

Original Approximate Method Studies

- Approximate method studies were typically developed using drainage area based regression techniques to find depths above streambed. A flooded area was then drawn on the best available USGS Quadrangles (typically either 10-, 20- or 40-foot contour intervals).
- One method to define the flooded area was to plot a streambed profile based on the river mile the contour lines cross the streamline. The regression based depths were added to this streambed and the resulting flood profile was interpolated (outlined) based on the shape of the contour lines.

Possible Methods to Convert Approximate Study Streams Under the New Map Modernization Program

Adapt Old Method

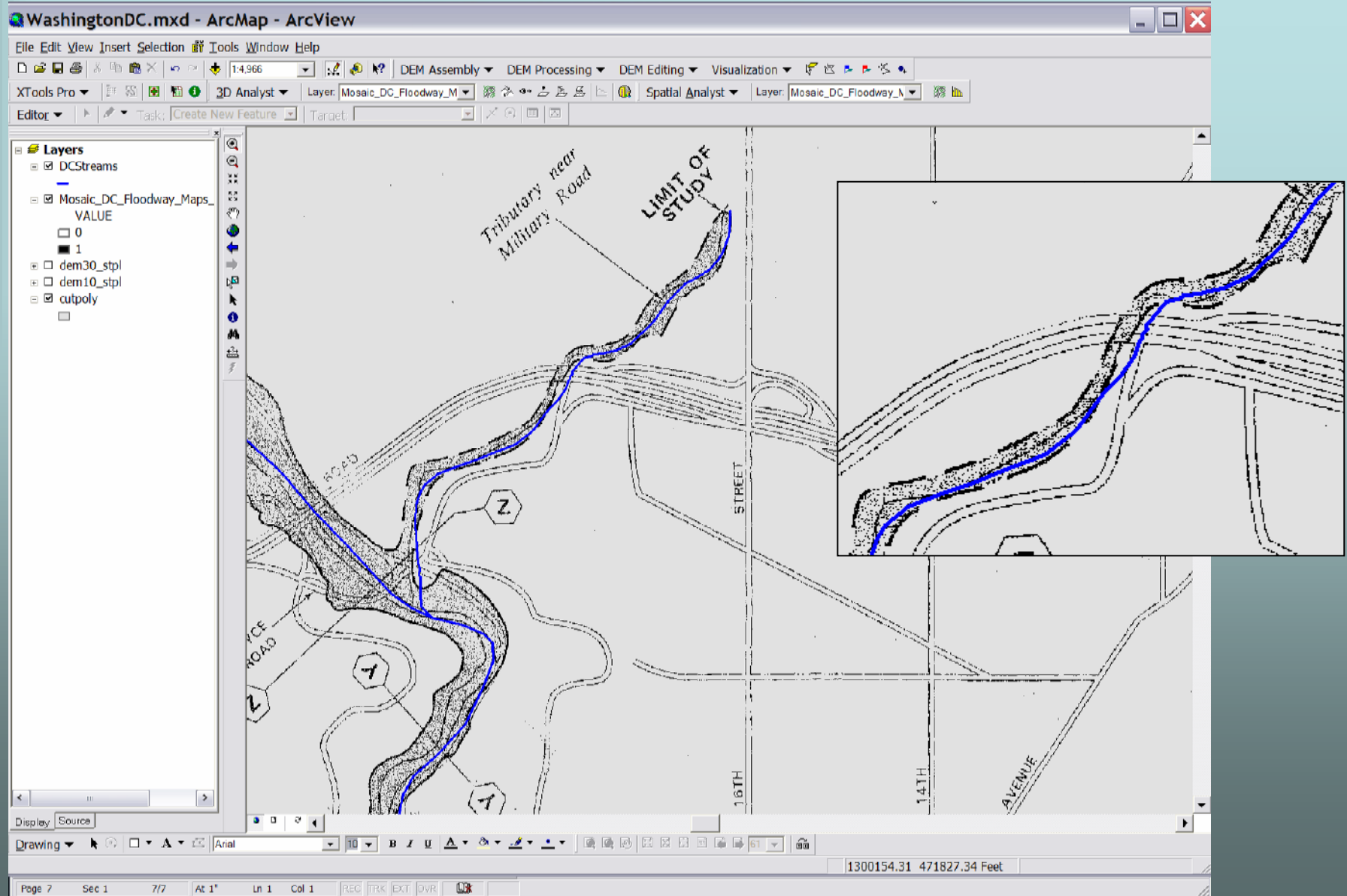
- Drainage area based regression equations
 - Use digitally georeferenced USGS quad or best available georeferenced digital map
 - Digitize flooded area based on estimating techniques
- (Generally NO BETTER THAN original flooded areas, just on better mapping)

Scan and Digitize

- Scan FIS Map
 - Georeference scanned map to digitally georeferenced USGS quad maps
 - Digitize flood zone from georeferenced FIS map
- (Problems with original flooded area as well as georeferencing problems)

Come Up With a New Method

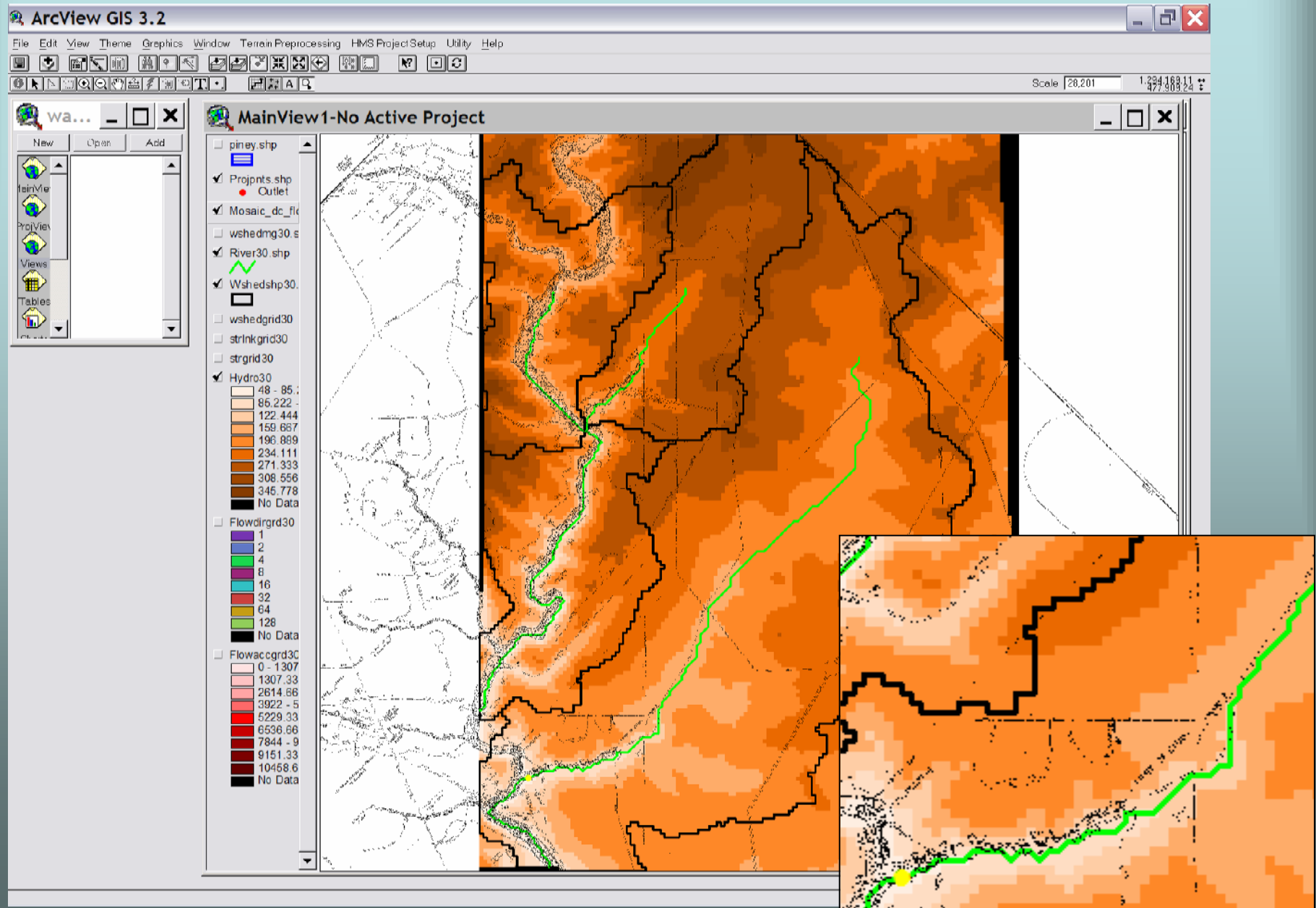
Georeferenced Scanned FIS Maps compared with NHD stream data



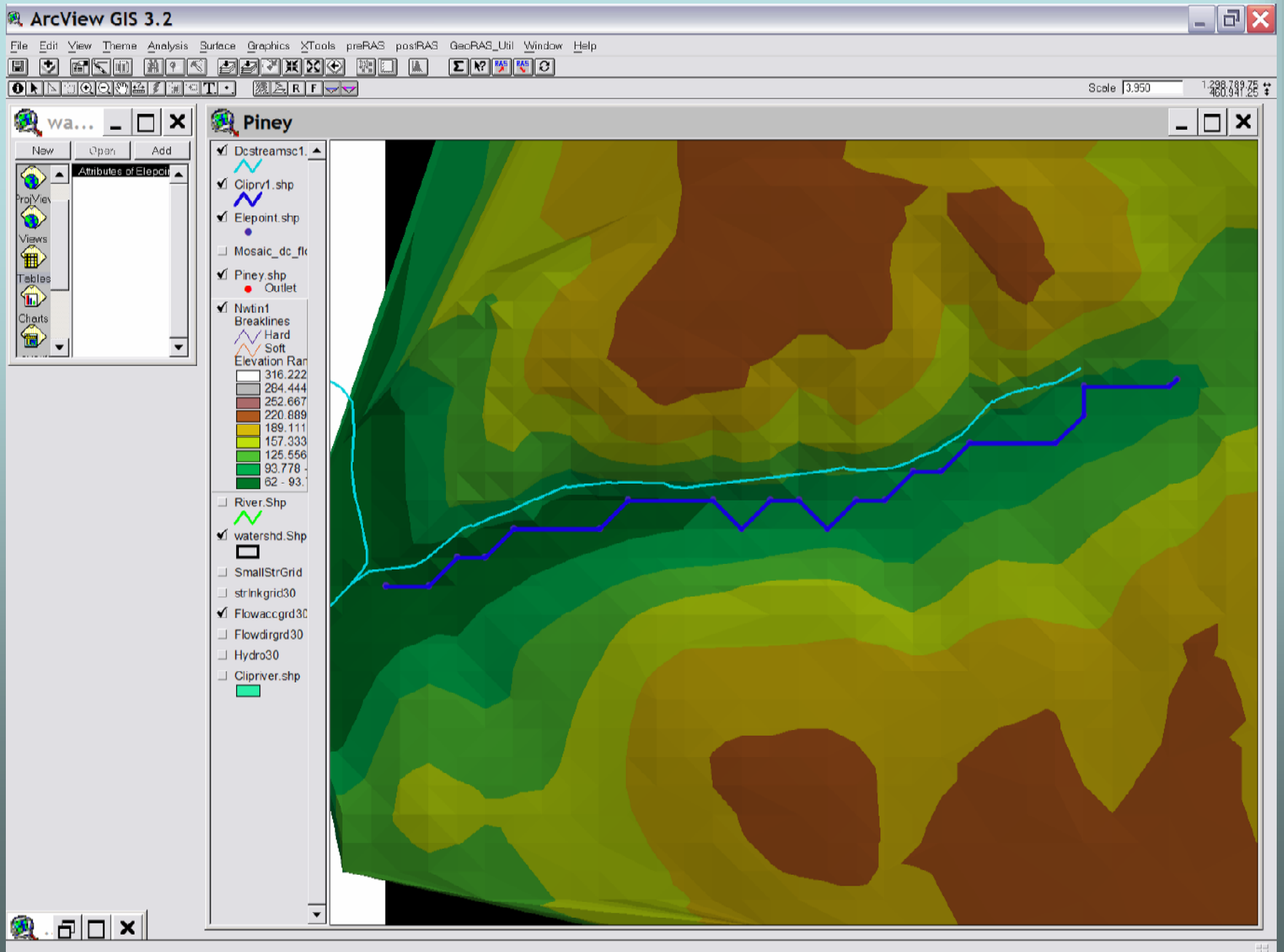
Any new method should adapt to all available digital mapping options
(so choose a worst case as a test case)

- 30-meter Digital Elevation Model (DEM)
- 10-meter DEM
- 1-meter DEM
- Light Detection and Ranging (LIDAR) data
- 5-foot or less contour maps

View of GeoHMS developed subbasin from 30-meter DEM

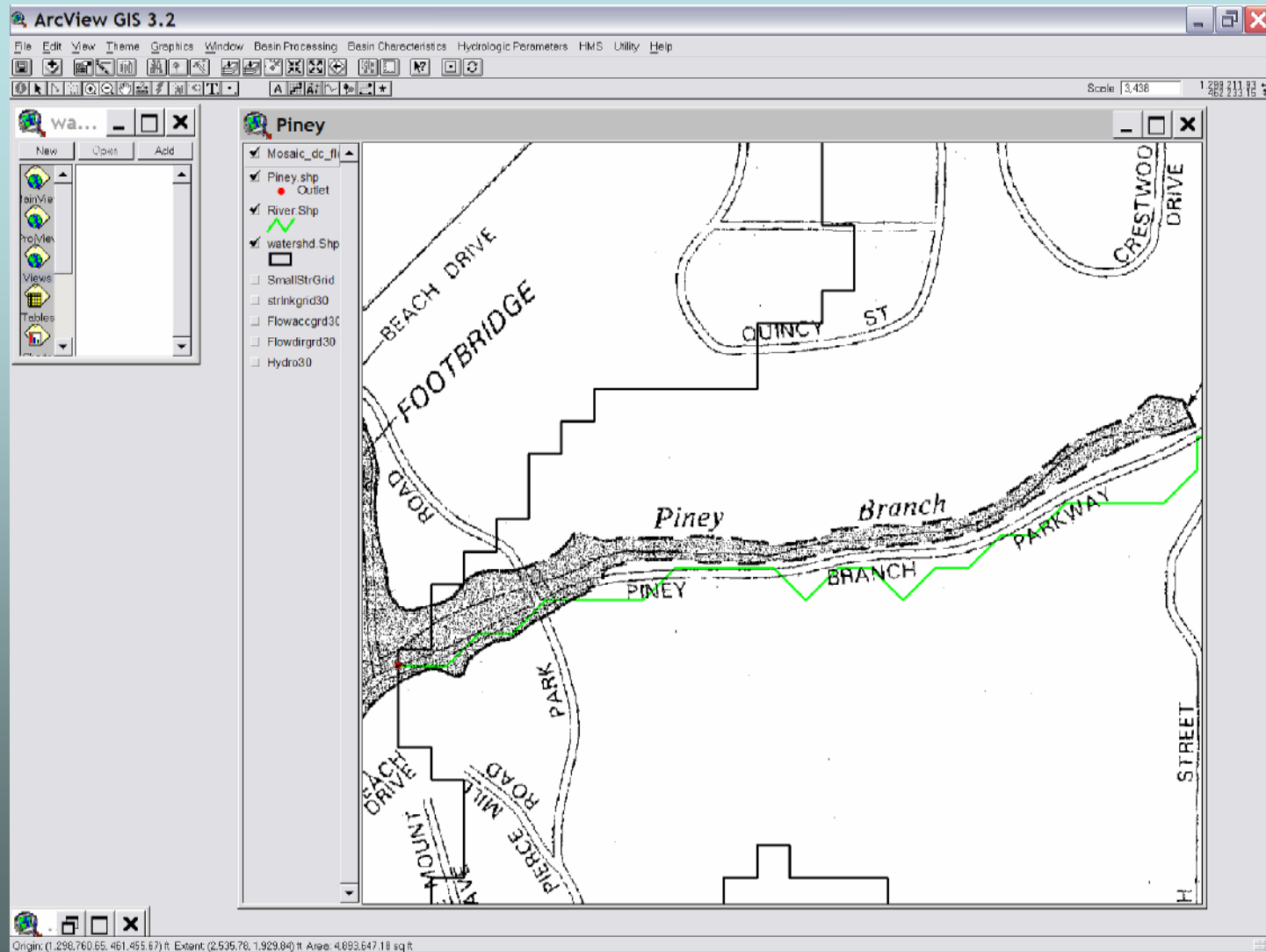


Comparison of 30-meter DEM GeoHMS flowline and NHD



Comparison of 30-meter DEM GeoHMS flowline overlaid on FIS Map

(Can it be possible to use 30-meter DEM data?)



