Prepared by/for:

Modeling, Mapping, and Consequences

Appendix 4.1.1

Pre-Modeling Data Production Guide

FY2023 Standard Operating Procedure for Dams

March 2022

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SECTION 1
Introduction

Hydraulic modeling in the Modeling, Mapping, and Consequences (MMC) production center is based on uniform base datasets. This document describes how those base datasets are developed by the MMC Geographic Information System (GIS) mapping team for delivery to the MMC Hydraulics and Hydrology (H&H) modeling team.

The base datasets described here meet minimum criteria for use in MMC models. If higher quality data is available from the district or other source, it may be used with guidance from the MMC GIS/Mapping team. All data used for MMC modeling must be compatible and comparable to the data described herein.

The primary datasets provided to H&H by the GIS/Mapping team are:

Vector:

- Stream Centerline
  - Digitized by MMC GIS/Mapping team.
- Stream Banklines
  - Digitized by MMC GIS/Mapping team.
- Study Area Boundary
  - Rough boundary assumed by GIS/Mapping to contain the terrain needed for modeling
- Vertical Datum Conversion Points
  - Points along the centerline containing the conversion factor for converting elevations from National Geodetic Vertical Datum of 1929 (NGVD 29) to North American Vertical Datum of 1988 (NAVD 88) or to the official federally-supported vertical datum appropriate to the geographical study area.
- Top of Dam Storage Area Polygon
  - Polygon derived from the top of dam elevation extended upstream, effectively containing the highest possible lake inundation and identifying the upstream extents of elevation data needed.

Raster:

- DEM (Digital Elevation Model) _Geo
  - Derived from the 10-meter National Elevation Dataset (NED) (latest available version at data development time) provided in native geographic projection (North American Datum of 1983 [NAD 83]).
- DEM (Digital Elevation Model) _MMC
  - Derived from the 10-meter National Elevation Dataset (latest available version at data development time) provided in MMC projection. If it is determined that additional efforts are required to include levee elevation from the National Levee Database (NLD) in the pre-model DEM, Appendix 4.1.11, Levee Pre-model Data Production Guide, describes these methods.
- Hillshade
  - Generated from the provided DEM.
- Preliminary Depth Grid
  - Generated from the provided DEM.

The datasets are organized into a standard folder structure that persists throughout the life cycle of the MMC process. These files are then delivered to the assigned H&H modeler to begin hydraulic modeling using the folder structure described in Appendix 4.3.1, MMC File Schema Guide.

SECTION 2
Deliverable Package schema

All vector files are provided in ESRI shapefile (.shp) format. Raster data is in ESRI Grid format or GeoTiff format. Within the naming conventions described in this document, [Proj_Code] corresponds to the three-letter abbreviation for the study dam in question.

2.1 MODELING, MAPPING, AND CONSEQUENCES PROJECTION

The projection used for modeling in the MMC is the USA_Contiguous_Albers_Equal_Area_Conic_USGS version projection with the linear units set to U.S. feet. The vector and raster data (Tables 2-1 and 2-2) are noted with either the MMC or Geographic projection, which corresponds to the native projection of the NED.

The standard horizontal projection for Hawaii, Alaska and Puerto (or other locations where the Albers projection listed above does not reach) is the state plane that the majority for the modeled area is located within.

Alaska is within the range of the NAVD 88 system and will use this datum for all vertical data. The standard vertical datum for Hawaii is local mean sea level (LMSL). The standard vertical datum for Puerto Rico is the Puerto Rico Vertical Datum of 2002 (PRV 02).

An ESRI .prj projection file is provided along with the pre-modeling deliverable that can be used to project any data into the MMC projection.

2.2 VECTOR DATA

Table 2-1. Vector Shapefiles

Layer Name	Naming Convention	Projection
River Centerline	[Proj_Code]_CL.shp	MMC
River Banklines	[Proj_Code]_BL.shp	MMC
Study Area	[Proj_Code]_SA.shp	MMC
TOD Storage Area Polygon	[Proj_Code]_TOD.shp	MMC

2.3 RASTER DATA

Table 2-2. Raster Grids

Layer Name	Naming Convention	Projection
Native DEM	[Proj_Code]_DEM_Geo	Geographic
Model DEM	[Proj_Code]_DEM_MMC	MMC
Hillshade	[Proj_Code]_HLS	MMC
Preliminary Depth Grid	[Proj_Code]_PDG	MMC

2.4 OTHER DELIVERABLE FILES

In addition to the vector and raster base data, an ArcGIS .mxd document with links to each of the datasets as well as the ESRI image services is provided. It can be named “BaseMap.mxd” or “[Study Area]_Base-Map.mxd”. The ESRI .prj projection description file set to the MMC projection is also provided.

SECTION 3
Pre-Model Data Development

The following steps are designed for the GIS/Mapping team member assigned to develop the pre-model dataset to follow for a given dam. This document is also provided to the H&H modeler as background information to describe the development of the data that they are using. The first step to the data production process is to locate the study dam via the National Inventory of Dams (NID) database.

Once the dam location is identified and verified against aerial photography, the data production can begin. The location of the dam in the NID is verified using aerial photography.

3.1 FOLDER STRUCTURE

Using Windows Explorer create the deliverable folder structure shown and discussed in Figure 1-1 of Appendix 4.3.1. Optionally, a zip file containing a blank copy of the folder structure is available from the MMC mapping technical lead and is called MMC_File_Structure.zip.

Rename the folder called [Study_Dam_Name] to the name of the study dam and it’s NIDID with all spaces represented by an underscore i.e., Big_Bend_SD01092.

Rename the folder called [Year—Draft or Final] located directly beneath the [Study_Dam_Name] folder to the fiscal year of the assignment and the word “Draft” separated by a single hyphen i.e., 2010-Draft.

Create a folder under the [Year–Draft or Final] folder called “Working.” All processes covered in this document use this folder as their workspace. Final data layers are moved into the appropriate folders for delivery after they are created. The “Working” folder is not included in the delivery to the modeler, but is archived with the MMC mapping technical lead.

3.2 PRE-MODEL GEODATABASE

All vector data generated in this process is created directly into the MMC Pre-Model geodatabase schema or imported prior to export to the shapefile deliverable format. This ensures uniform data structure and provides a check on all of the datasets. Make an empty copy of the Pre-Model geodatabase in the working folder created as described in Section 3.1. This geodatabase is available from the MMC Mapping Technical Lead.

The Pre-Model geodatabase has empty feature class templates for the four vector datasets. The feature class schema is fully attributed as the data is generated prior to export as a shapefile.

3.3 CENTERLINE CREATION

The centerline may be digitized as a shapefile or obtained from a previous study. Coincident datasets may be available from previously developed dam break studies or CWMS basin studies. If available, this data should be used if available and the digitation step can be eliminated.

