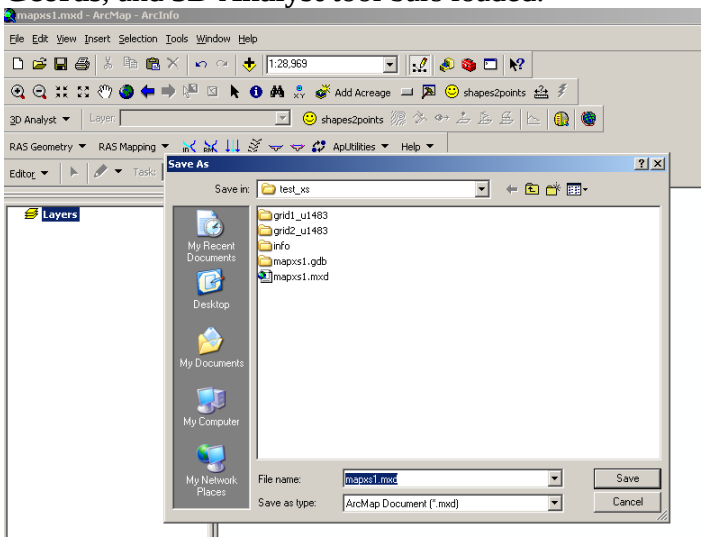
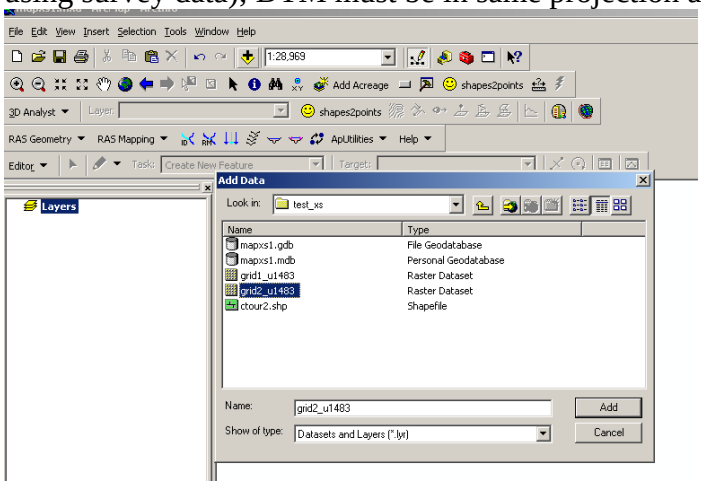
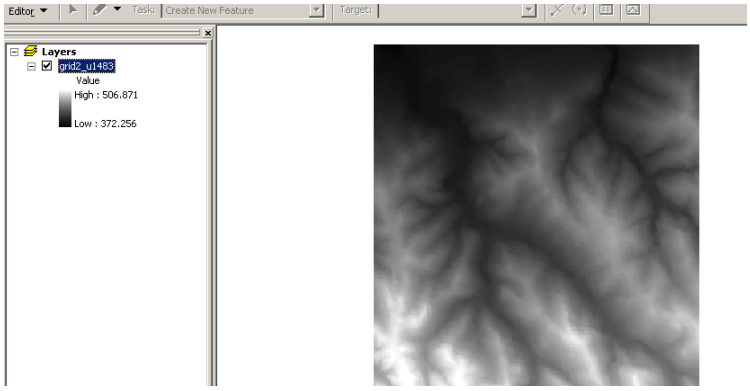
Using Hec-GeoRas to Extract Cross Sections from a DTM for HEC/RAS Input

Open **Arcmap** and create a new mxd file (**File/New or File/Save As**); must have **Editor**, **Georas**, and **3D Analyst** tool bars loaded.



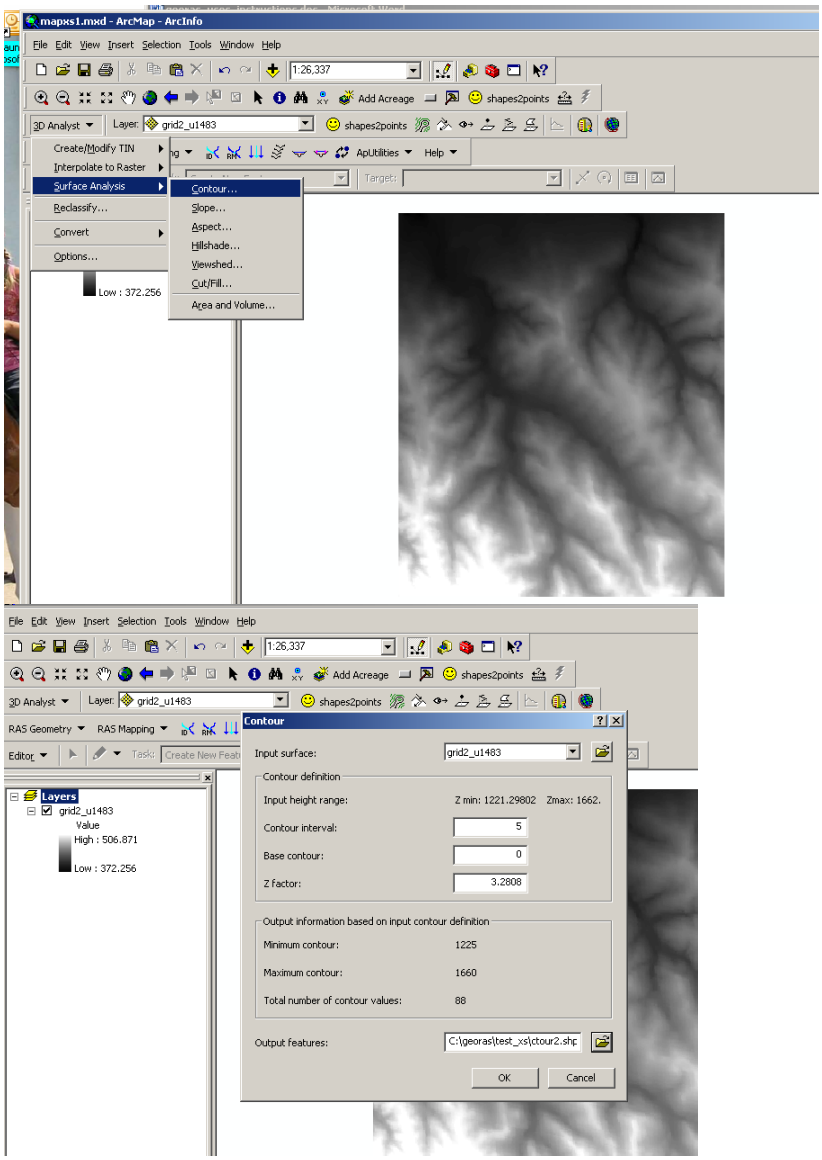
Add a DTM in tin or grid format (using existing DEM grid or previously created TIN using survey data); DTM must be in same projection as the other datasets used.