So Let's Begin Developing a Better Lightbulb



Software Needed

- ArcMap 8.3
- Spatial Analyst for ArcMap 8.3
- 3D Analyst for ArcMap 8.3
- EZ GeoWizards for ArcMap 8.3
- Xtools for ArcMap 8.3
- ArcView 3.X
- Spatial Analyst for ArcView 3.X
- 3D Analyst for ArcView 3.X
- Xtools for ArcView 3.X
- GeoHMS for ArcView 3.X
- GeoRAS for ArcView 3.X
- MrSid Extension

Let's start with a few simple Steps

ArcMap 8.3

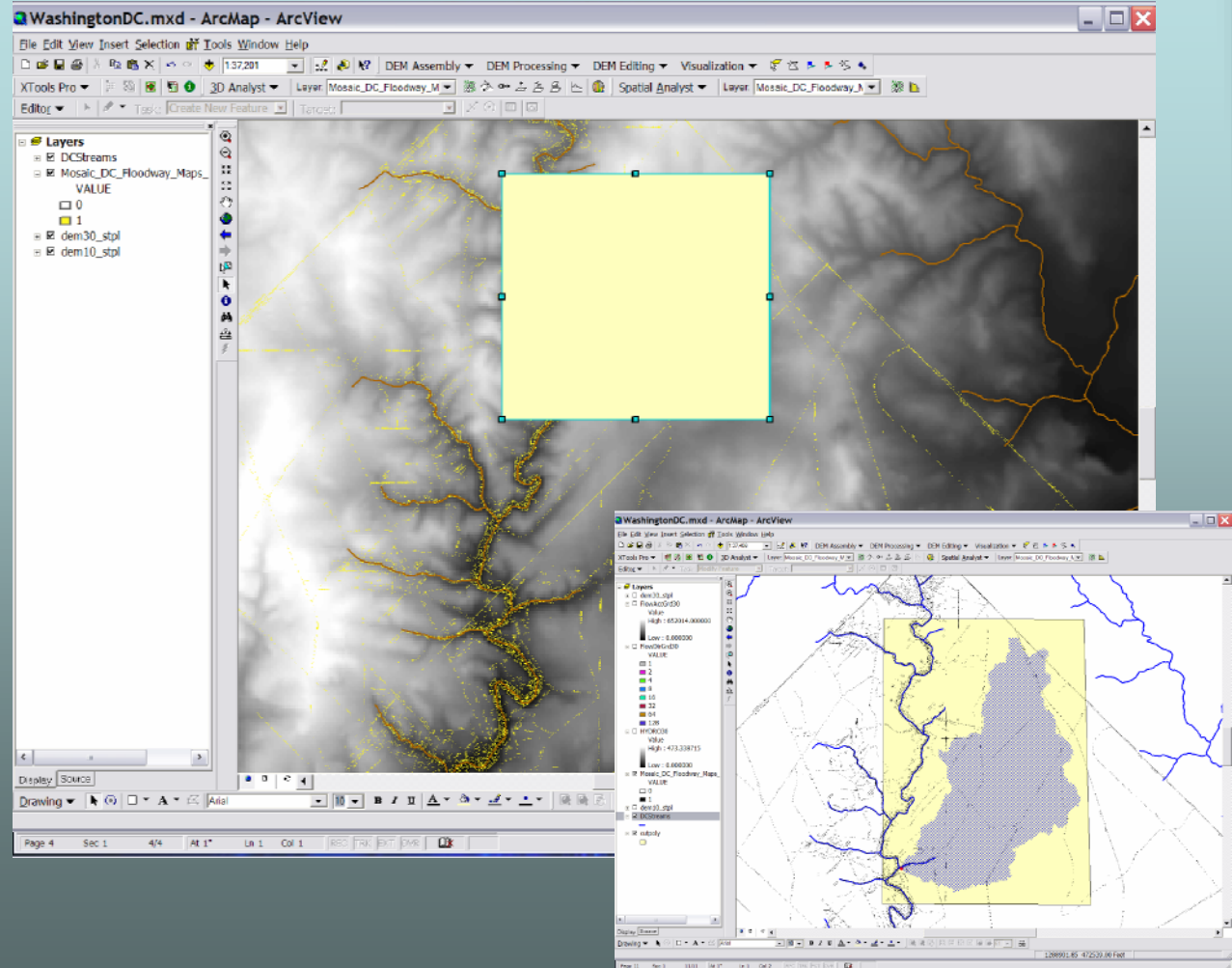
- Step 1: Load base data obtained for study
- Step 2: Draw a rectangle encompassing watershed
- Step 3: Convert rectangle to shapefile
- Step 4: Set the Extent of the data
- Step 5: Clip data layers
- Step 6: Digitize Stream
- Step 7: Convert Vertices of the Digitized Streamline to a Points Shapefile and Add Streambed Elevations to Vertices
- Step 8: Convert Points Shapefile to a 3D Line
- Step 9: Densify the 3D Polyline
- Step 10: Convert Dense 3-D Polyline to a Raster
- Step 11: Convert 3D Polyline to a Points File
- Step 12: Set an Analysis Mask Using the Raster Grid of the Stream Flowline
- Step 13: Assign an Elevation to Each Cell of the Stream Grid
- Step 14: Reset "Options" in Spatial Analysis
- Step 15: Cropping the DEM
- Step 16: Create TIN from Clipped DEM
- Step 17: Create a Resampled Raster from the TIN
- Step 18: Burn Stream into Resampled DEM
- Step 19: Create Final TIN from Resampled Grid using 3D Analyst
- Step 20: Run the HEC ArcMap Software
- Step 21: Create Flowlines
- Step 22: Create Top of Bank lines

ArcView 3.X

- Step 1: Prepare ArcView
- Step 2: Add data created previously in ArcMap
- Step 3: Step through GeoHMS Terrain Preprocessing
- Step 4: Create Study Area
- Step 5: HMS Basin Characteristics
- Step 6: HMS Export File Creation
- Step 7: Export Basin Data for Input into EXCEL
- Step 8: Import ArcView Table into EXCEL
- Step 9: Create a HMS File
- Step 10: Import the Basin File Created in ArcView
- Step 11: Bring in the Basin Map Created in ArcView
- Step 12: Enter the Hydrologic Parameters into HMS
- Step 13: Get Hypothetical Rainfall Data from Internet
- Step 14: Input Frequency Rainfall Data into a HMS MET file
- Step 15: Set a Control Specification and Run Model
- Step 16: Begin Developing RAS Export File using GeoRAS
- Step 17: Covert Stream, banks and flowlines to GeoRAS Shapefiles
- Step 18: Create Cross Sections for RAS model
- Step 19: Complete preRAS Processing
- Step 20: Create HEC-RAS file to Import GIS RAS file
- Step 21: Set Bank Stations and n-values
- Step 22: Improve geometry data
- Step 23: Input Steady Flow Data, Run and Export GIS data
- Step 24: Input UnSteady Flow Data, Run and Export GIS data
- Step 25: Run postRAS in ArcView for Steady Flow
- Step 26: Run postRAS in ArcView for Unsteady Flow

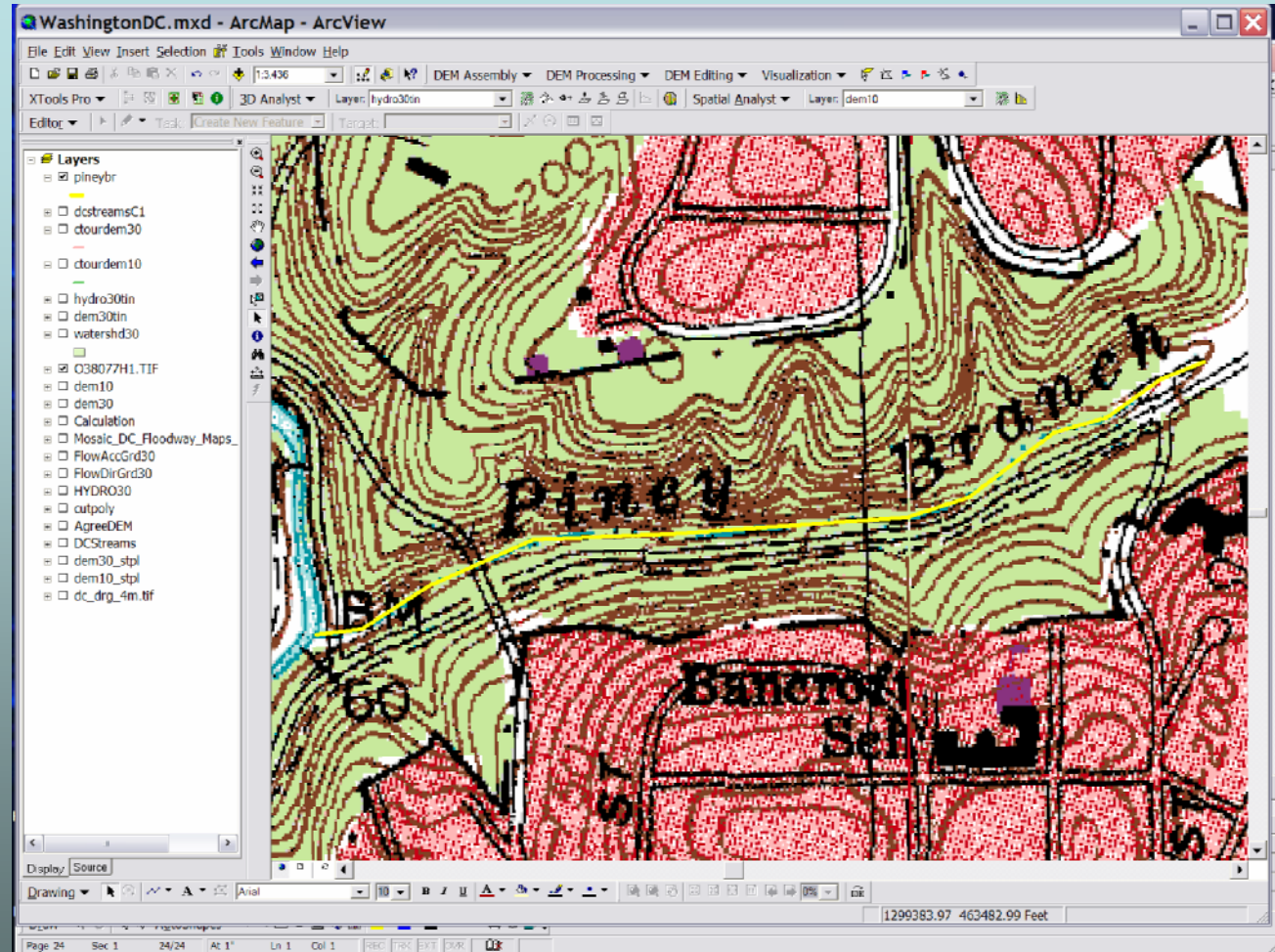
Clip Only Data Needed!

- Step 1: Load base data obtained for study
- Step 2: Draw a rectangle encompassing watershed
- Step 3: Convert rectangle to shapefile
- Step 4: Set the Extent of the data
- Step 5: Clip data layers



Digitize stream using best available data and fewest vertices needed (Quad Map assumed as worst case)

Step 6: Digitize Stream



Add elevations to each of the vertices defining the stream

Step 7: Convert Vertices of the Digitized Streamline to a Points Shapefile and Add Streambed Elevations to Vertices

Step 8: Convert Points Shapefile to a 3D Line Vertices of the Digitized Streamline to a Points Shapefile and Add Streambed Elevations to Vertices

The screenshot displays the ArcMap interface with several windows open. The 'Attributes of PBpt' table is visible at the top, showing a list of points with their coordinates and elevations. The 'ET GeoWizards' tool interface is open in the foreground, with the 'Point To Polyline Z (M)' dialog box selected. The dialog box contains a list of conversion options, with 'Point to Polyline Z (M)' selected. The background shows the ArcMap main window with a map of a stream and a context menu open over it.

FID	Shape*	ID	ELEM TEXT	ET X	ET Y	ET ORDER	ET ID	ET IDP	Elevation
0	Point	0		1298765.11174	462036.39667	0	0	0	46
1	Point	0		1298922.14849	462054.16069	0.0481	0	0	48
2	Point	0		1299125.1659	462186.12201	0.1324	0	0	50
3	Point	0		1299439.84289	462323.15876	0.2519	0	0	54
4	Point	0		1299848.41543	462340.92278	0.3943	0	0	60
5	Point	0		1300226.53536	462366.29996	0.5263	0	0	70
6	Point	0		1300561.51409	462389.13942	0.6432	0	0	76
7	Point	0		1300749.30519	462450.04484	0.7119	0	0	80
8	Point	0		1301005.61468	462645.4489	0.8241	0	0	85
9				691.12782	0.882	0	0	0	87
10				805.32511	0.9504	0	0	0	90
11									

ET GeoWizards

Point To Polyline Z (M)

Converts a point data set to a polyline shapefile

The point layer needs to have at least two numeric fields: one that identifies the points to be used for creation of each polyline and one to be used as a source for Z (M) values

Polygon To Polyline

Polygon To Point

Polyline To Point

Polyline To Polygon

Point To Polyline

Point To Polygon

Multipoint To Point

Shape Z (M) to Shape

Polygon Z (M) to Point

Polyline Z (M) to Point

Point Z (M) to Point

Point to Polyline Z (M)

Point to Polygon Z (M)

Point to Point Z (M)

Help

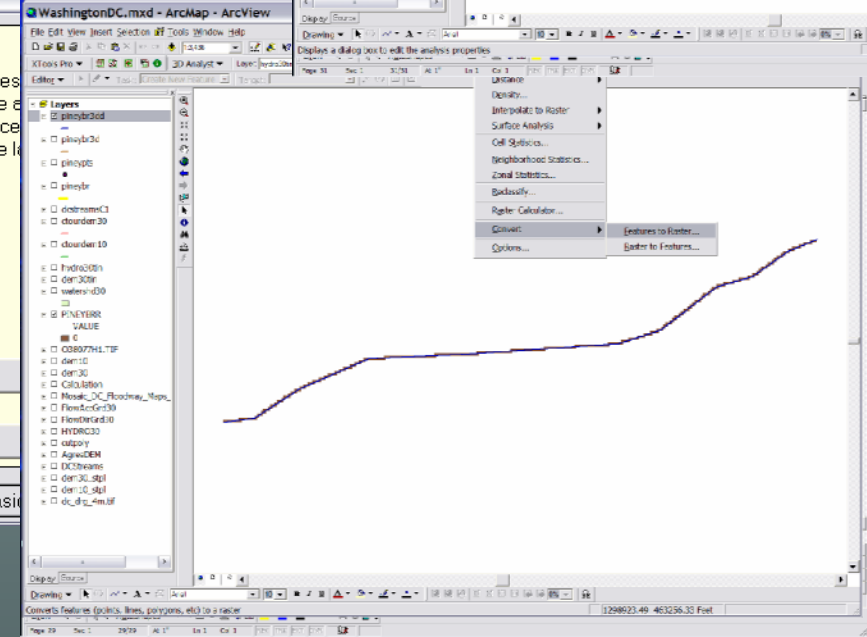
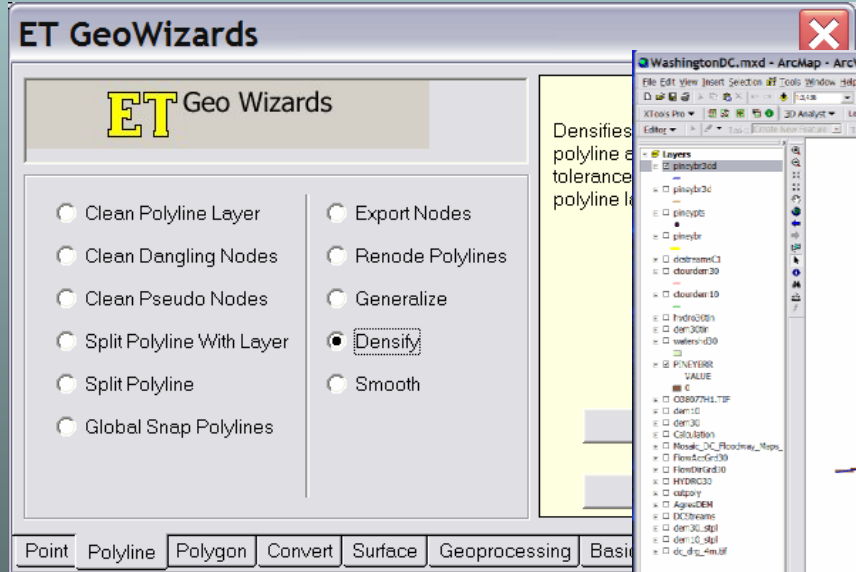
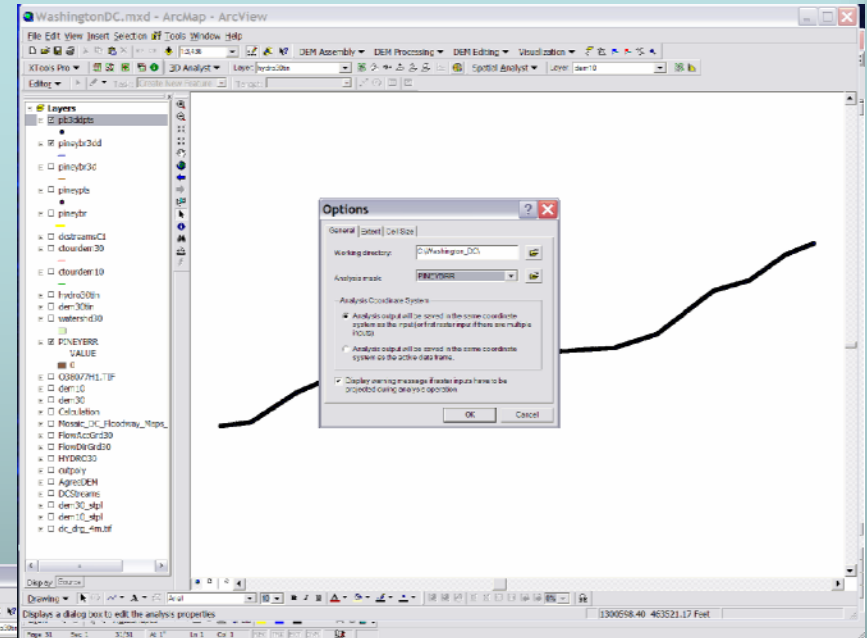
GO