Digitize the centerline:

1. The most current available aerial imagery is used as the background data. If a project-specific image service is unavailable, use the ESRI world imagery service to digitize the centerline at a minimum scale of 1:15000 from the dam approximately 200 miles downstream or until the river reaches a confluence with another river of sufficient size as to absorb the flow.
2. The centerline must be digitized from upstream to downstream, or from the dam downstream. It's helpful to the modeler to have the centerline extended upstream of the dam so they can set up their model. Therefore, it will be helpful to extend the centerline several hundred feet upstream of the dam.
3. The centerline must be generated as a single continuous line feature.
4. If the centerline was digitized as a shapefile, load that feature into the centerlines feature class in the pre-model geodatabase, otherwise skip to step 5.
5. Fill in the attribute table for the centerline:
    a. [NIDID]—National Inventory of Dams Identification number (if applicable)
    b. [NLDID]—National Levee Database Identification number (if applicable)
    c. [MMCID]—Modeling, Mapping and Consequences Identification number (not used)
    d. [MMC_Name]—Name of the dam or levee project, same as used in NLD or NID
    e. [MMC_FY]—Fiscal year of MMC assignment
    f. [Proj_Code]—Three letter code used in file names for pre-model data
    g. [Del_Date]—Assigned delivery due date for pre-model data to modeler
6. Export the centerline to the \GIS_Modeling\Shapefiles folder as a shapefile named using the three letter [Proj_Code] and "CL" separated by an underscore i.e., BIG_CL.shp.

3.4 BANKLINE CREATION

The banklines may be digitized as a shapefile or obtained from a previous study. Coincident datasets may be available from previously developed dam break studies or CWMS basin studies. If available, this data should be used if available and the digitation step can be eliminated.

Digitize the banklines:

1. The most current available aerial imagery is used as the background data. If a project-specific image service is unavailable, use the ESRI world imagery service to digitize the banklines at a minimum scale of 1:15000 from the dam to the same downstream extent as the centerline.
2. The banklines must be digitized from upstream to downstream, or from the dam downstream. Since it's helpful to the modeler to have the centerline extended upstream of the dam, it's necessary to extend the banklines to follow the edges of the centerline upstream of the dam.
3. The banklines must be digitized along the right and left descending banks as separate features in the same feature class.
4. If the banklines were digitized as a shapefile, load those features into the banklines feature class in the pre-model geodatabase, otherwise skip to step 5.
5. Fill in the attribute table for each bankline:
    a. [NIDID]—National Inventory of Dams Identification number (if applicable)
    b. [NLDID]—National Levee Database Identification number (if applicable)
    c. [MMCID]—Modeling, Mapping and Consequences Identification number (not used)
    d. [MMC_Name]—Name of the dam or levee project, same as used in NLD or NID
    e. [MMC_FY]—Fiscal year of MMC assignment
    f. [Proj_Code]—Three letter code used in file names for pre-model data
    g. [Del_Date]—Assigned delivery due date for pre-model data to modeler
6. Export the centerline to the \GIS_Modeling\Shapefiles folder as a shapefile named using the three letter [Proj_Code] and "BL" separated by an underscore i.e., BIG_BL.shp.

3.5 STUDY AREA CREATION

The study area is used to define the rough area that needs to be included in the DEM for modeling. There is some subjectivity in the creation of the study area and care should be taken to include all areas that could be inundated by the model. The project manager should provide a project workplan for the study which will include an approved model extents diagram. The study area should include all area upstream of the study dam that would be inundated by water at the top of dam elevation as well.

1. Buffer the centerline:

    a. In a new ArcMap document, add the centerline generated in Section 3.3.
    b. Select the centerline feature.
    c. Use the buffer tool to buffer the centerline by 20 miles to create a polygon shapefile in the working folder.
    d. Verify that only one polygon has been created.
    e. If the buffer polygon needs to be expanded to cover all of the areas that look like they might be inundated, manually edit the polygon to cover those extents. Buffer polygon should cover the entire model extents as provided by the project manager.

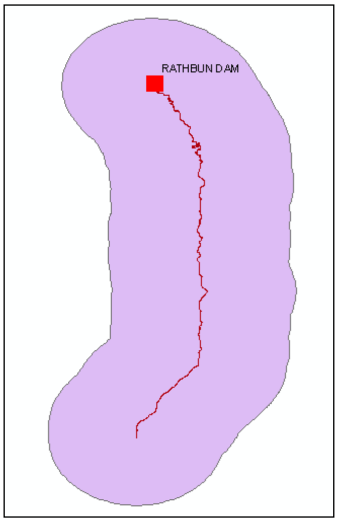

Figure 3-1. Buffered Centerline

2. Upstream extent:

    a. Add the Raster_Extents shapefile available within the NED.
    b. Add the NED tile intersecting the dam.
    c. Use the identify tool to find the maximum elevation of the dam as it appears in the elevation model. Alternatively, get the top of dam elevation from supplemental information gathered from the owning district or other source. The example shown in Figure 3-2 is one where the dam is not sufficiently represented in the NED, so another source of data would be helpful in determining the top of dam elevation.

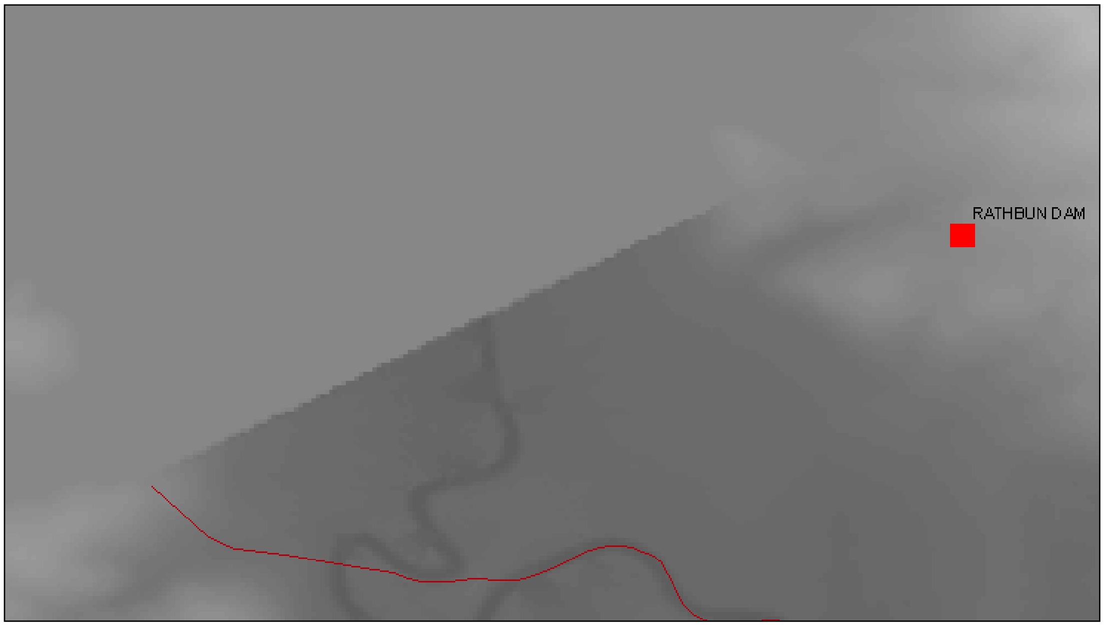

Figure 3-2. Example of a Dam in the National Elevation Database

d. Adjust the symbology of the tile to a two-class classification, breaking at the top of dam elevation. This will let you visualize the top of dam elevation. Add any additional tiles needed to reach the upstream extent of that elevation as shown in Figure 3-3.

