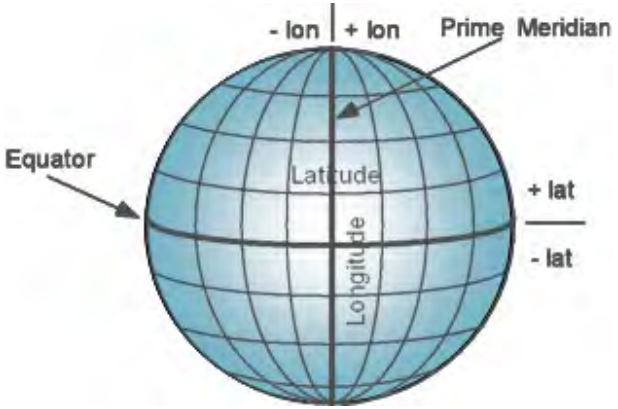
Background Data and DEMs

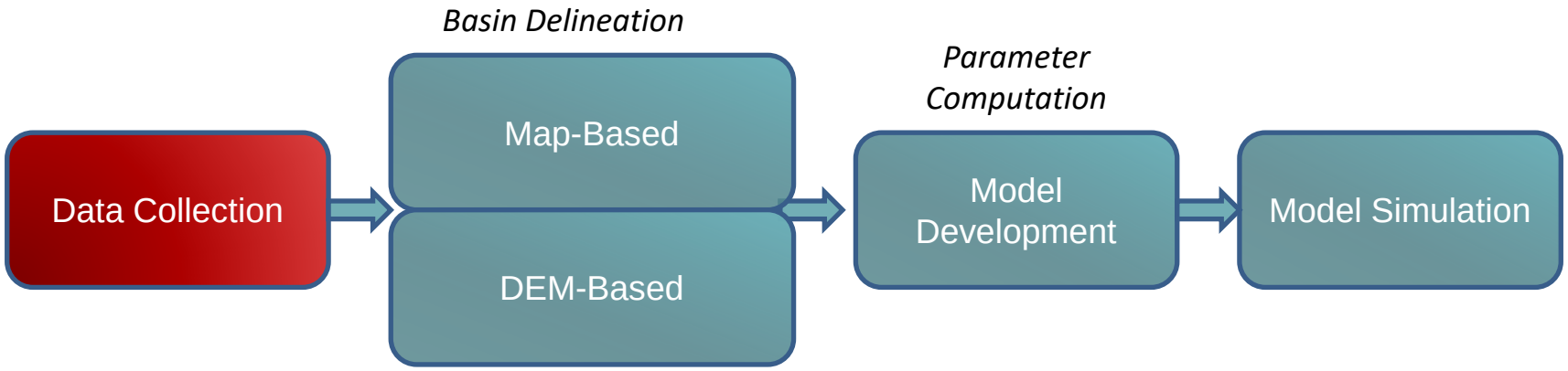


Lesson Learning Outcomes

Upon completion of this lesson, we will be able to:

- Define data projections
- Assess how to set projections in WMS and how to reproject data from one system to another
- Define digital elevation models (DEMs) in the context of WMS.
- Demonstrate the usage of DEMs in WMS

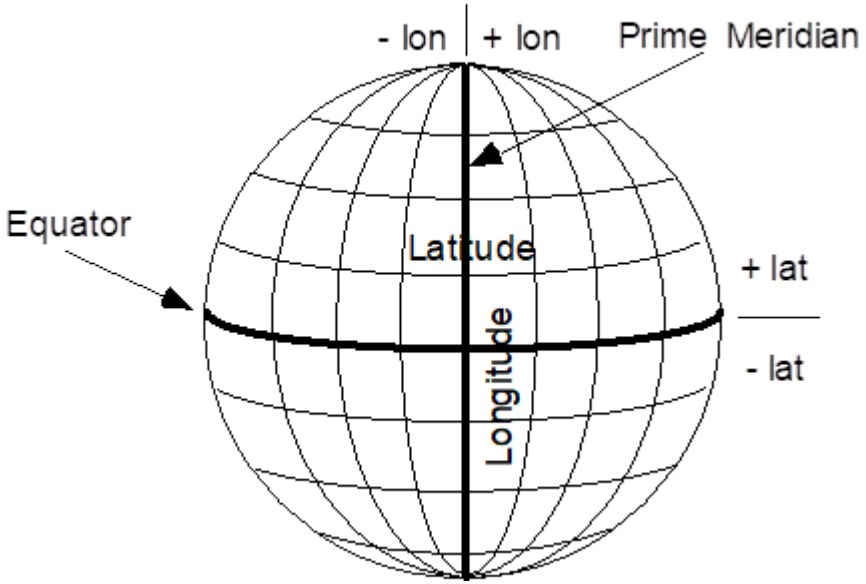
Work Flow


Basin Delineation
Parameter Computation
Data Collection
Map-Based
DEM-Based
Model Development
Model Simulation