Point Polyline Polygon Convert Surface Geoprocessing Basic About

Step 9: Densify the 3D Polyline

Step 10: Convert Dense 3-D Polyline to a Raster

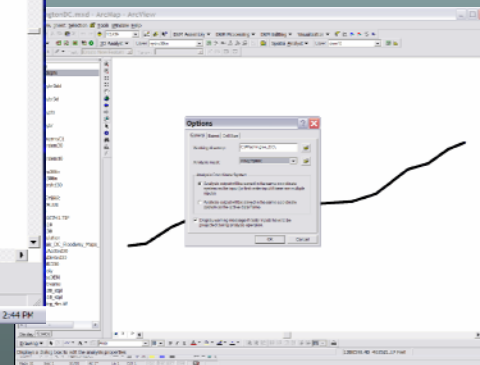
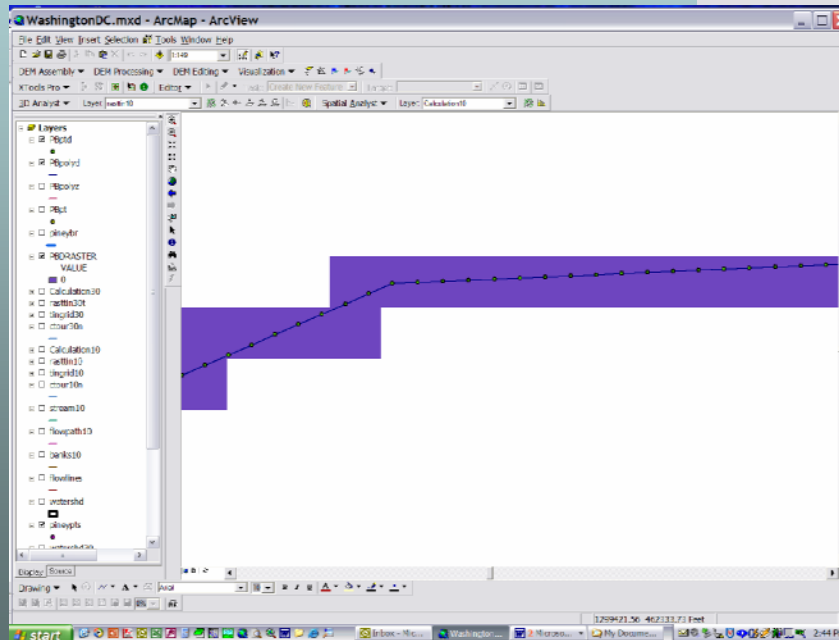
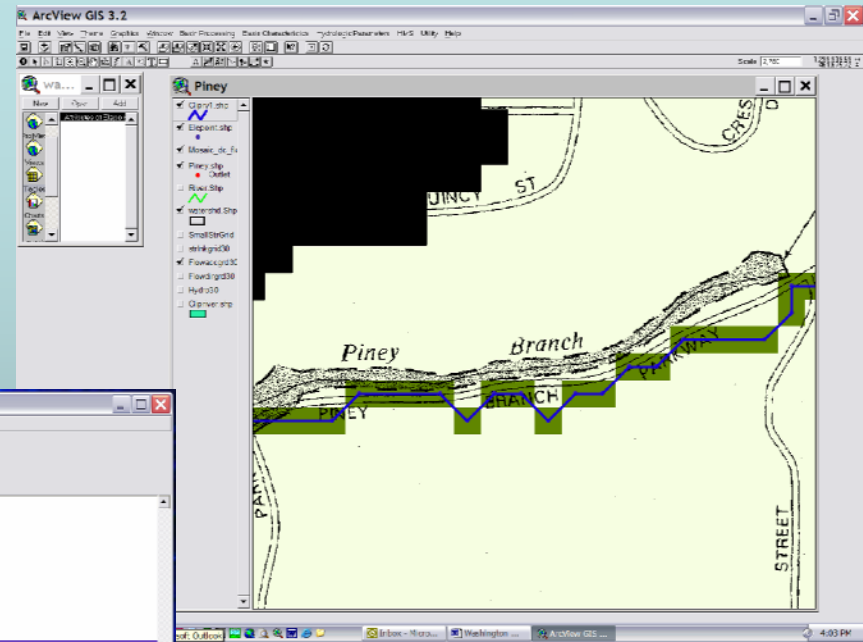
Step 11: Convert 3D Polyline to a Points File



Properly prepare DEM to burn in stream

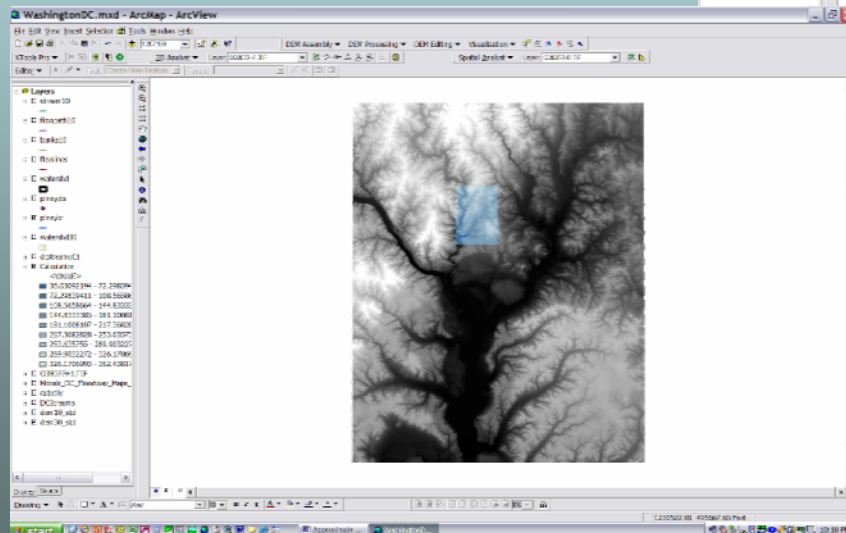
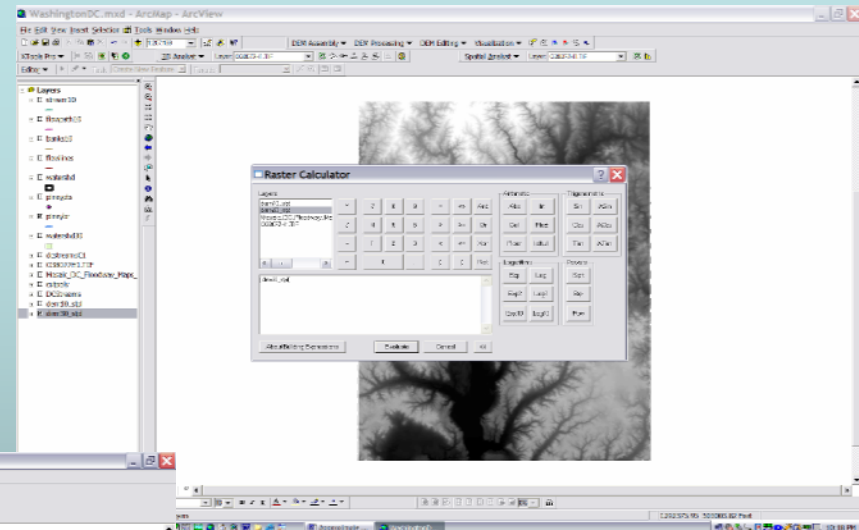
Step 12: Set an Analysis Mask Using the Raster Grid of the Stream Flowline

Step 13: Assign an Elevation to Each Cell of the Stream Grid



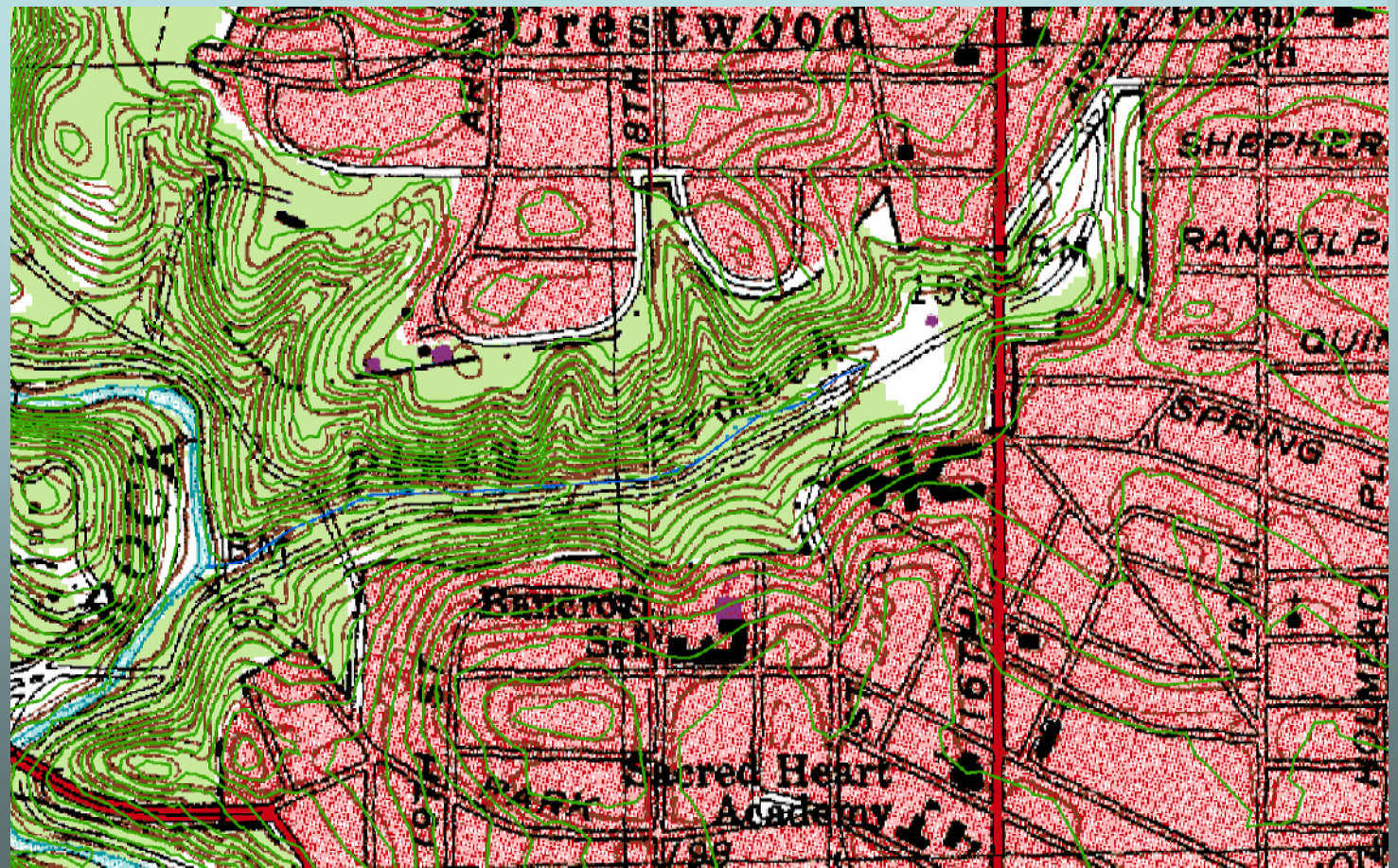
Step 14: Reset "Options" in Spatial Analysis

Step 15: Cropping the DEM



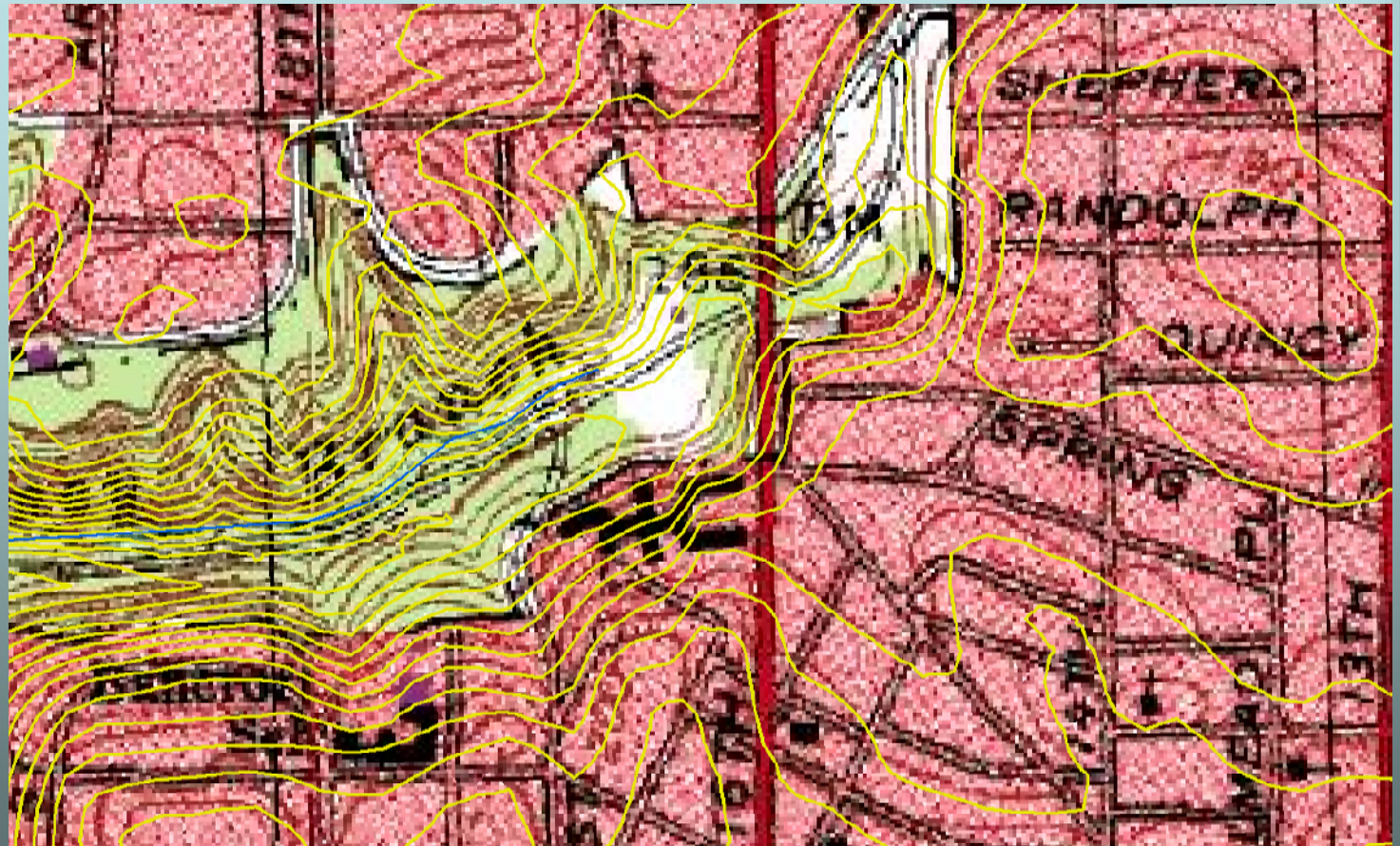
Quick Check by Comparing 10-meter DEM at this point to 10-foot contour Quad

