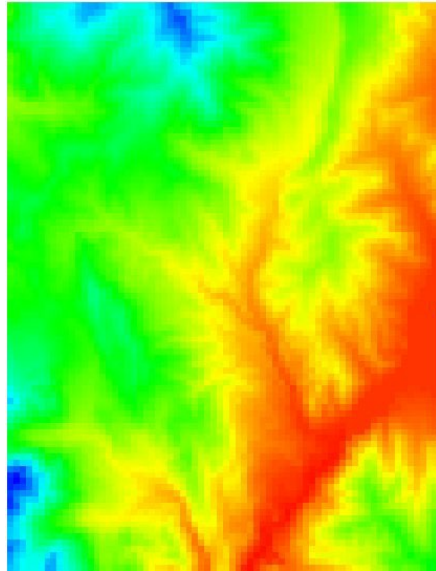


# Developing a Basic GSSHA Model

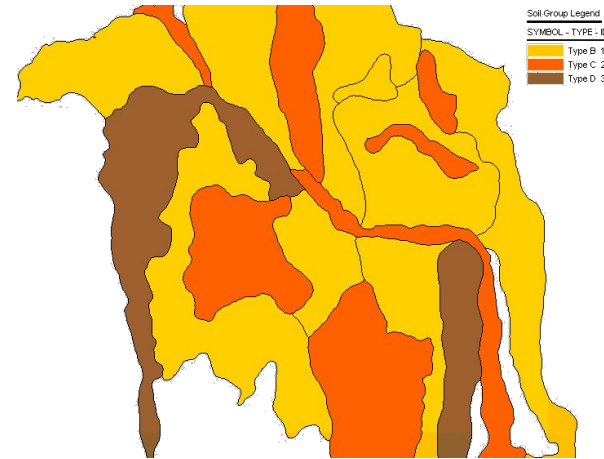


- Obtain Your Data
  - DEM, Land Use, Soils, Mapping Table, Precipitation
- Delineate the watershed
- Generate a GSSHA grid
- Job Control
  - Time step
  - Determine processes to simulate
  - Output Control
- Generate Index Map and Mapping Table for roughness
  - Uniform to begin with
- Define roughness in Mapping Table parameters
- Define rainfall
- Save and run
- Visualize results to determine and fix surface runoff problems