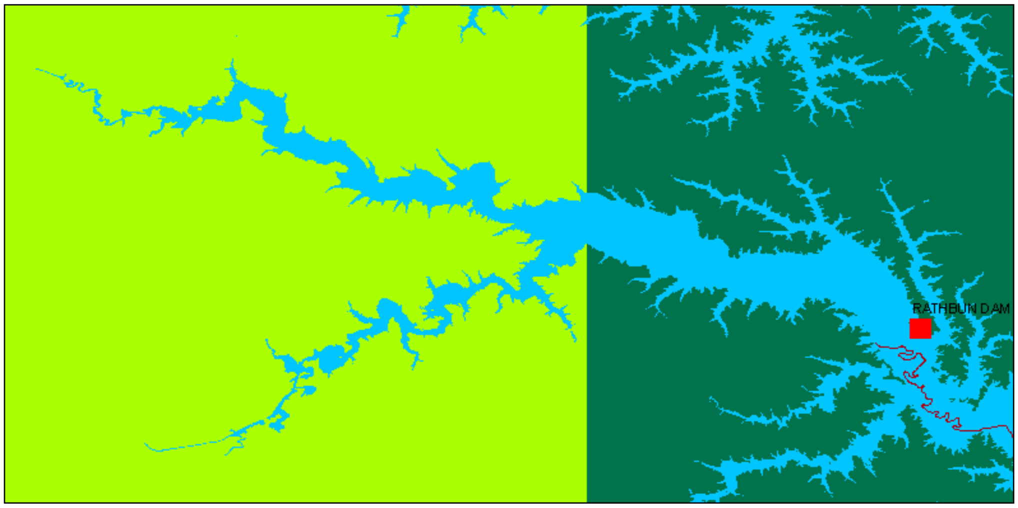

Figure 3-3. Two Digital Elevation Model Tiles Classified

e. Edit the buffer polygon created earlier to include the area upstream of the dam below the top of dam elevation as shown in Figure 3-4. This ensures enough DEM will be extracted later.

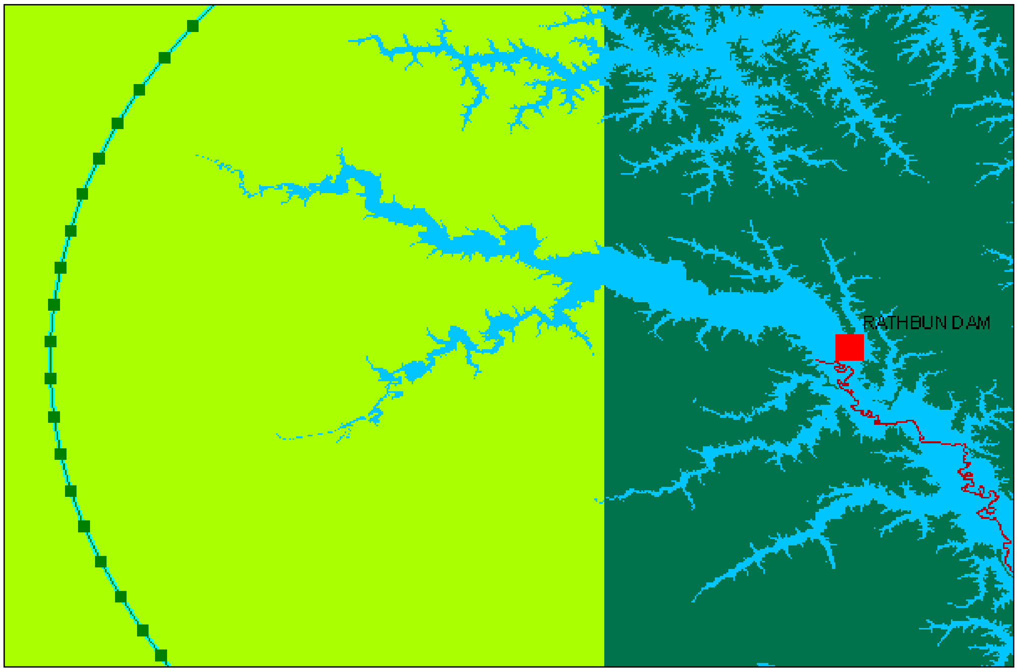

Figure 3-4. Study Area Edit

3. Save the study area:

   a. Load the feature from the buffer shapefile into the Study_Areas feature class in the pre-model geodatabase.
   b. Fill in the attribute table for the study area:
      1) [NIDID]—National Inventory of Dams Identification number (if applicable)
      2) [NLDID]—National Levee Database Identification number (if applicable)
      3) [MMCID]—Modeling, Mapping and Consequences Identification number (not used)
      4) [MMC_Name]—Name of the dam or levee project, same as used in NLD or NID
      5) [MMC_FY]—Fiscal Year of MMC assignment
      6) [Proj_Code]—Three letter code used in file names for pre-model data
      7) [Del_Date]—Assigned delivery due date for pre-model data to modeler
   c. Export the study area to the \GIS_Modeling\Shapefiles folder as a shapefile named using the three letter [Proj_Code] and “SA” separated by an underscore i.e., BIG_SA.shp.

4. Project the study area:
   In order to use the study area to set the extent of the DEM, it must be in the same projection as the DEM tiles.

   a. Use the project tool (located in the ArcGIS toolbox at *Data Management Tools—Projections and Transformations—Feature—Project*) to change the projection from the MMC projection to the same projection as the DEM tiles by importing the projection from one of the DEM tiles. If another elevation source is to be used, use the projection that source is provided in.
   b. Save the new shapefile to the working folder and name it [Proj_Code]_SA_Geo].
      *Note, there are two study area shapefiles; the original in the MMC projection is the one that

needs to be included in the data delivery folders.

3.6 DIGITAL ELEVATION MODEL COMPILATION

1. Prerequisites:

    a. DEM tiles must include the levee elevation values. If not, see Appendix 4.1.11, Sections 3.3 and 3.7 for creating the levee line of protection and incorporating it into the DEM.
    b. All of the DEM tiles must have a correctly defined projection.
    c. The map document dataframe must be set to the DEM projection.
    d. The study area must be in the same projection as the DEM tiles.

2. Find which tiles are needed:

    a. In ArcMap, load the study area shapefile that was projected to the DEM native projection in the working folder and the DEM_Extents shapefile (located with the NED data).
    b. Click on the selection tab on the top of the screen and choose select by location.
    c. Select features from the DEM_Extents layer that intersect features in the study area layer.
    d. The selected DEM tiles are the tiles that need merged in the next step.

3. Merge the DEM tiles:

    a. Load the DEM tiles selected in the previous step into the ArcMap document by using the attribute table of DEM extents to locate them on disc.
    *It is useful to set ArcMap to not display layers as they are loaded so users don't have to wait on the DEM tiles to display.
    b. Set the analysis extent of the spatial analyst extension to the extent of the study area layer using the options selection on the spatial analyst toolbar dropdown menu.
    c. Using the mosaic to new raster tool found in the ArcToolbox\Data Management\Raster\Raster Dataset\Mosaic to new raster. Choose all the properties in the tool options to match the properties of the DEM grids such as the number of bands, pixel type, etc. Also make sure to set the processing extents to the study area extents in the environments window. See Figures 3-6 and 3-7 for reference.

