



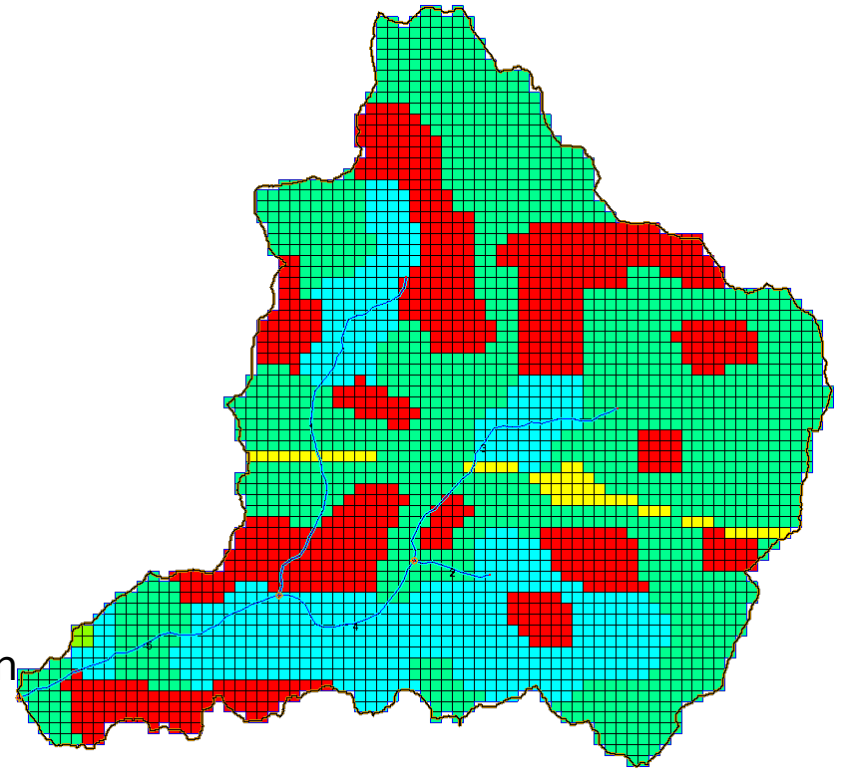
Setting up Rainfall methods





Base Model

- We will continue working with the Judys Branch Watershed
- The base model that you will open has the following processes defined:
 - Uniform Precipitation
 - Distributed Infiltration
 - Distributed overland flow roughness
- You will change the precipitation methods to :
 - Uniform
 - Gage
 - Hyetograph
 - Nexrad Radar
- You will run the model with each of these precipitation methods and compare the results
- You will be using a real storm obtained from NOAA and use different temporal and spatial distributions
- The Nexrad Radar rainfall also corresponds to the same time period as gage data





Using Uniform Precipitation

- The rainfall depth is uniformly distributed over time and is assumed to have same intensity all over the watershed
- Intensity: mm/hr
- Duration: min

The image shows a software dialog box titled "GSSHA Precipitation". It contains a section for "Rainfall event(s)" with a dropdown menu set to "Uniform" and an "Import Gage File..." button. Below this is a table with three rows: "Intensity (mm/hr)" with the value "1.81", "Duration (min)" with the value "1740", and "Start date/time" with the value "5/7/2008 12:00:00 PM". A large empty text area is located below the table. At the bottom of the dialog is a section for "Multi-gage interpolation method" with two radio buttons: "Inverse distance weighted (IDW)" (which is selected) and "Thiessen polygons". At the very bottom are three buttons: "Help", "OK", and "Cancel".

Rainfall event(s)	
Uniform	Import Gage File...
Intensity (mm/hr)	1.81
Duration (min)	1740
Start date/time	5/7/2008 12:00:00 PM

Multi-gage interpolation method

☒ Inverse distance weighted (IDW)

