

MIN_z_diff (Double): Minimum difference of vertex Z value from corresponding DEM value

MEAN_z_diff (Double): Mean difference of vertex Z values from corresponding DEM value

STD_z_diff (Double): Standard deviation of vertex Z values from corresponding DEM value

MEAN_z_diff_abs (Double): Absolute value of "MEAN_z_diff“

STD_z_diff_abs (Double): Absolute value of "STD_z_diff“

vert_z_flag (SmallInteger): Count of vertices that were flagged along the line feature in "Flag Unintegrated Vertices"

Tool 7 – EDH Streams Initiating Near Roads

This tool identifies EDH stream line features that initiate within the specified flagging distance from a specified road feature.

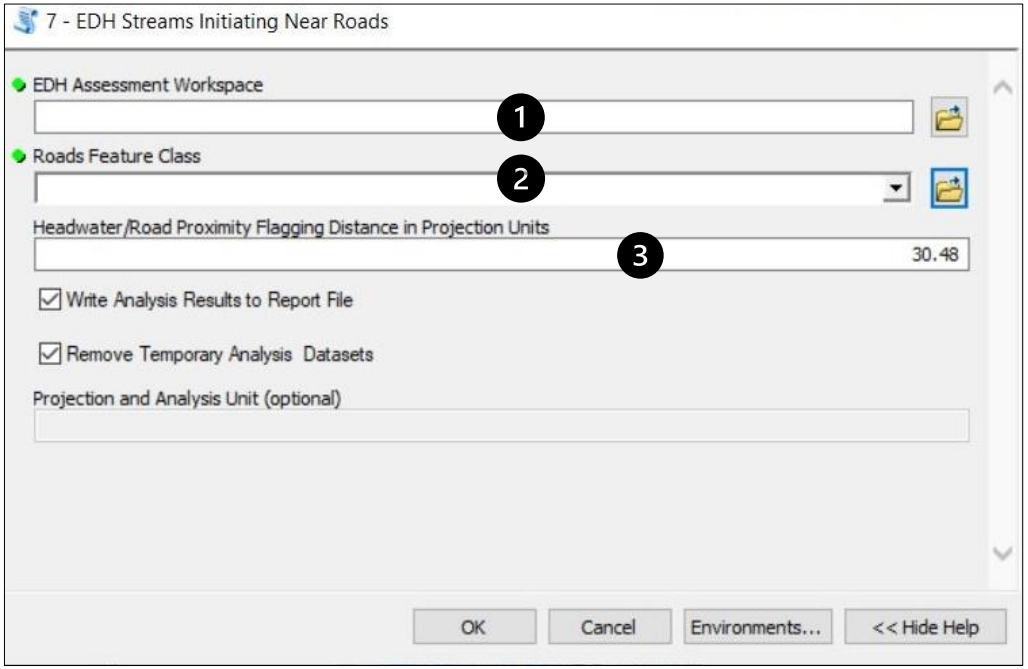

Figure 12: EDH Streams Initiating Near Roads GUI

1) **EDH Assessment Workspace:** The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).

2) **Roads Feature Class:** Road lines feature class to be evaluated.

3) **Headwater Road Proximity Flagging Distance in Projection Units:** Flagging distance threshold from EDH stream headwaters to road features.

Tool 7 – EDH Streams Initiating Near Roads

4) Write Analysis Results to Report File: If checked, the summary statistics of this operation will be written to "EDH_EvalReport.txt.“

5) Remove Temporary Analysis Datasets: If checked, all intermediate datasets from the geodatabases in the "EDH_Assessment_TempDir“ will be deleted following completion of this tool.

6) Projection and Analysis Unit: The linear unit of “EDH_Lines” which is used as the unit in all distance calculations performed by the tool. This will be populated automatically once parameter 1 is provided.

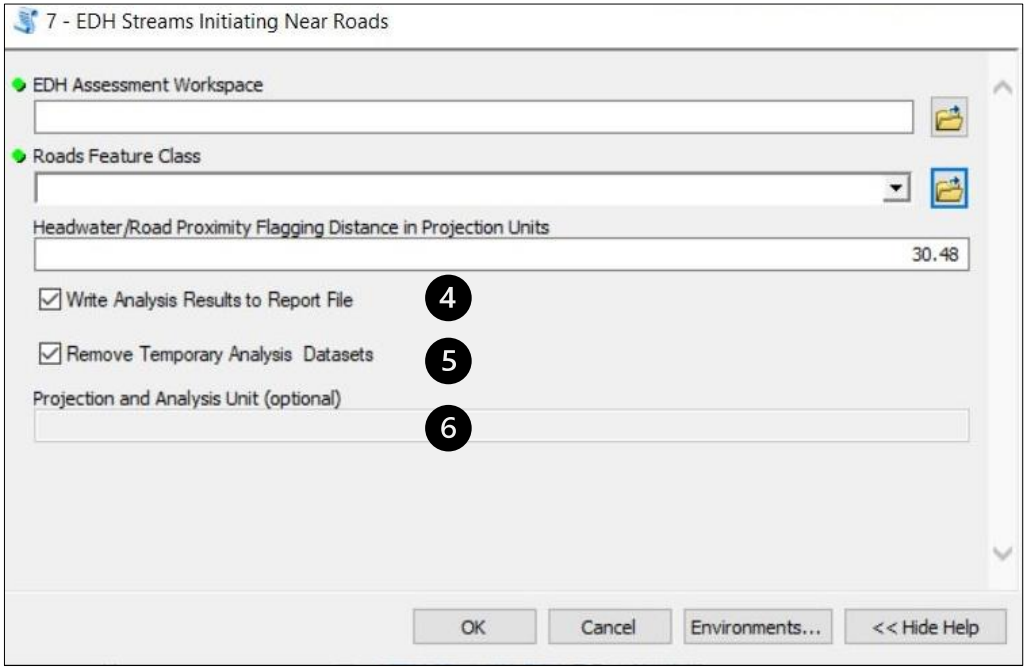

Figure 12: EDH Streams Initiating Near Roads GUI

Tool 7 – EDH Streams Initiating Near Roads Results

"EDH_Lines" is appended with the below field:

HwProximityToRoad (Double): Flagged distance from flow line initiation point to nearby road feature

Tool 8 – Import NHD Lines Post-Eval Environment Set-Up

This tool is only to be used when the NHD lines are not imported during initial set-up. It offers the user the chance to import them after the "Create EDH Evaluation Environment" tool has been run.

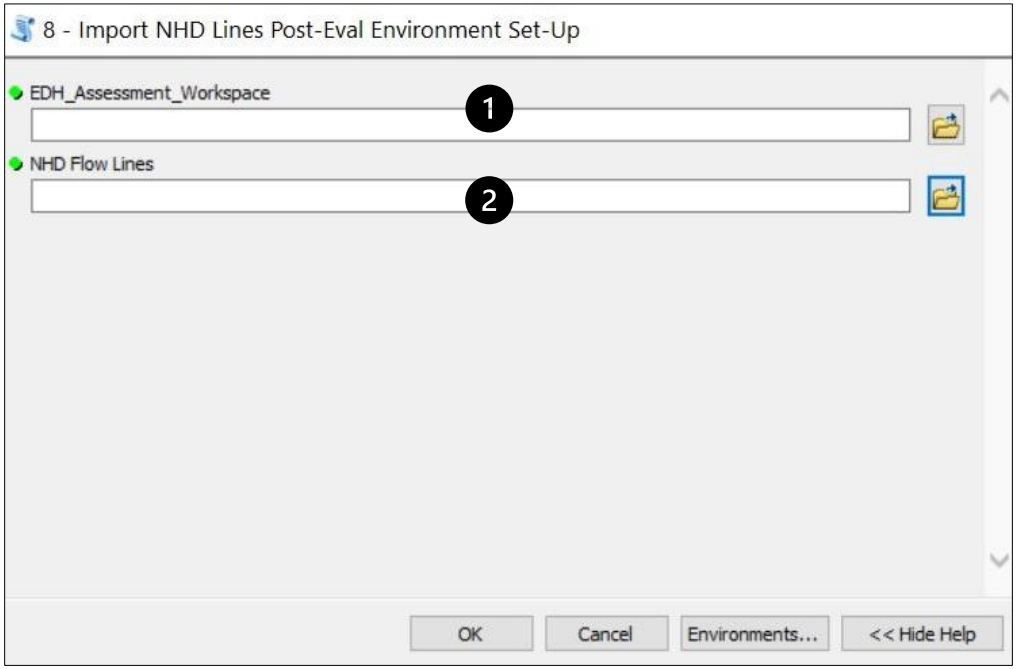

Figure 13: Import NHD Lines Post-Eval Environment Set-Up GUI

1) **EDH Assessment Workspace:** The file directory that contains the EDH evaluation geodatabase (EDH_Evaluation.gdb) and temporary analysis directory (EDH_Assessment_TempDir) (see figure 5).

2) **NHD Flow Lines:** the layer, feature class, or shapefile containing the National Hydrography Dataset Flowlines (NHDFlowline). This data will be copied to the "EDH_Evaluation.gdb" and be named "NHD_Lines." A field named "OrigNHD_ID" will be appended to the original lines provided here so that analytical fields may be joined by the user at a later time.

Tool Results: NHD flow lines are imported into EDH_Evaluation.gdb (see tool 1 results).