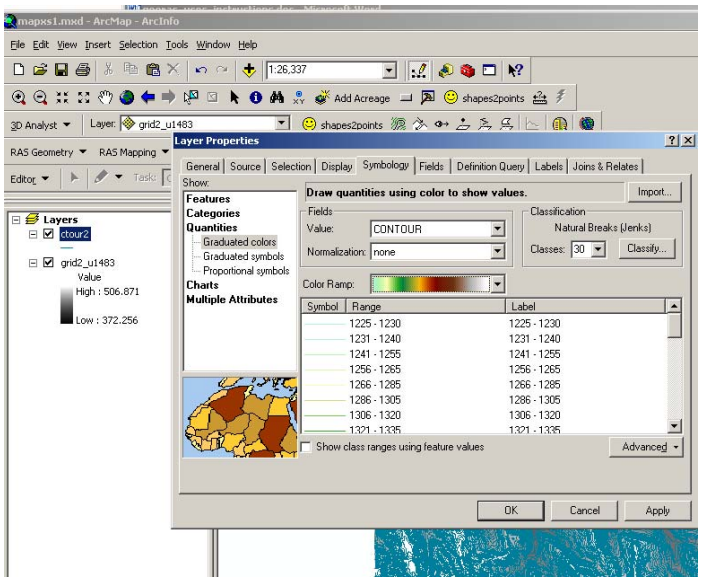


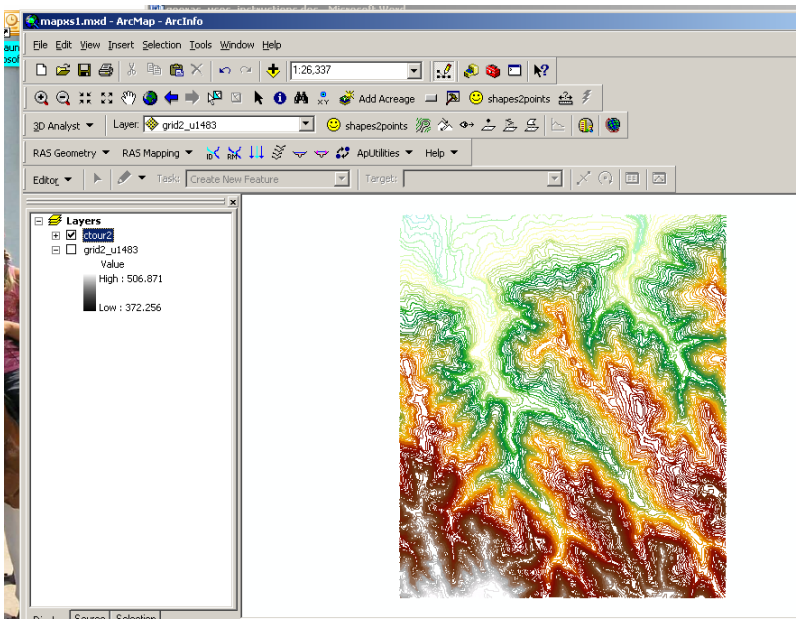
*To cut out a part of a 10- or 30-meter DEM grid, open arc/grid, mape gridname, display 9999, grids gridname, setwindow * (draw box around area of interest), gridnew = gridold, quit; this creates a smaller DEM grid.*

Make a contour shapefile out of DTM for help in drawing xsections, flowlines, etc. using **3D Analyst/Surface Analysis/Contour.**



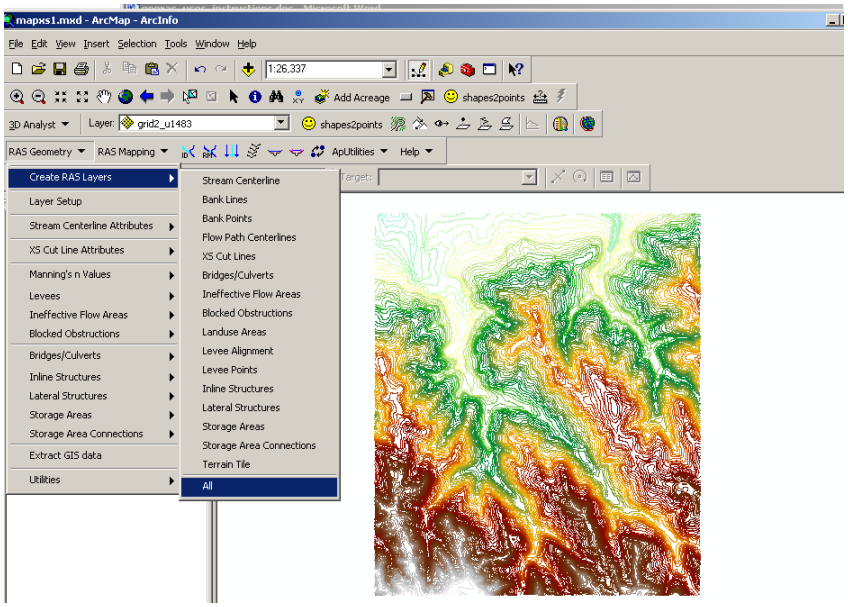
Set up display for the contour shapefile.



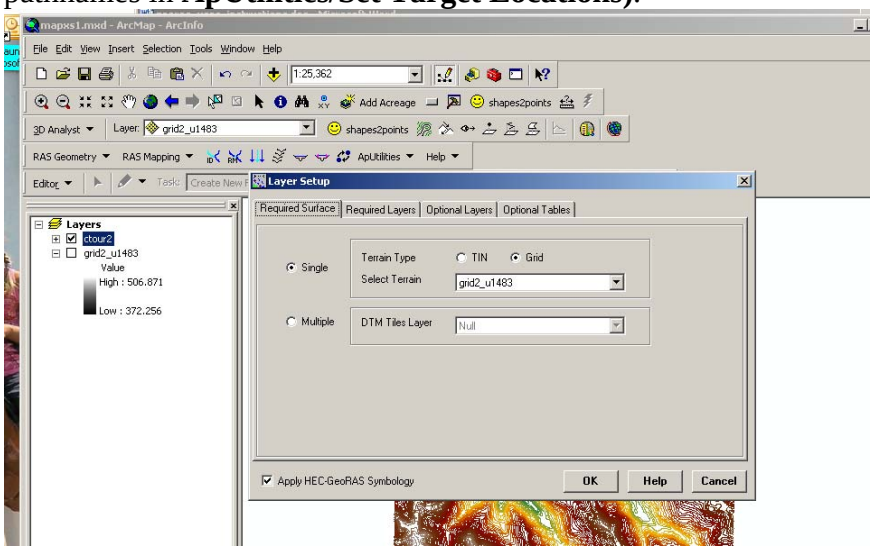


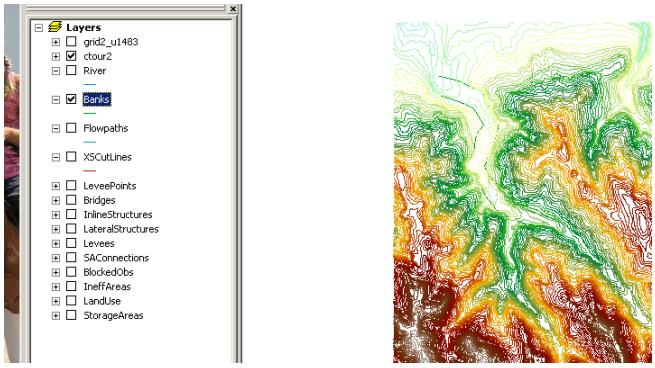
Recommend that you save map often in Arcmap to avoid lost of work.