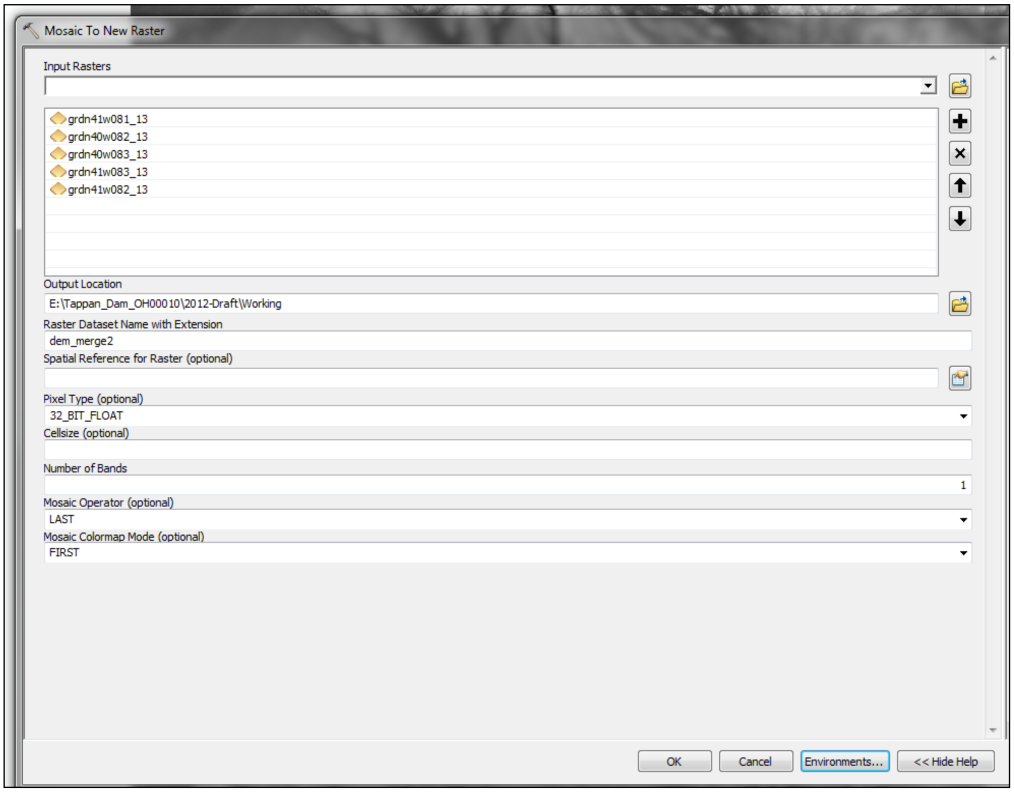

Figure 3-5. Mosiac to New Raster Method in ArcGIS version 10 Procedures

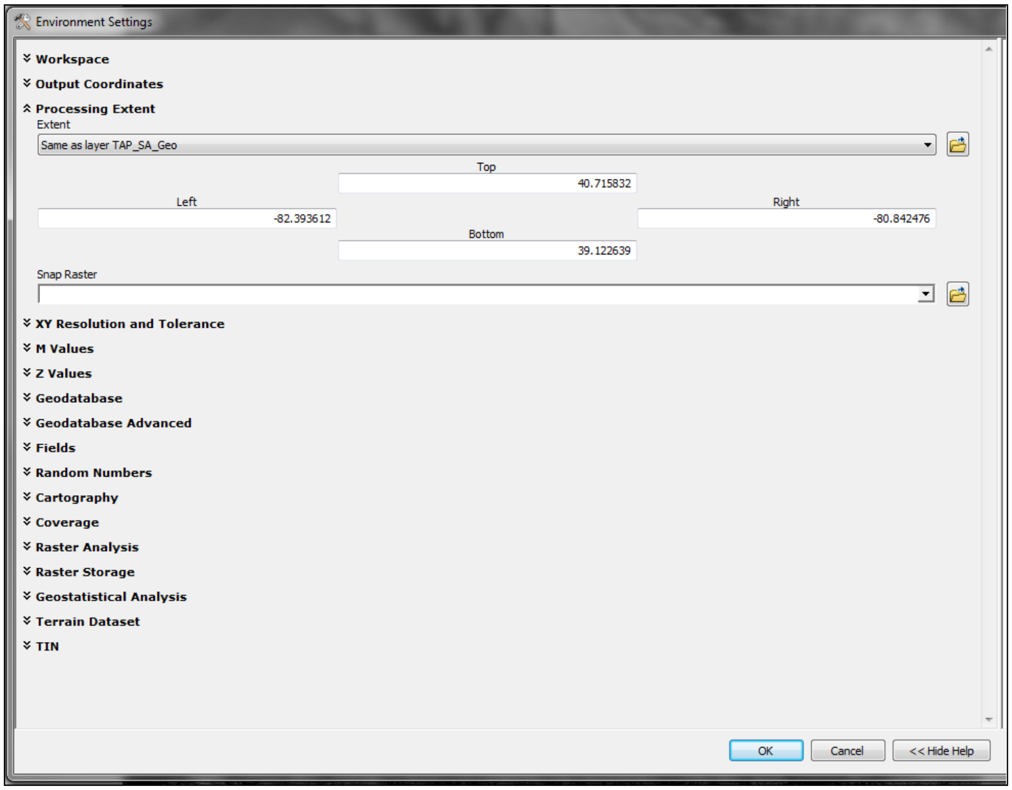

Figure 3-6. Mosiac to New Raster Environment Settings

4. Convert the vertical units from meters to feet:
   Using the raster calculator again, multiply the resulting DEM by 3.28084 to convert the vertical units from meters to feet. The raster calculator in Arc GIS version 10 can be found in ArcToolbox/Spatial Analyst Tools/Map Algebra/Raster Calculator (Figure 3-8). Store the raster in ESRI Grid format as [Proj_Code]_DEM_Geo in the \GIS_Modeling\DEMs folder.