Page 1 Intro Animation

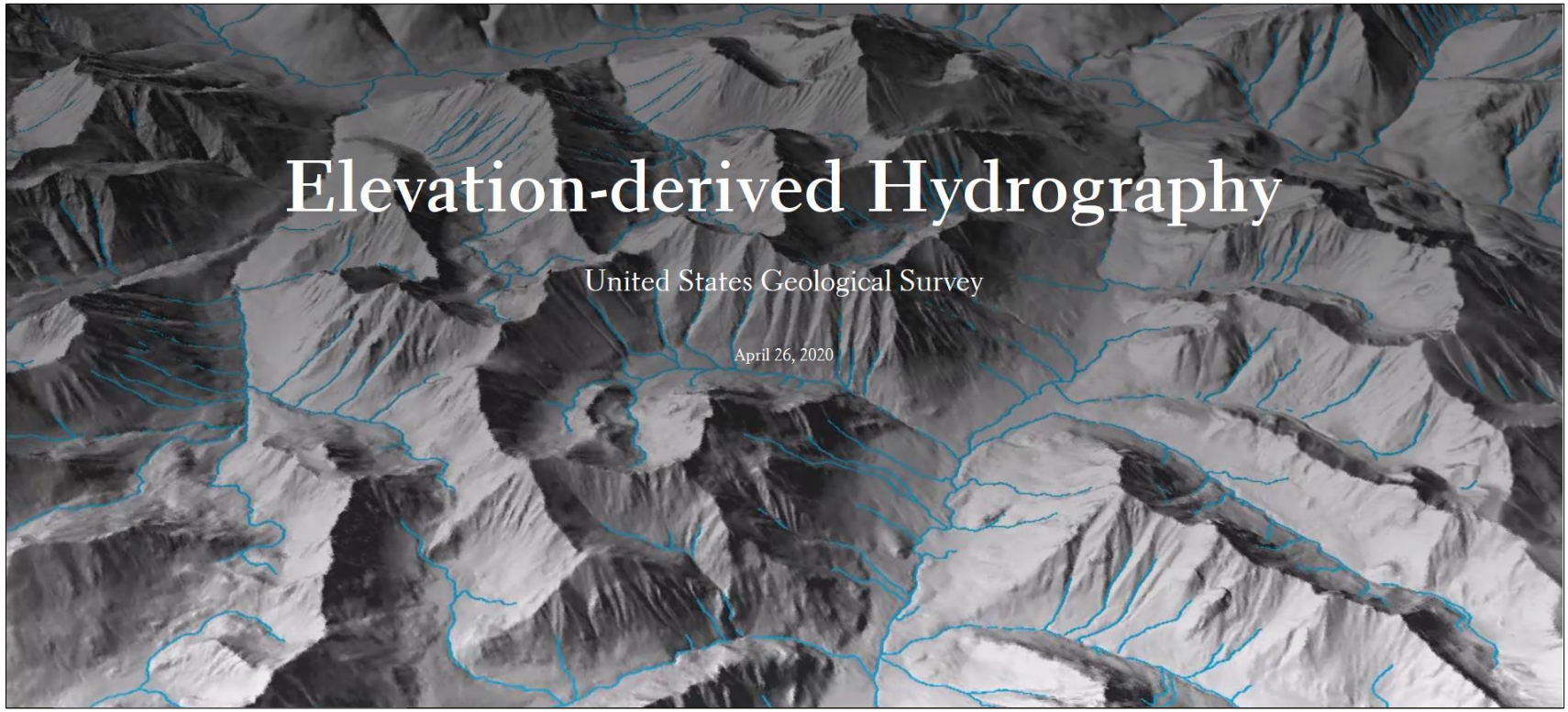

Figure 14: Story Map Welcome Page

Story Map URL:
https://storymaps.arcgis.com/stories/d9d9ceb7d70941a78dcfd2ee57fac111

The user is welcomed to the site with a “fly-through” animation featuring a 3D scene. Scroll down to continue.

Page 2 Welcome Message

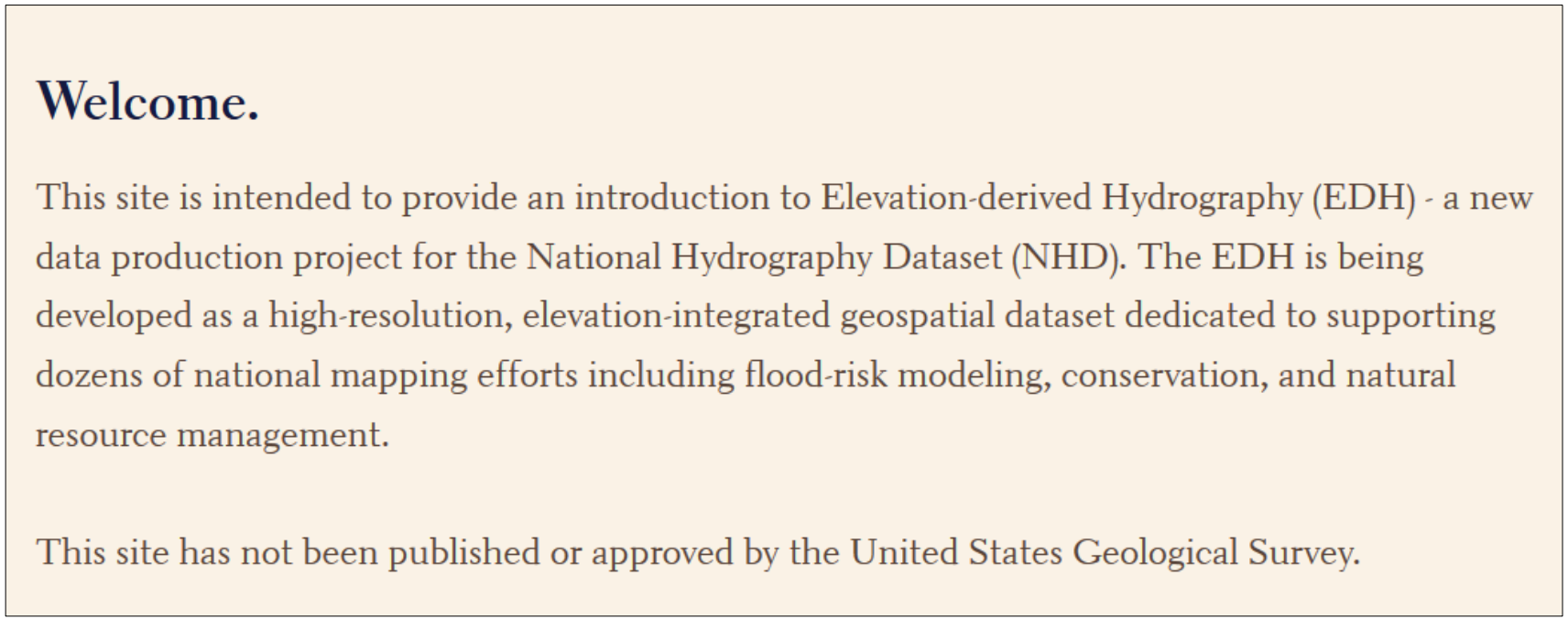

Figure 15: Story Map Welcome Message

A welcome message is provided to briefly explain the purpose of the site.