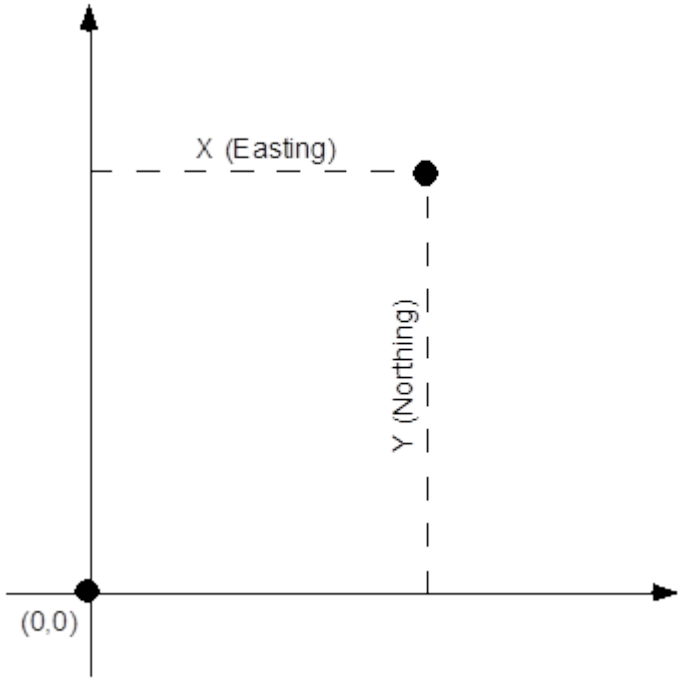
Projections

- Data must have a projection
- All data must be in a consistent projection
- Data sources are in different projections
- WMS can convert from one projection to another