Click on **RAS Geometry/Create RAS layers/All** to create blank layers used to prepare data to transfer to HEC/RAS.

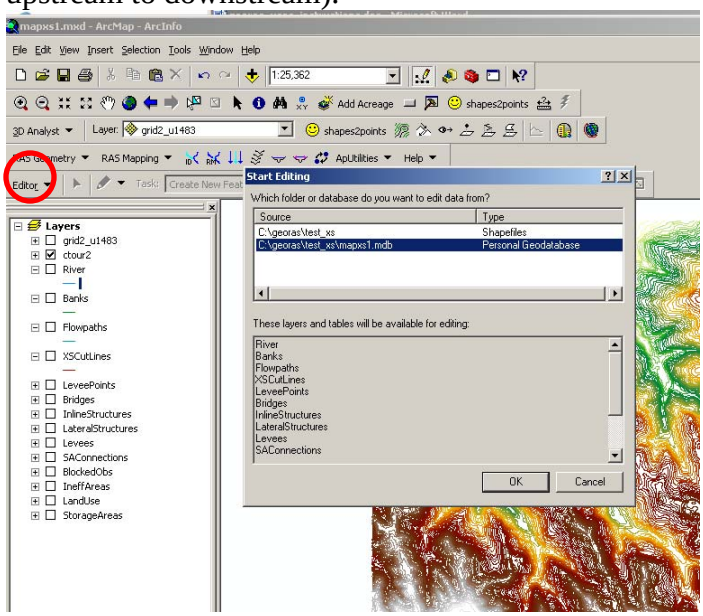


In **RAS Geometry/Set Layers**, click on type of DTM that you have (may also have to set pathnames in **ApUtilities/Set Target Locations)**.

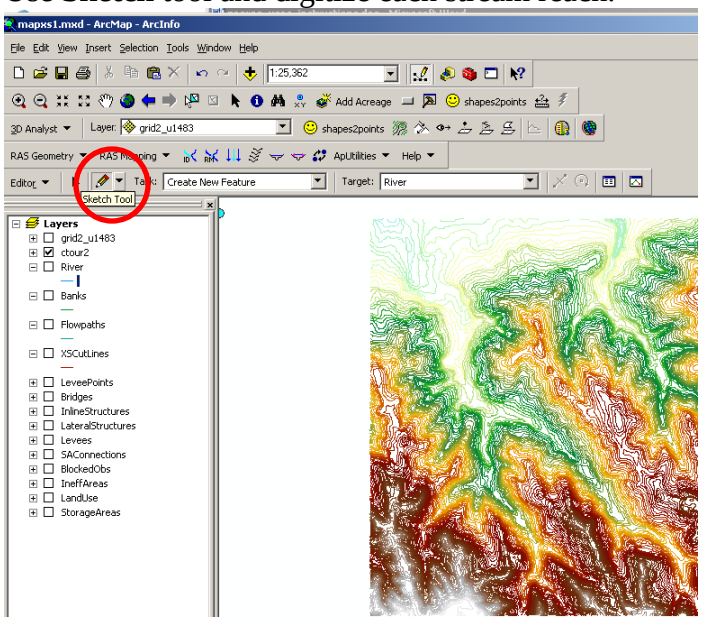




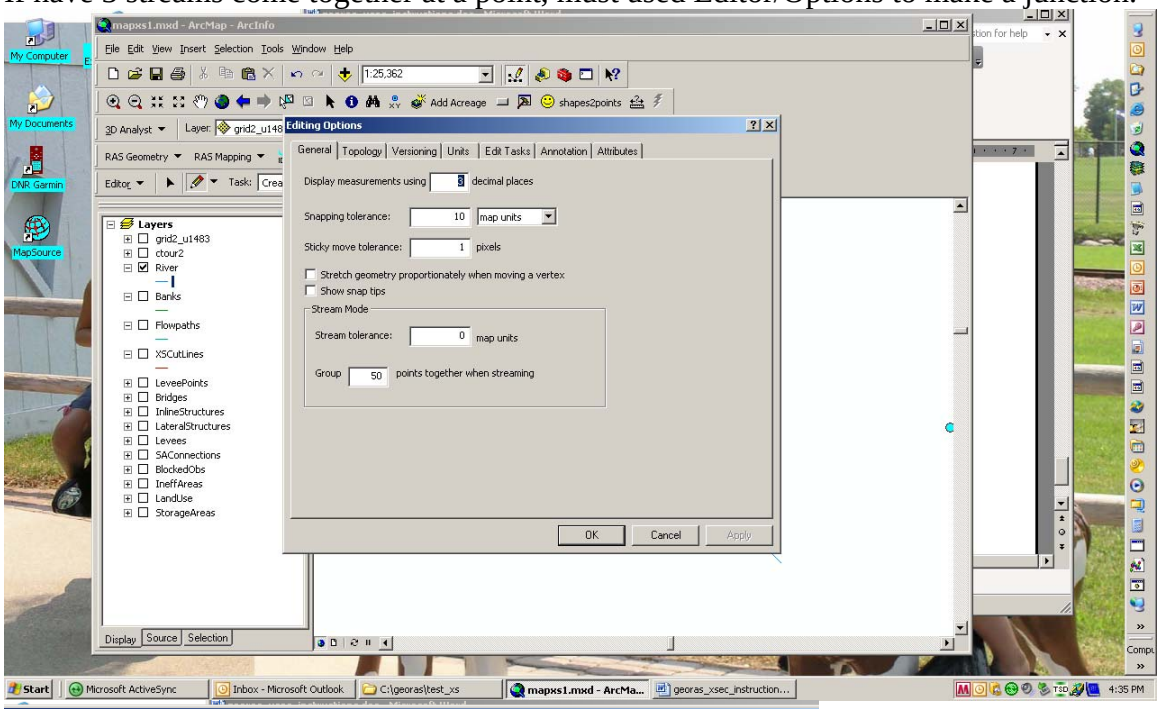
Use **Editor** to digitize stream in **River** layer in your personal geodatabase (digitize from upstream to downstream).