- Compute Contours to make comparison
- First check 10-meter DEM



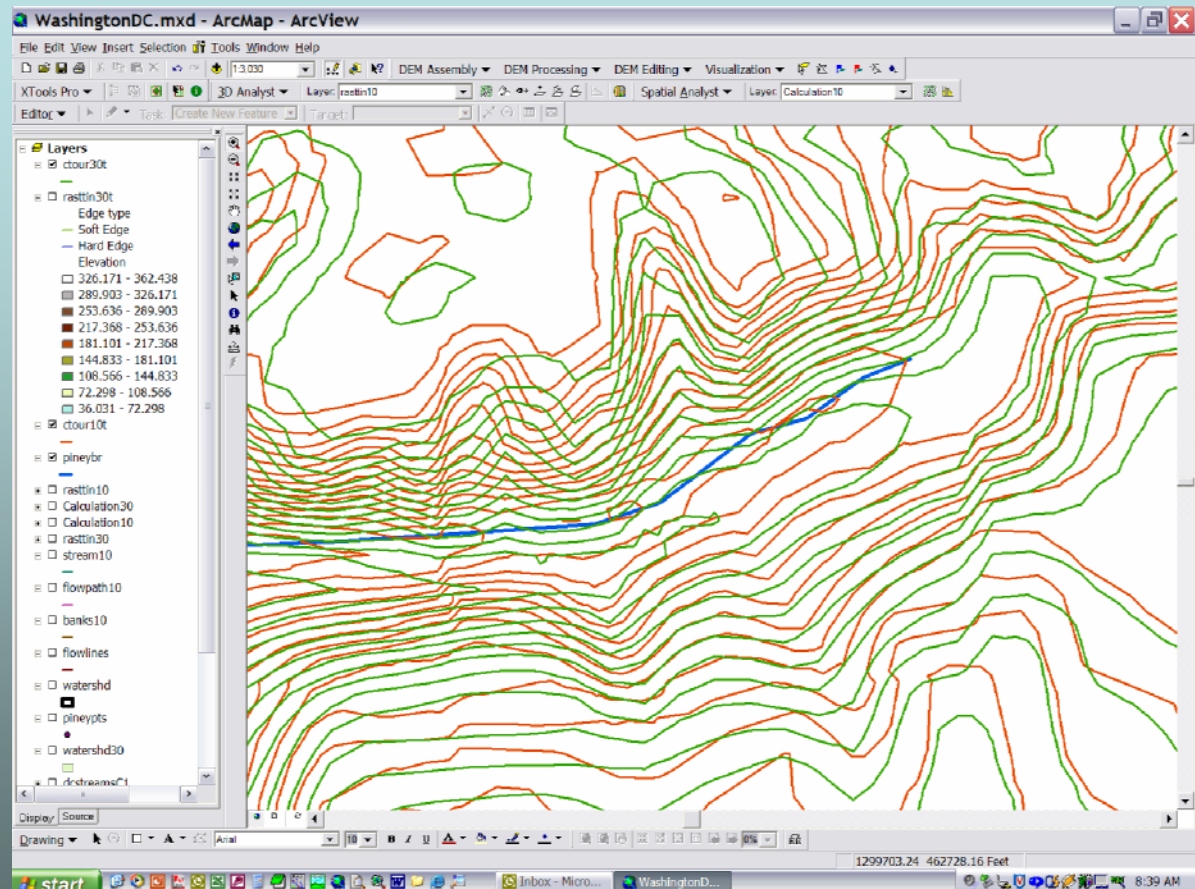
Quick Check by Comparing 30-meter DEM at this point to 10-ft contour Quad

- Compute Contours to make comparison
- Next check 30-meter DEM



Quick Check by Comparing 30-meter DEM at this point to 10-meter DEM

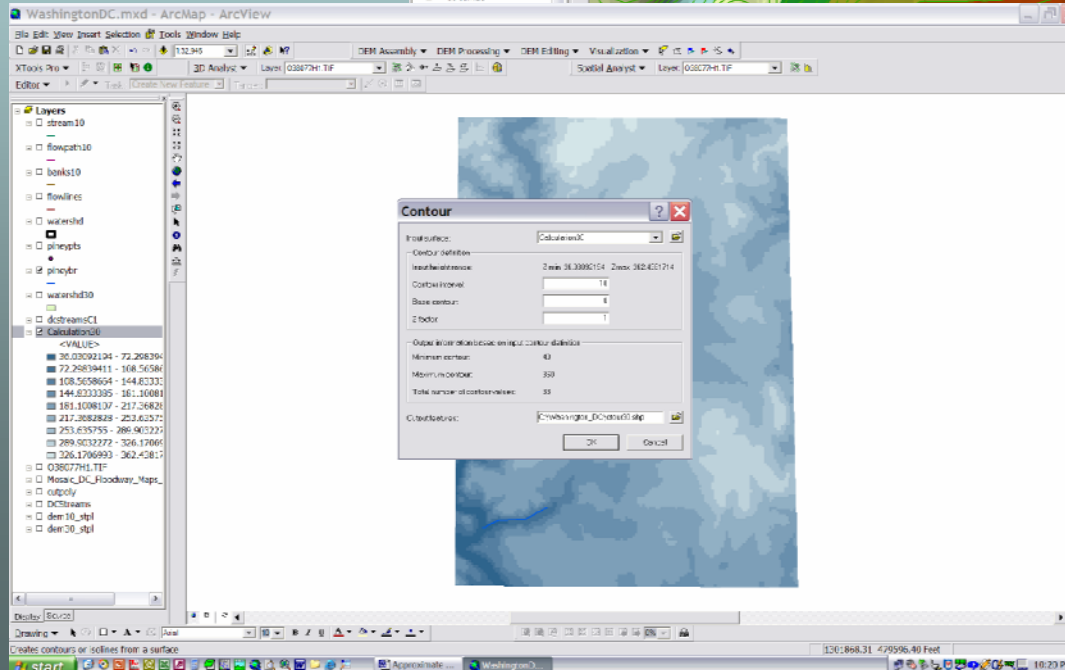
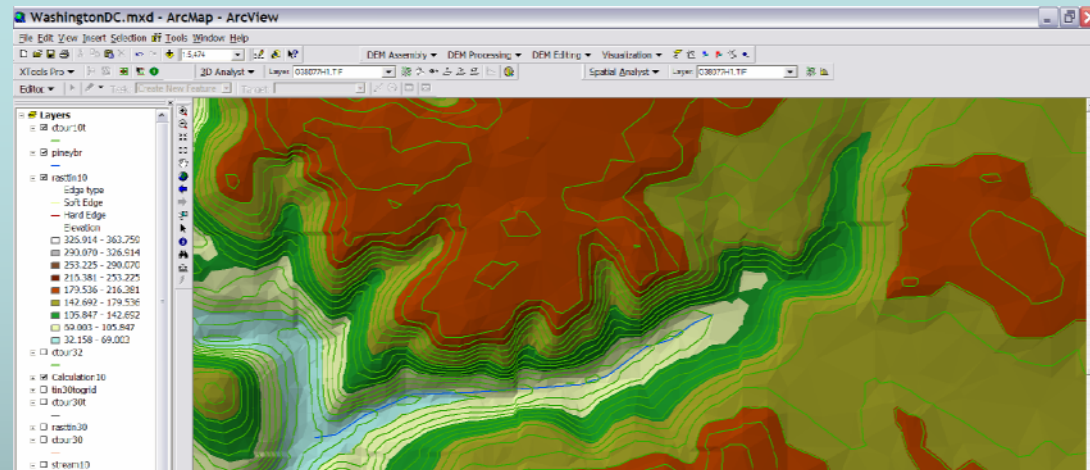
- Overlay of only the Contours to make comparison
- Looks pretty bad so far!



Create a TIN from 30-meter DEM then Resample a 10-foot DEM from the TIN

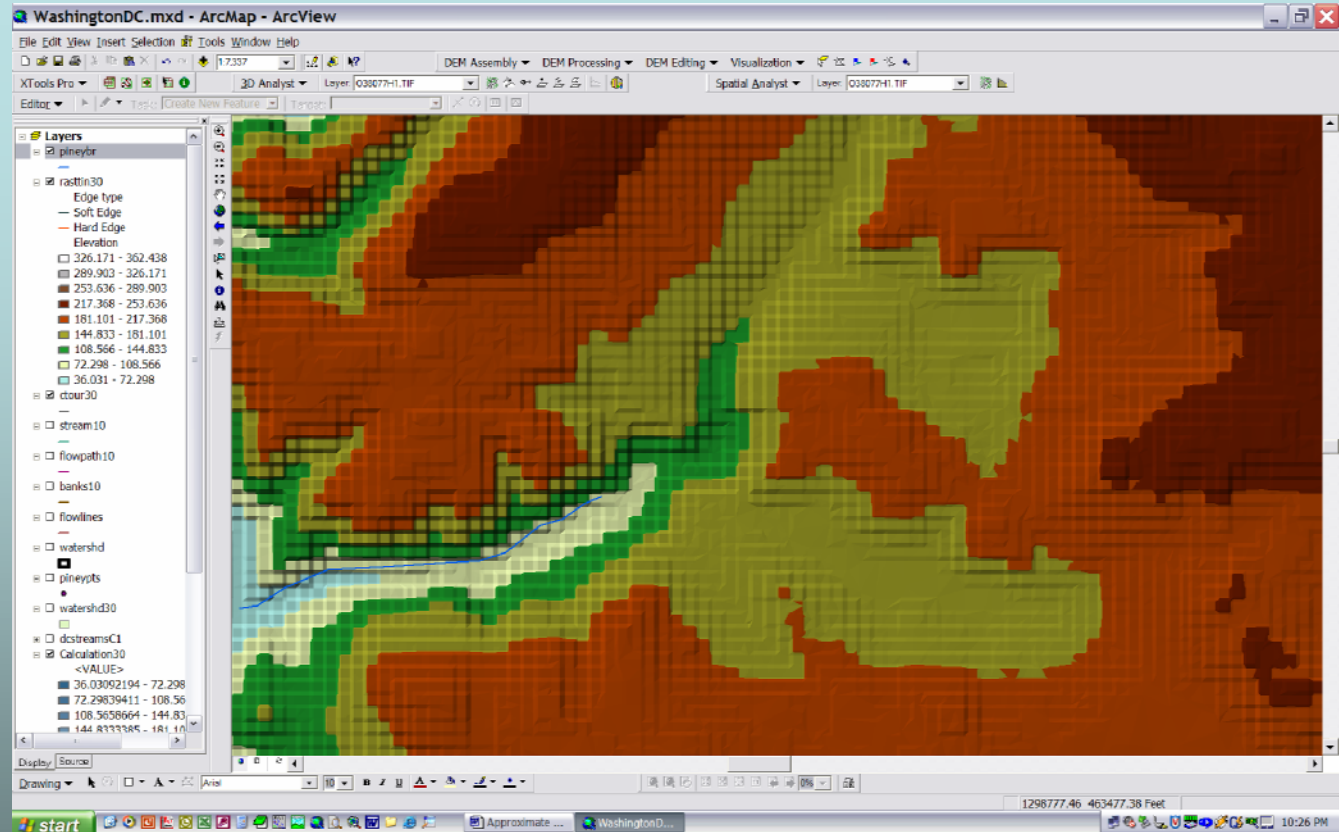
Step 16: Create TIN from Clipped DEM

Step 17: Create a Resampled Raster from the TIN



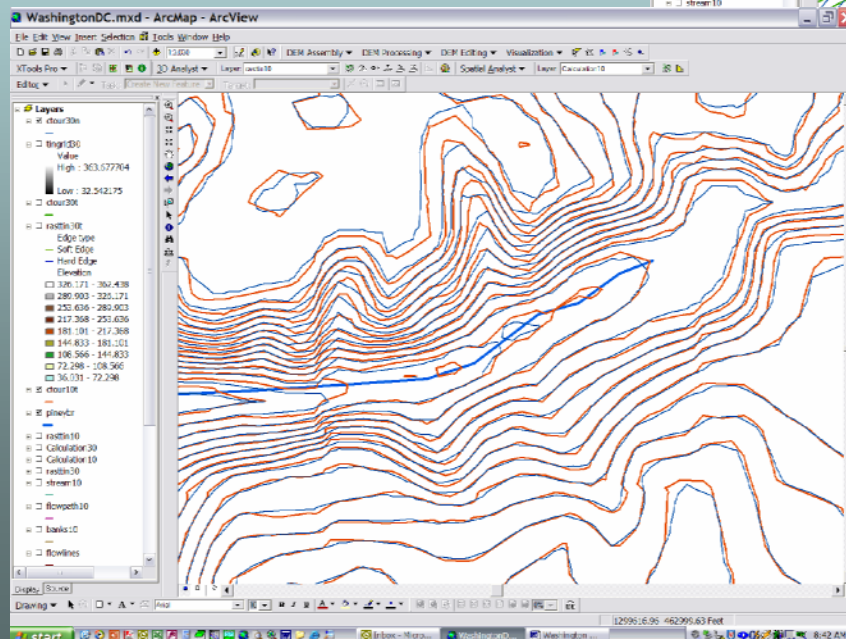
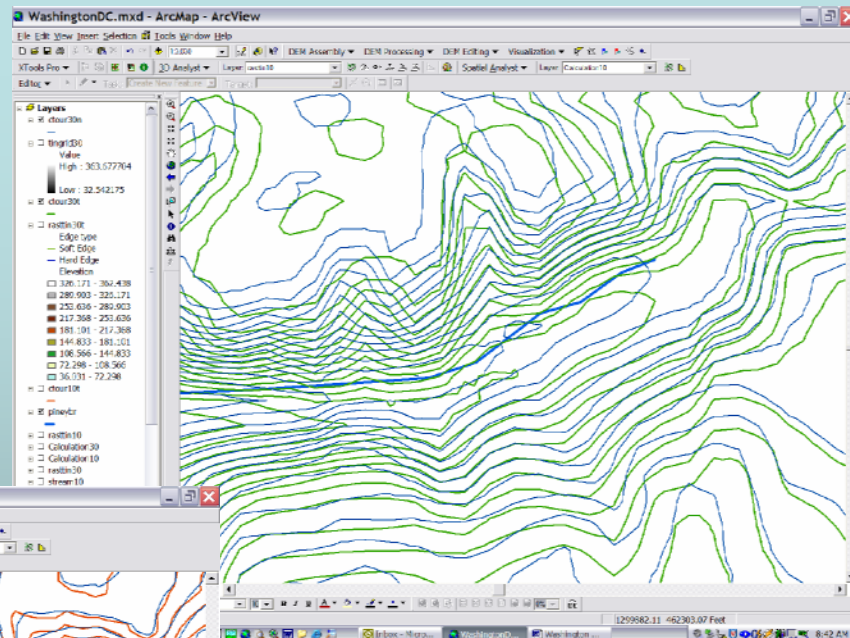
OOOPs

- This is what a TIN looks like if the wrong cell size of the original 10-meter DEM is entered as 10 feet

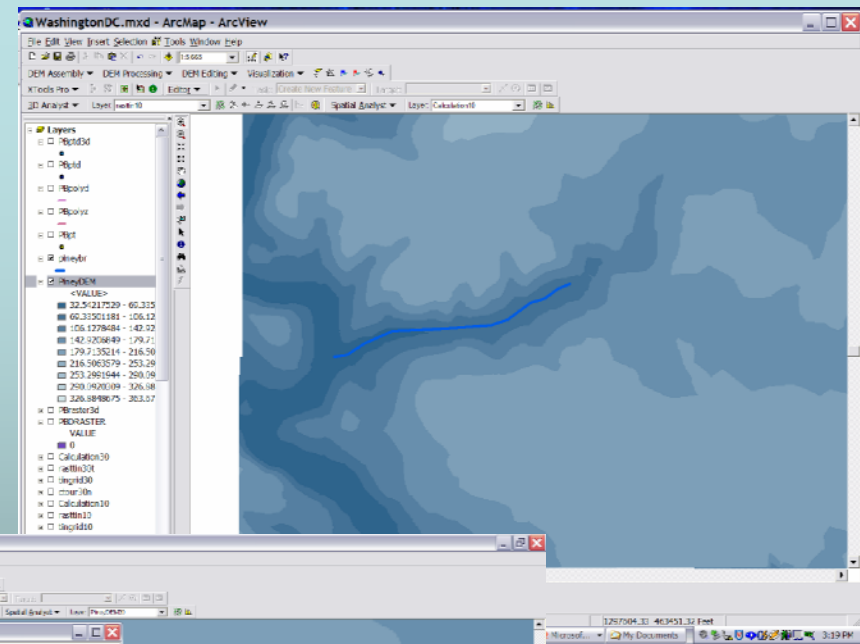
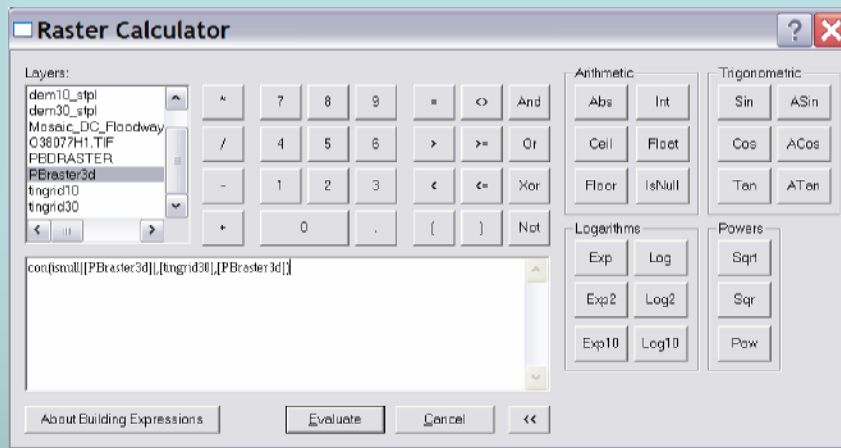