Projections

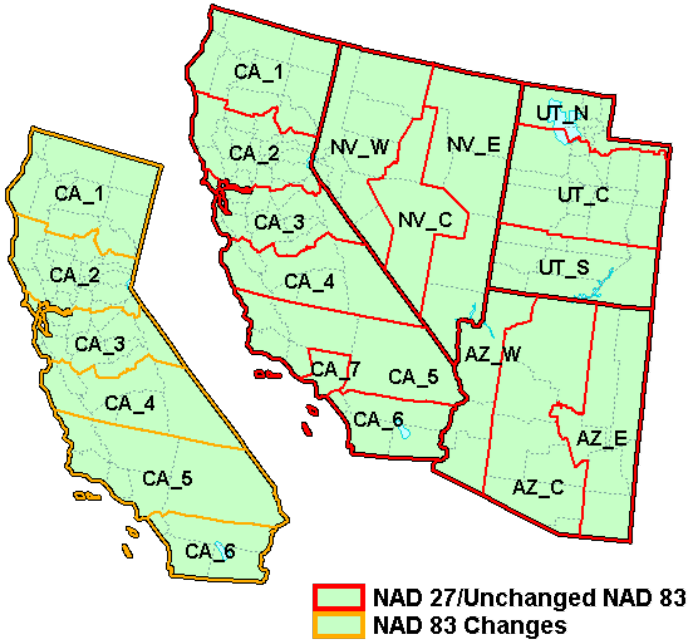


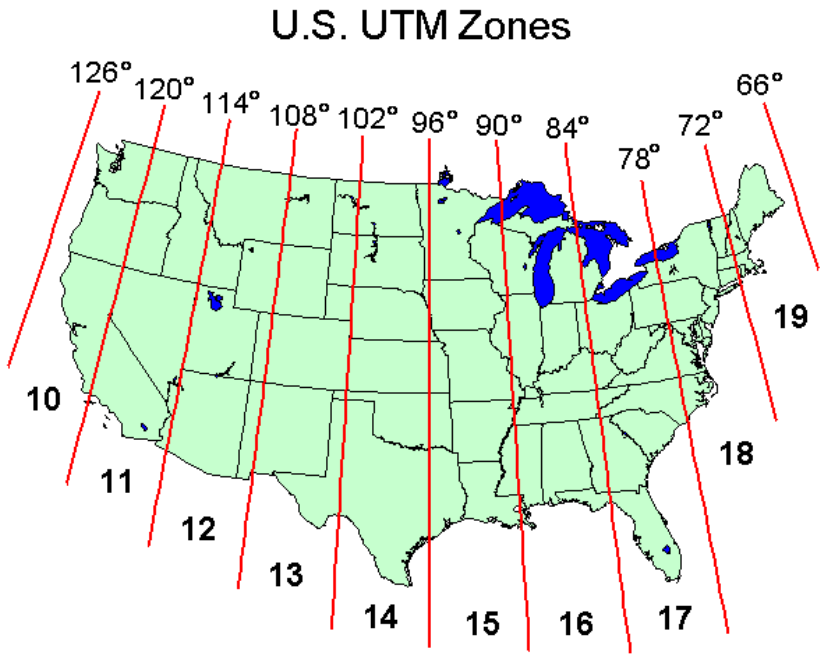
Geographic



Planimetric

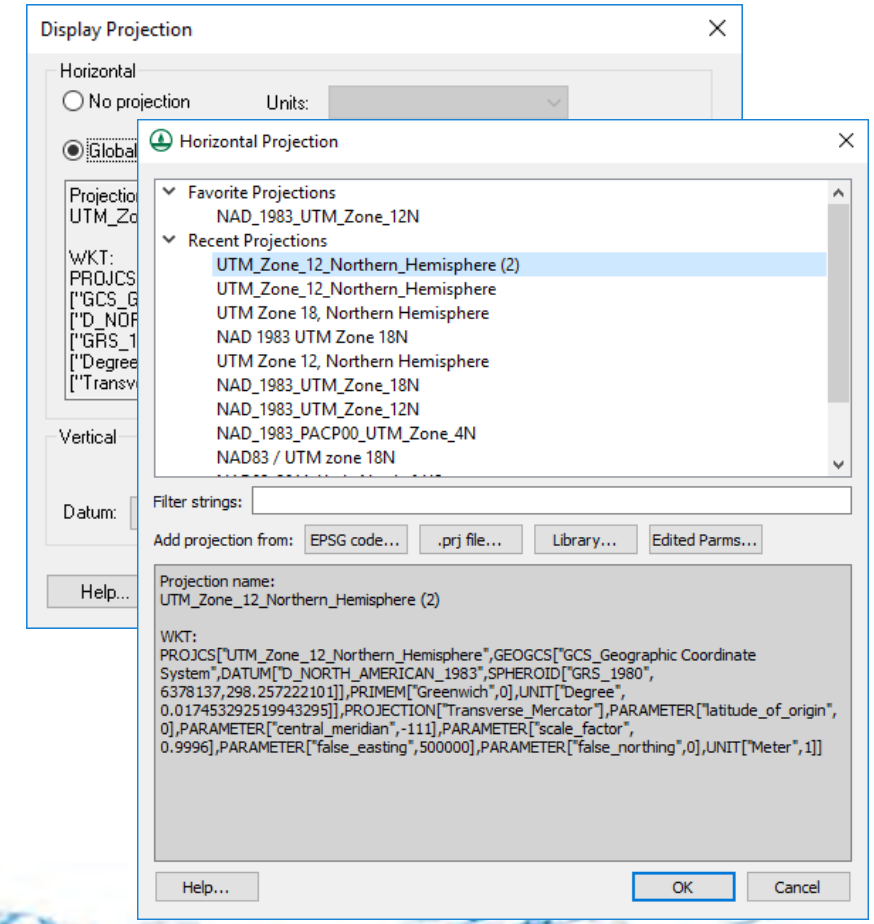
Projections





Display Projection

- Working projection
- Set when starting a project
- Can be set by first dataset loaded
- Does not need to be same as any data