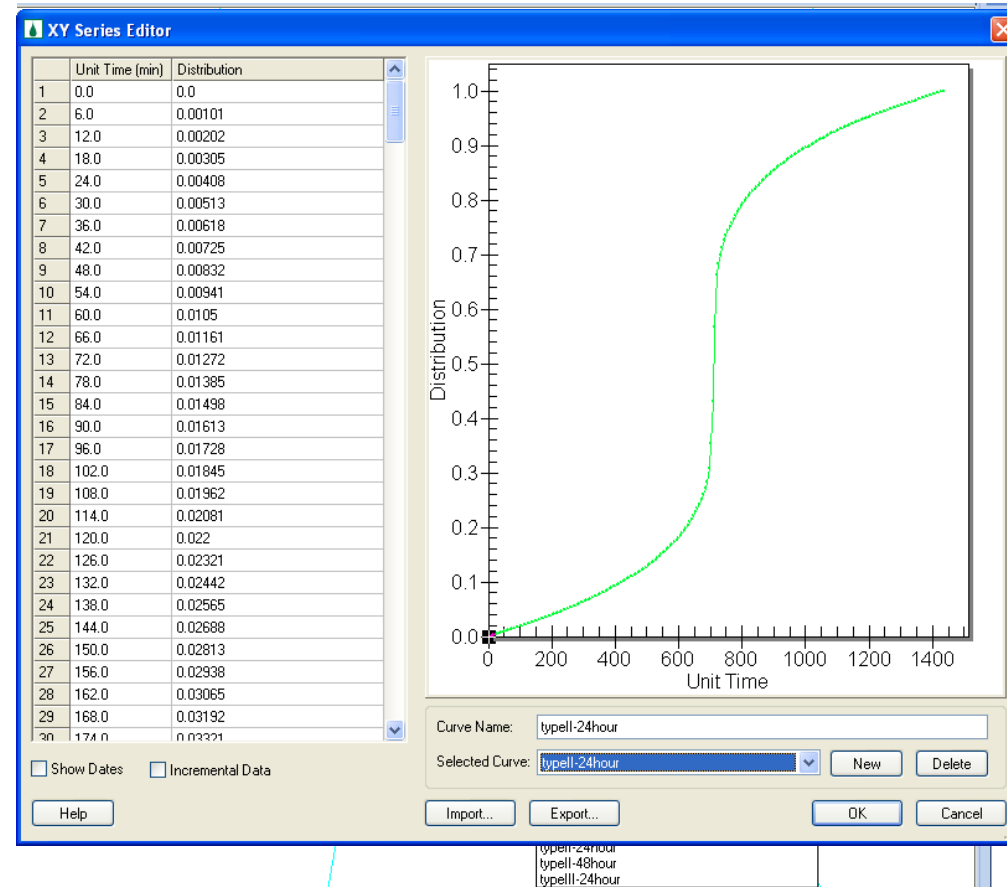
☐ Thiessen polygons

Help OK Cancel



Using a design storm hyetograph

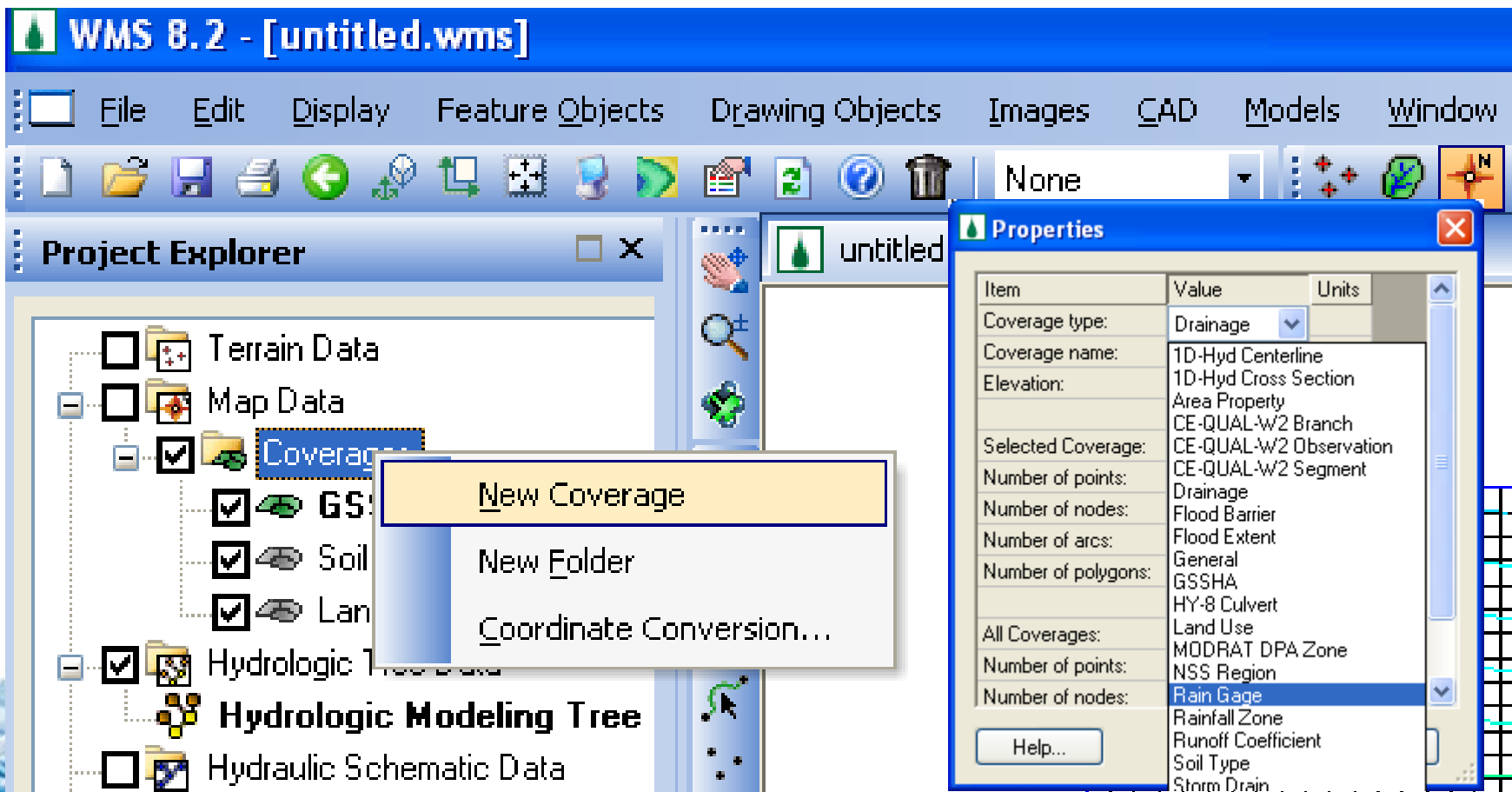
- This option is useful if the normalized temporal distribution is available (eg NRCS storms)
- The distribution is defined in the XY series editor and total storm depth(mm) is defined.
- This method can be used for multiple gages too





