

Watershed Mapping Project Description

Software Used in Watershed Analysis

- ESRI's ArcView 3.2 (licensed software)
- ESRI's Spatial Analyst 2.0 Extension (licensed software)
- SDTS2DEM (translation software that converts the USGS sdts format files into usable DEM files) <http://software.geocomm.com/translators/sdts/>
- CRWR-PrePro (watershed modeling software developed by the University of Texas) <http://www.cwr.utexas.edu/gis/gishyd98/watchar/watchar.htm>

Data Used in Watershed Analysis

- USGS 1:24000 Digital Elevation Model (DEM) files (these files can be downloaded by quad) <http://data.geocomm.com/dem/demdownload.html>
Note: 10 meter DEM's are only available for the upper watersheds.
- USGS 1:100000 Hydro Digital Line Graph (DLG) files (stream line data) <http://edc.usgs.gov/geodata/>

Watershed Analysis Process

- Burn in Stream Data
Stream DLG vector data is burned into the DEM by raising the ground elevations around it. This burning process makes the streams distinct in the DEM landscape.
- Fill Sinks in DEM
Fills any low spots or pits which might cause a wrong flow direction or disrupt flow.
- Compute Flow Direction (Aspect)
Calculates what direction water will flow based on compass heading (east, southeast, south...etc).
- Compute Flow Accumulation (Slope)
Using flow direction each individual cell is given an accumulative value based on the number of cells that flow into it.
- Construct the Basic Stream Network
Stream network is created by assigning a cell threshold (10,000 cells was used for the SJD analysis). Smaller thresholds will create smaller sub-watersheds.
- Calculate Stream Links and Outlets
Breaks stream network into sub-watersheds where each sub-watershed has one outlet point.
- Delineate Sub-Watersheds
Sub-watershed is created from cells that all drain to the same outlet.
- Vectorize Stream and Sub-Watershed Grids
Convert stream and sub-watershed grid (raster) cells into line and polygon ArcView .shp files.

- Create Watershed Basins
Combine sub-watersheds that have a common stream network.

Note: Stream networks and sub-watershed basins that are generated within the valley floor are sometimes conflicting and are not as well defined as those in the upper watersheds. Manmade features will also disrupt historical stream flow and direction. For this reason most basin boundaries shown within the valley floor are inferred.