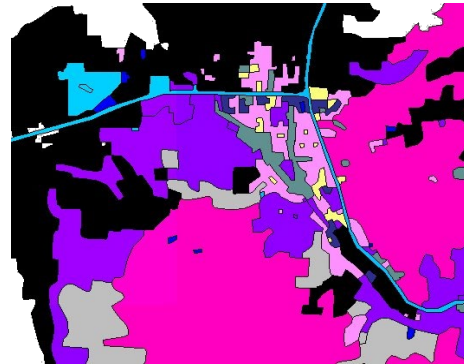
# Obtain Your Data



DEM

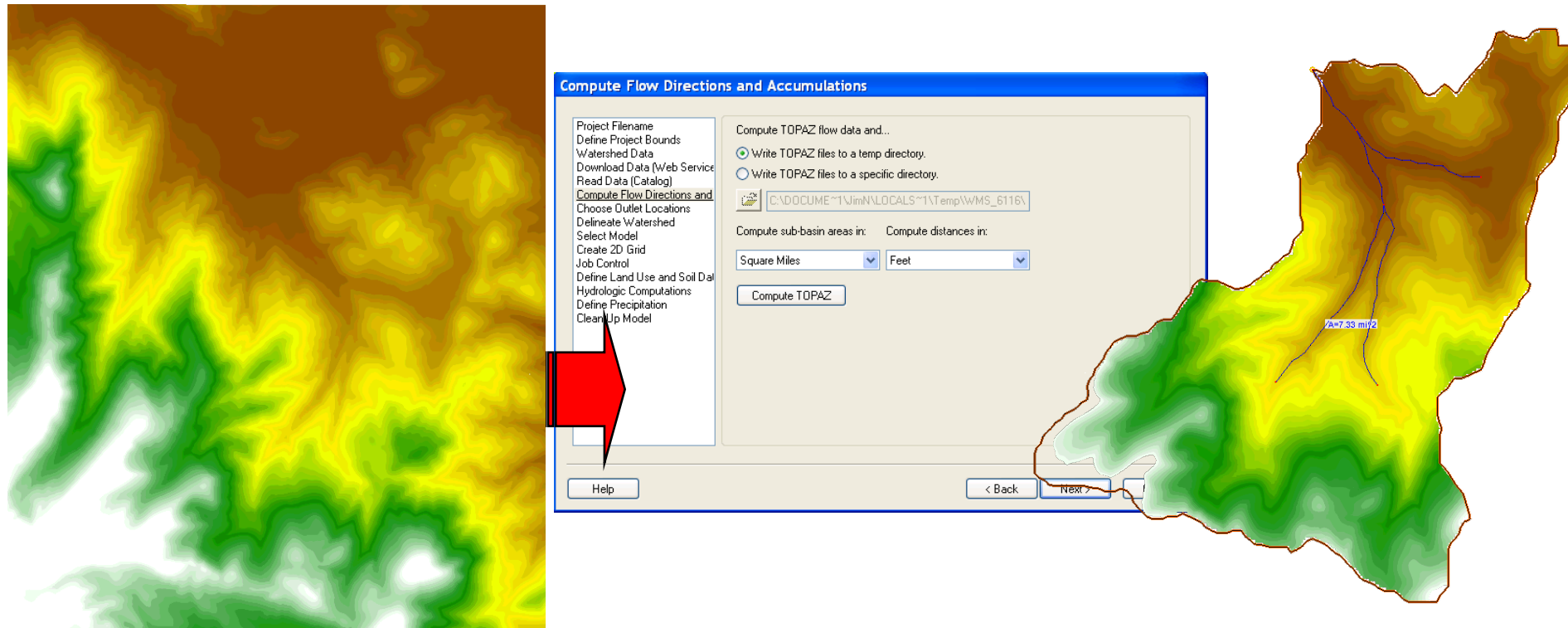


Soils

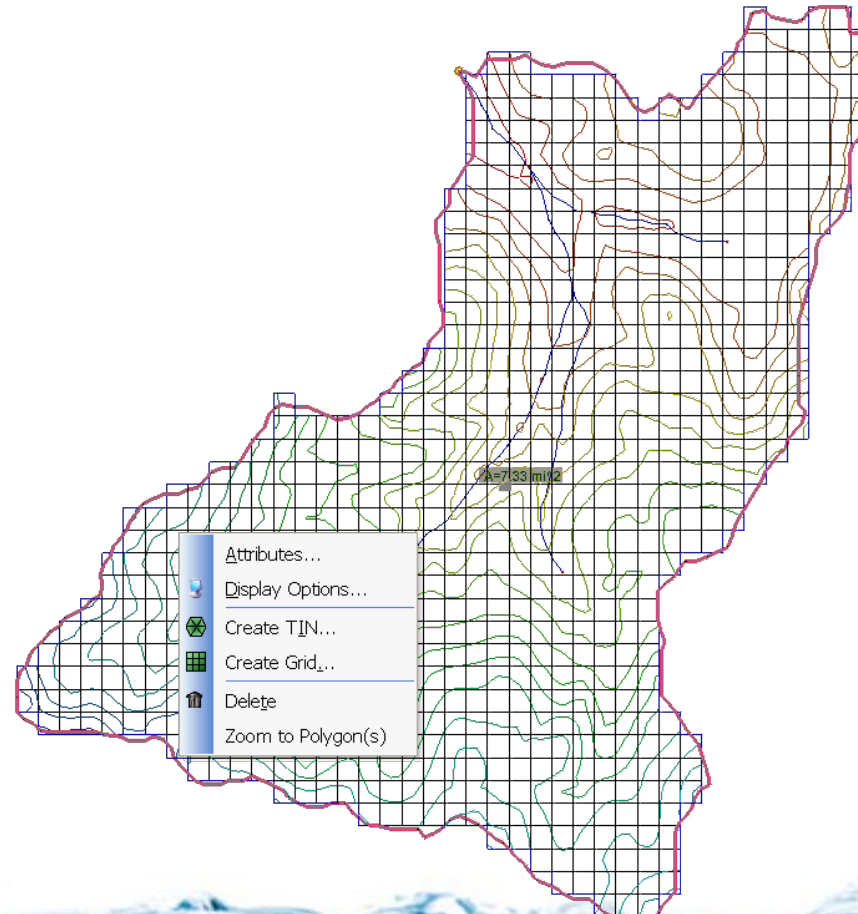


Land Use

# Delineate the Watershed



- Use the watershed basin polygon to create the grid





# Job Control Setup

**GSSHA Job Control Parameters**

**Computation parameters**

Total time (min): 1500

Time step (sec): 10

**Overland flow**

Computation method: Explicit

☐ Interception

☐ Initial depth

☐ Retention depth

☐ Area reduction depth

**Outlet information**

Column: 1