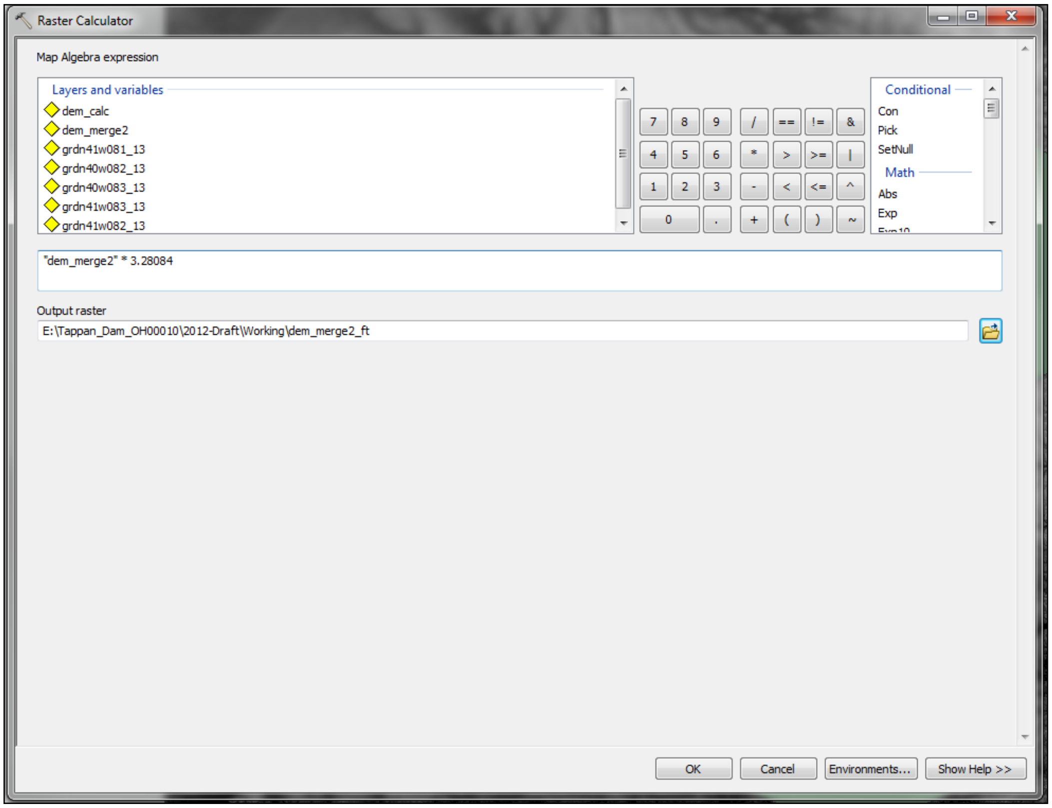

Figure 3-7. ArcGIS version 10 Raster Calculator

5. Project the DEM:

   a. Use the project raster tool (located in the ArcGIS toolbox at *Data Management Tools—Projections and Transformations—Raster—Project Raster*) to set the projection of the DEM to the MMC project projection.
   b. Set the output raster to [Proj_Code]_DEM_MMC in the \GIS_Modeling\DEMs folder.
   c. Set the output projection to the MMC projection.
      *Important, set the resampling method to bilinear instead of the nearest neighbor default option.

(ArcGIS version 10 may project the DEM to the NAD_1983_Albers projection even when the correct MMC projection was originally specified as USA_Contiguous_Albers_Equal_Area_Conic_USGS_version. In order to fix it, use the define projection tool (in ArcToolbox/data management tools/projections and transformations/define Projection) to assign the DEM to have the correct MMC projection. This step may also apply to the hillshade and preliminary depth grid creation; therefore make sure to verify they are all in the correct MMC projection.)

3.7 HILLSHADE CREATION

Generate the hillshade from the projected DEM:

1. Set the target layer for the spatial analyst toolbar to the DEM that was projected into the MMC projection ([Proj_Code]_DEM_MMC).
2. Choose the hillshade tool from the surface analysis list under the spatial analyst drop-down. In ArcGIS version 10, this is located in ArcToolbox/spatial analyst tools/surface/hillshade.
3. Use the default settings to generate the hillshade dataset named [Proj_Code]_HLS in the \GIS_Modeling\DEMs folder.

3.8 TOP OF DAM STORAGE AREA POLYGON

1. Prerequisites:

   The DEM with the MMC projection should be used.

2. Create a top of dam depth grid:

   a. Add the projected DEM to a new ArcMap document.
   b. Use the create constant raster tool from the raster creation toolset in the spatial analyst toolbox to generate a raster dataset with the value of the top of dam elevation plus 10 feet. The top of dam elevation can be found in the water control manual, the SPRA report, consequences-based top screen (CTS) worksheet, or any other accompanying documents which can be found in the Risk Assessment for Dam Safety (RADS II) database. Be aware what datum the elevation was referenced to and apply the conversion from NGVD 29 to NAVD 88 using the value from the conversion points created earlier or the cf29to88 grid. Import the cell size and extent from the DEM.

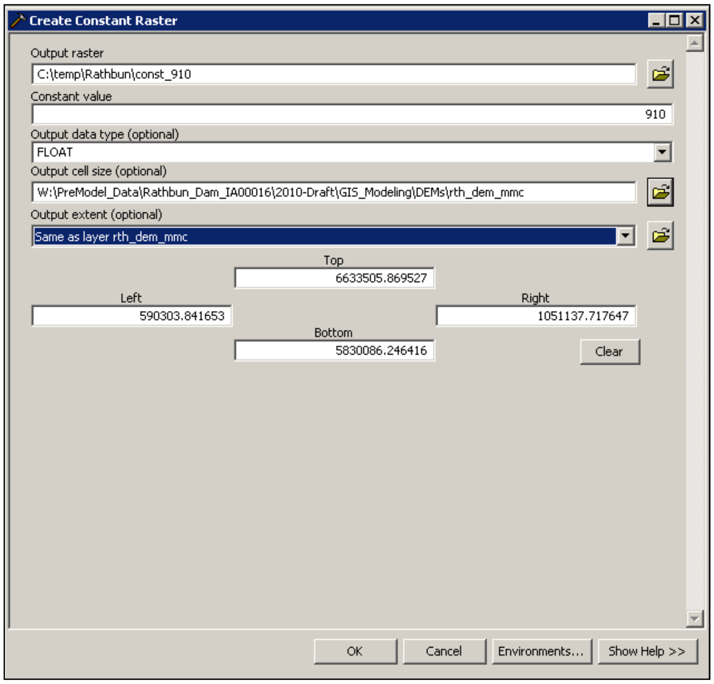

Figure 3-8. Create Constant Raster

Use the raster calculator to subtract the DEM from the constant raster. The output will contain positive and negative numbers; the positive numbers will indicate inundated area. The result will have a lot of inundated area below the dam, but that can be ignored at this time.

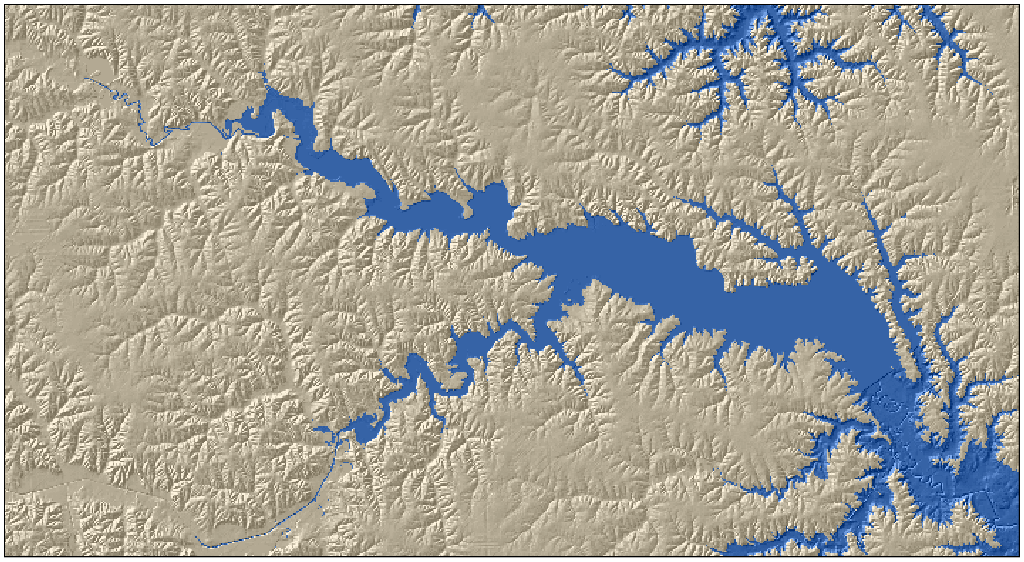

Figure 3-9. Raster Calculator Result

c. Right click the name of the calculation layer in the table of contents. Choose data and then make permanent to save the layer locally. (This step is not needed in ArcGIS version 10 because it is automatically permanent.)

d. Reclassify the saved raster layer into two classes using the reclassify tool in the spatial analyst toolbar, breaking at 0 as shown in Figure 3-11. In ArcGIS version10, the reclassify tool is located in ArcToolbox/spatial analyst tools/reclass/reclassify.