Page 3 EDH Project Background

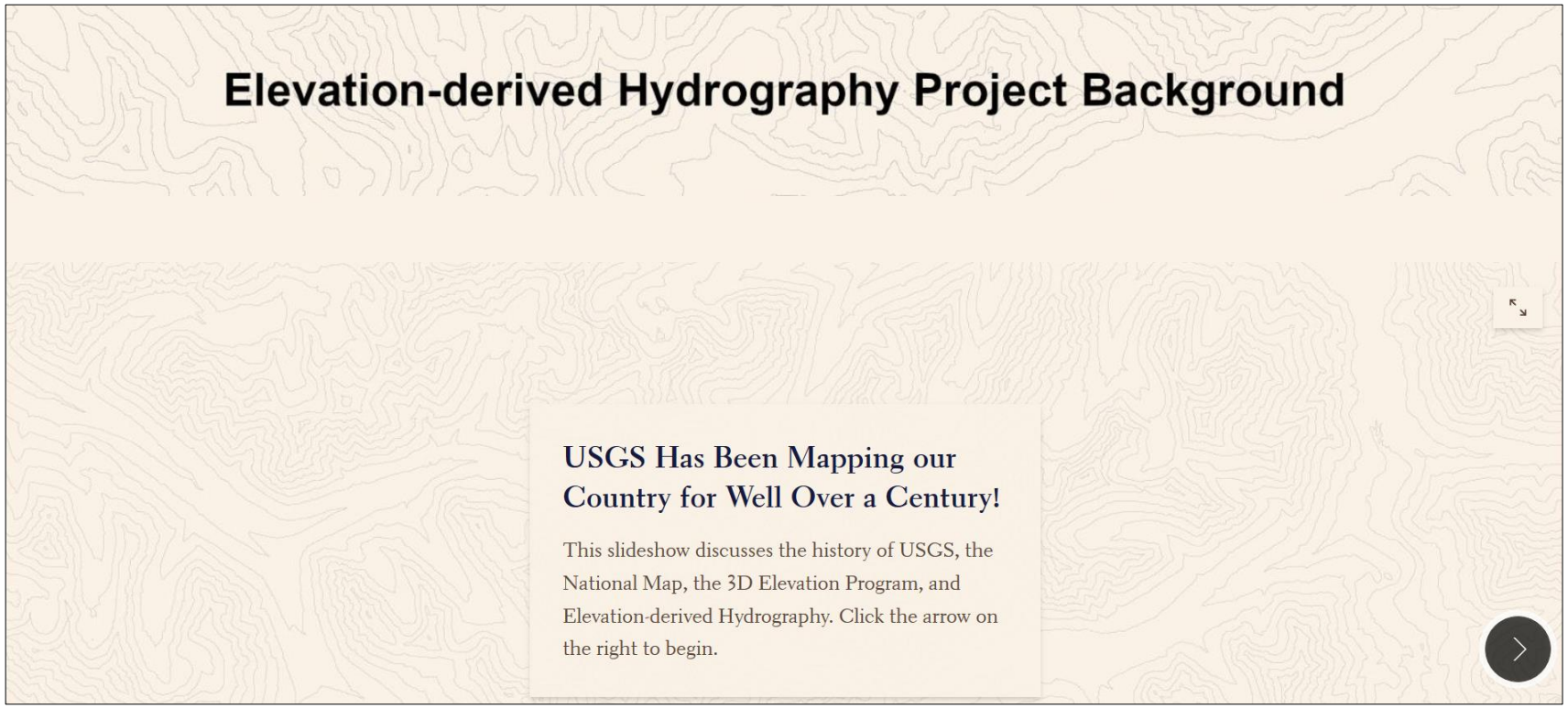

Figure 16: EDH Project Background Slideshow

The EDH Project Background is described in a slide show. The arrow on the right provides navigation of 11 informational slides featuring USGS logos and graphics.

Page 4 EDH Specification Goals

EDH Specification Goals

Since different vendors are assigned to different project areas, it is important that their delivered datasets can be seamlessly blended together for spatial continuity and consistent schema.

The project specifications are quite expansive but center around the below goals:

1. The delivered hydrographic data must be vertically and horizontally integrated with the elevation surface from which it was derived.
2. The delivered hydrographic attribute data must accurately describe the type of feature captured by the geospatial object.

These data qualities ensure that the EDH can be relied upon and used in conjunction with other national base mapping layers. Data integration contributes to the efficiency of analyses that drive

Figure 17: EDH Specification Goals

A brief description of the EDH Specification Goals is provided to succinctly explain the qualities of the dataset in development.