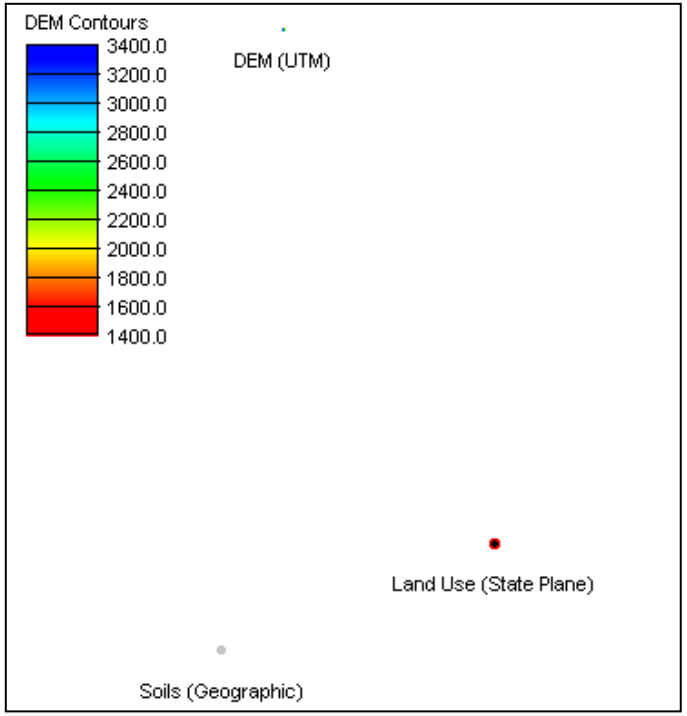


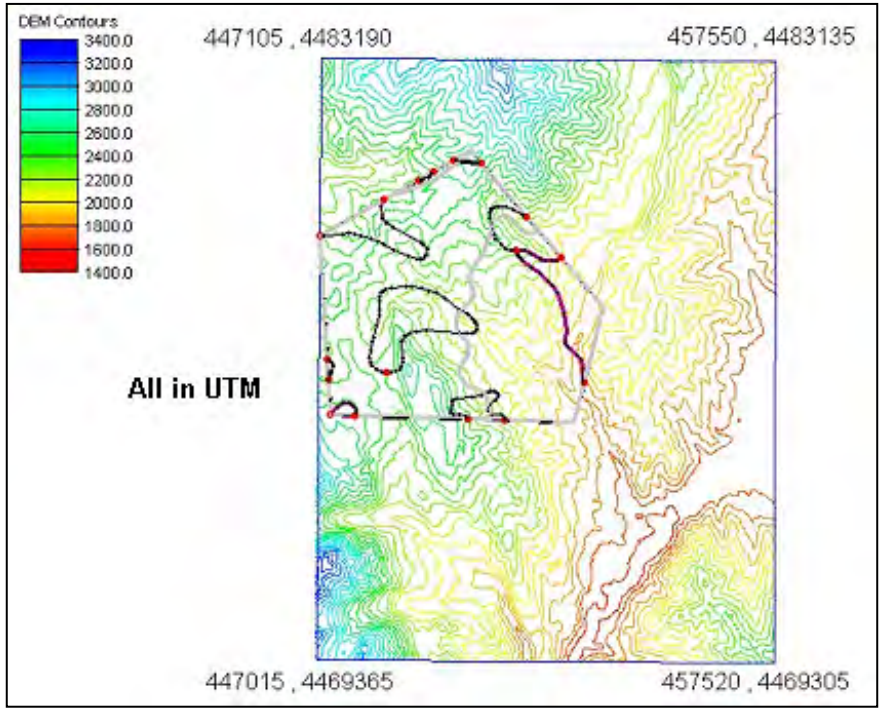
Projection “On the Fly”

- Each object has a projection
  - .prj file attached or embedded
- WMS reprojects “on the fly” to display projection
- Unprojected objects
  - When no projection is available for data
  - Can/should assign projection when determined
  - Displayed as if in “Display Projection”
- Local Projection (with units)
  - Useful for lab or flume studies