Improvement by Resampling DEM from a TIN

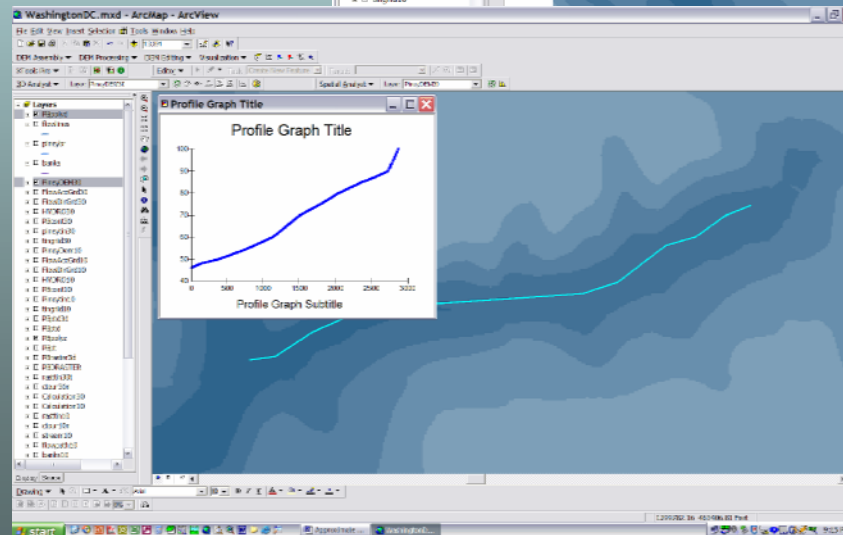
- Let's check for any improvements by resampling a 10-foot DEM from a TIN based on a 30-meter DEM



Step 18: Burn Stream into Resampled DEM using Stream DEM created in Steps 12 and 13

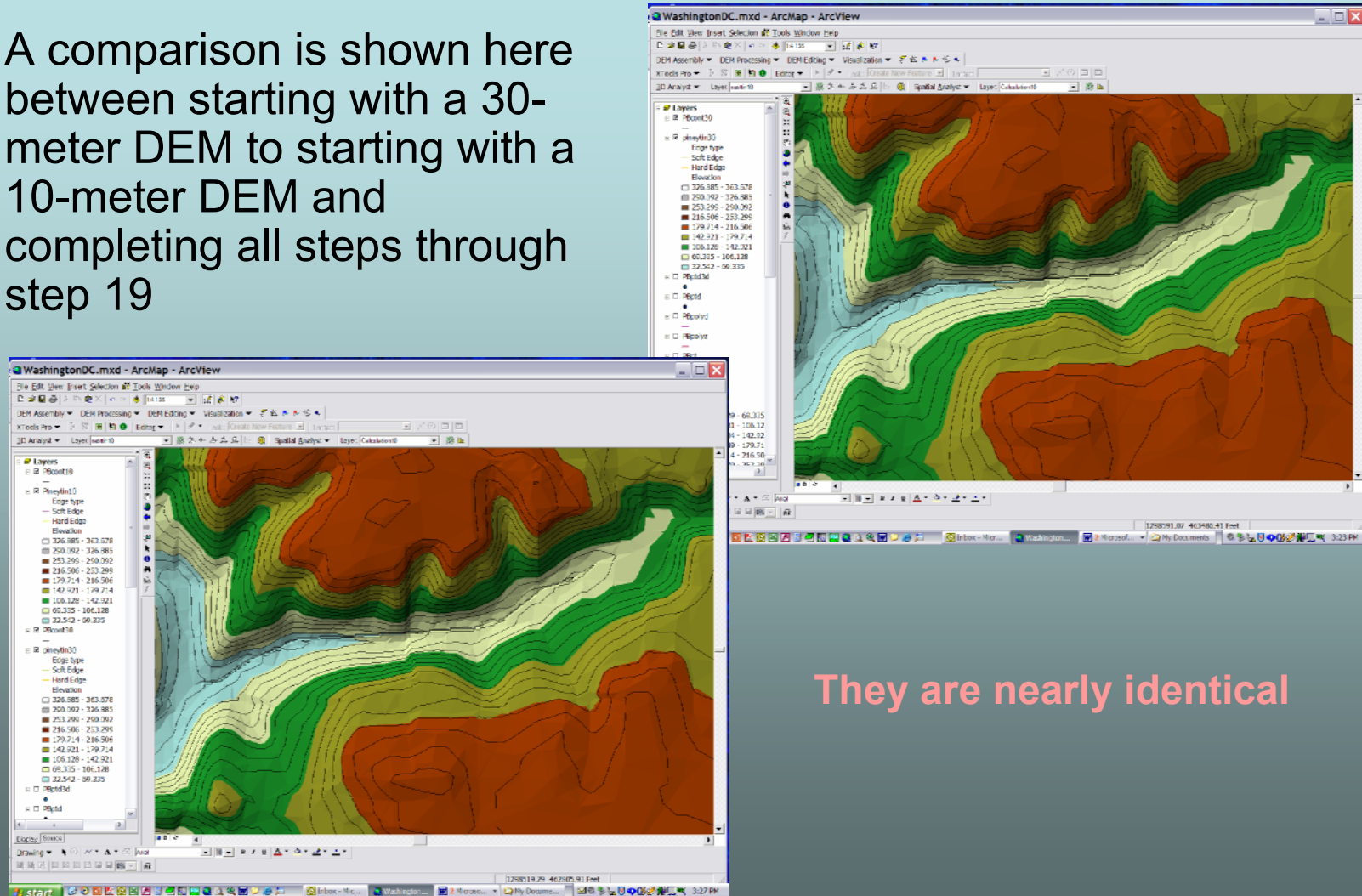


To insure the stream is burned in, the elevations on the grid under the digitized stream line can be plotted

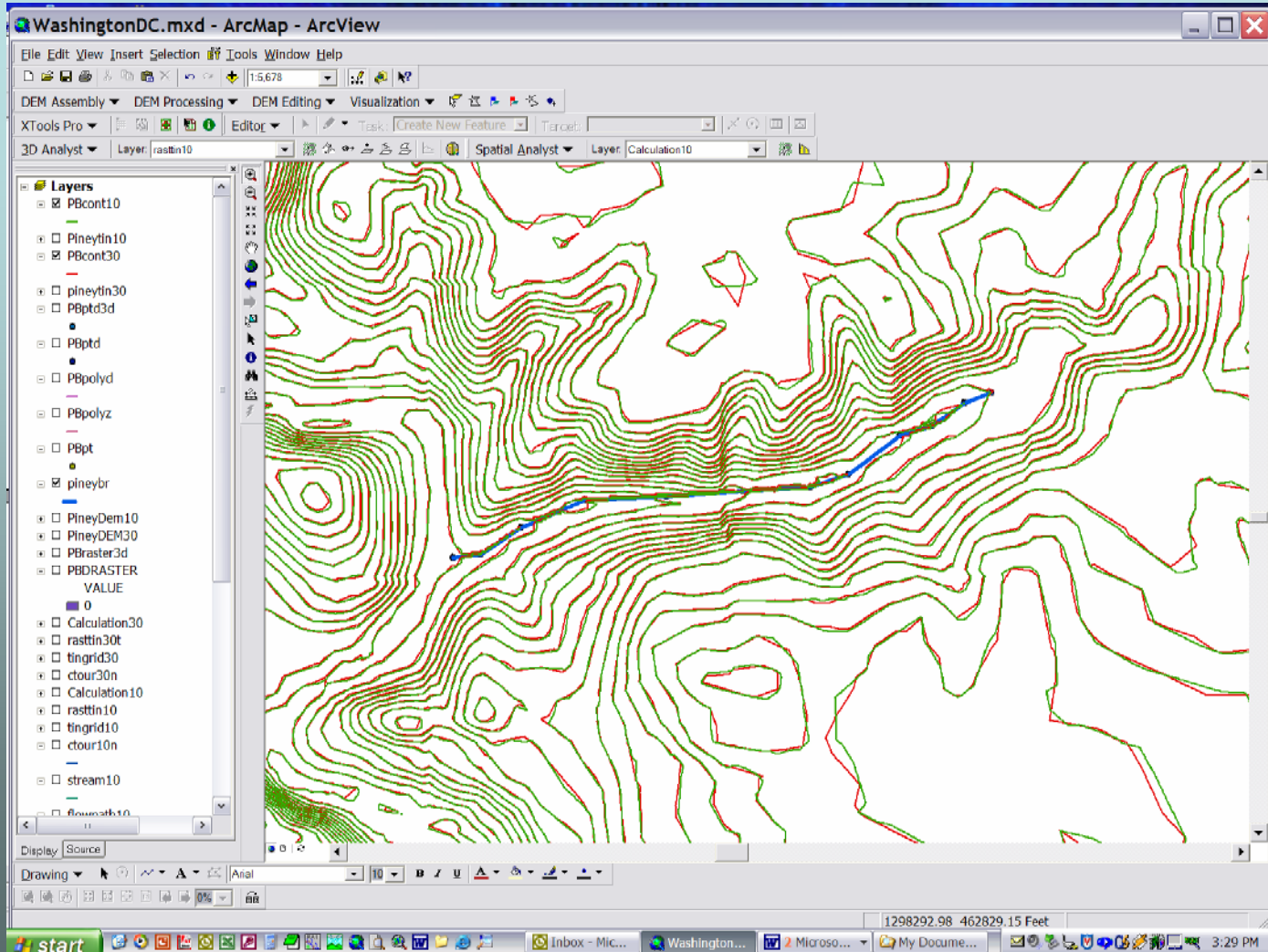


Step 19: Create Final TIN from Resampled Grid using 3D Analyst

- A comparison is shown here between starting with a 30-meter DEM to starting with a 10-meter DEM and completing all steps through step 19

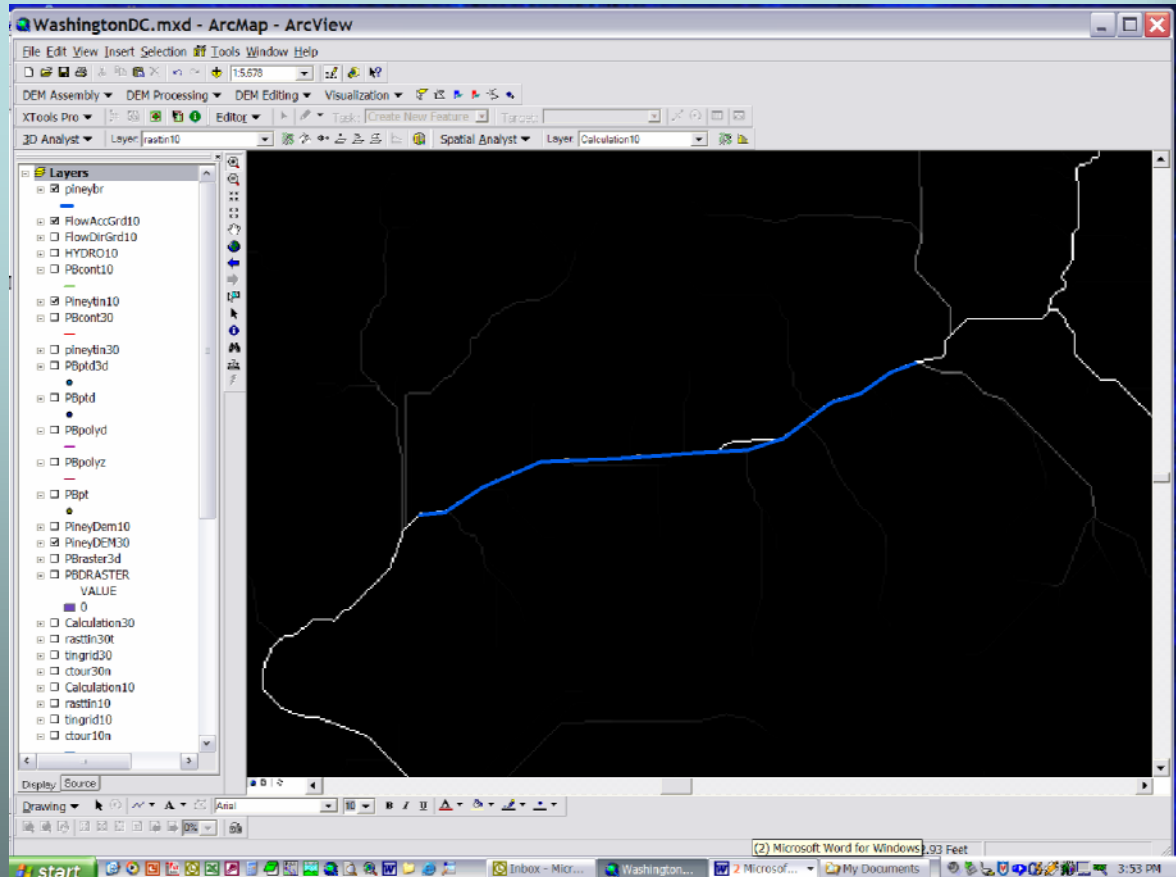


This comparison is further emphasized by comparing contours



Step 20: Run the HEC ArcMap Software

- Although we have finished hydraulically correcting and improving our DEM, there are a few more processes that may be easier to do in ArcMap before we switch to ArcView 3.X.
- Using the HEC ArcMap extension now run the following processes.
- Fill Sinks
- Flow Direction
- Flow Accumulation

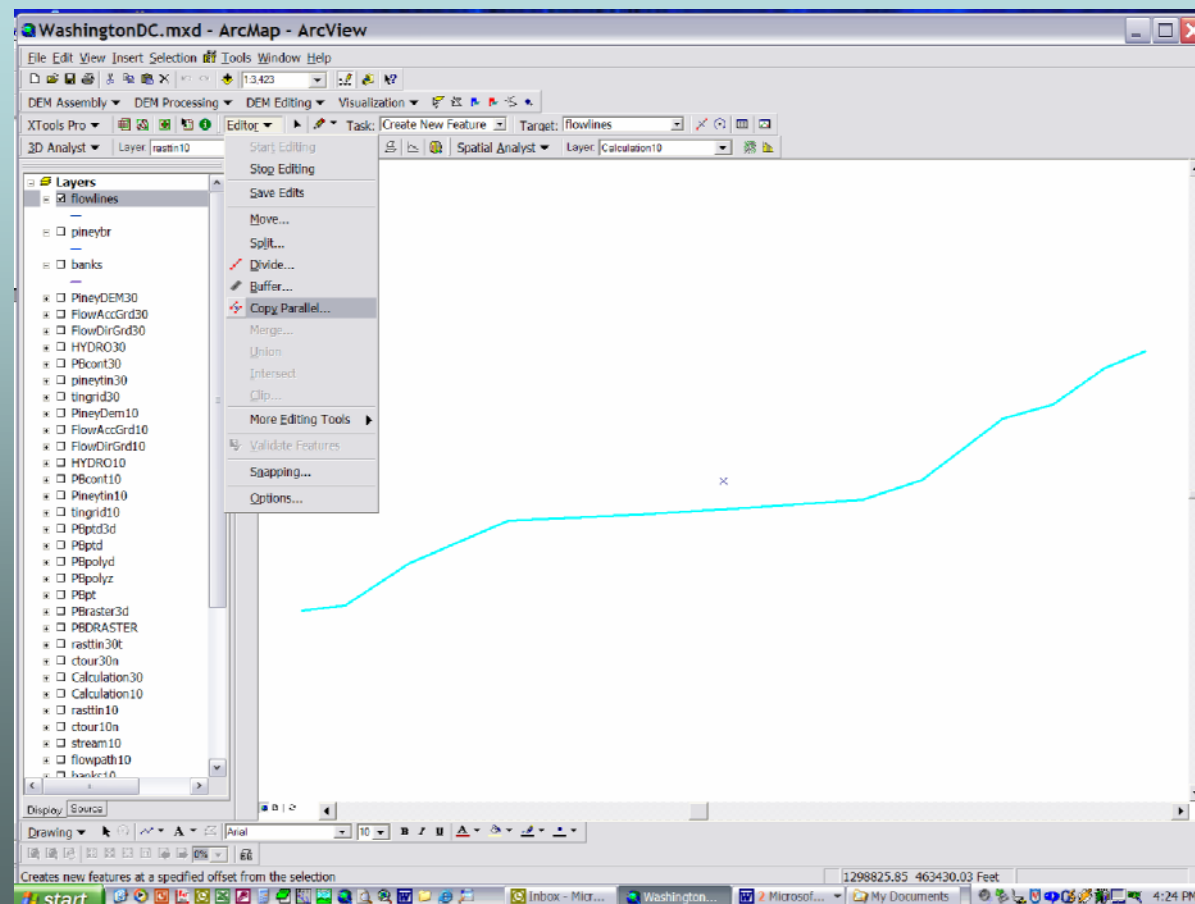


Comparison of Flow Accumulation stream lines and our digitized stream line

Step 21: Create Flowlines

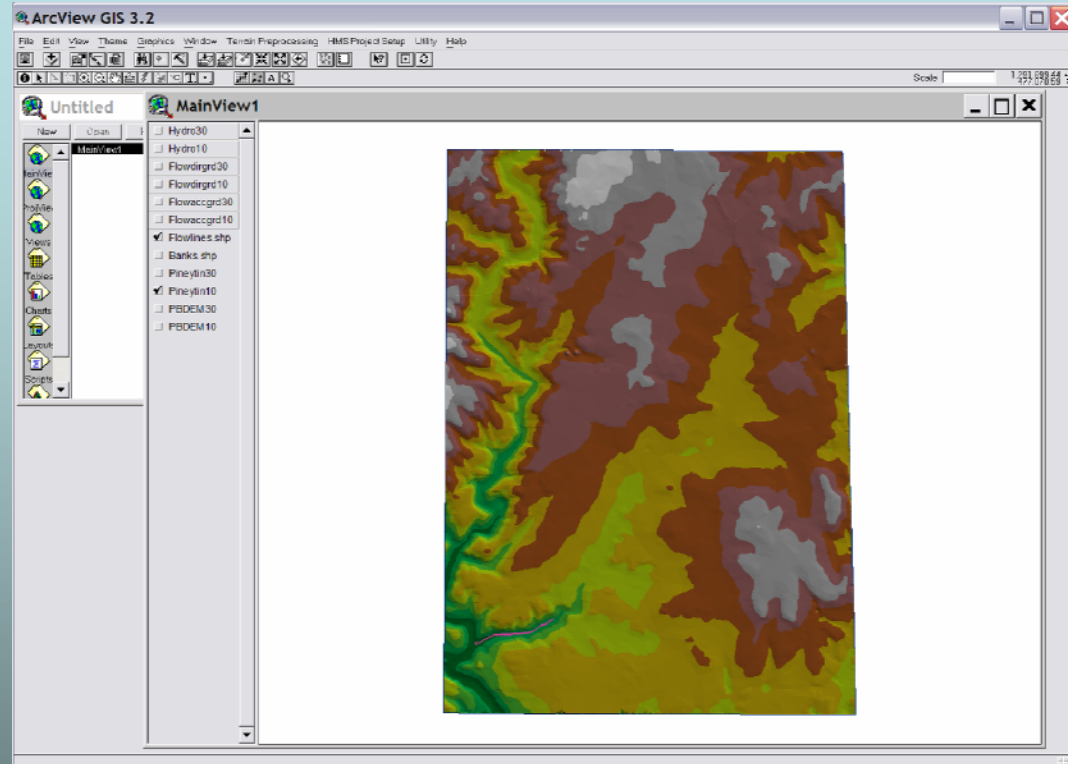
Step 22: Create Top of Bank lines

Flowlines and top of bank lines can also be quickly developed by coping lines parallel to the digitized stream line