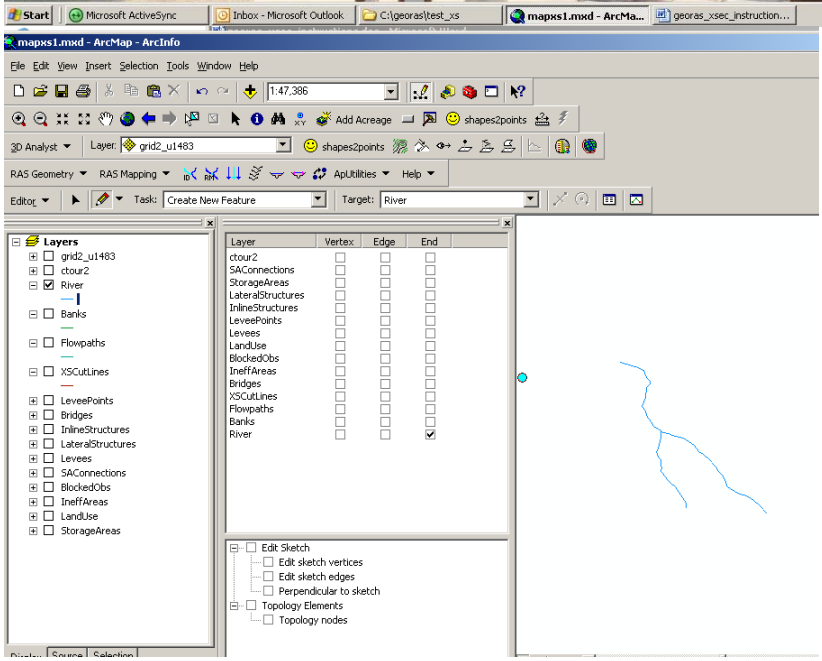


Use **Sketch** tool and digitize each stream reach.

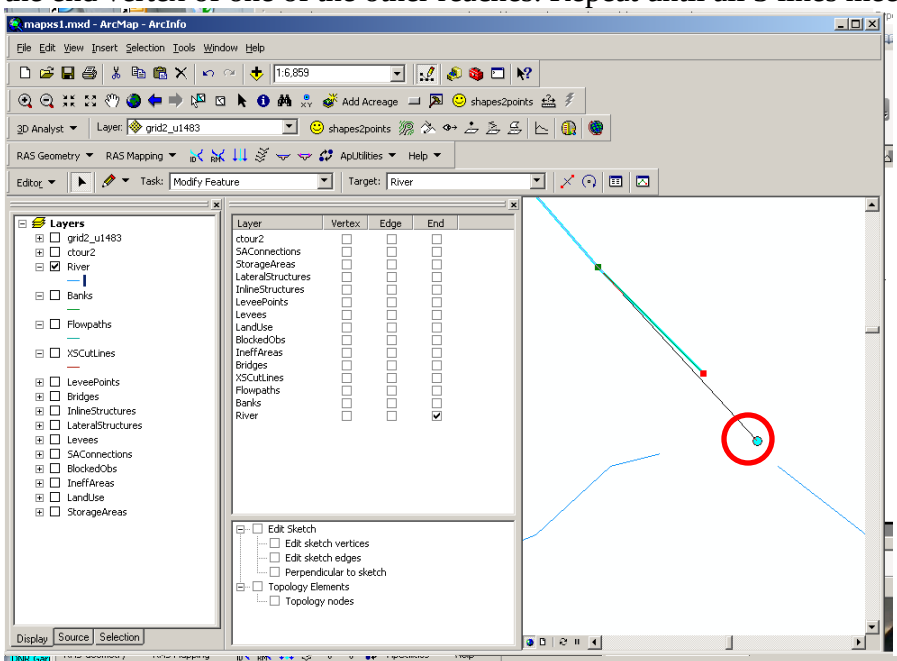


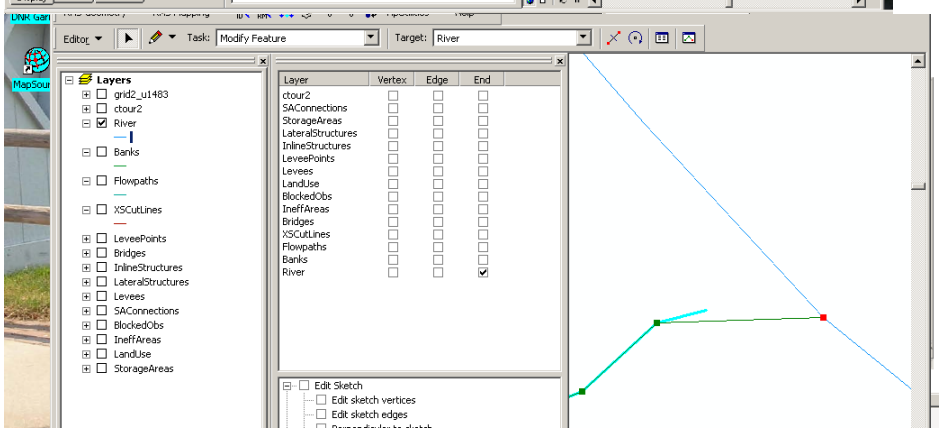
If have 3 streams come together at a point, must used Editor/Options to make a junction.



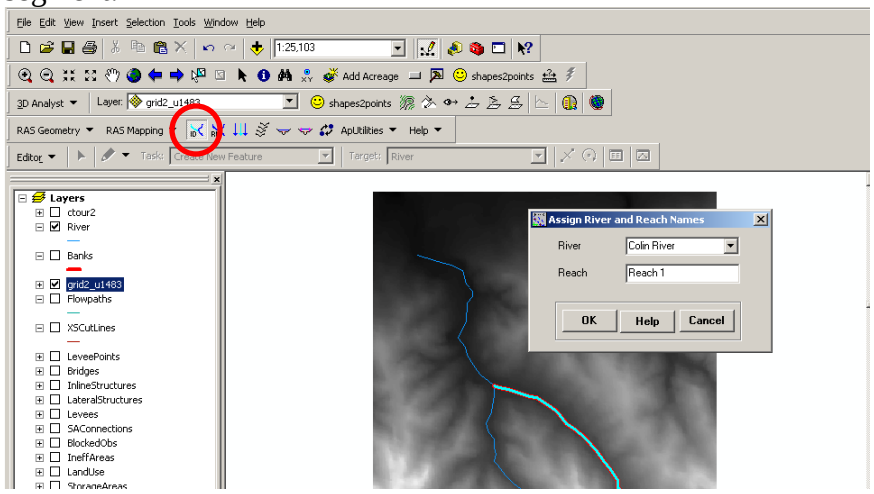


Then double click on one of the lines to expose the end vertex and move it so it joins with the end vertex of one of the other reaches. Repeat until all 3 lines meet at a point.