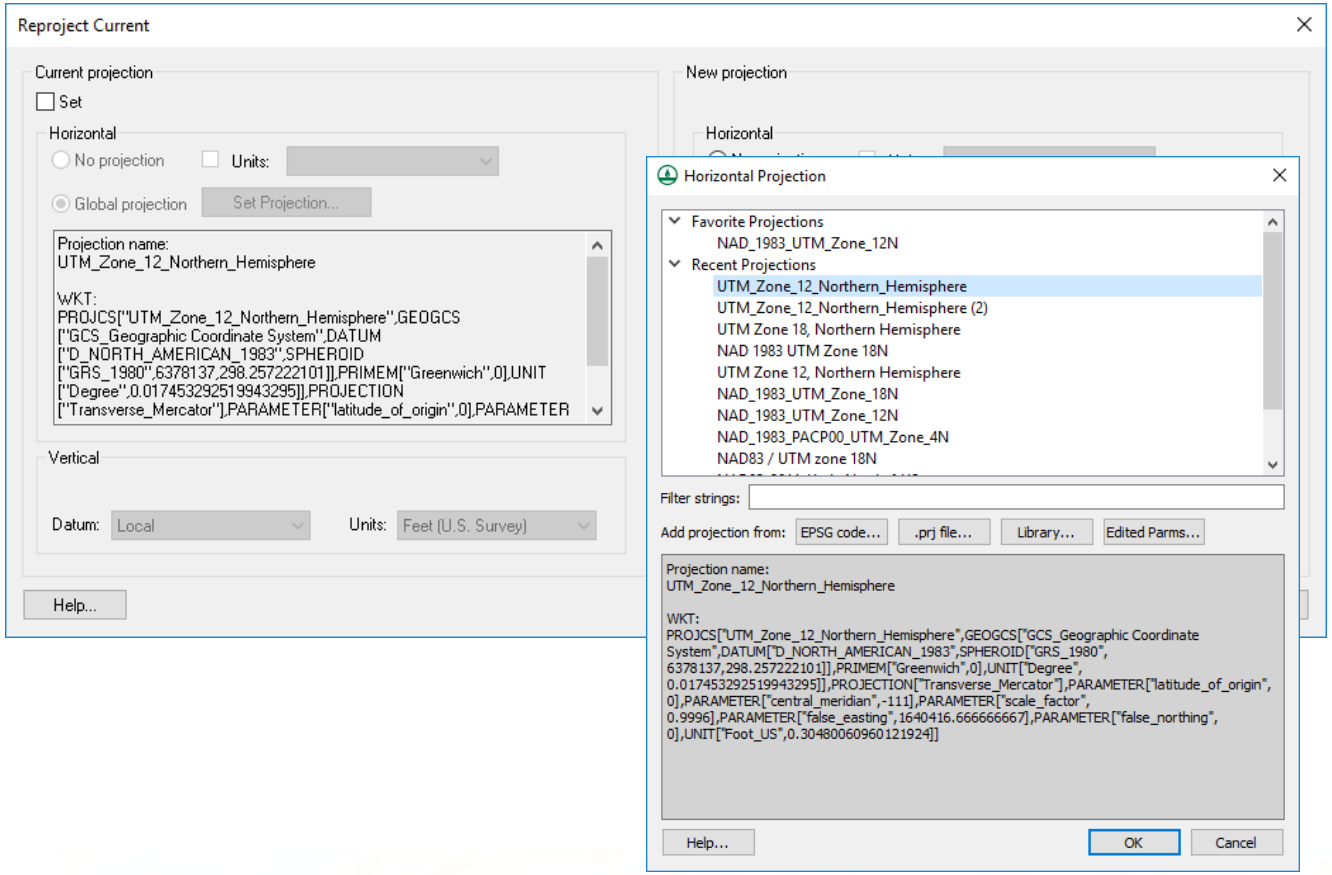
Inconsistent Projections

DEM in one projection, Soils and Land Use in another





Reprojection



Why must we know the coordinate system of our data?

A) So that we can make correct calculations of area, distance, slope, etc.

B) So that we can convert to another coordinate system if necessary

C) So that we can accurately overlay one layer of data with another

D) All of the above

Why must we know the coordinate system of our data?

- The correct answer is:

A) To make correct calculations of area, distance, slope, etc.
B) To be able to convert to another coordinate system if necessary.
C) So that we can accurately overlay one layer of data with another.
D) All of the above

Which coordinate system/projection would not be effective as a display projection?

A) State Plane

B) Universal Transverse Mercator (UTM)