We now switch to ArcView 3.X and begin using HEC's GeoHMS extension

- Step 1: Prepare ArcView
- Step 2: Add data created previously in ArcMap (10-foot DEM with stream burn in)

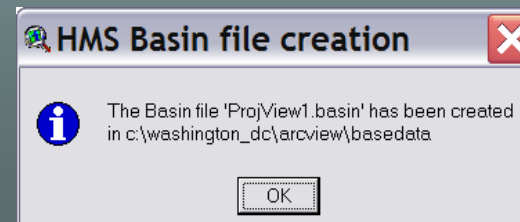
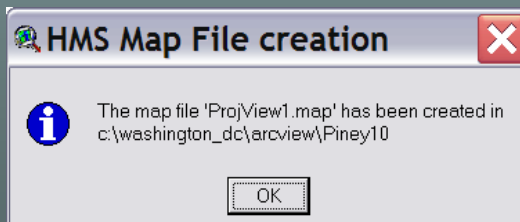
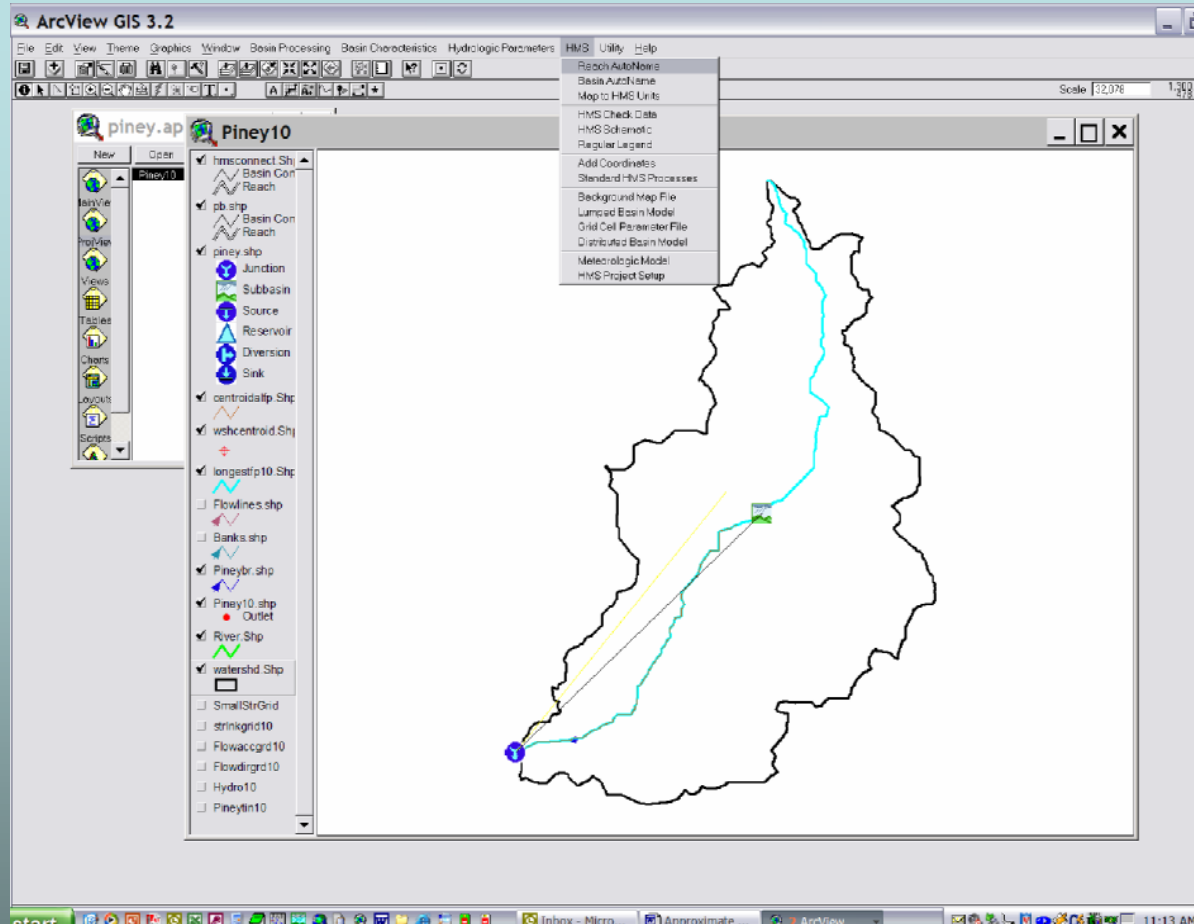


Step 3: Step through GeoHMS Terrain Preprocessing

The screenshot displays the ArcView GIS 3.2 interface with the 'Terrain Preprocessing' menu open. The background shows a map with a color-coded terrain. Several dialog boxes are overlaid, illustrating the steps of the terrain preprocessing workflow:

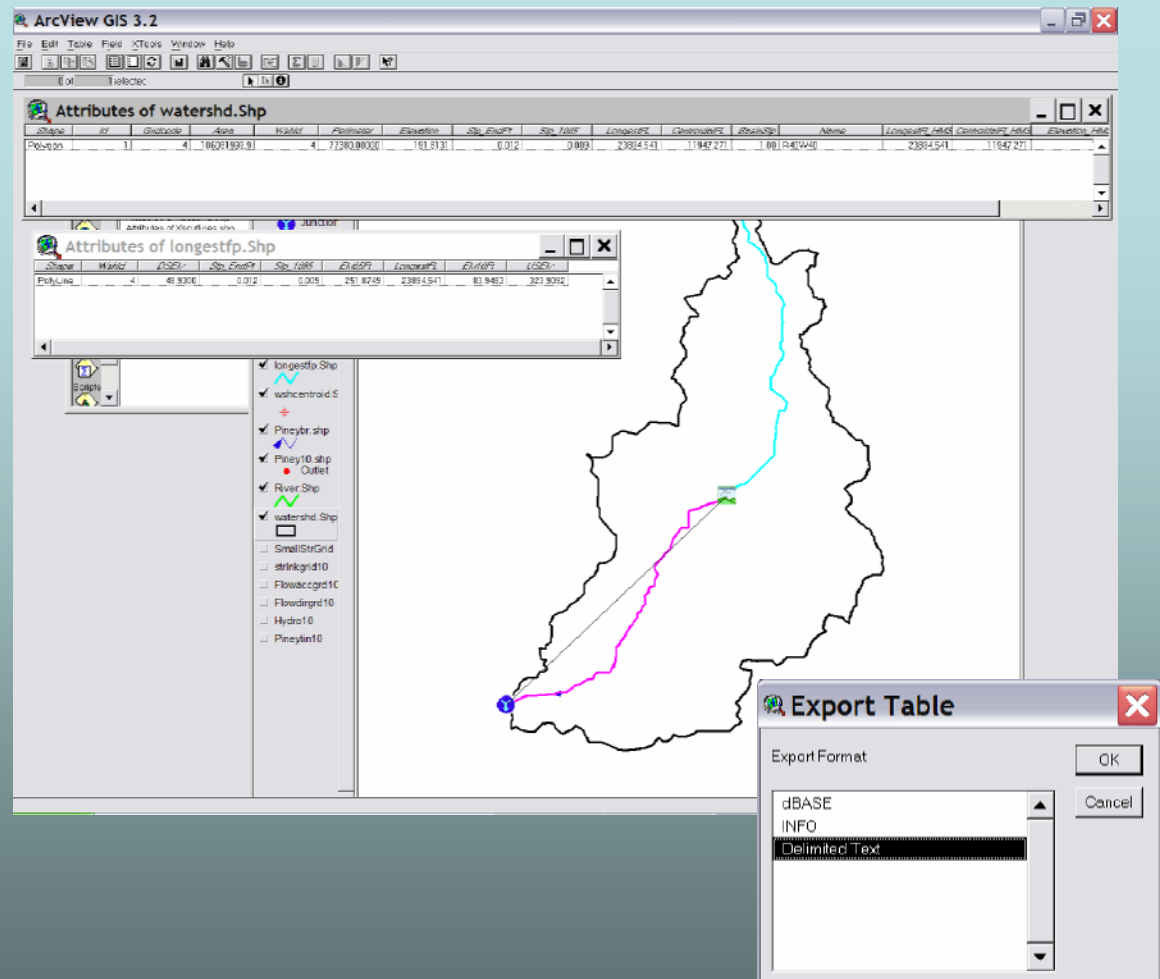
- Themes Used in Preproces...:** A list of themes with dropdown menus for selection:
 - HydroDEM: Hydro10
 - FlowDirGrid: Flowdirgrd10
 - FlowAccGrid: Flowaccgrd10
 - StreamGrid: NULL
 - LinkGrid: (empty)
 - WaterGrid: (empty)
 - Watershed: (empty)
 - River: (empty)
 - Aggregated: (empty)
- Stream GRID Definition:** A dialog box for defining stream parameters:
 - FlowAccGrid: Flowaccgrd10
 - StreamGrid: StrGrid10
- Stream Link GRID Definition:** A dialog box for defining stream link parameters:
 - FlowDirGrid: Flowdirgrd10
 - StreamGrid: strgrid10
- Stream Segment Processing:** A dialog box for processing stream segments:
 - LinkGrid: strlinkgrid10
 - FlowDirGrid: Flowdirgrd10
 - River: River10
- GRID Watershed Delineation:** A dialog box for delineating watersheds:
 - FlowDirGrid: Flowdirgrd10
 - LinkGrid: strlinkgrid10
 - WaterGrid: WShedGrid10
- Stream Threshold Defi...:** A dialog box for selecting a stream initiation threshold type:
 - Threshold type: Area in Distance Units squared
- Enter the Area in Distance ...:** A dialog box for entering the largest drainage area:
 - Largest drainage area: 1.53178e+019 feet squared
 - Input value: 25000000
- Watershed Polygon Proces...:** A dialog box for processing watershed polygons:
 - WaterGrid: wshedgrid10
 - Watershed: WshedShp10
- Creating Aggregated Wate...:** A dialog box for creating aggregated watersheds:
 - River: River10.shp
 - Watershed: Wshedshp10.Shp
 - AggregatedWatershed: WshedMq10.shp

Step 4: Create Study Area

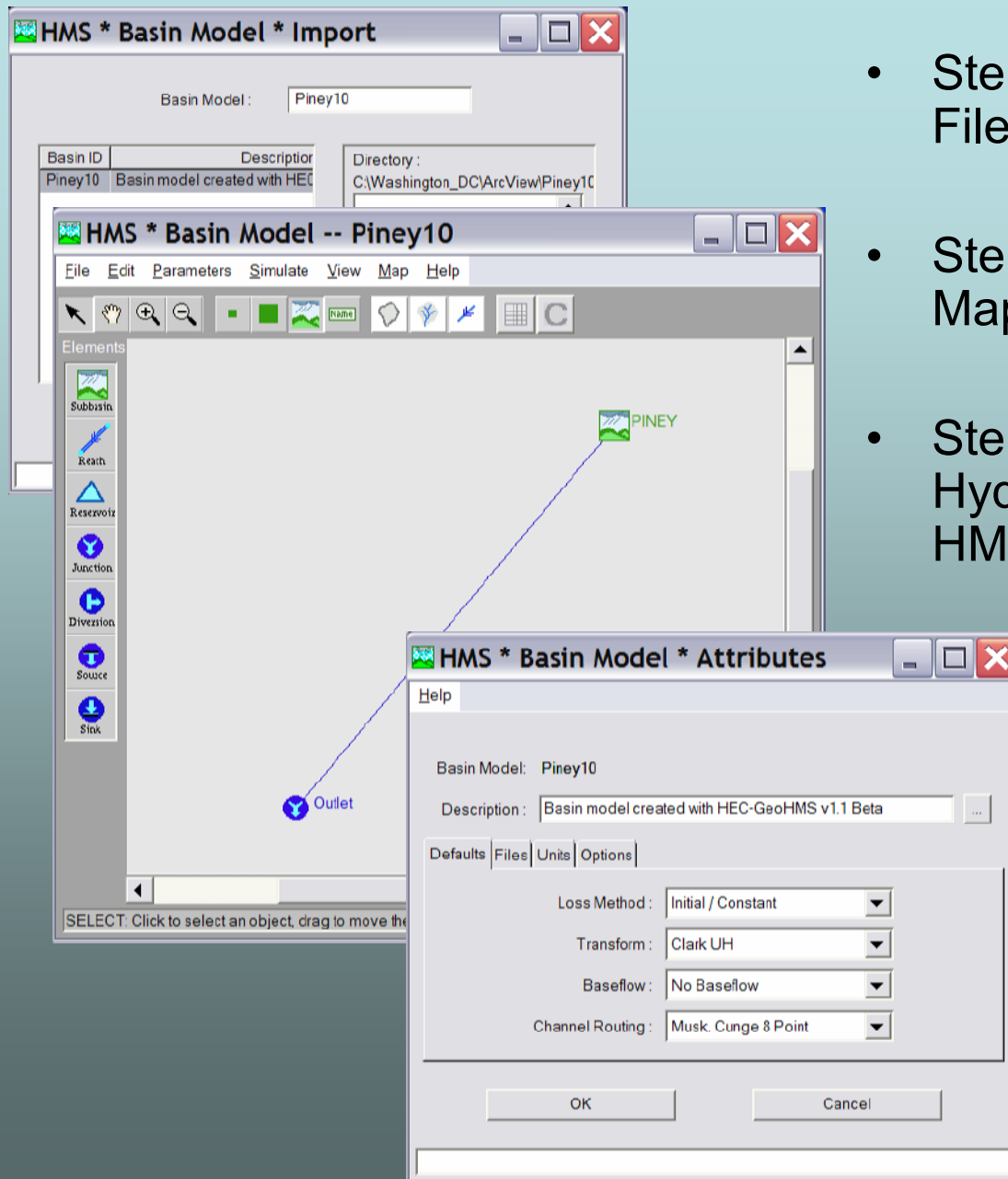


- Step 5: HMS Basin Characteristics
- Step 6: HMS Export File Creation
- Step 7: Export Basin Data for Input into EXCEL

Note: must select centroid procedure along stream



Step 9: Create a HMS File



- Step 10: Import the Basin File Created in ArcView
- Step 11: Bring in the Basin Map Created in ArcView
- Step 12: Enter the Hydrologic Parameters into HMS

Step 13: Get Hypothetical Rainfall Data from Internet

The image displays two overlapping browser windows from the NOAA's National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS).