Using Rain gages with IDW interpolation

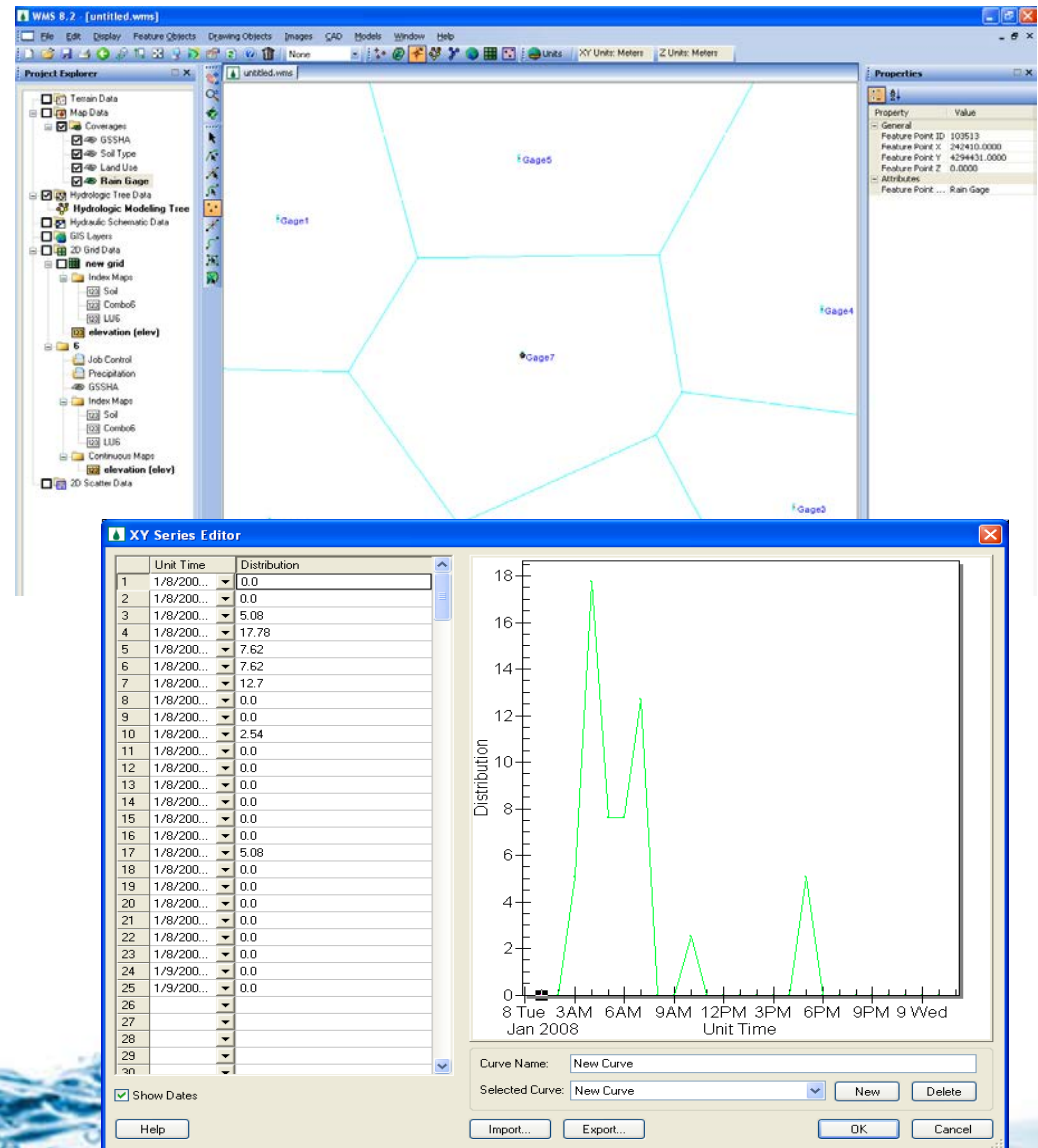
- Multiple gages can be used but each gage must have the same temporal distribution of rainfall
- A rain gage coverage is created