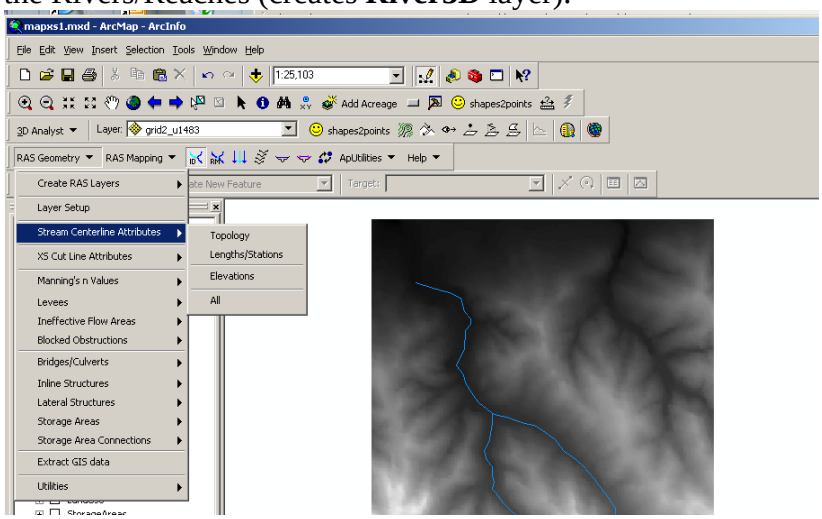




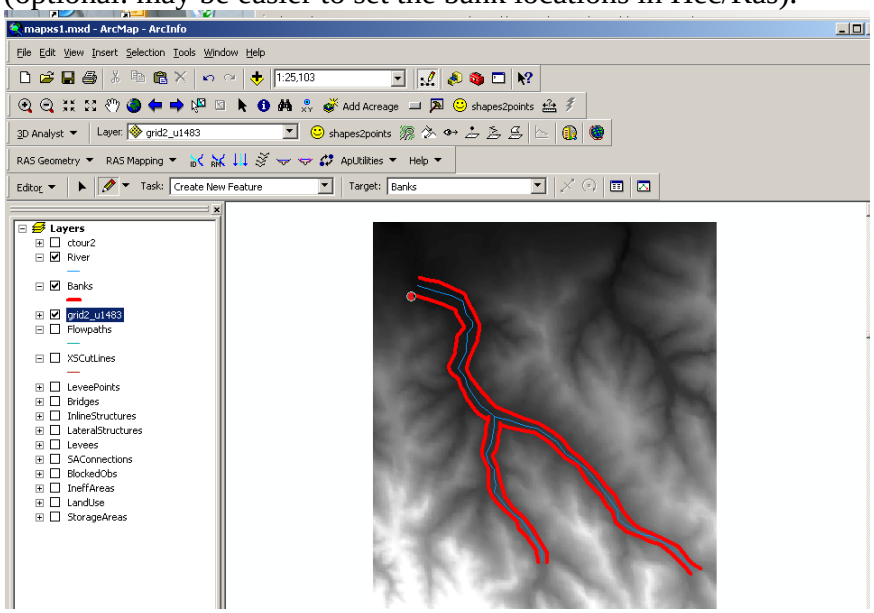
Use ID icon to **assign River/Reach Codes**; put in names of river and reach for each segment.



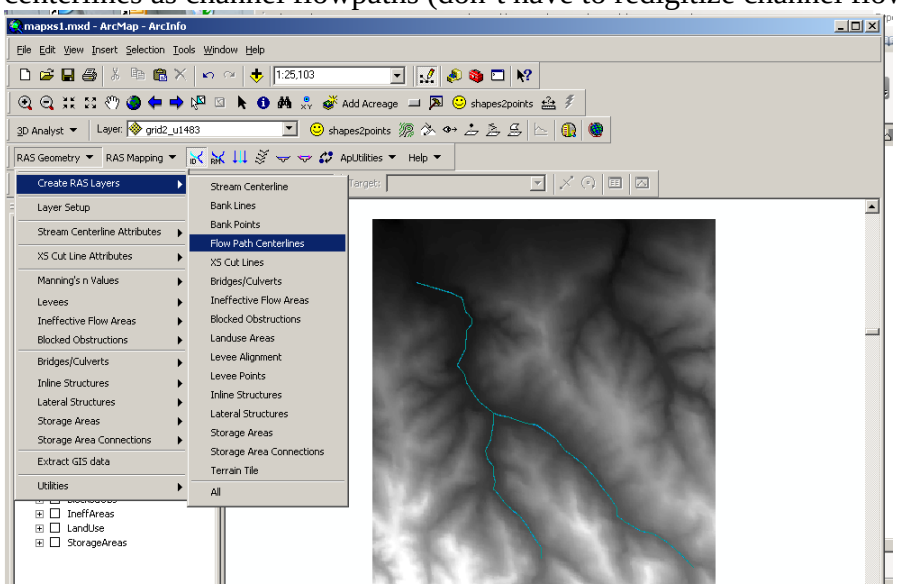
Use **RAS Geometry**, to create **Topology**, **Lengths/Stations**, and assign **Elevations** to the Rivers/Reaches (creates **River3D** layer).



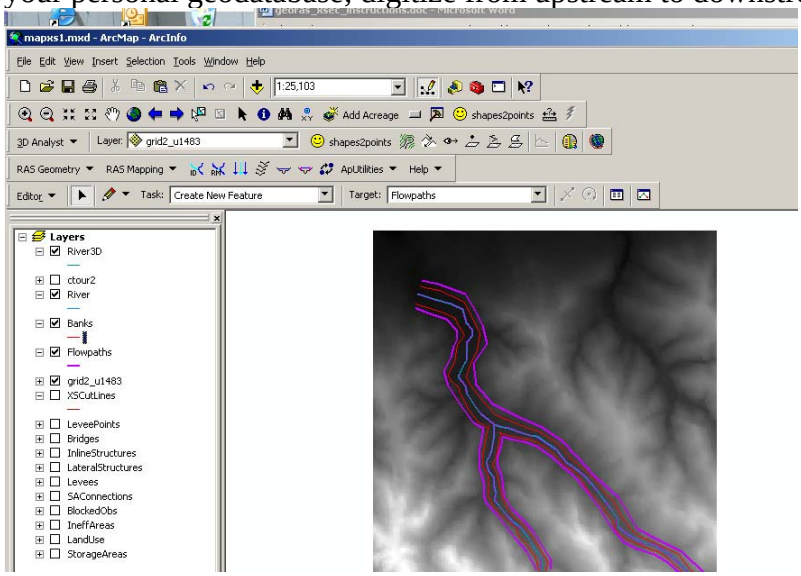
Use **Editor** to digitize stream banks in **Banks** layer in your personal geodatabase (optional: may be easier to set the bank locations in Hec/Ras).