Row: 64

Slope: 0.00100

**Evapotranspiration**

☒ No evaporation

☐ Deardorff method

☐ Penman method

☐ Seasonal resist.

**Infiltration**

☒ No infiltration

☐ Green + Ampt

☐ Green + Ampt with soil moisture redistribution

☐ Richard's infiltration

**Channel routing computation scheme**

☒ No routing

☐ Diffusive wave

☐ MESH

**Groundwater**

☐ Groundwater

☐ Soil erosion

☐ Long term simulation

☐ Contaminant transport

☐ Nutrients

☐ Storm/tile drain

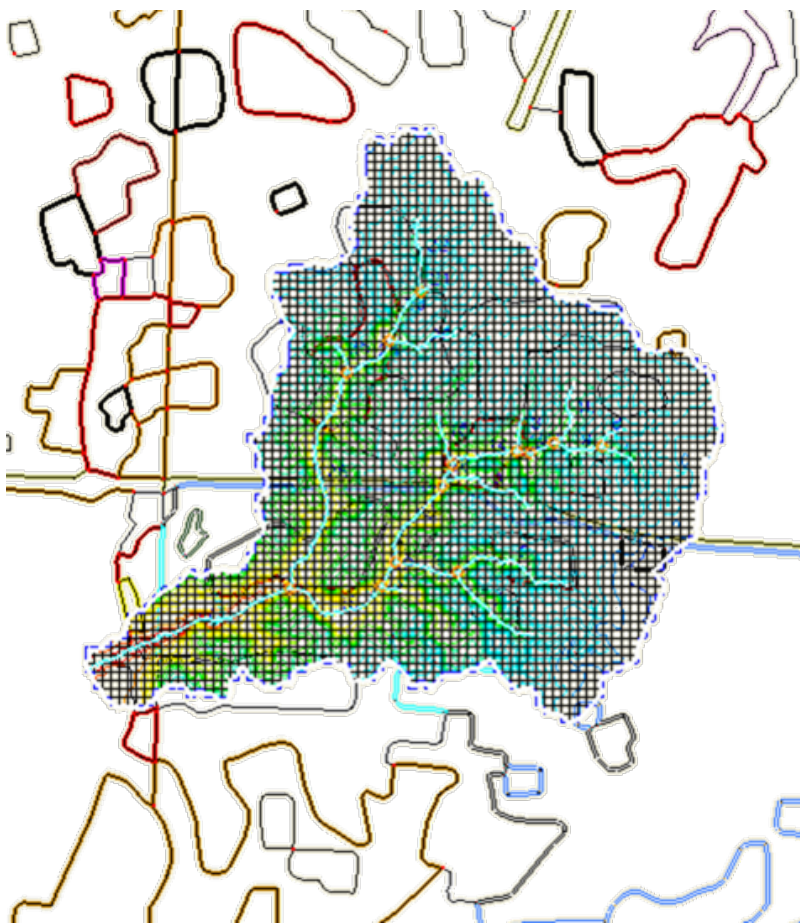
☐ Stochastic

☐ Link CE-QUAL-W2 ...