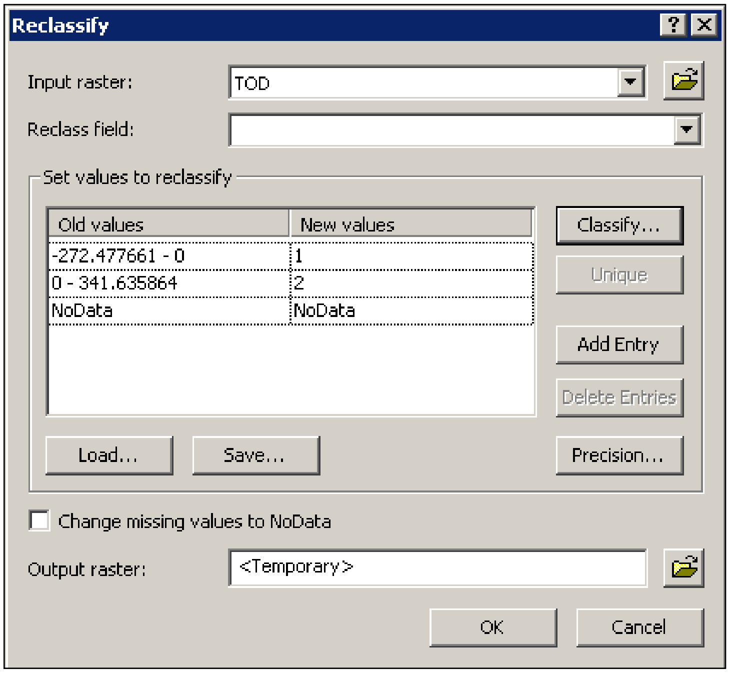

Figure 3-10. Reclassify Tool

3. Convert the reclassified raster layer from raster to feature using the spatial analyst toolbar. If using ArcGIS version 10, the tool to use is in the ArcToolbox\conversion tools\from raster\raster to polygon (see Figure 3-13).

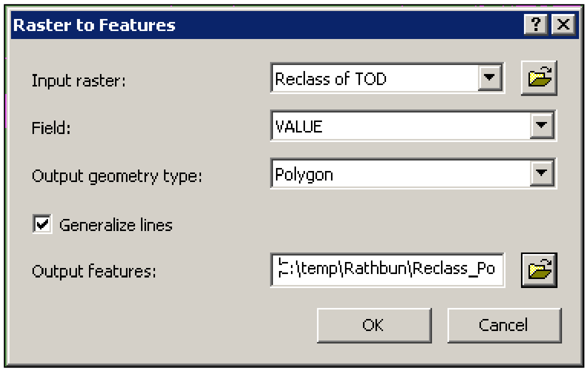

Figure 3-11. Raster to Features Tool

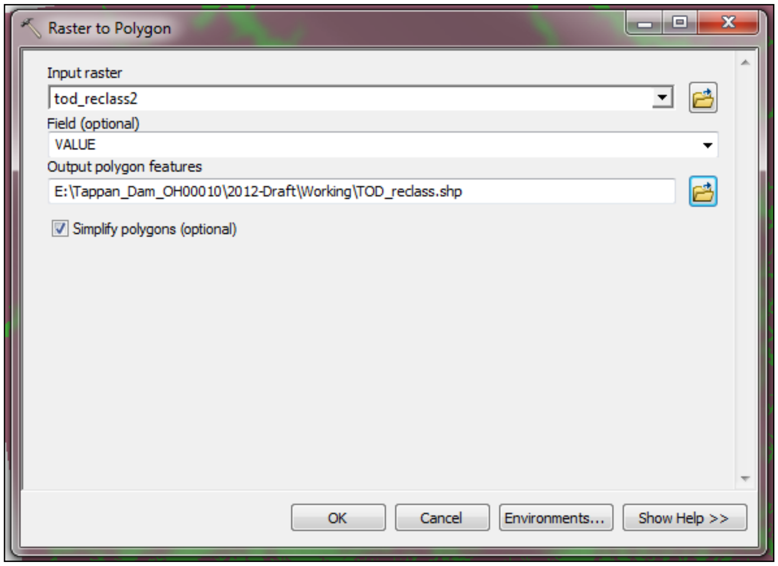

Figure 3-12. ArcGIS version 10 Raster to Polygon Tool

4. Start editing the resulting polygon layer and delete the non-inundated polygon(s).
5. Select the polygon representing the inundated area of the lake behind the study dam.
6. Reverse the selection and delete all other features.
7. Use the cut polygon task in the editor toolbar to cut the remaining polygon along the centerline of the dam, and delete all but the upstream remaining polygon.