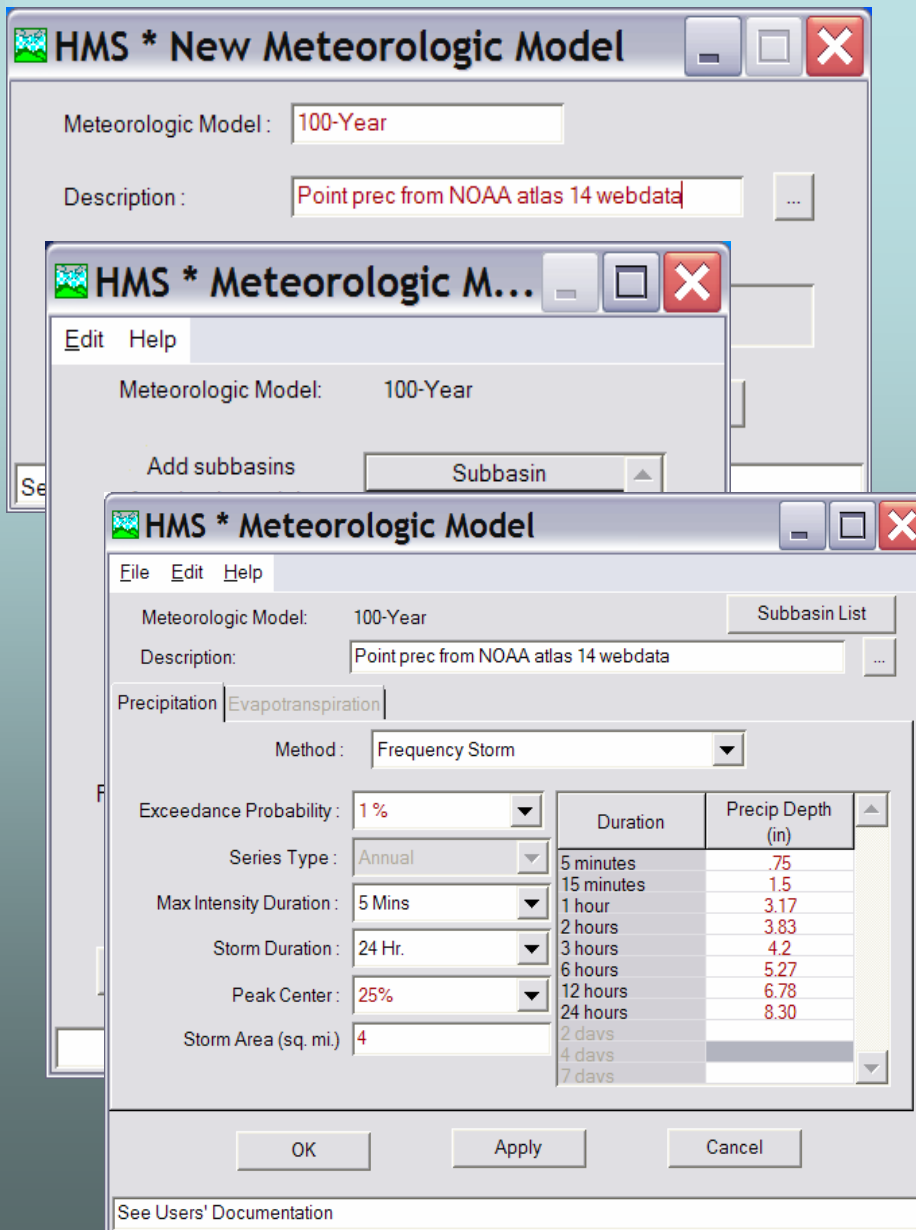
The background window shows the main PFDS interface. At the top, it reads "NOAA's National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server". Below this is a navigation menu with options like "News", "Organization", and "Search". A search bar contains "All NWS Search". A "State:" dropdown menu is set to "Choose a state (or click map)", with a "Load" button next to it. A map of the United States is shown, with several states (including CA, NV, UT, AZ, CO, KS, MN, WI, MI, IN, OH, PA, NY, VA, NC, TN, and AL) highlighted in purple. A legend indicates "Updated data available." for these states. A welcome message states: "Welcome to NOAA's National Weather Service Precipitation Frequency Data Server (PFDS)! NEW! FINAL documentation for NOAA Atlas 14 Volume 1 is now available."

The foreground window is titled "MARYLAND" and shows a detailed map of the state with a grid overlay. The map is color-coded, with green and yellow areas. To the right of the map are several input fields and buttons for data selection:

- Reset** button
- Data type:** (NOAA Atlas 14 Precipitation Frequency Estimates)
- Partial duration or annual maxima based results:**
 - Partial duration (PD) (dropdown)
 - Partial duration (PD) (dropdown)
 - Annual maxima (AM) (dropdown)
 - Units: inches or mm (dropdown)
- Select specific observing site from list.**
 - Select observing site (dropdown)
 - Submit site** button
- Enter fixed location.**
 - Latitude: list (input field)
 - Longitude: lon (input field)
 - Submit location** button
- Use map for selecting location.**
 - Location linked to map - click on map to submit.
 - Latitude: 38.689 (input field)
 - Longitude: -75.603 (input field)
 - Decimal degrees | Grid resolution: 30-sec (.0003 decimal deg.)
 - Image resolution is less than actual underlying grid data.
- Elevation (feet):** 32 (input field) *Inferred from 30-sec DEM.*
- Area estimate - COMING SOON!**
- Enter ordered list of perimeter coordinates in decimal degrees:** (input field)

At the bottom of the Maryland window, it says "Projection: Geographic; Elevation data based on resampled (3- to 10-sec) Digital Terrain Elevation Data (DTED)".

Step 14: Input Frequency Rainfall Data into a HMS MET file



HMS * New Meteorologic Model

Meteorologic Model: 100-Year

Description: Point prec from NOAA atlas 14 webdata

HMS * Meteorologic M...

Edit Help

Meteorologic Model: 100-Year

Add subbasins Subbasin

HMS * Meteorologic Model

File Edit Help

Meteorologic Model: 100-Year Subbasin List

Description: Point prec from NOAA atlas 14 webdata

Precipitation Evapotranspiration

Method: Frequency Storm

Exceedance Probability: 1%

Series Type: Annual

Max Intensity Duration: 5 Mins

Storm Duration: 24 Hr.

Peak Center: 25%

Storm Area (sq. mi.): 4

Duration	Precip Depth (in)
5 minutes	.75
15 minutes	1.5
1 hour	3.17
2 hours	3.83
3 hours	4.2
6 hours	5.27
12 hours	6.78
24 hours	8.30
2 days	
4 days	
7 days	

OK Apply Cancel

See Users' Documentation

Step 15: Set a Control Specification and Run Model

Note:

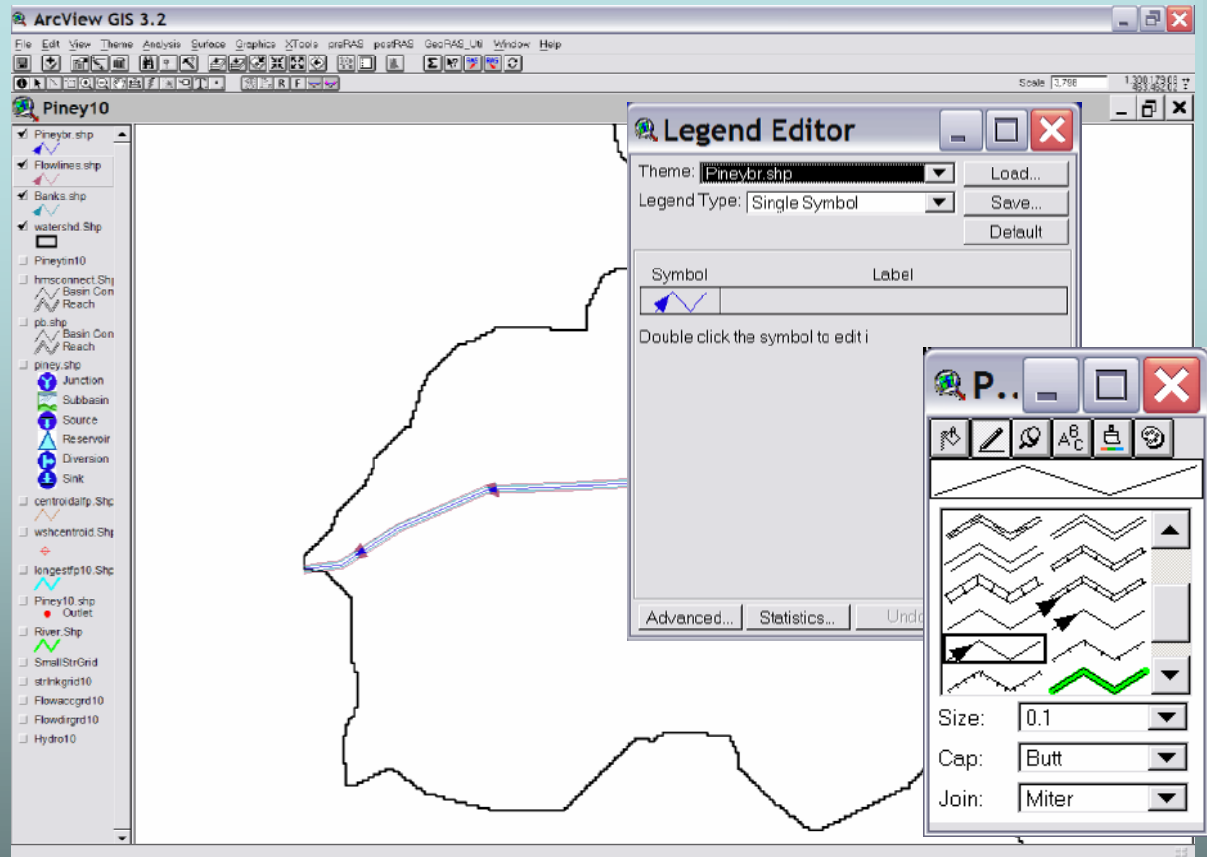
You now have both a peak discharge and a complete runoff hydrograph for the 100-year frequency storm.

Now let's develop a HEC-RAS model utilizing HEC's GeoRAS

- Step 16: Begin Developing RAS Export File using GeoRAS
- Step 17: Covert Stream, banks and flowlines to GeoRAS Shapefiles

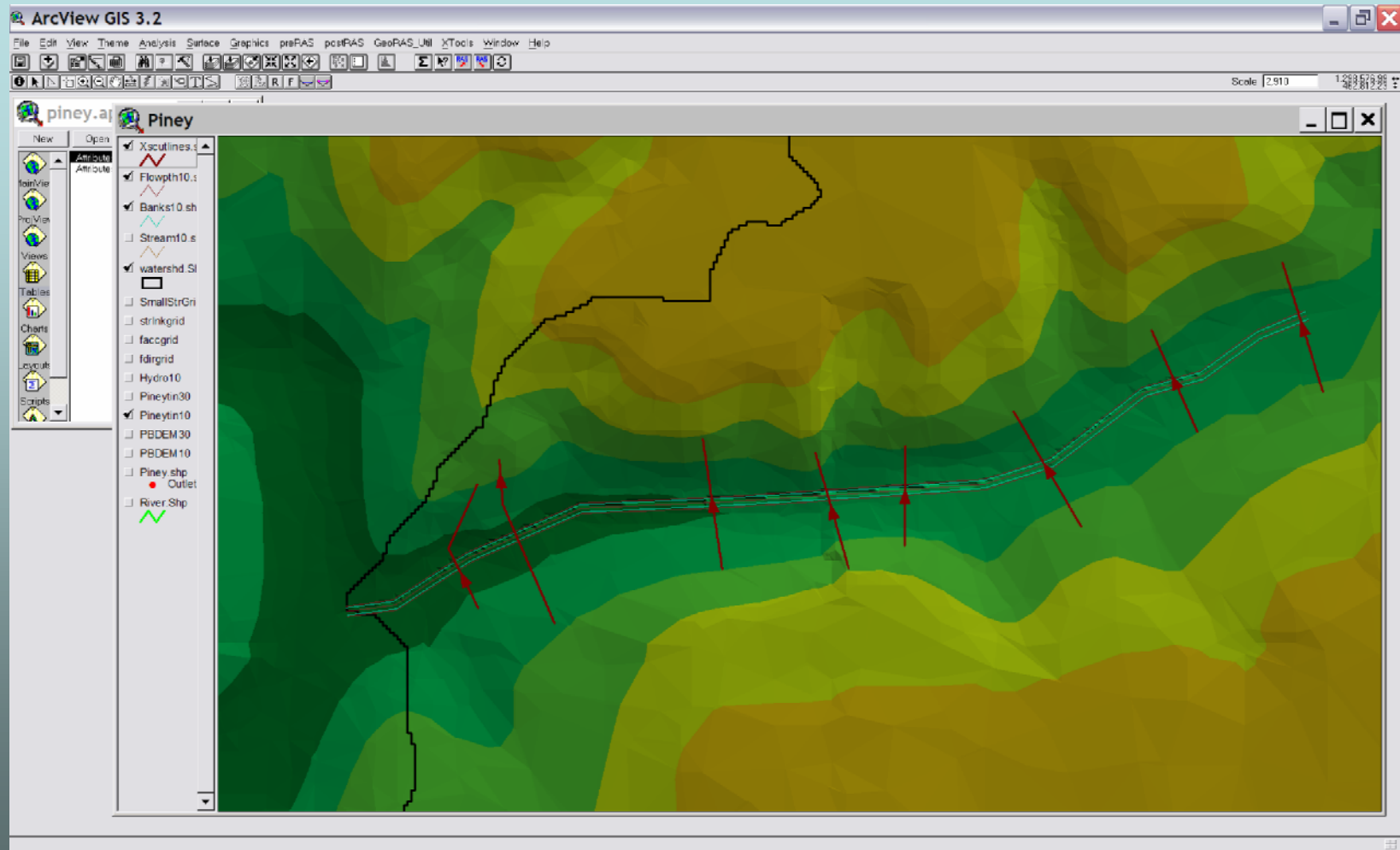
Note:

Change line symbols to lines with arrows to insure proper direction for RAS



Step 18: Create Cross Sections for RAS model

Note: Make sure the final TIN file from ArcMap is added into work area



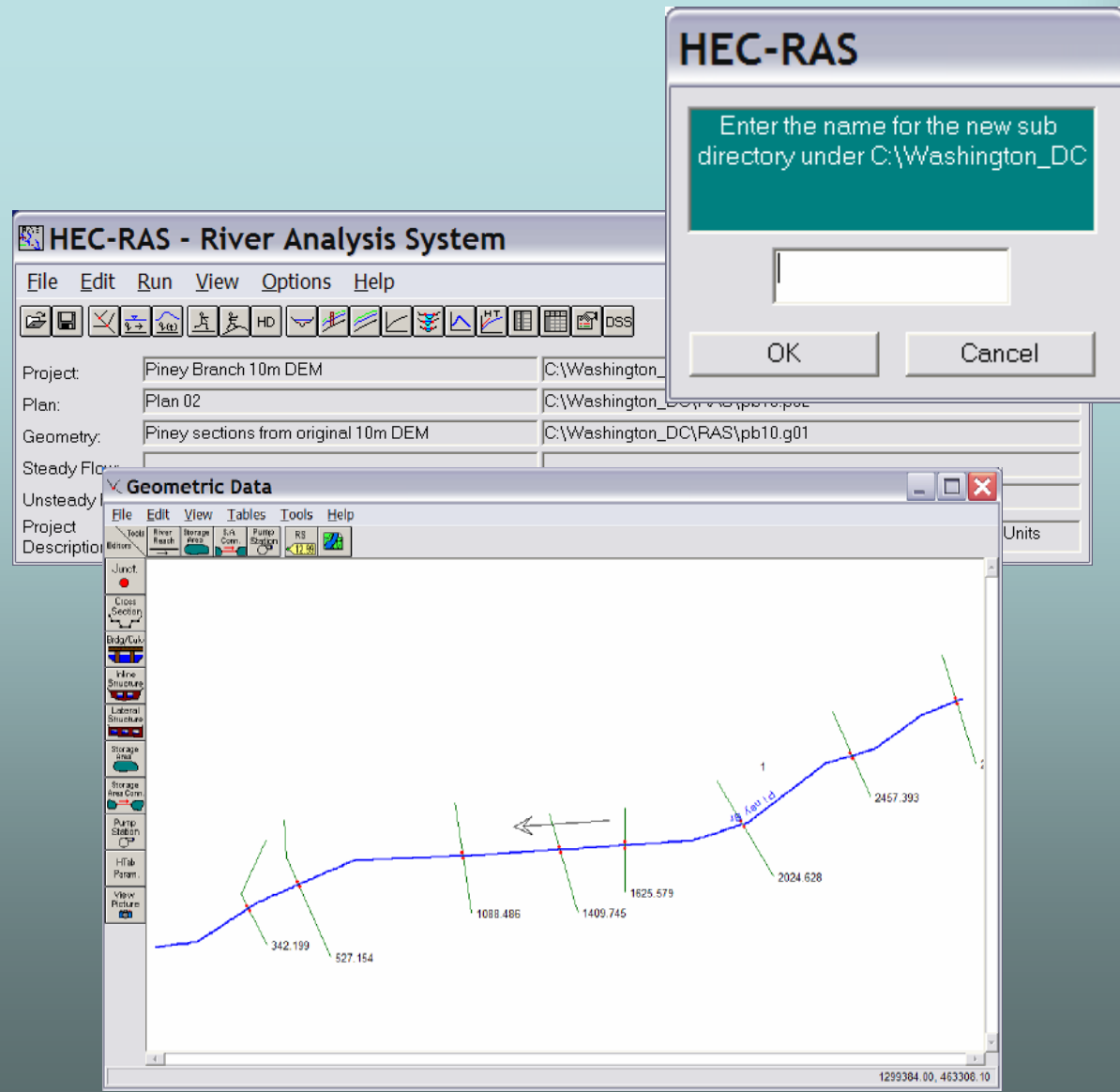
Step 19: Complete preRAS Processing

The screenshot displays four overlapping dialog boxes from the HEC-GeoRAS software interface:

- GeoRAS Theme Selecti...:** A configuration window with the following settings:
 - Terrain TIN*: Pineytin10
 - Input Data:
 - Stream Centerline (2D): Stream10.shp
 - XS Cut Lines (2D)*: Xscutlines.shp
 - Main Channel Banks: Banks10.shp
 - Flow Path Centerlines: Flowpth10.shp
 - Levees (2D): Null
 - Land Use: Null
 - Ineffective Flow Areas: Null
 - Storage Areas: Null
 - Intermediate Data:
 - Stream Centerline (3D): Null
 - XS Surface Line (3D): Null
 - Levees (3D): Null
 - RAS GIS Import Fil: [Empty] .RASImpo
- River an...:** A dialog box for entering river and reach information:
 - Enter or select a River name, and enter a Reach name. (16 characters max.)
 - River: Piney Br
 - Reach: 1
- HEC-GeoRAS: Editing F...:** A dialog box for editing flowpath types:
 - Enter Flowpath type for selected features:
 - Flowpath type: Left
 - Buttons: OK, Cancel
- RAS GIS Import File Gene...:** An information dialog box:
 - Icon: Information (i)
 - Message: RAS GIS Import File created successfully.
 - Button: OK

Step 20: Create HEC-RAS file

Create a RAS project and save, then open Geometric Data in import the export file created in Step 19 by GeoRAS



Step 21: Set Bank Stations and n-values

This can be done quickly by setting each column of data at a time

Edit Manning's n or k Values

River: Edit Interpolated XS's

Reach:

Channel n Values have a blue background

Selected Area Edit Options

	River Station	Frctn (n/K)	n #1	n #2	n #3
1	2852.559	n			
2	2457.393	n			
3	2024.628	n			
4	1625.579	n			
5	1409.745	n			
6	1088.486	n			
7	527.154	n			
8	342.199	n			

Step 22: Improve geometry data

Channel Modification - 20-foot bottom with channel

River: Piney Br
 Reach: 1
 Upstream Riv Sta: 2952.559
 Downstream Riv Sta: 3421.199

Modified Geometry: [Dropdown]
 Cut and Fill Areas: [Dropdown]
 Rotation Angle: 41
 Azimuth Angle: 24

Compute Cuts Reset Lengths

Cut	Center	Bottom	Invert	Left	Right	Cut
Cuts (ft)	Width	Elev	Slope	Slope	n(K/ft)	
1	y	20	1	1		
2						
3						

Same cut to all sections
 Project cut from upper RS at slope
 Project cut from lower RS at slope
 Fill Channel Apply Cuts to Selected Range

RS	Frdr	LOB	Channel	ROB	Fill Chan	Center	Bottom	Invert	Left	Right	Cut	Center	Bottom	Invert	Left	Right	
	(ft)		Length	Length	(sqm)	Sta	Width	Elev	Slope	Slope	ft/ft	Sta	Width	Elev	Slope	Slope	
1	2652.559	n	363.36	365.2	395.96	n											
2	2457.393	n	431.01	432.72	434.52	n											
3	2024.629	n	467.2	393.04	390.8	n											
4	2192.672	n	511.56	515.8	520.15	n											

Cut across section until cut daylight occurs
 Select the end of the range for applied cuts.

XS Interpolation by Reach

River: Piney Br
 Reach: 1
 Upstream Riv Sta: (All RS)
 Downstream Riv Sta: (All RS)
 Maximum Distance between XS's: 100
 2 Decimal places
 Delete Interpolated XS's Interpolate XS's
 Close Help
 Enter max distance between interp XS's.

Graphic XS Editor

File Options
 River: Piney Br Comparison XS Persistence Scale
 Reach: 1 RS: 3421.199
 Description: [Text Box]
 Bank Station Tools: [Buttons: +LB, LB, +RB, RB, etc.]

Elevation (ft) vs Station (ft) graph. The y-axis ranges from 50 to 110, and the x-axis ranges from 0 to 400. A black line represents the ground profile, and red dots represent bank station points. A legend indicates 'Ground' (black line) and 'Bank Sta' (red dot).

Move Objects

Geometric Data - 20-foot bottom with

File Edit View Tables Tools Help

Tools: River Reach, Storage Area, S/A Even, Pump Station, RS, [Buttons]

Junct. [Buttons]
 Cross Section [Buttons]
 Body/Cut [Buttons]
 In-line Structure [Buttons]
 Lateral Structure [Buttons]
 Storage Area [Buttons]
 Storage Area Cont [Buttons]
 Pump Station [Buttons]
 In-line Piping [Buttons]
 View Picture [Buttons]

Detailed view of the channel geometry showing cross-sections at various stations. The channel is shown in blue, and the ground profile is in black. Stationing is provided for various points along the channel.

1299980.00, 463297.10

Step 23: Input Steady Flow Data, Run and Export GIS data

Steady Flow Data

File Options Help

Enter/Edit Number of Profiles (2000 max):

Locations of Flow Data Changes

River:

Reach: River Sta.:

Flow Change Location		Profile Names and Flow Rates	
River	Reach	RS	PF 1
1 Piney Br	1	2852.559	

Edit Steady flow data for the profiles (cfs)

Steady Flow Analysis

File Options Help

Plan: Short ID:

Geometry File:

Steady Flow File:

Flow Regime

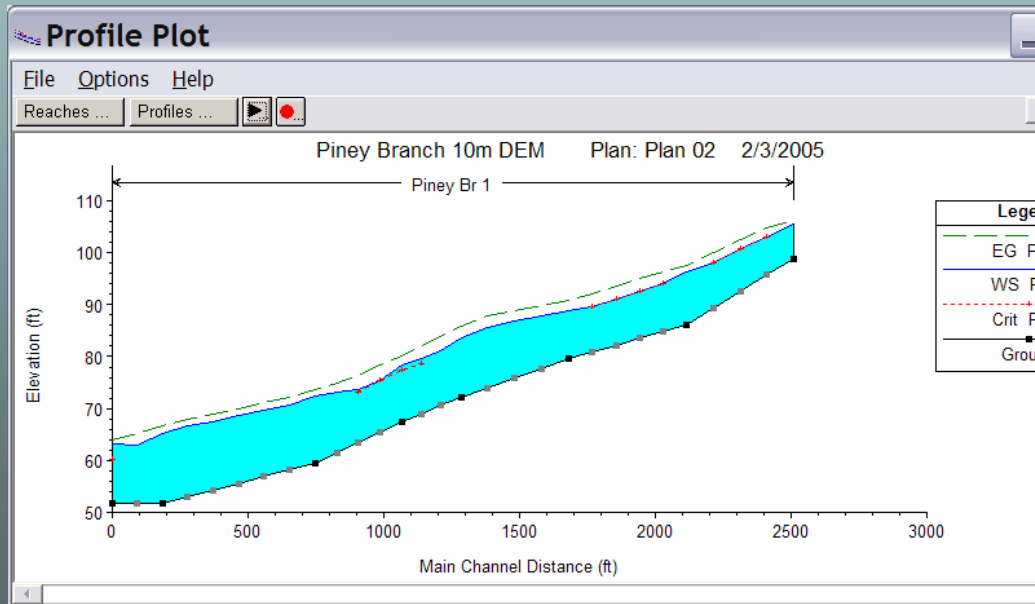
Subcritical

Supercritical

Mixed

Plan Description:

Enter to compute water s...



GIS Export

Export File:

Results Export Options

Export Water Surfaces

Profiles to Export:

Export Velocity Distribution Information where available.

Use version 2.2 export format

Geometry Data Export Options

Export River (Stream) Centerlines

Cross Section Surface Lines

Export User Defined Cross Sections (all XS's except Interpolated XS's)

Export Interpolated Cross Sections

Entire Cross Section

Channel only

Additional Properties

Reach Lengths

Bank Stations

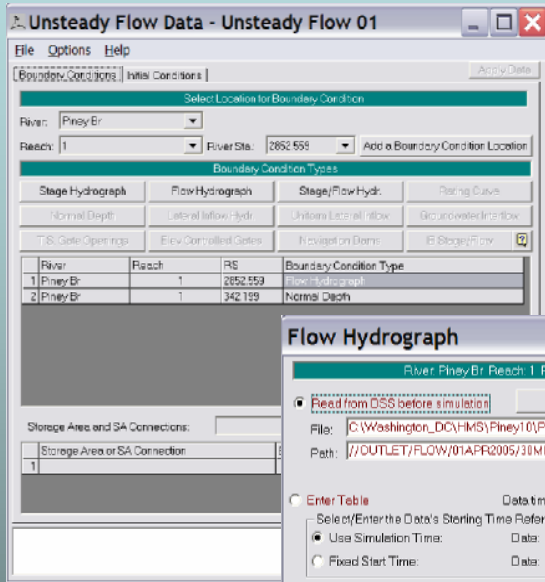
Levees

Ineffective Areas

Blocked Obstructions

Step 24: Input UnSteady Flow Data, Run and Export GIS data

Note: It is just a easy to run the UnSteady version of RAS since you have already computed the entire runoff hydrograph in HMS



Unsteady Flow Data - Unsteady Flow 01

File Options Help

[Boundary Conditions] Initial Conditions [Apply Data]

Select Location for Boundary Condition

River: Piney Br

Reach: 1 River Sta: 2852.553 Add a Boundary Condition Location

Boundary Condition Types

Stage Hydrograph Flow Hydrograph Stage/Flow Hydrograph Rating Curve

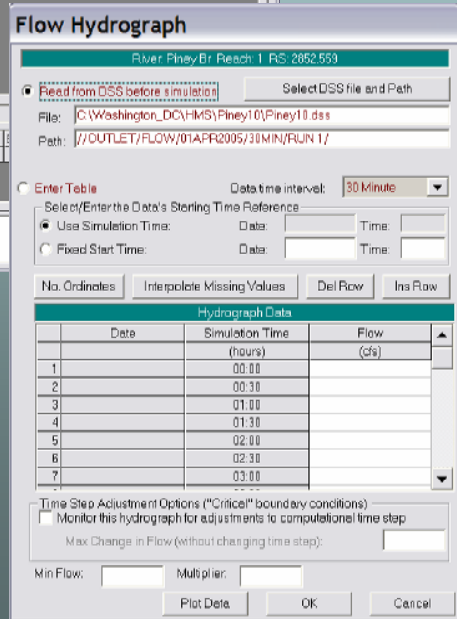
Normal Depth Lateral Inflow Hydrograph Uniform Lateral Inflow Backwatered Inflow

T/S Gate Openings Flow Controlled Gates Inflow on Dams In Stage/Flow

River	Reach	RS	Boundary Condition Type
1 Piney Br	1	2852.553	Flow Hydrograph
2 Piney Br	1	342.189	Normal Depth

Storage Area and SA Connections:

Storage Area or SA Connection
1



Flow Hydrograph

River: Piney Br Reach: 1 RS: 2852.553

Read from DSS before simulation Select DSS file and Path

File: C:\Washington_DC\HMS\Piney10\Piney10.dss

Path: \\OUTLET\FLOW\01APR2005\30MIN\RUN 1\

Enter Table Data time interval: 30 Minute

Select/Enter the Data's Starting Time Reference

Use Simulation Time: Date: Time:

Fixed Start Time: Date: Time:

No. Ordinates Interpolate Missing Values Del Row Ins Flow

Hydrograph Data		
Date	Simulation Time (hours)	Flow (cfs)
1	00:00	
2	00:30	
3	01:00	
4	01:30	
5	02:00	
6	02:30	
7	03:00	

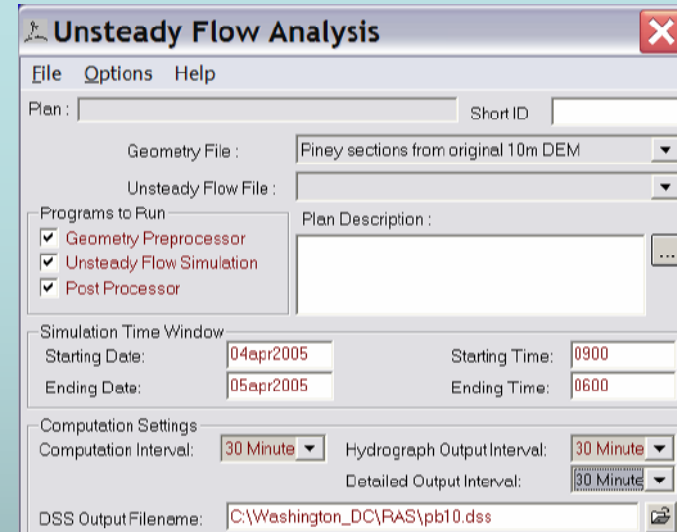
Time Step Adjustment Options ("Critic" boundary conditions)

Monitor this hydrograph for adjustments to computational time step

Max Change in Flow (without changing time step):

Min Flow: Multiplier:

Plot Data OK Cancel



Unsteady Flow Analysis

File Options Help

Plan: Short ID

Geometry File: Piney sections from original 10m DEM

Unsteady Flow File:

Programs to Run:

- Geometry Preprocessor
- Unsteady Flow Simulation
- Post Processor

Plan Description:

Simulation Time Window

Starting Date: 04apr2005 Starting Time: 0900

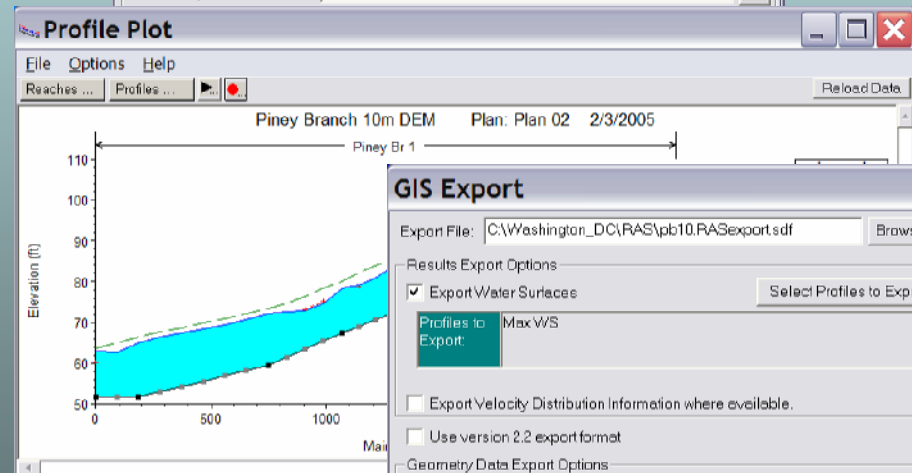
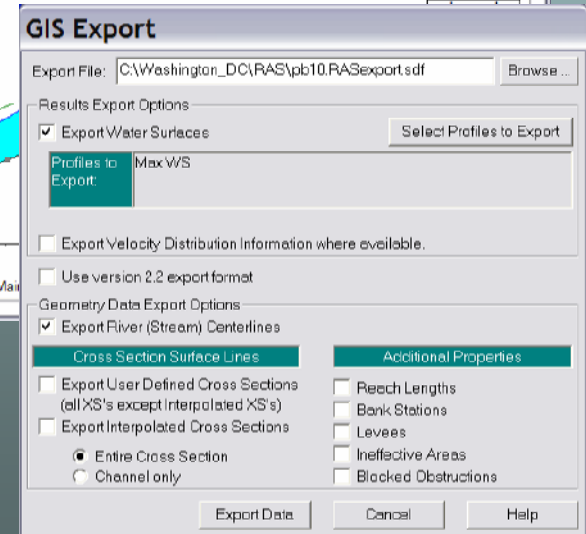
Ending Date: 05apr2005 Ending Time: 0600

Computation Settings

Computation Interval: 30 Minute Hydrograph Output Interval: 30 Minute

Detailed Output Interval: 30 Minute

DSS Output Filename: C:\Washington_DC\RAS\pb10.dss

GIS Export

Export File: C:\Washington_DC\RAS\pb10.RASexport.sdf Browse...

Results Export Options

Export Water Surfaces

Profiles to Export: Max WS

Export Velocity Distribution Information where available.

Use version 2.2 export format

Geometry Data Export Options

Export River (Stream) Centerlines

Cross Section Surface Lines

- Export User Defined Cross Sections (all XS's except Interpolated XS's)
- Export Interpolated Cross Sections
- Entire Cross Section
- Channel only

Additional Properties

- Reach Lengths
- Bank Stations
- Levees
- Ineffective Areas
- Blocked Obstructions

Export Data Cancel Help

Step 25: Run postRAS in ArcView for Steady Flow

Step 26: Run postRAS in ArcView for Unsteady Flow