Using Rain gages with IDW interpolation

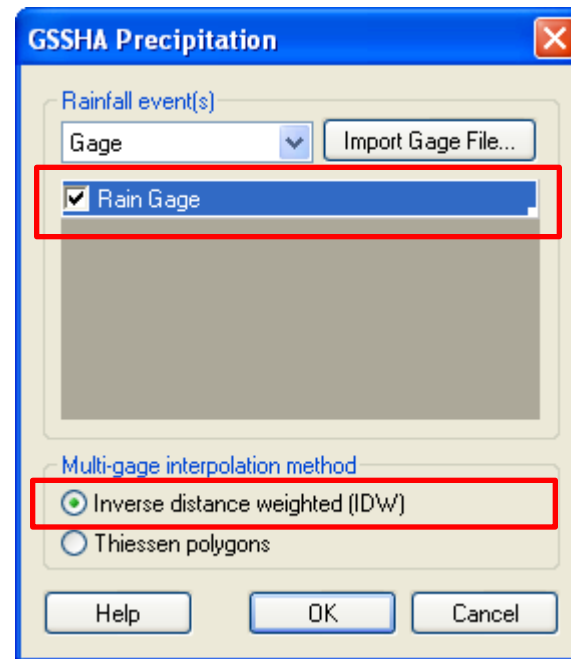
- Once the gages are created, they will be plotted and Thiessen polygons are generated automatically.
- The gages are created in the rain gage coverage
- You can then define the temporal distribution of the storms for each gage





Using Rain gages with IDW interpolation

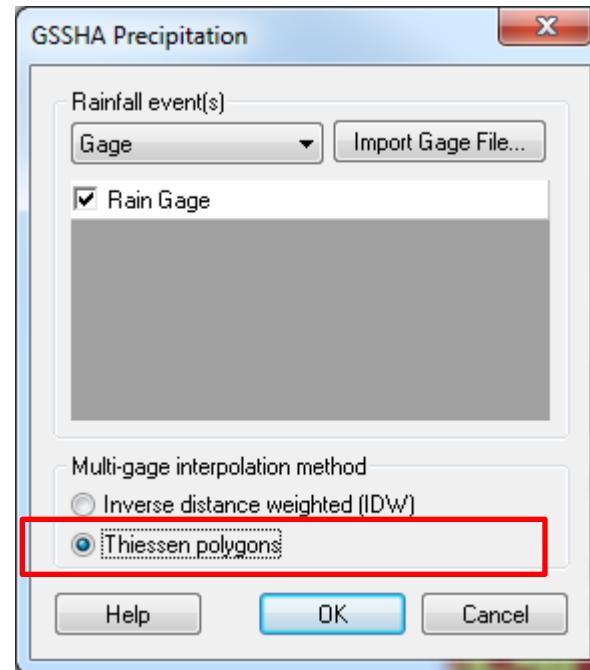
- Once all the gages are defined, go back to GSSHA | Precipitation and select "Rain Gage" coverage to be used to get the gage information