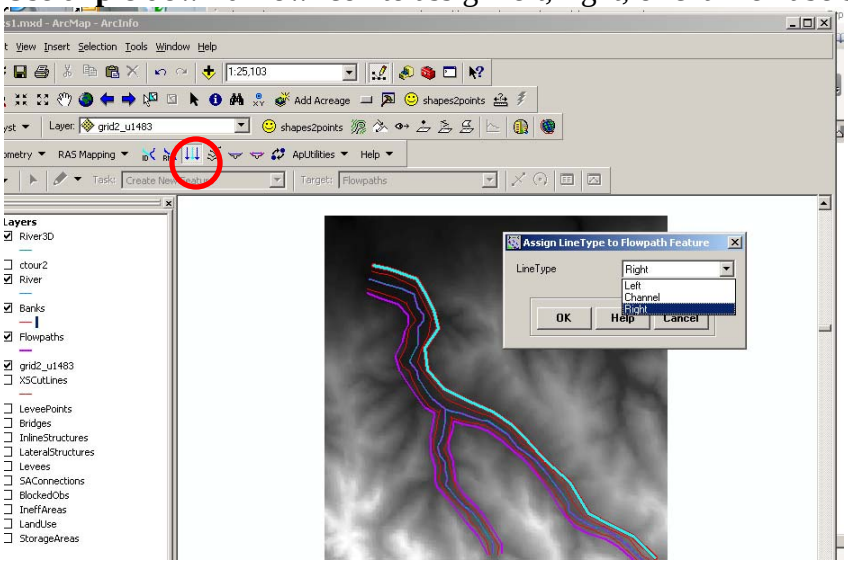
Run **RAS Geometry/Create RAS layers/Flow Path Centerlines** to use the stream centerlines as channel flowpaths (don't have to redigitize channel flowpaths).



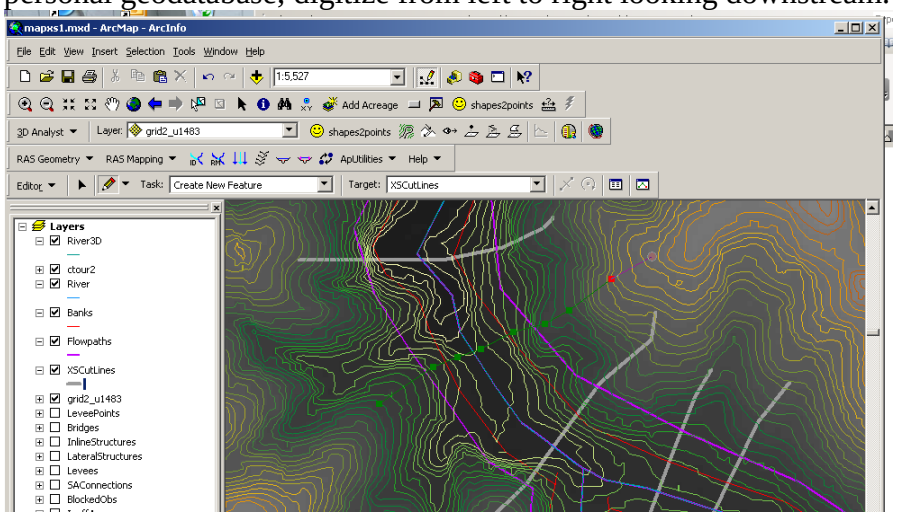
Use **Editor** to digitize the left and right overbank center flowlines in **Flowpaths** layer in your personal geodatabase; digitize from upstream to downstream.



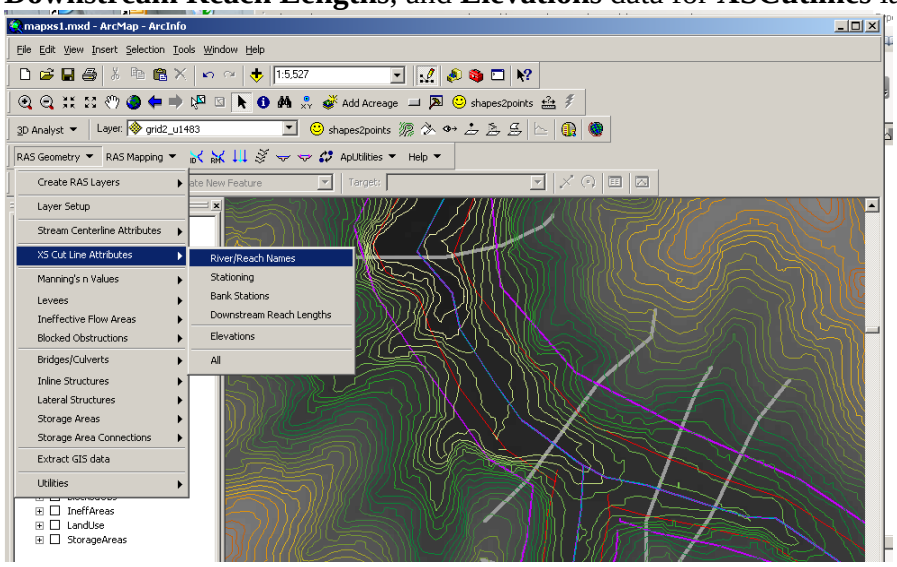
Use **triple down arrow** icon to assign left, right, or channel labels all the flowpaths.



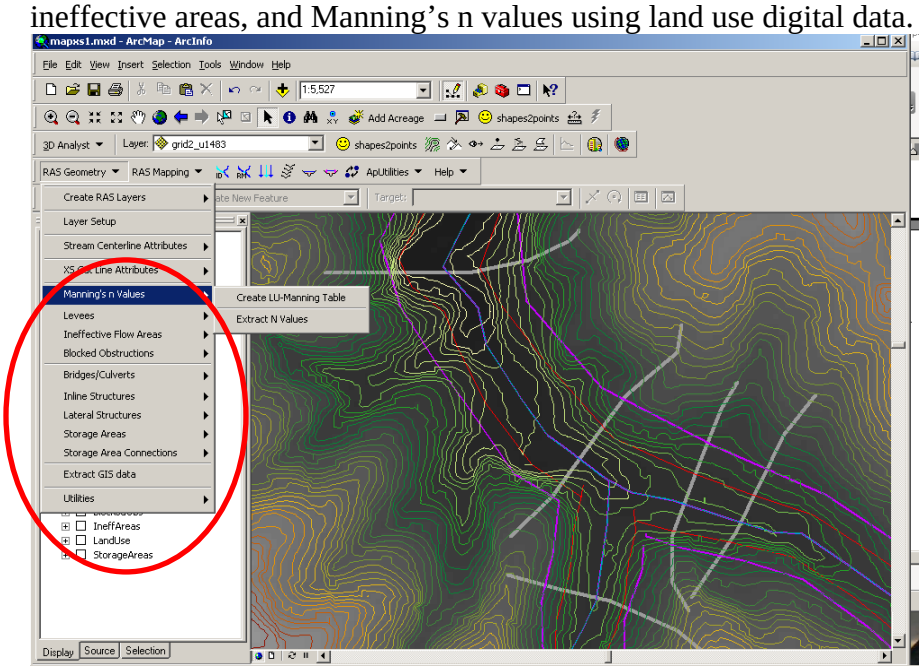
Use **Editor** to digitize the xsection locations for Hec/Ras in **XSCutlines** layer in your personal geodatabase; digitize from left to right looking downstream.