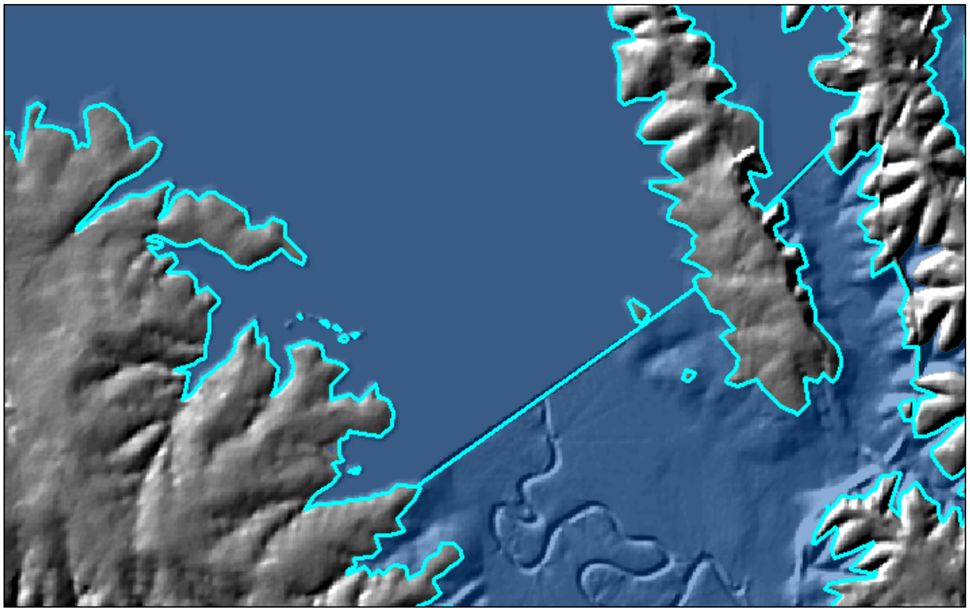

Figure 3-13. Cut Polygon Features

8. Stop editing and save edits.
9. Load the feature from the edited shapefile into the TOD_Storage_Area feature class in the pre-model geodatabase.
10. Fill in the following fields with the appropriate information for the study area.
    a. [NIDID]—National Inventory of Dams Identification number (if applicable)
    b. [NLDID]—National Levee Database Identification number (if applicable)
    c. [MMCID]—Modeling, Mapping and Consequences Identification number (not used)
    d. [MMC_Name]—Name of the dam or levee project, same as used in NLD or NID
    e. [MMC_FY]—Fiscal year of MMC assignment
    f. [Proj_Code]—Three letter code used in file names for pre-model data
    g. [Del_Date]—Assigned delivery due date for pre-model data to modeler
11. Export the individual polygon to the \GIS_Modeling\Shapefiles folder as a shapefile named using the three letter [Proj_Code] and TOD separated by an underscore i.e., BIG_TOD.shp.

3.9 PRELIMINARY DEPTH GRID CREATION

1. Prerequisites:

- All layers included in these steps, as well as the data frame should be projected to the MMC project projection.
- Spatial analyst and 3D analyst extensions must be installed.

2. Create the cross section shapefile:

    a. In ArcCatalog, navigate to the working folder; right click, choose new, then choose shapefile.
    b. Name the cross section shapefile [Study Area]_XS.shp.
    c. Change the feature type to polyline.

d. Set the coordinate system to the MMC projection.
e. Check the boxes so the shapefile coordinates contain M and Z values.
f. Click OK. The new shapefile should be in the working folder.
*Note that these cross sections are for preliminary depth grid creation only and are not intended to be used for hydraulic modeling as such they will not be provided to the modeling team.

3. Digitize cross sections:

a. Digitize a cross section approximately every 10 miles from the dam to the end of the centerline. Each cross section should be long enough to cross the entire flood plain of the river. If the cross section intersects an area that is lower in elevation than the river in question, the line should be made shorter so the river is the lowest point in the DEM beneath the cross section line. The line can be extended to the desired length for the triangulated irregular network (TIN) after the calculations are completed.
b. Create two new fields each with a type of double in the attribute table called StreamElev and NewElev respectively.
c. Use the field calculator to calculate the ID field to equal the feature ID (FID) field so that you can use it in the next step.

4. Run zone stats:

a. Run the Zonal Statistics as Table from the spatial analyst toolbox, zonal toolset in ArcToolbox.
b. Set the cross section layer as the input zone layer, the Id field as the zone field, the DEM as the value raster, name the table ZStats, and save it in the working folder. Add the resulting table to the map if it does not by default.

5. Join stats table to cross sections:

a. Right click on the cross sections layer choose joins and relates, then choose join.
b. Select the ID field from the cross section layer.
c. Choose the ZStats table created in the previous step as the table to join to.
d. Select the value field from the table as the field to join on.
e. Choose to keep all records.

6. Calculate the elevation fields:

a. Using the field calculator, calculate the value of the Stream_Elev field to equal the min field from the ZStats table.
b. Calculate the value of the New_Elev field to equal the Stream_Elev plus flood depth. Flood depth varies between study areas and can usually be set to half the height of the dam. Dam height can be determined by referencing the NID_HEIGHT field in the COE_NID_Dams layer. Sometimes, such as in the case of a dry dam or diversion dam, it may be required to use a smaller value for the flood depth in which case it is up to the user to use a value that makes sense. The value can be manually altered for individual cross sections in areas where very deep flooding doesn't make sense. If questions arise, contact the GIS/Mapping Technical Lead or an H&H modeler for clarification.
c. Remove the join when finished.

7. Convert the cross sections into a TIN:

a. Using the 3D analyst toolbar, choose Create/Modify TIN then choose create TIN from features.

(In ArcGIS version 10, the tool is located in ArcToolbox/3D analyst tools/TIN management/create TIN, see Figure 3-15).

b. Check the box next to the name of the cross section layer.
c. Set the height source dropdown to the New_Elev field and leave hard line as the value below it.
d. Save to the working directory and name the TIN [Proj_Code]_TIN as the output.
e. Verify that the TIN covers the entire floodplain. If it doesn't, edit the cross sections to cover the entire floodplain and re-run zonal statistics if the locations of the cross sections in relation to the centerline change. After editing the cross sections, re-generate the TIN using the steps above.

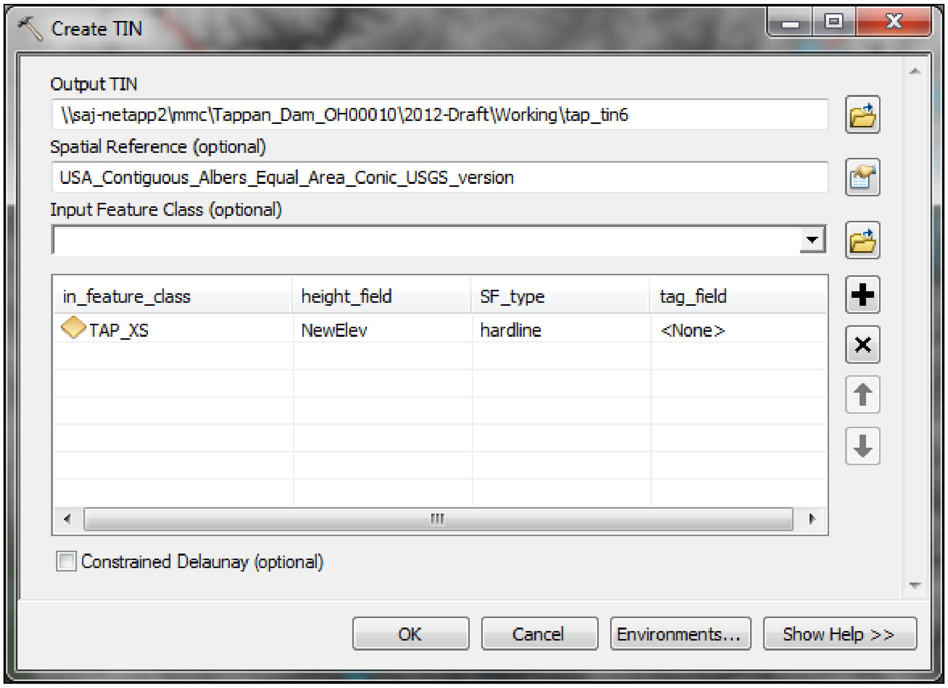

Figure 3-14. ArcGIS version 10 Create TIN

8. Convert the TIN to a raster

   a. Using the 3D analyst toolbar, choose convert then choose TIN to raster. (In Arc10, the tool is located in ArcToolbox/3D analyst/ conversion/from TIN/TIN to raster).
   b. Set the new TIN as the input.
   c. Leave elevation as the attribute and 1 as the Z factor.
   d. Set the cell size to 50 and save the output raster to your working surface directory.