Page 5 EDH Specification Review Process

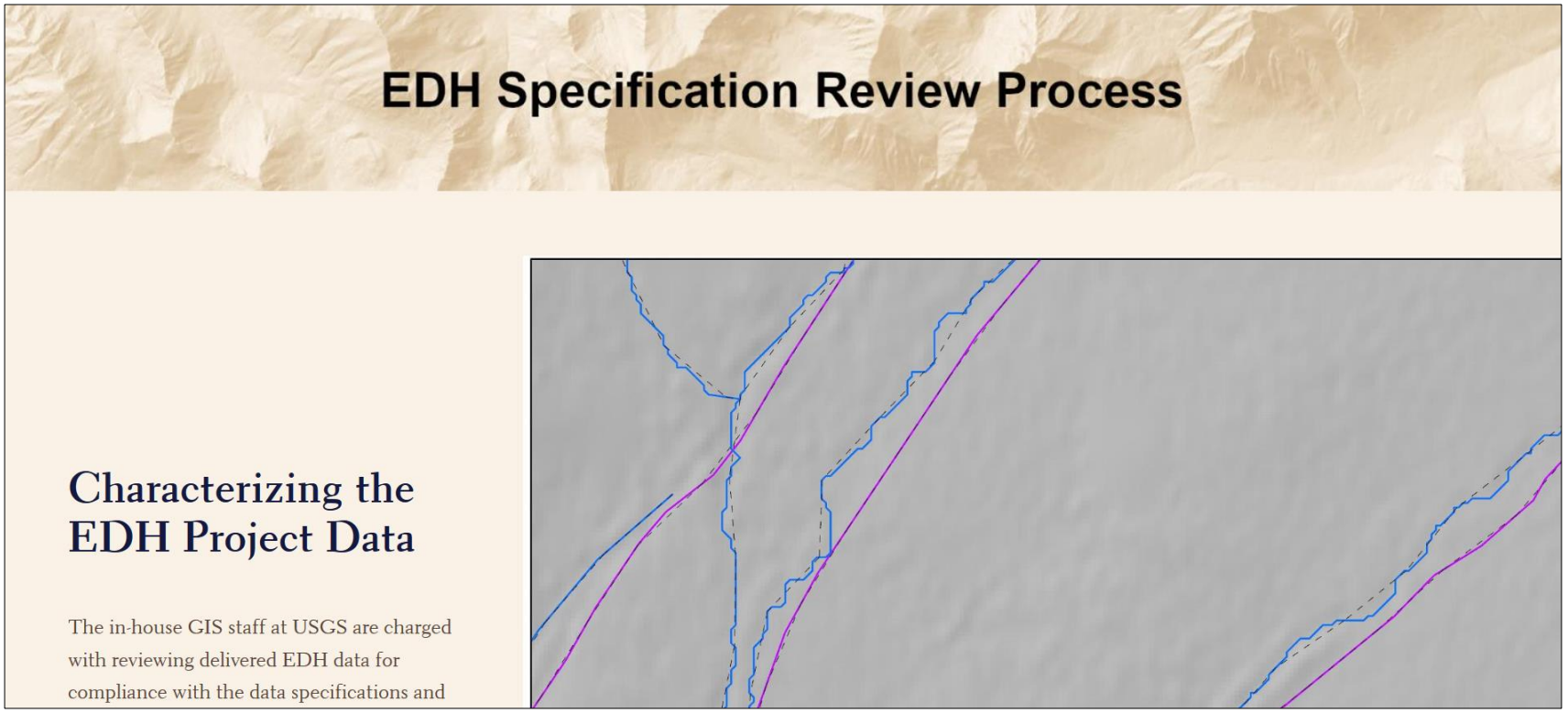

Figure 18: EDH Specification Review Process

The details of the review process and a brief mention of the partnership with NC State University is provided in a “sidecar” featuring example reports and “fly-throughs” to engage the user.