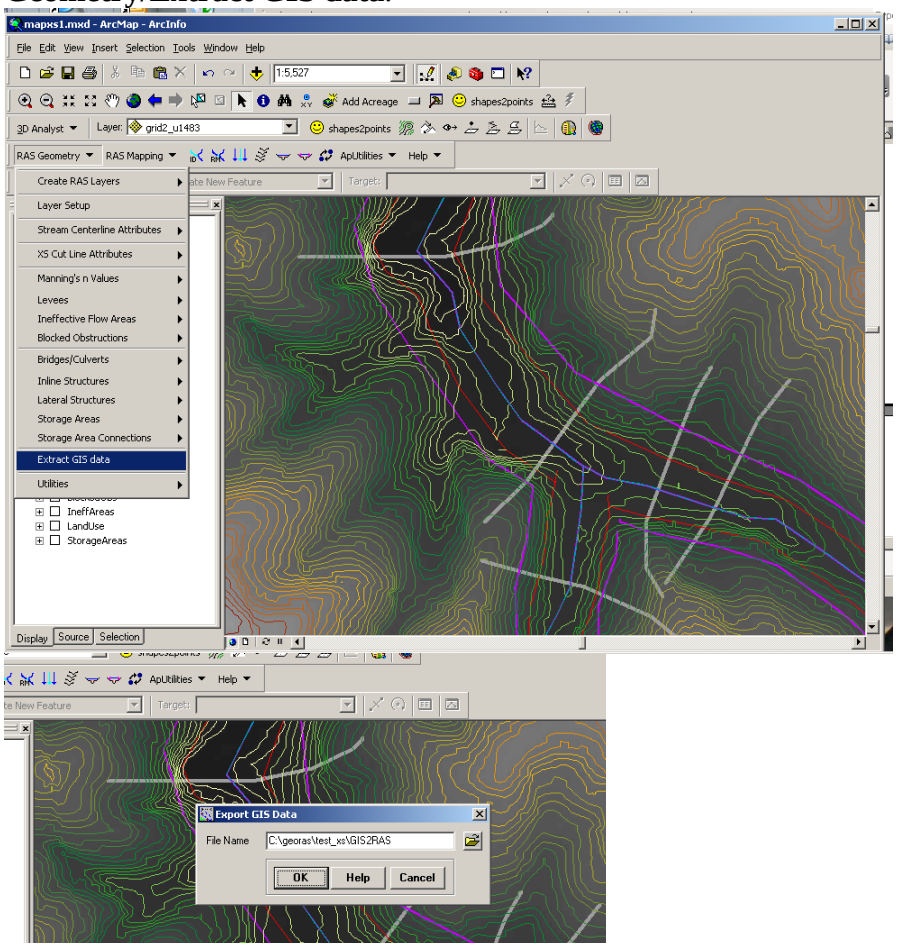
Use **RAS Geometry**, to populate **River/Reach Names**, **Stationing**, **Bank Stations**, **Downstream Reach Lengths**, and **Elevations** data for **XSCutlines** layer.



Optional: can also digitize and add data for levees, bridges, culverts, inline structures, lateral structures, storage areas, storage area connections, blocked obstructions, ineffective areas, and Manning's n values using land use digital data.

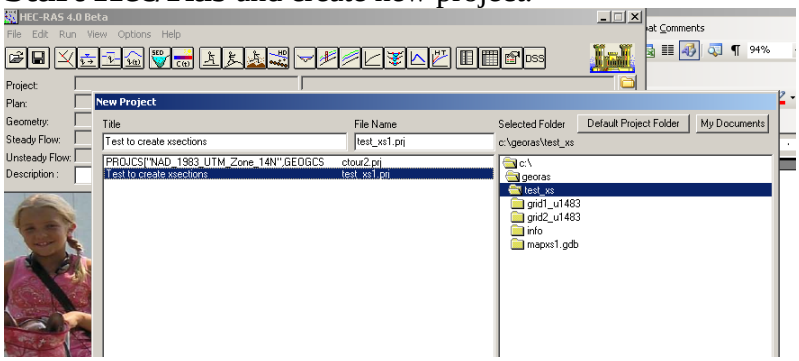


Export created GIS data to file that is used for input into Hec/Ras using **Ras Geometry/Extract GIS data**.

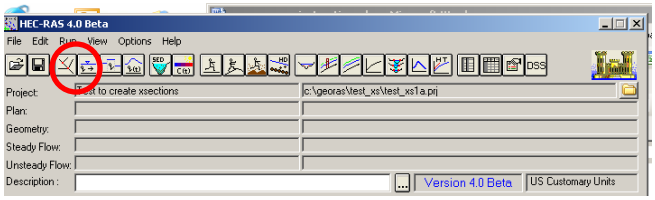


Georas processing is complete.

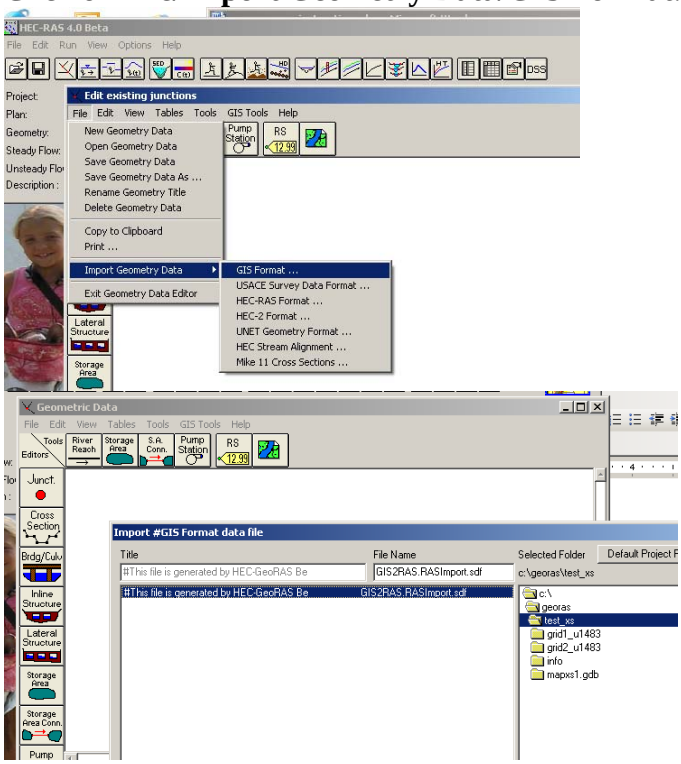
Start Hec/Ras and create new project.