☐ Manage files

**Buttons:** Initialize GSSHA, Delete GSSHA Data, Edit Parameters..., Edit parameter..., Edit parameter..., Edit parameter..., Edit parameter..., Edit parameter..., Edit parameter..., Edit parameter..., Edit parameter..., Help, Output Control..., OK, Cancel

# Create an Index Map for Roughness



GSSHA Maps

Index - Grid   Index - Stream   Continuous - Grid

Compute index using GIS data

Input coverage (1): Soil Type

Coverage attribute: Id

☐ Input coverage (2): Soil Type

Coverage attribute: Id

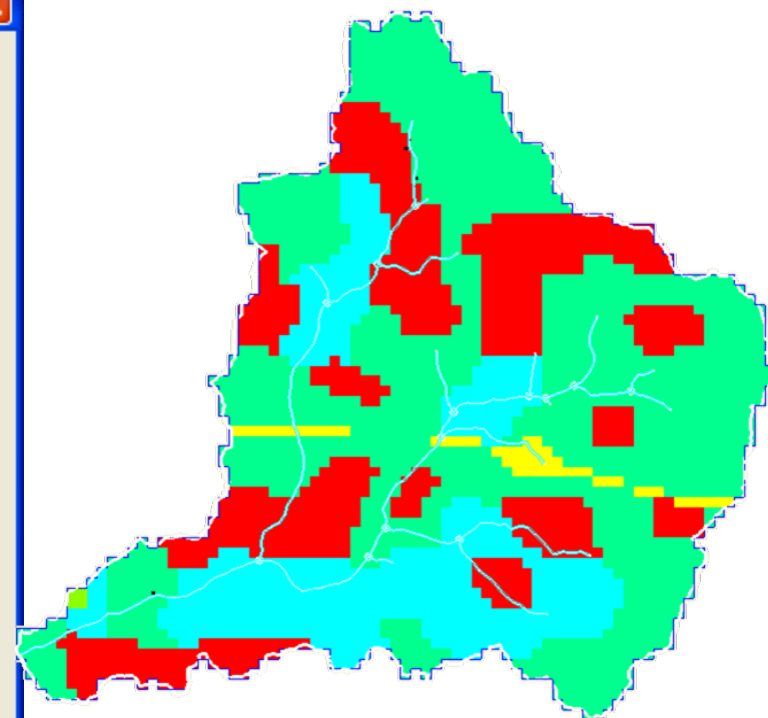
Index map name: new

GIS Data -> Index Map

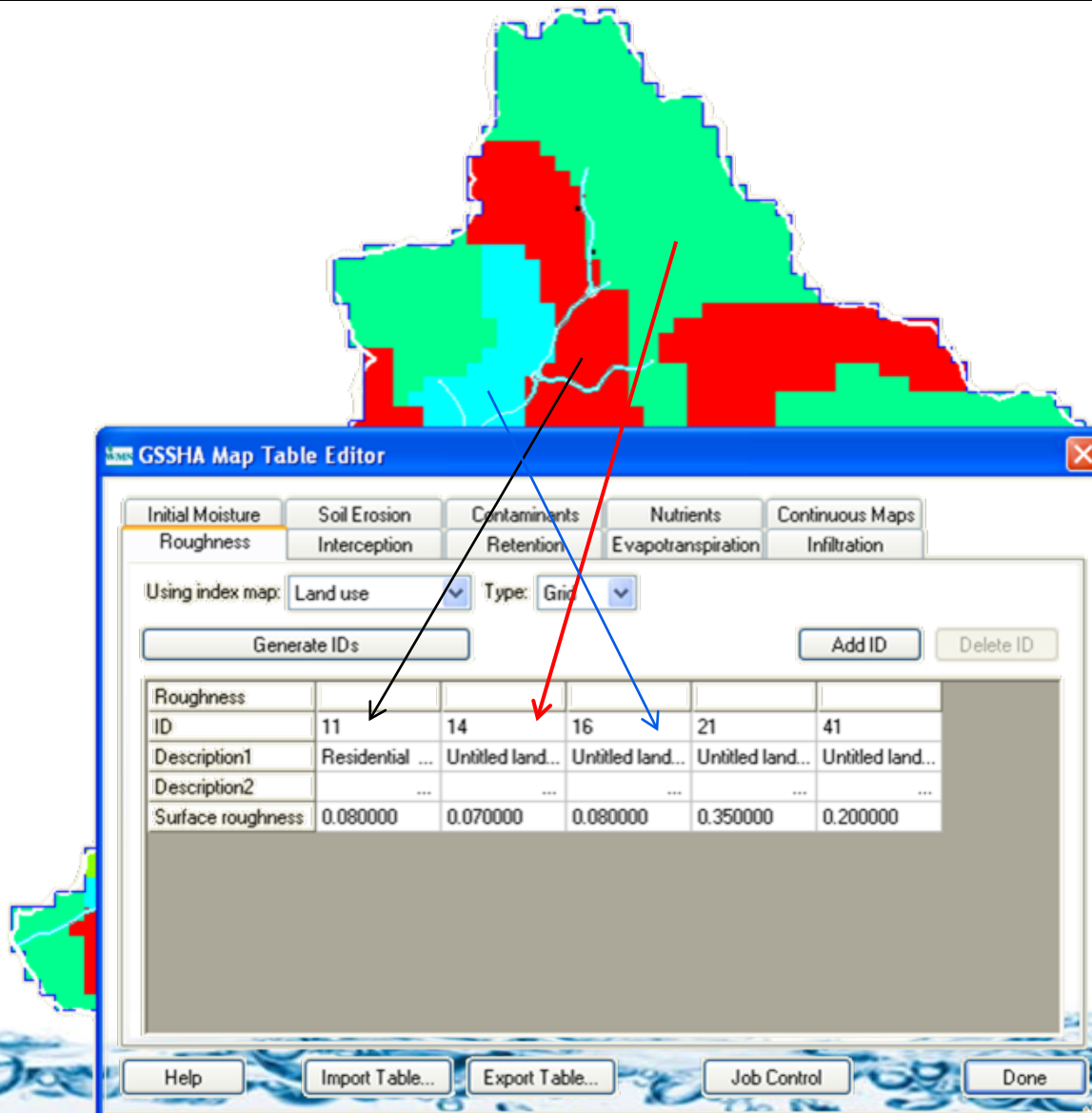
Compute index using data calculator (uniform map)

Data Calculator...

Help   Done



# Define Roughness in Mapping Table



GSSHA Map Table Editor

Initial Moisture Roughness Soil Erosion Interception Contaminants Retention Nutrients Evapotranspiration Continuous Maps Infiltration

Using index map: Land use Type: Grid

Generate IDs Add ID Delete ID

Roughness					
ID	11	14	16	21	41
Description1	Residential ...	Untitled land...	Untitled land...	Untitled land...	Untitled land...
Description2	...	...	...	...	...
Surface roughness	0.080000	0.070000	0.080000	0.350000	0.200000

Help Import Table... Export Table... Job Control Done



# Define Rainfall

**GSSHA Precipitation** [X]

Rainfall event(s)