Page 6 Intro to Automated Review Method Maps

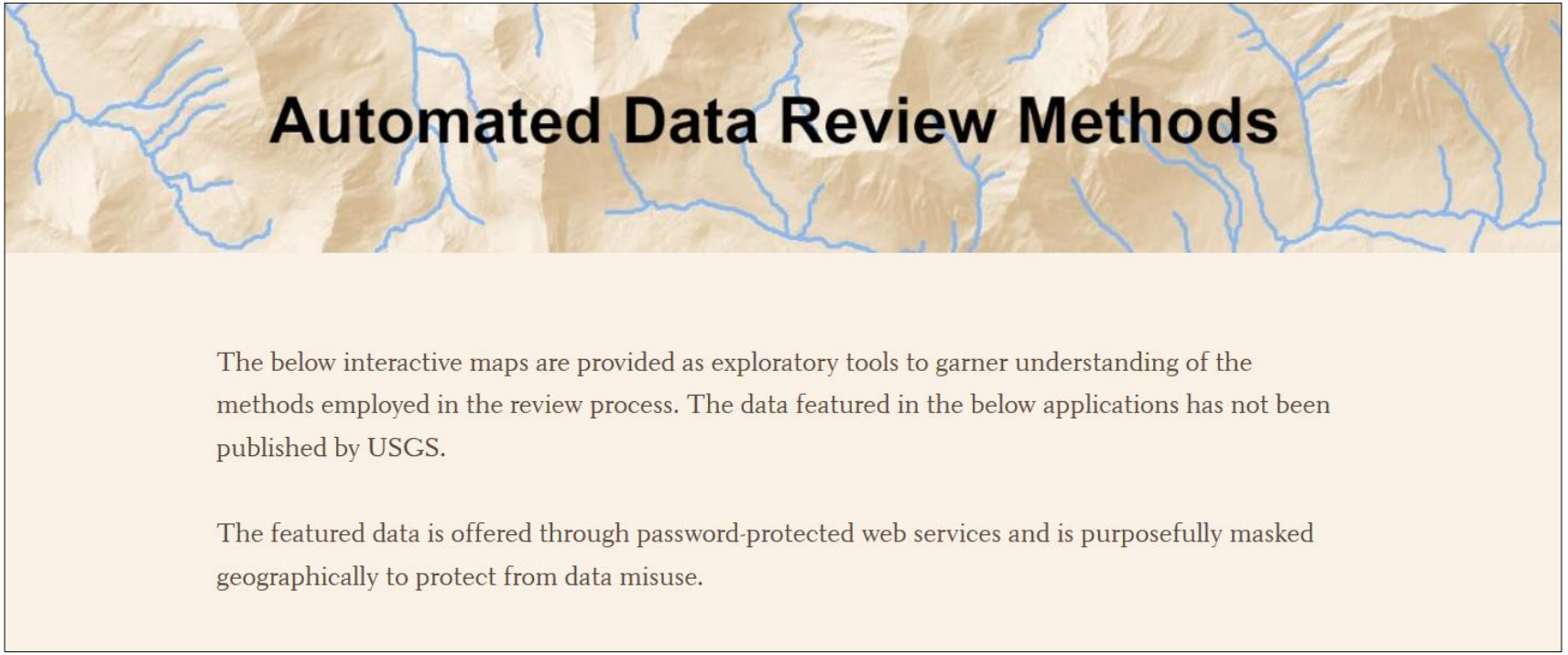

Figure 19: Automated Review Methods Intro Message

The user is provided an explanation of the upcoming interactive maps which are provided to display example results of the automated review methods.

Popup – Sign In Dialog

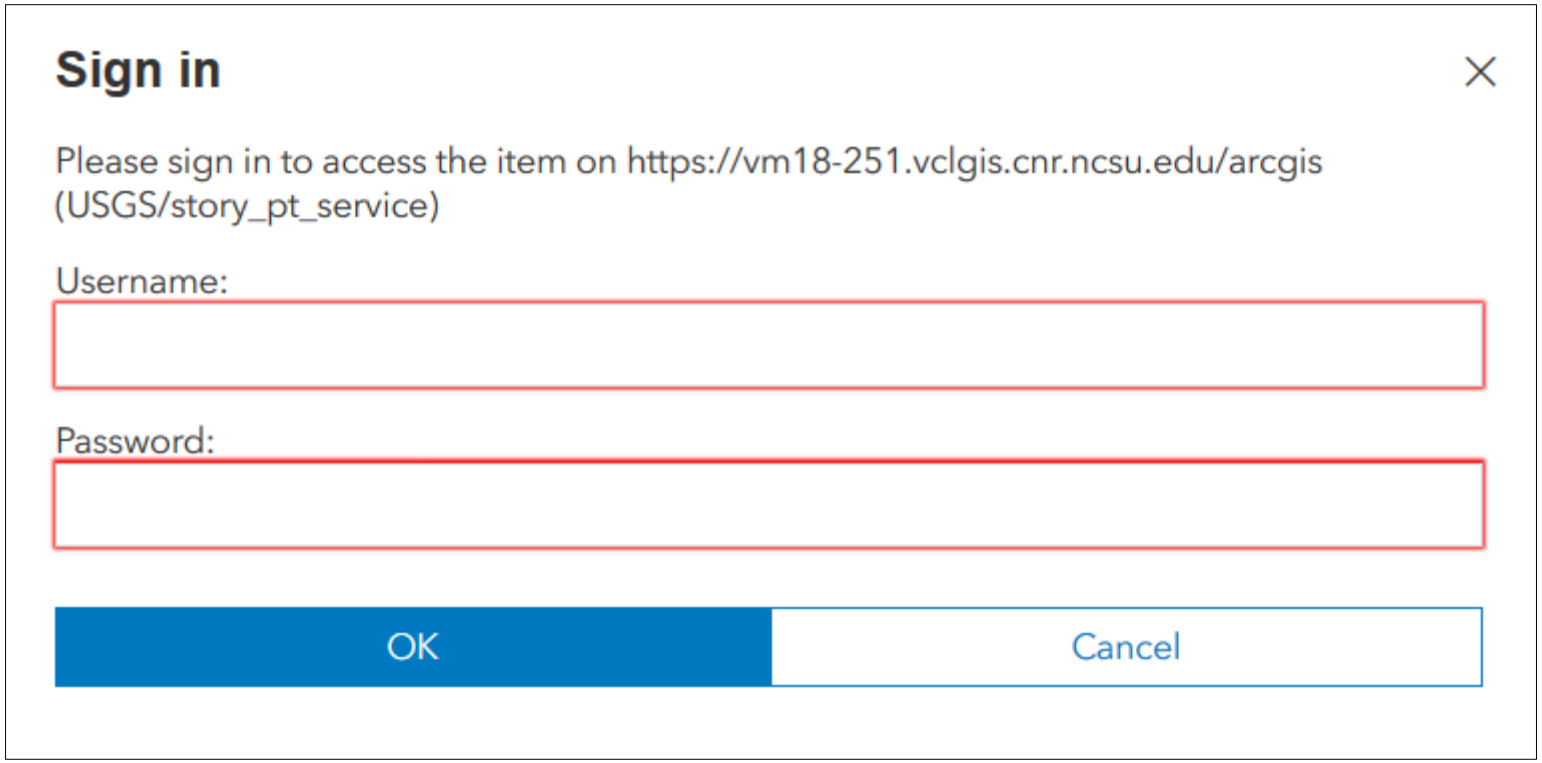

Figure 20: Pop-up Sign In Box

The content featured in the web services displayed upon the upcoming interactive maps is password protected. USGS asked NCSU to restrict access to these services since they feature unpublished, preliminary data.