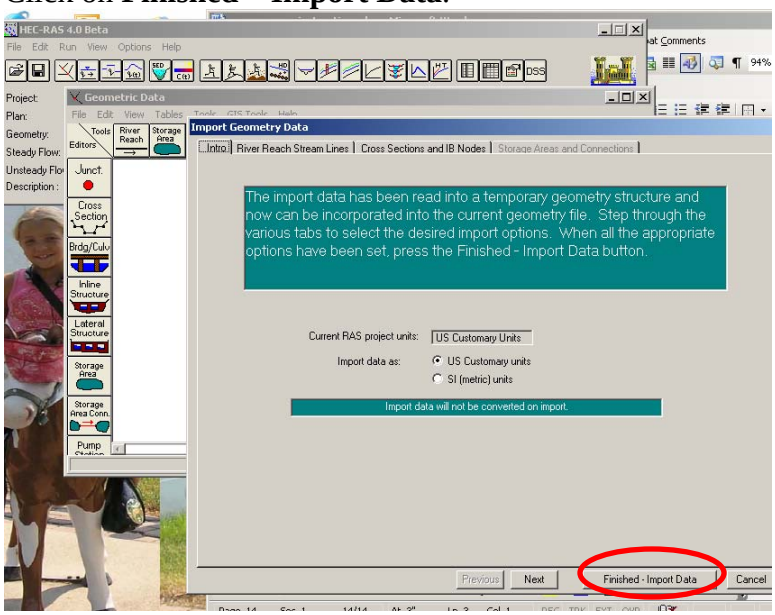
Click on **Edit/Enter Geometric Data** icon.



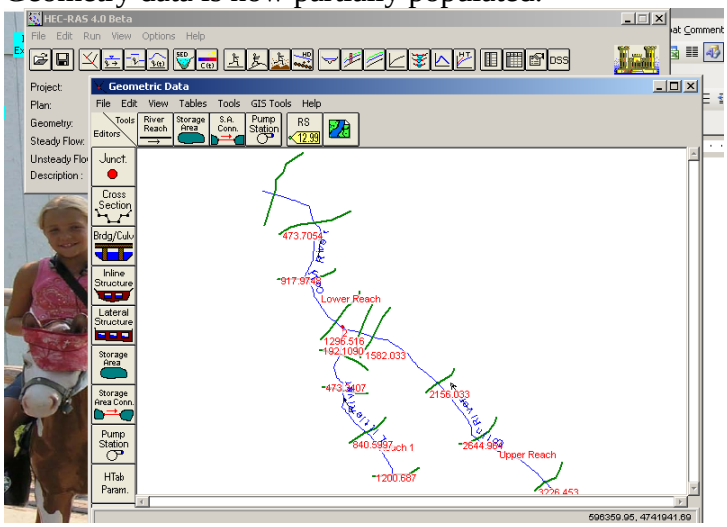
Click on **File/Import Geometry Data/GIS Format**.



Click on **Finished – Import Data**.



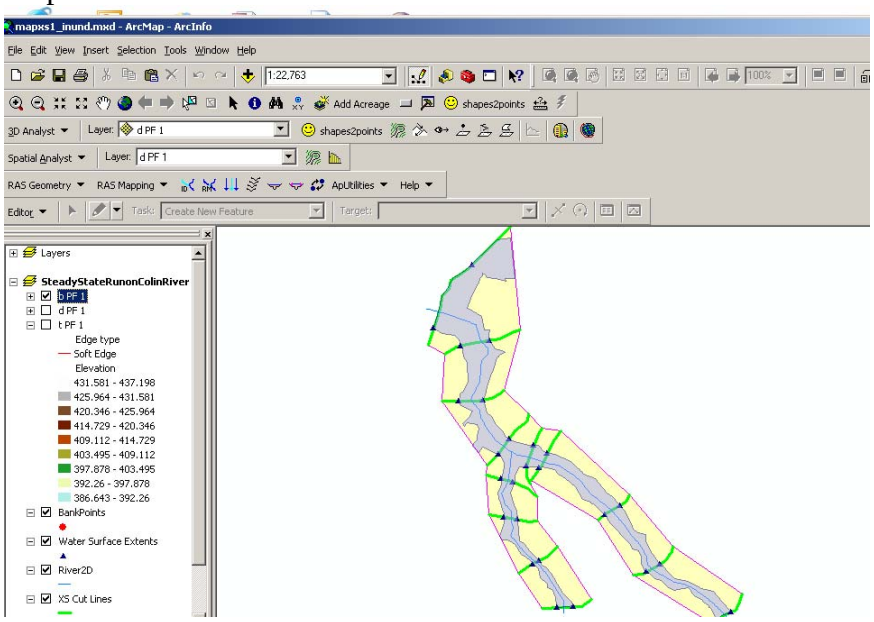
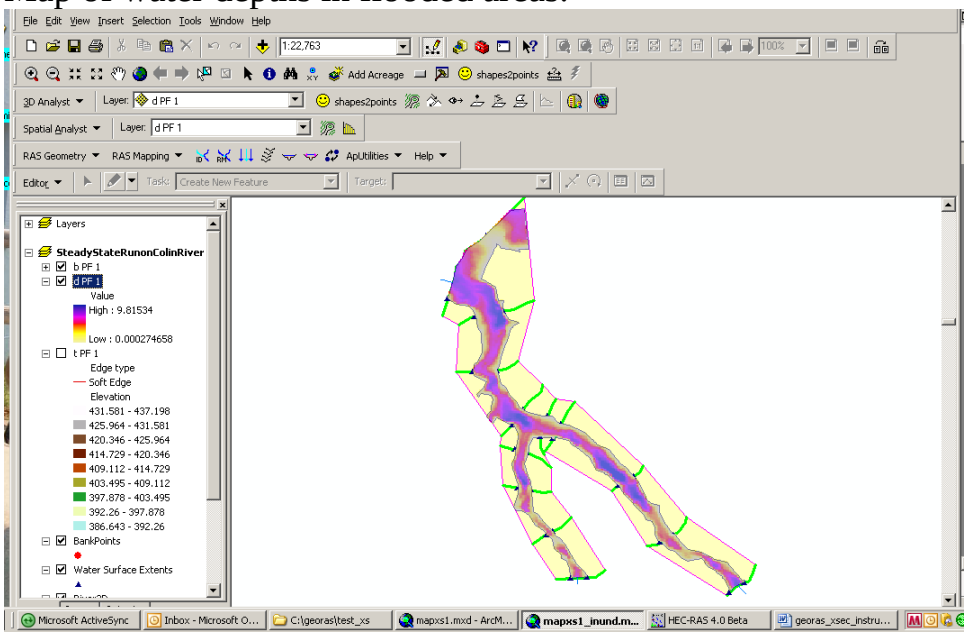
Geometry data is now partially populated.



Edit/enter data to complete Hec/Ras input.

Georas also has capability to read Hec/Ras output and create inundation/depth maps in Arcmap.

Map of inundated areas.



Map of water depths in flooded areas.