Using Rain gages with Thiessen Polygon interpolation

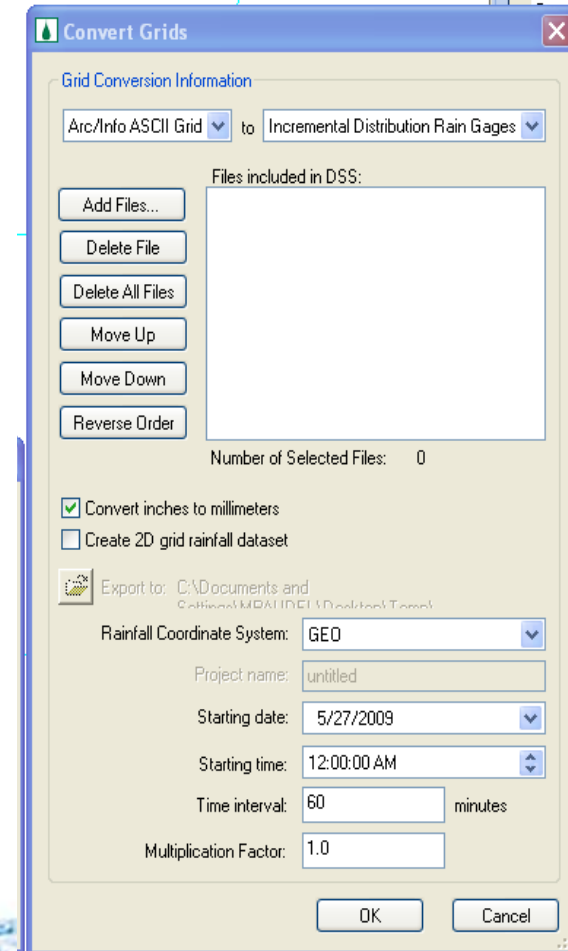
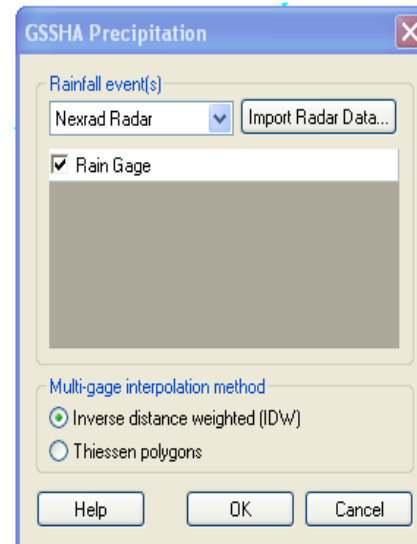
- After running the previous model, go back to GSSHA | Precipitation and select "Rain Gage" coverage to be used to get the gage information and select *Thiessen polygons*
- Rerun the model



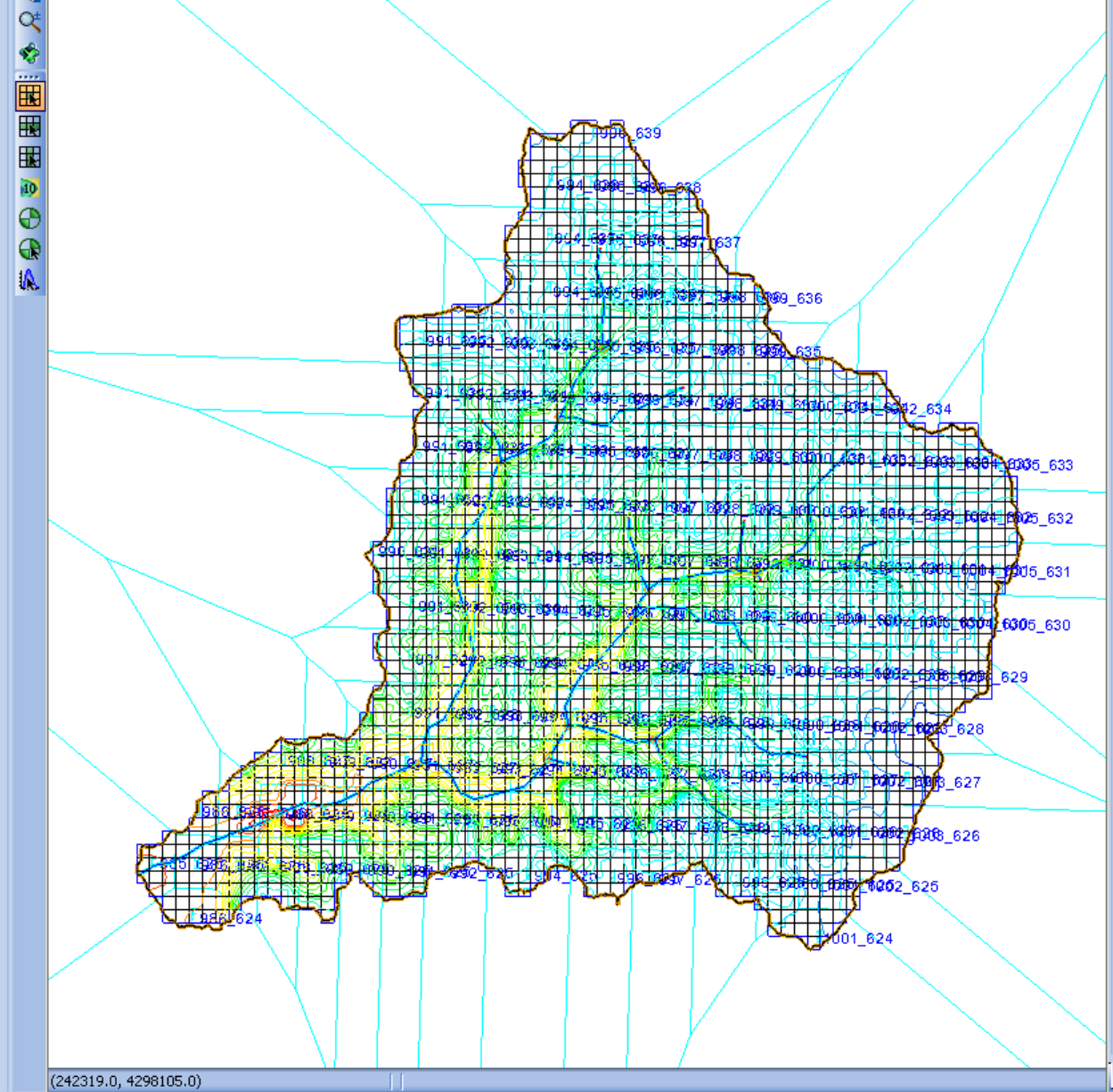


Using NEXRAD Radar data

- NEXRAD radar data is used to define the spatially and temporally varying rainfall
- It involves more computation compared to previous methods.
- This will be discussed in more detail next.