C) Geographic

D) All of the above could be used as a display projection

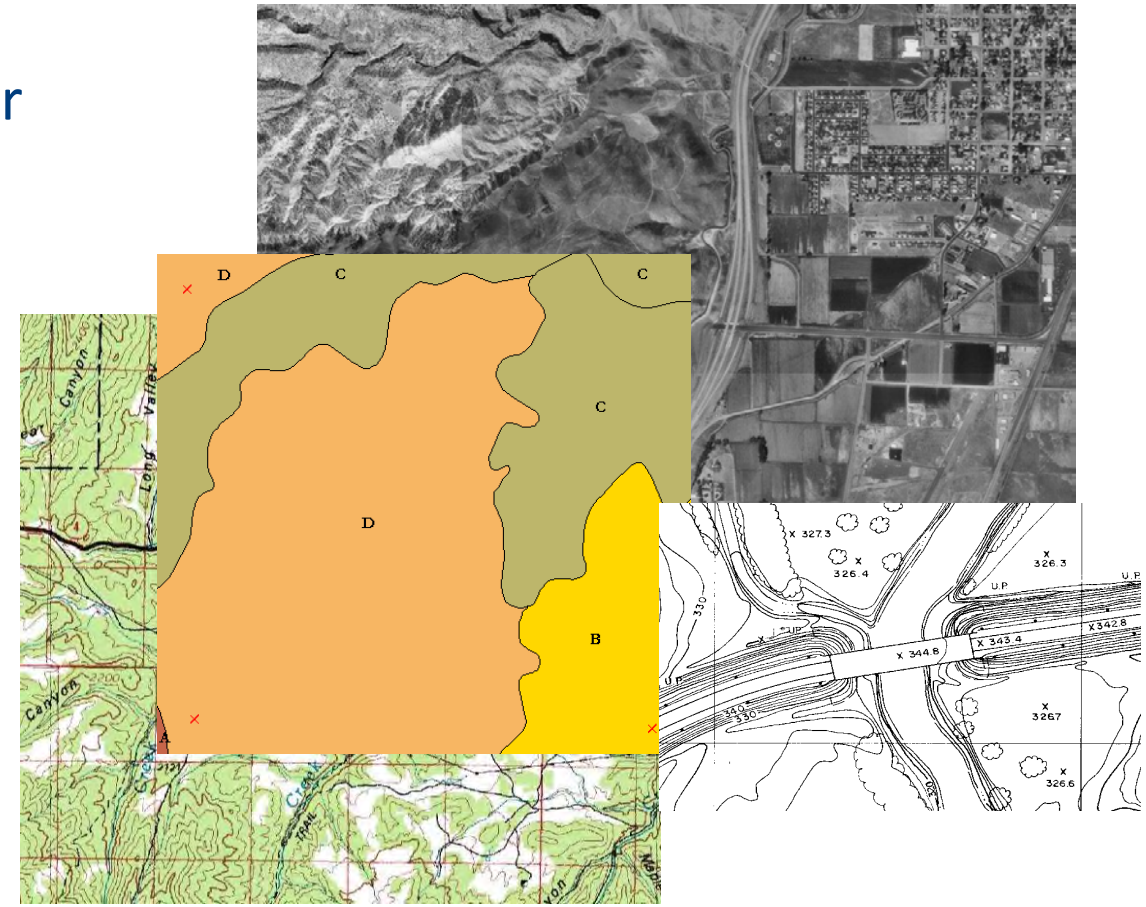
Which coordinate system/projection would not be effective as a display projection?

- The correct answer is:

A) State Plane
B) Universal Transverse Mercator (UTM)
C) Geographic
D) All of the above could be used as a display projection