Uniform [v]  
Uniform  
Gage  
Hyetograph  
Nexrad Radar

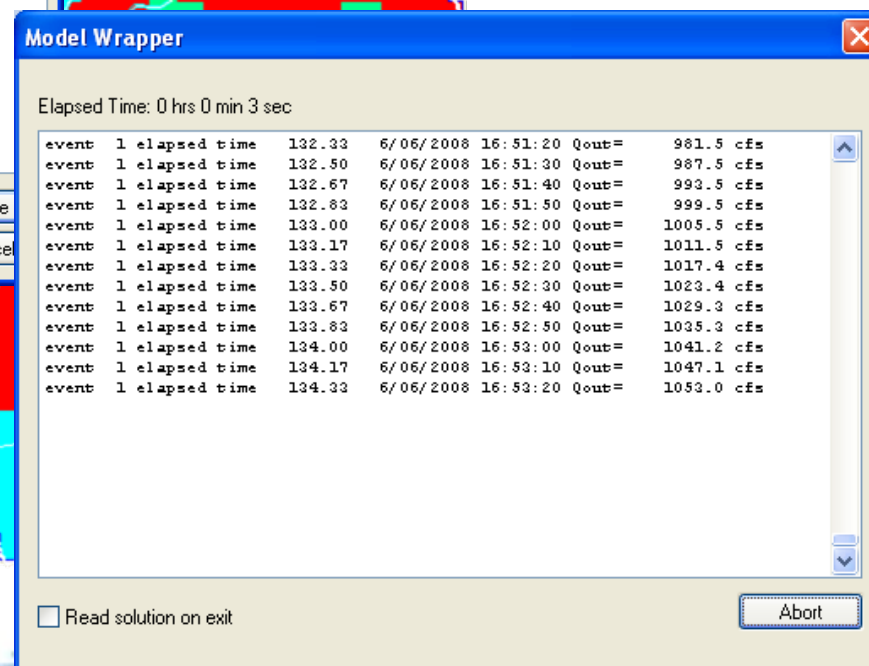
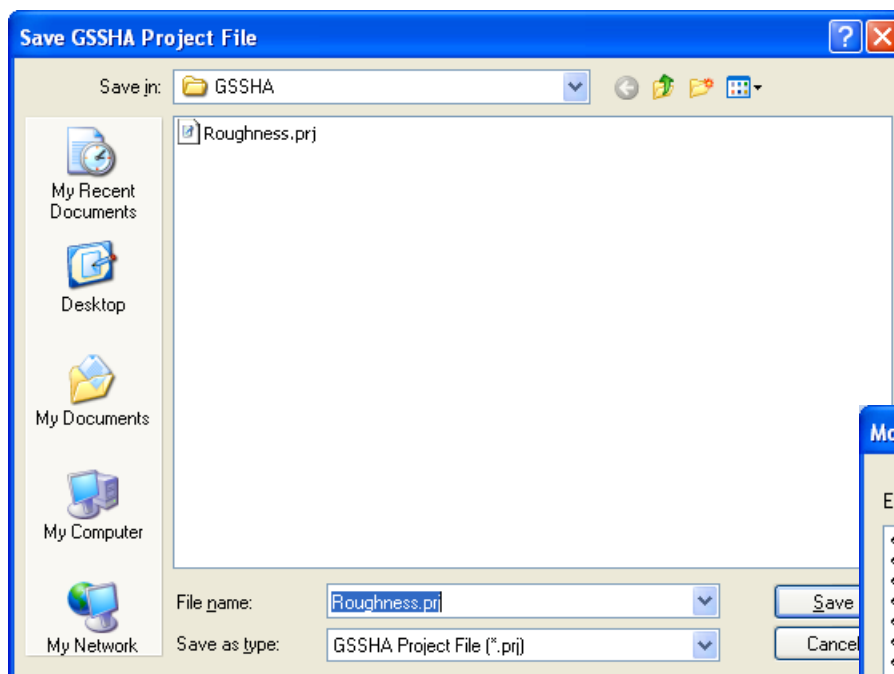
Import Gage File...