- Terrain Data
- Map Data
 - Coverages
 - GSSHA
 - Soil Type
 - Land Use
 - Gridded Rainfall Gages
 - Hydrologic Tree Data
 - Hydrologic Modeling Tree
 - Hydraulic Schematic Data
 - GIS Layers
 - 2D Grid Data
 - new grid
 - Index Maps
 - 123 Uniform
 - 123 Soil Type
 - 123 Land Use
 - 123 Combined
 - 123 elevation (elev)
 - nexrad
 - Job Control
 - Precipitation
 - GSSHA
 - Index Maps
 - 123 Uniform
 - 123 Soil Type
 - 123 Land Use
 - 123 Combined
 - Continuous Maps
 - 123 elevation (elev)
 - 2D Scatter Data

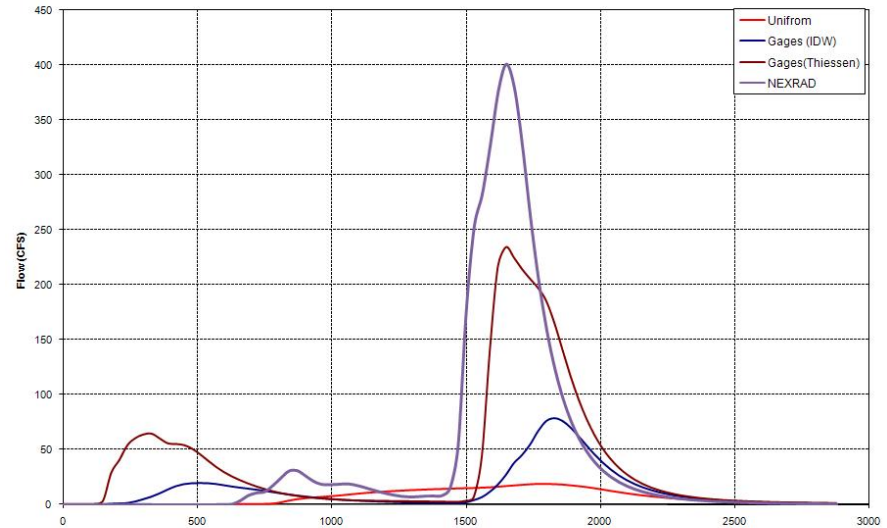


Property	Value
General	
Tree Name	Coverages

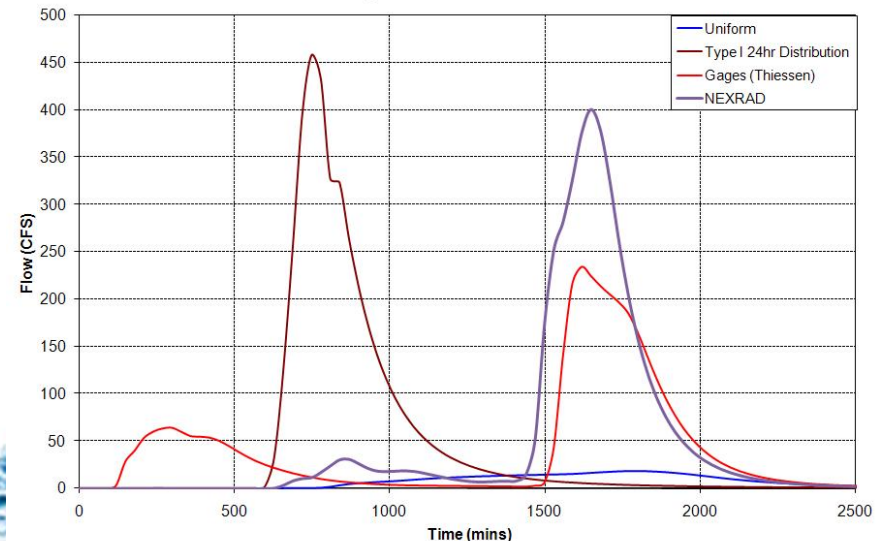


- At the end of each simulation run with a different precipitation method, you will copy the outflow hydrograph ordinates to a spreadsheet and compare the results