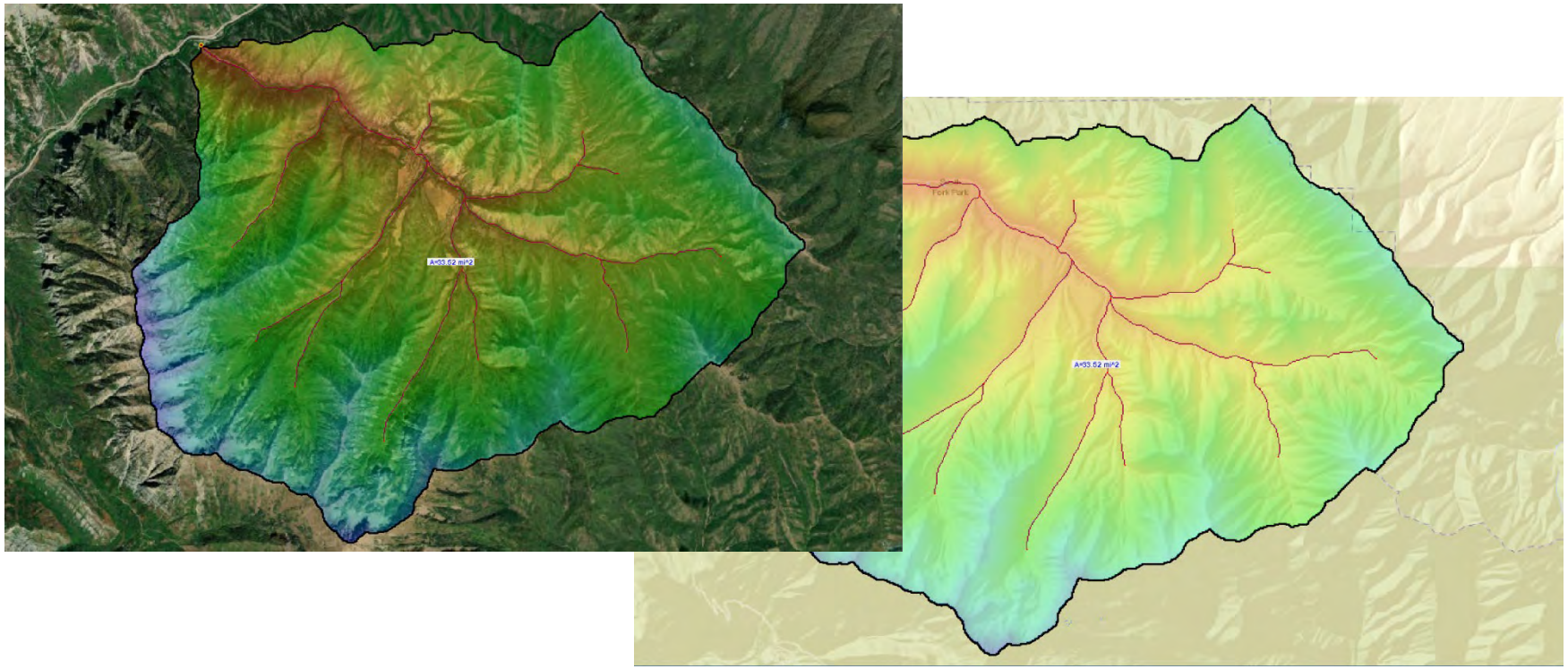
Base Map Data

- Reference data for the site:
  - Aerial photos
  - Topo charts/maps
  - CAD
  - GIS