Page 7 Interactive Result Maps

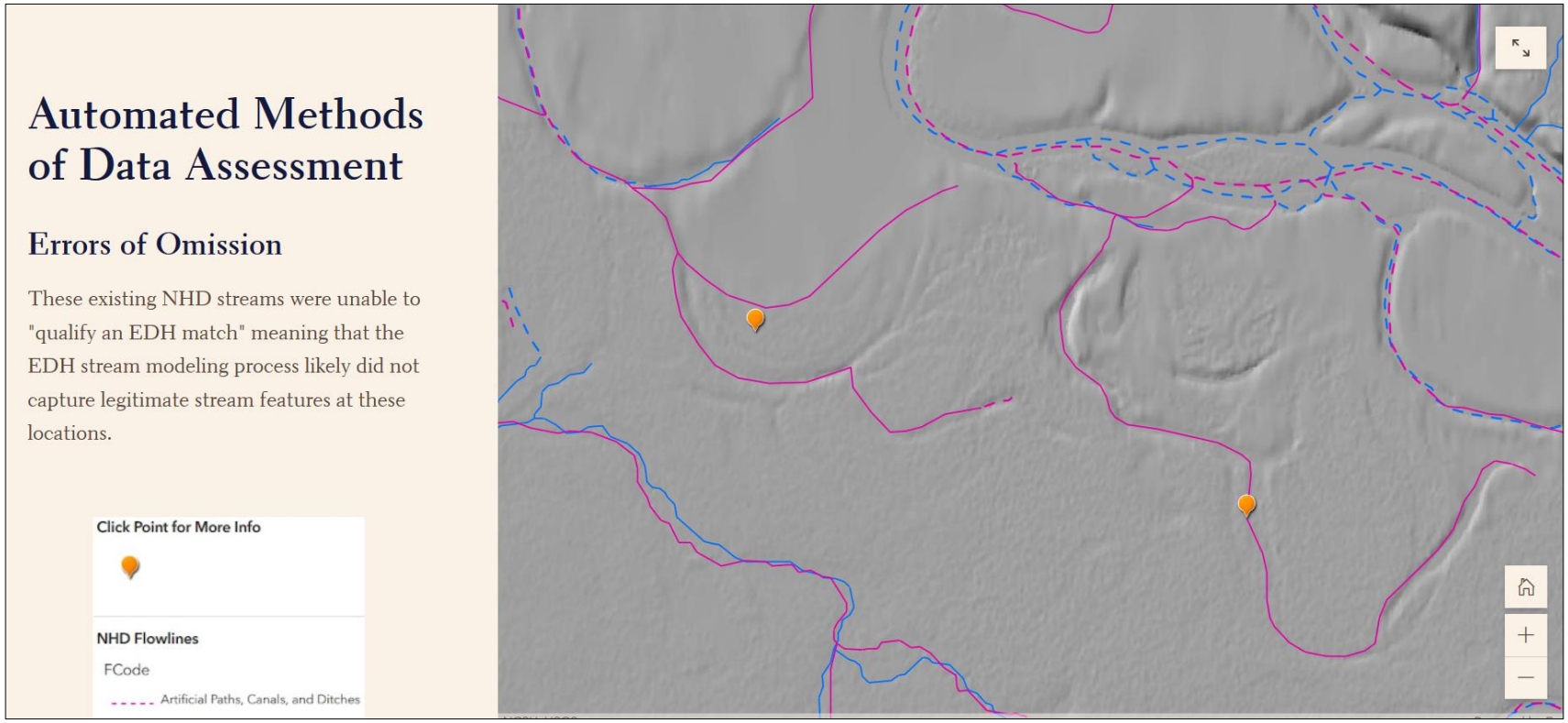

Figure 21: Embedded Interactive Maps

Five interactive maps are provided to explore automated assessment results. The maps are masked geographically to protect from data misuse. The user can click the orange “tour points” for a detailed description or click designated stream features for feature-specific statistics related to each method.