Spatial Variations - GSSHA



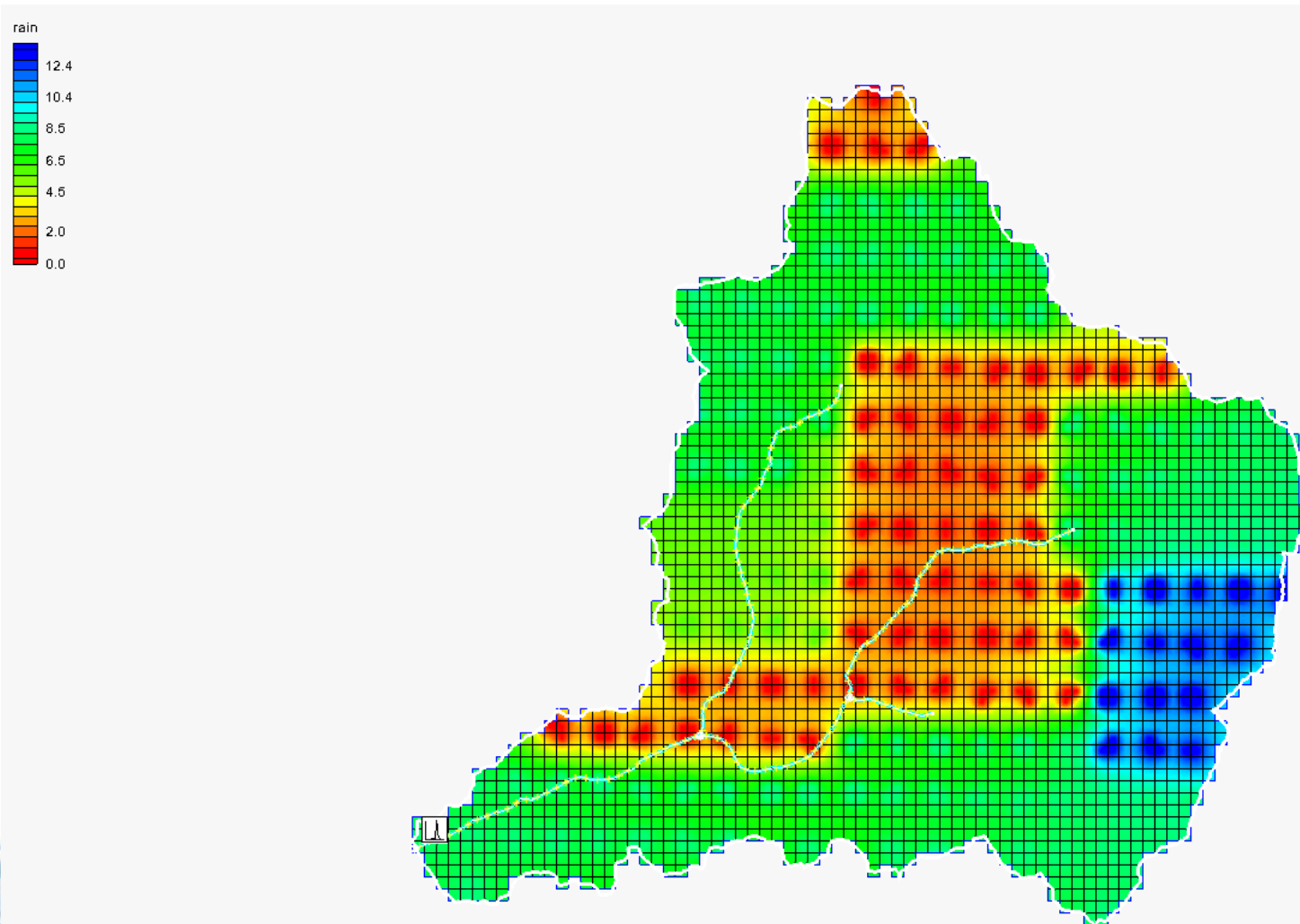
Temporal Variations - GSSHA





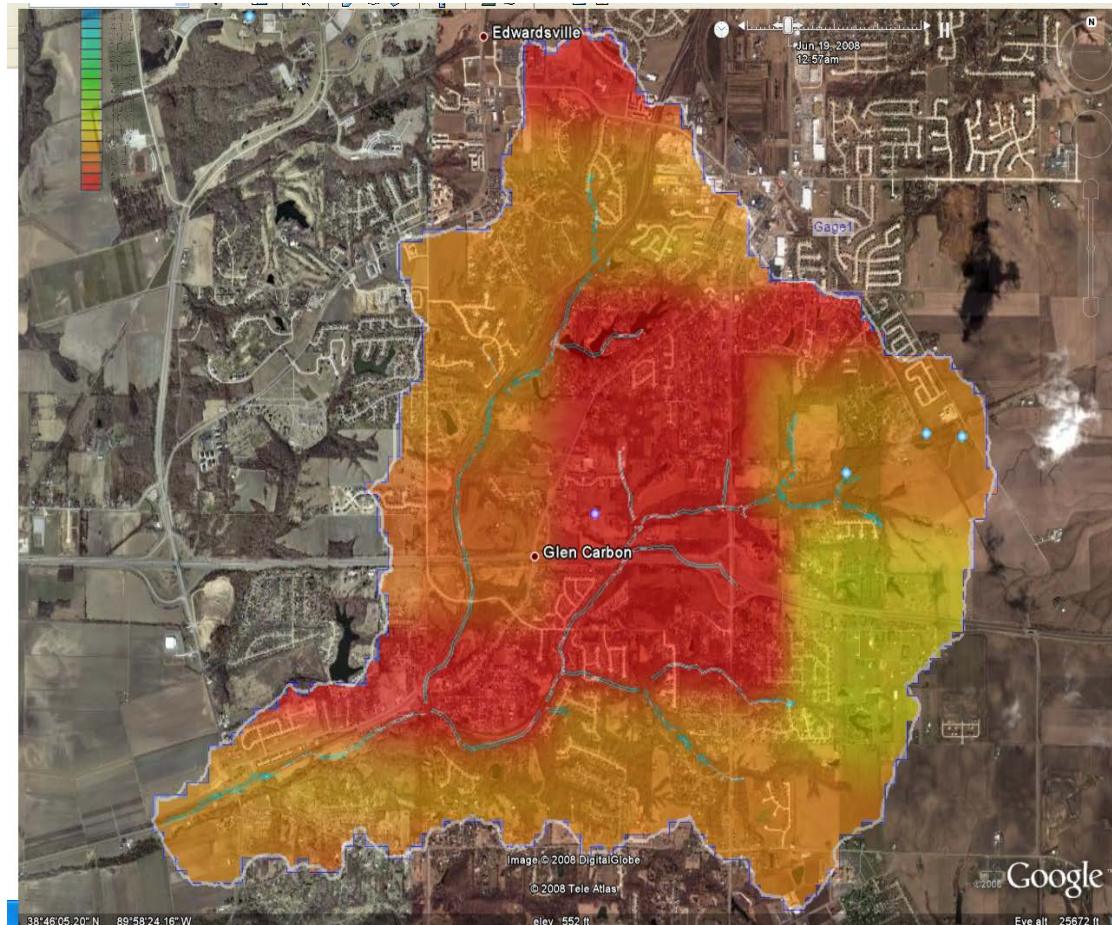
Visualizing the Rainfall Data