9. Intersect with DEM:

   a. Set the analysis extent for the spatial analyst extension to the intersection of inputs.
   b. Open the raster calculator tool under spatial analyst (ArcToolbox/spatial analyst tools/map algebra/raster calculator) and, in order to calculate the preliminary depth grid, set the equation to

subtract the DEM from the TIN raster just created. Then, in order to set up the analysis extents, select the environments options, and under processing extent, choose intersection of inputs. Save the layer to the \GIS_Modeling\DEMs folder as [Proj_Code]_PDG. See Figures 3-16 and 3-17.

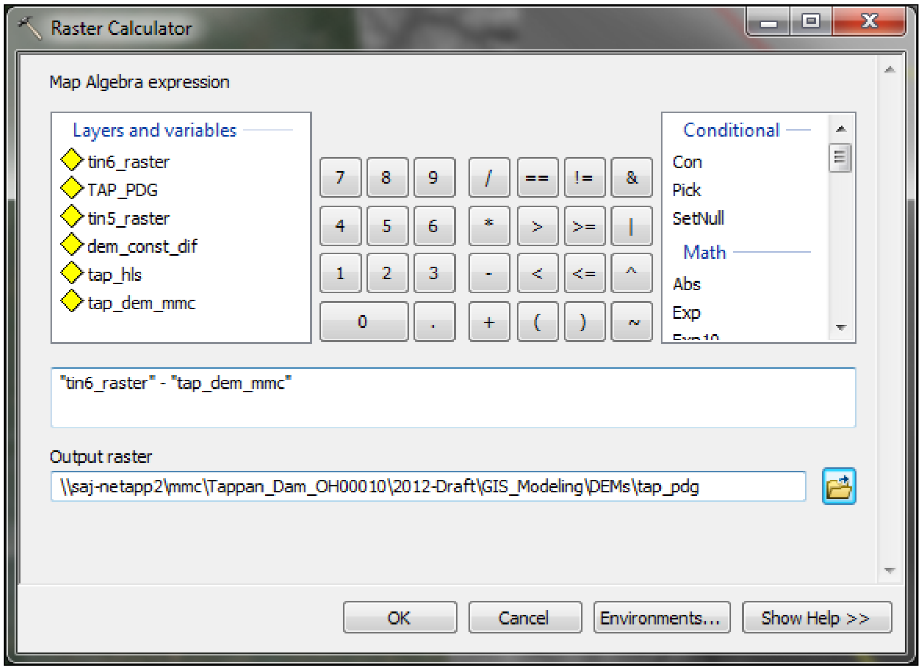

Figure 3-15. ArcGIS version 10 Raster Calculator

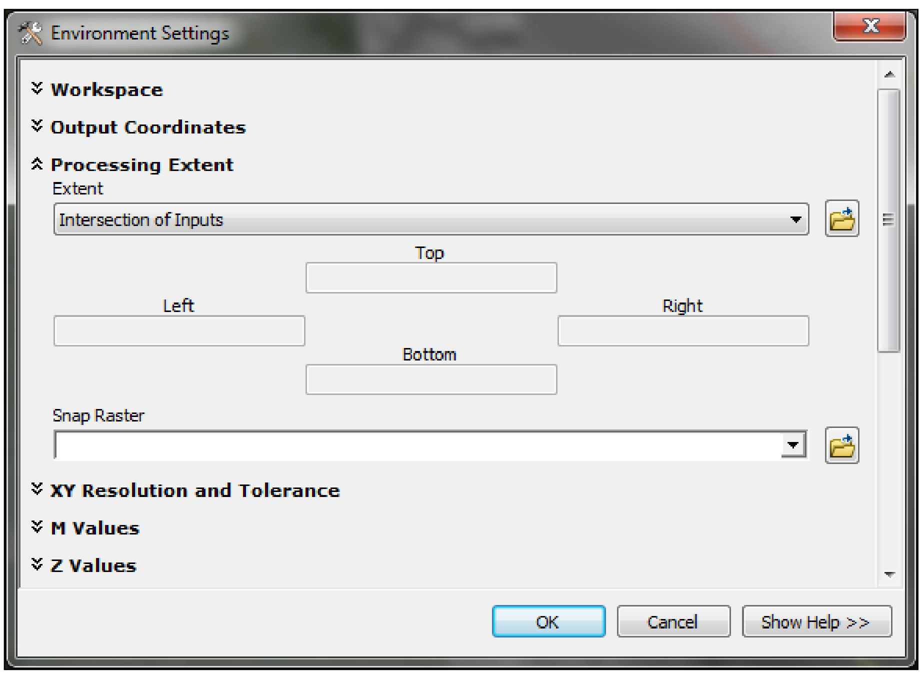

Figure 3-16. ArcGIS version 10 Analysis Extents

SECTION 4
Deliverable Organization

Organize the data into the correct folders:

1. Organize the shapefiles and rasters created in the previous steps to match the deliverable schema in Tables 2-1 and 2-2. If the files were saved into the correct folders during production, file locations need verified, but files do not need moved around.
2. Ensure only the final versions of the datasets are included in the deliverable folders and leave all intermediate datasets in the working directory.

SECTION 5
Data Manifest

The data manifest should give a short description of the datasets that reside in each folder and of the organization responsible for the creation of the datasets. The manifest should be stored in an MS Word document in the \[Study_Dam_Name]\[Year–Draft or Final]\GIS_Modeling folder. Use the example below as a template for the structure of the manifest.

Example Manifest:

Study Area: [Study Area]

Study area folder contains this data manifest and the production documentation describing the data development steps taken by the GIS team. Also contains all of the blank folders for use in later steps in modeling, mapping and consequence estimation.

\GIS_Modeling\DEMs

Contains (list the raster datasets and any issues that might need to be addressed for any of the datasets)

\GIS_Modeling\Projections

Contains the ESRI .prj file for the MMC projection

\GIS_Modeling\shapefiles

Contains (list the shapefiles and any issues that might need to be addressed for any of the datasets)

Data Completed By:

GIS/Mapping Team Member
District
Contact Information

Include entries for all folders that contain data. Modelers and economists should add to this document as more data is added to the folder structure.

SECTION 6
Data Transfer

The data compiled and generated through the previous sections must be transferred to the H&H team to begin the modeling portion of the MMC process. One copy of the data will be posted to the MMC ProjectWise server.

1. Complete the PreModel_Checklist_Template provided by NWK in EXCEL format.
2. Post data to ProjectWise.
3. If a hard drive was requested, use a commercial parcel delivery company (UPS, FedEx) to ship the data to the assigned H&H modeling team member as assigned.

List of Acronyms and Abbreviations

CTS	consequences-based top screen
FID	feature ID
GIS	Geographic Information System
H&H	Hydraulics and Hydrology
ID	identification
MMC	Modeling, Mapping, and Consequences
MMCID	Modeling, Mapping, and Consequences identification
NAD 83	North American Datum of 1983
NAVD 88	North American Vertical Datum of 1988
NED	National Elevation Database
NGVD 29	National Geodetic Vertical Datum of 1929
NID	National Inventory of Dams
NIDID	National Inventory of Dams identification
NLD	National Levee Database
NLDID	National Levee Database Identification
NWK	Kansas City District
TIN	triangulated irregular network
U.S.	United States