Start date/time 6/6/2008 2:39:00 PM [v]

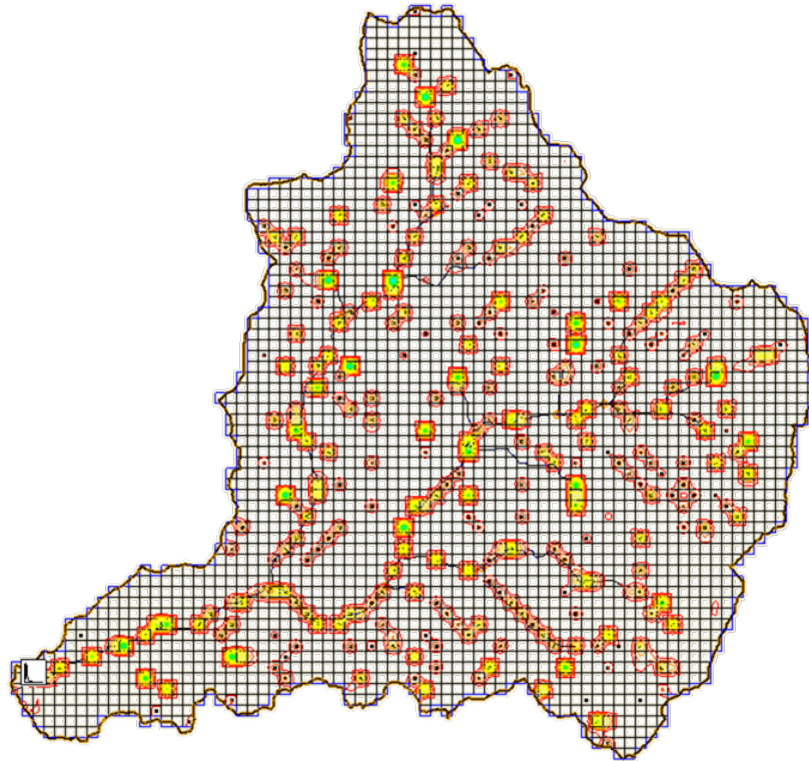
Multi-gage interpolation method

☒ Inverse distance weighted (IDW)  
☐ Thiessen polygons

Help OK Cancel

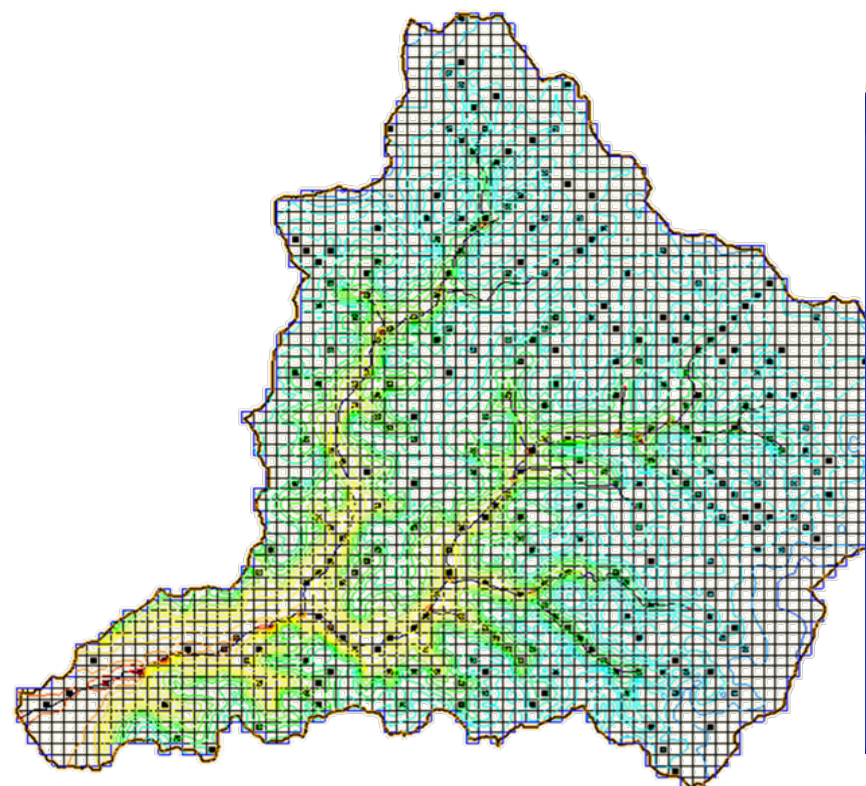


# Visualize Results to Determine Surface Runoff Problems





# Fixing Digital Dams

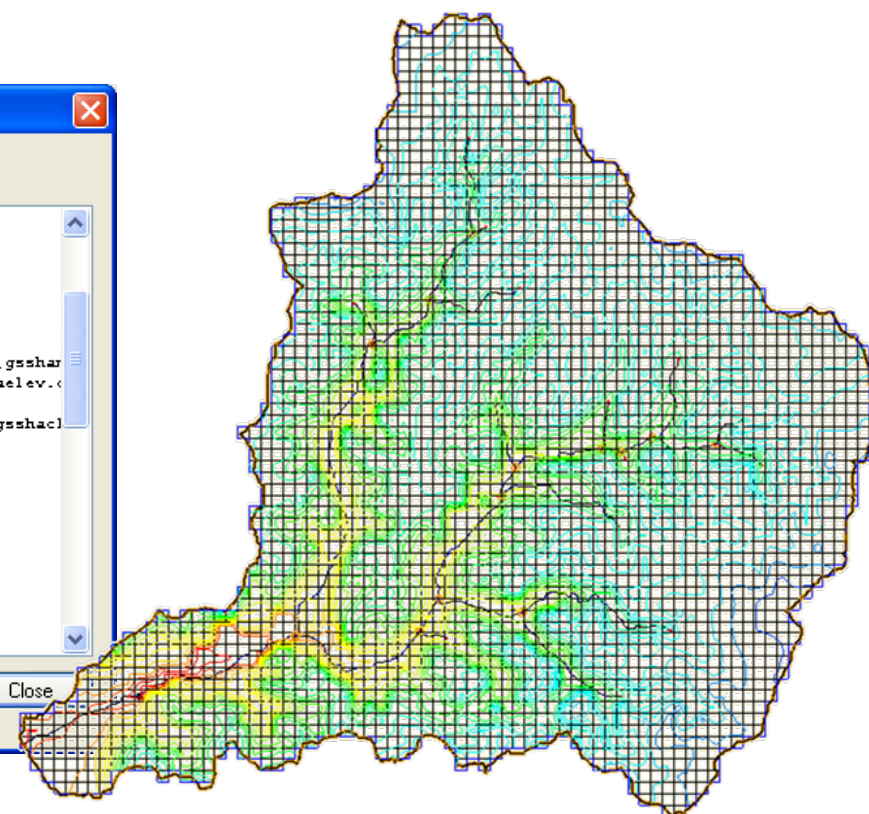


Model Wrapper

```
For more information about this program contact  
Barbara Parsons  
Barbara.A.Parsons@erdc.usace.army.mil  
601.634.2344  
3909 Halls Ferry Rd.  
Vicksburg, MS, 39180  
Copyright 2006 USACE  
Reading watershed mask file: C:\DOCUME~1\mpaudel\LOCALS~1\Temp\WMS_2700\gsshaw  
Reading elevation file: C:\DOCUME~1\mpaudel\LOCALS~1\Temp\WMS_2700\gsshalev.c  
Not using depression mask or unable to open. Will continue.  
Writing output to the file: C:\DOCUME~1\mpaudel\LOCALS~1\Temp\WMS_2700\gsshac  
The outlet is at... (64,1)  
# of active cells: 2764  
# of digital dams at start (not masked): 280  
# of masked digital dams (to be skipped): 0  
pass: 1, 53 dams left  
pass: 2, 42 dams left  
pass: 3, 41 dams left  
pass: 4, 41 dams left  
# of digital dams at end of initial passes: 41  
Starting fix using patch cut...  
Pass: 5, # of dams: 41
```

☒ Read solution on exit

Close





# Fix Surface Runoff Problems