- The spatial variation of the precipitation can be animated in WMS



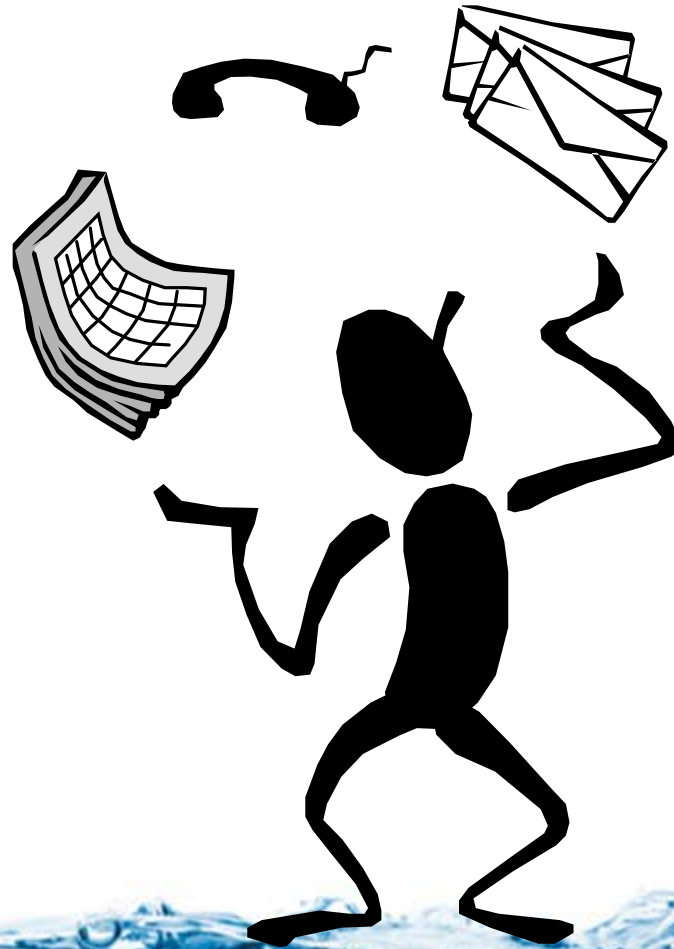


Animations in Google Earth





Demonstration





Workshop