Page 8 Message of Data Importance

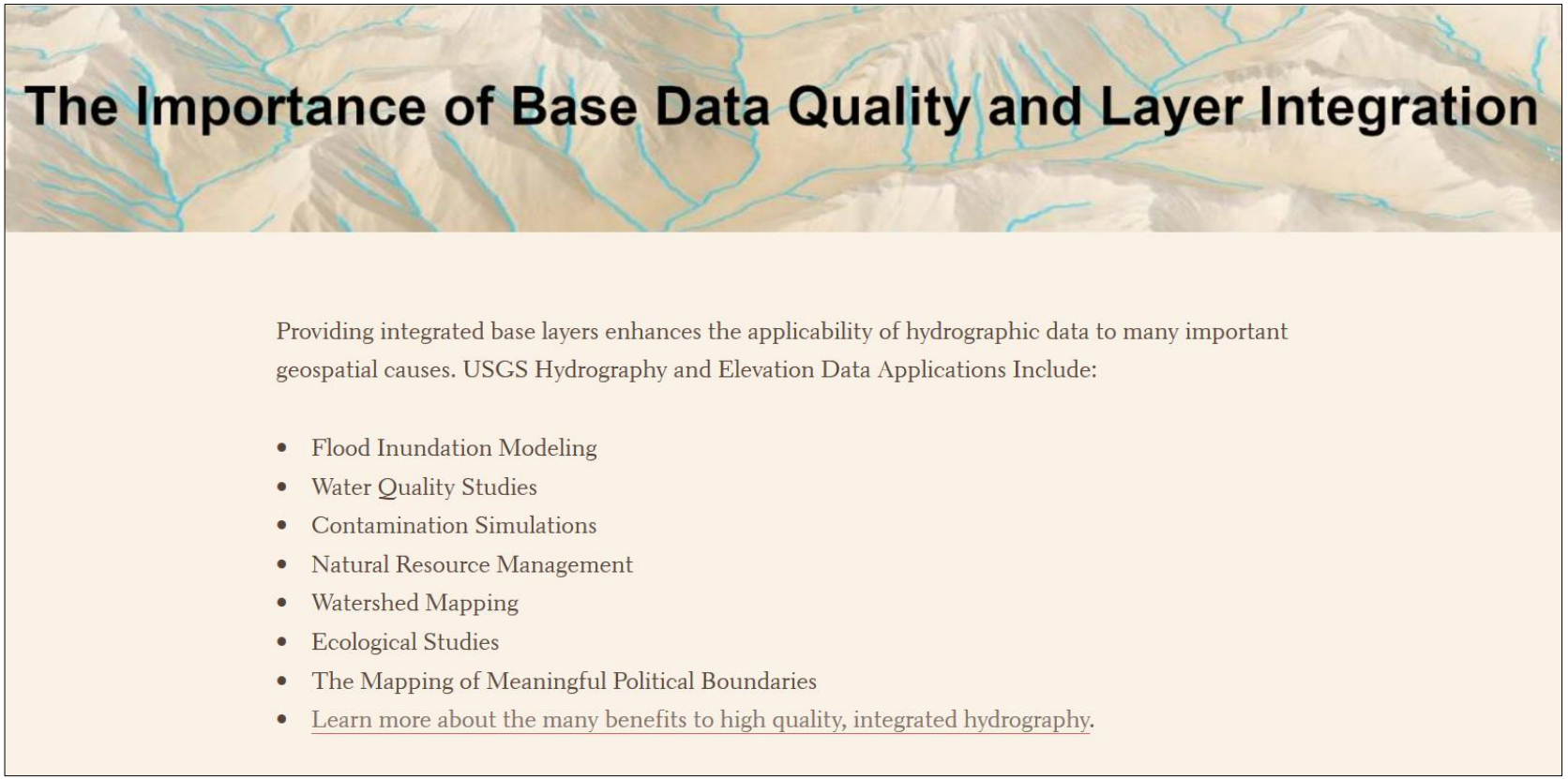

Figure 22: Importance of Base Data Quality and Layer Integration Page

The user is reminded of the importance of EDH data quality and integration for the betterment of its many projected applications.

EDH_Evaluation.gdb Feature Classes

Standardized EDH Evaluation Results Database		
	DPA	Defined Project Area (DPA) boundary encompassing the EDH lines
	DPA Grid	Grid encompassing DPA for Segmented Sinuosity Comparison
	EDH_Lines	Elevation Derived Hydrography (EDH) lines
	NHD_Lines	National Hydrography Dataset (NHD) flow lines
	EDH_SS_Segments	EDH Segmented Sinuosity line segments
	EDH_SS_Straights	EDH Segmented Sinuosity straight line segments
	NHD_SS_Segments	NHD Segmented Sinuosity line segments
	NHD_SS_Straights	NHD Segmented Sinuosity straight line segments
	EDH_StraightSegments	EDH line segments with no change in bearing within flagging distance
	EDH_Lines_VertZ_Outliers	EDH line segments that have at least 1 vertex wtih z value greater than flagging distance from surface
	EDH_Lines_SegZ_Outliers	EDH line segments whose vertex z values are on average greater than flagging distance from surface
	EDH_LineVertsTooClose	EDH vertices that are within the flagging distance
	EDH_UnintegratedVerts	EDH vertices that are above or below corresponding elevation surface

Figure 22: EDH Evaluation Feature Classes

Reviewing EDH Analysis Results

The analysis tools (tools 2 – 7) can be run in any order. Following the run of the first analysis tool, the user's EDH Evaluation Directory is populated with the items below.

The user may opt to explore the feature classes in their own map document (.mxd). But, to offer a standard review document, the "EDH_AnalysisResults.mxd" is provided and contains layers referencing the analysis results through relative file paths. The symbology of the standard map document can be modified using these instructions.

Figure 23: Analysis Result Files

Reviewing EDH Analysis Results

By default, each of the analysis tools contains a parameter to “Write Analysis Results to Report File.” If checked, the script will calculate summary statistics of each operation and write them to “EDH_EvalReport.txt.” When the tool finishes running, the text file will be automatically launched presenting statistics to the user. Results of each operation are appended to the file with a date-stamp allowing the user to compare the results of separate trials with different analysis parameters.

Figure 23: Analysis Result Files