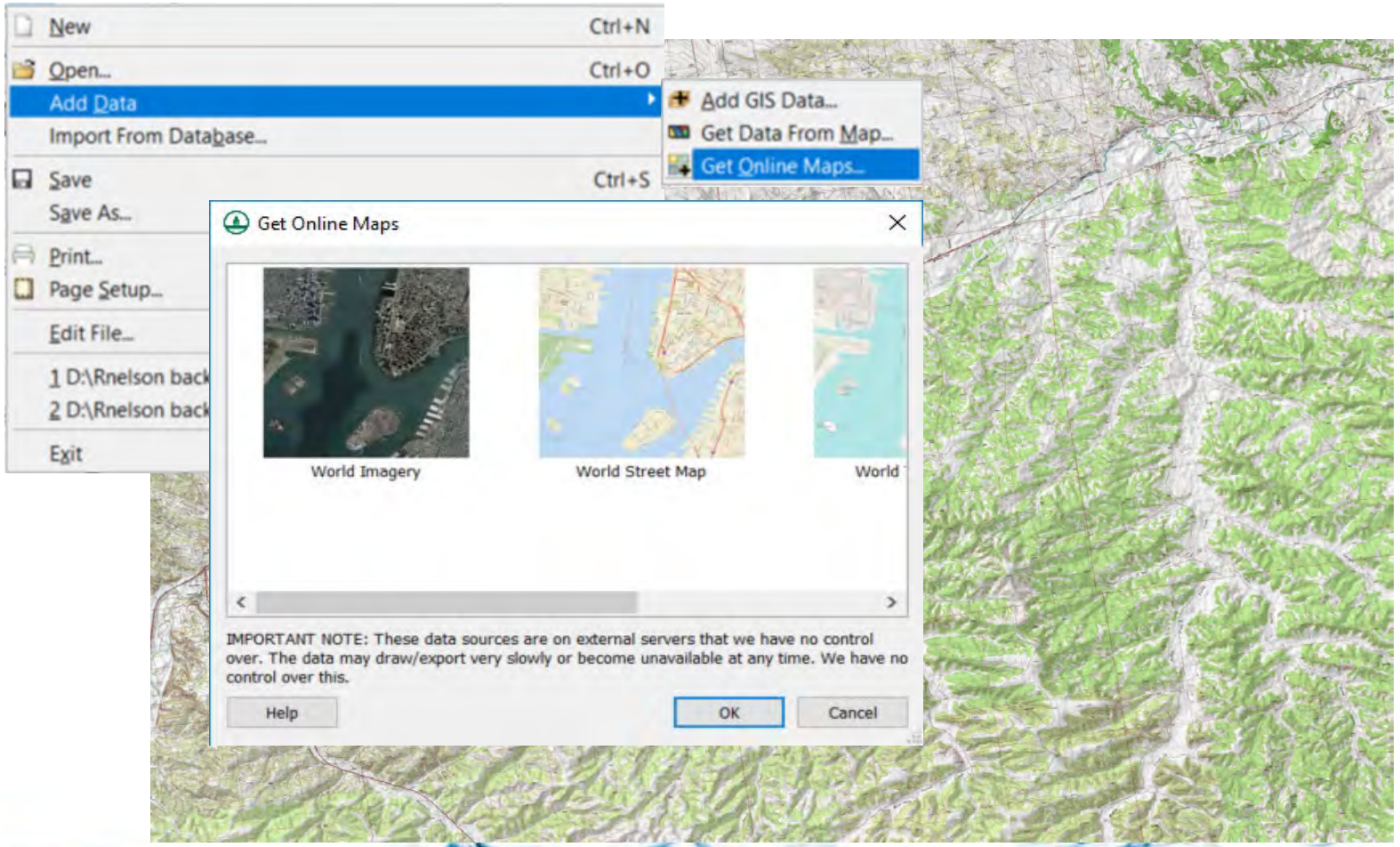


Images

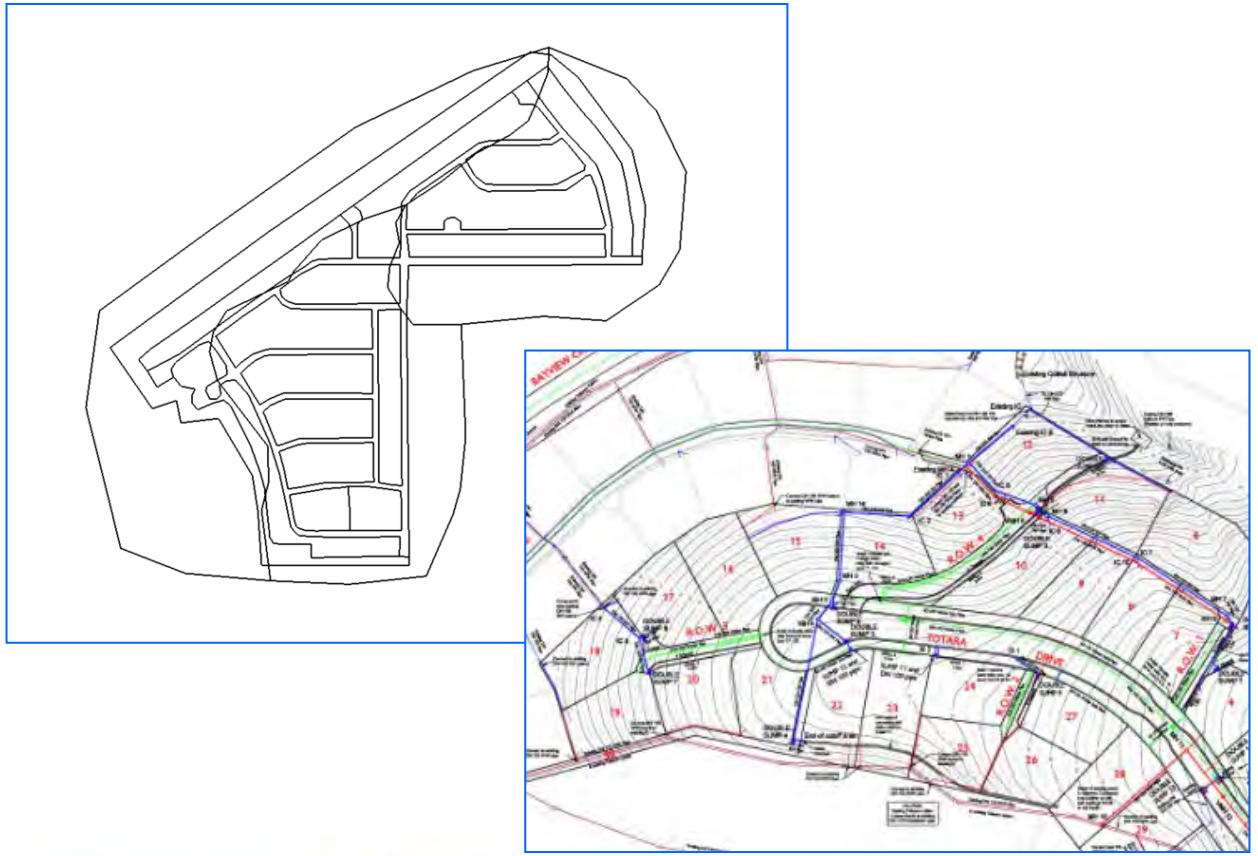
Overlay data on images



Online Maps


New Ctrl+N
Open... Ctrl+O
Add Data
Import From Database...
Save Ctrl+S
Save As...
Print...
Page Setup...
Edit File...
1 D:\Rnelson back
2 D:\Rnelson back
Exit
Add GIS Data...
Get Data From Map...
Get Online Maps...
Get Online Maps
World Imagery
World Street Map
World
IMPORTANT NOTE: These data sources are on external servers that we have no control over. The data may draw/export very slowly or become unavailable at any time. We have no control over this.
Help
OK
Cancel

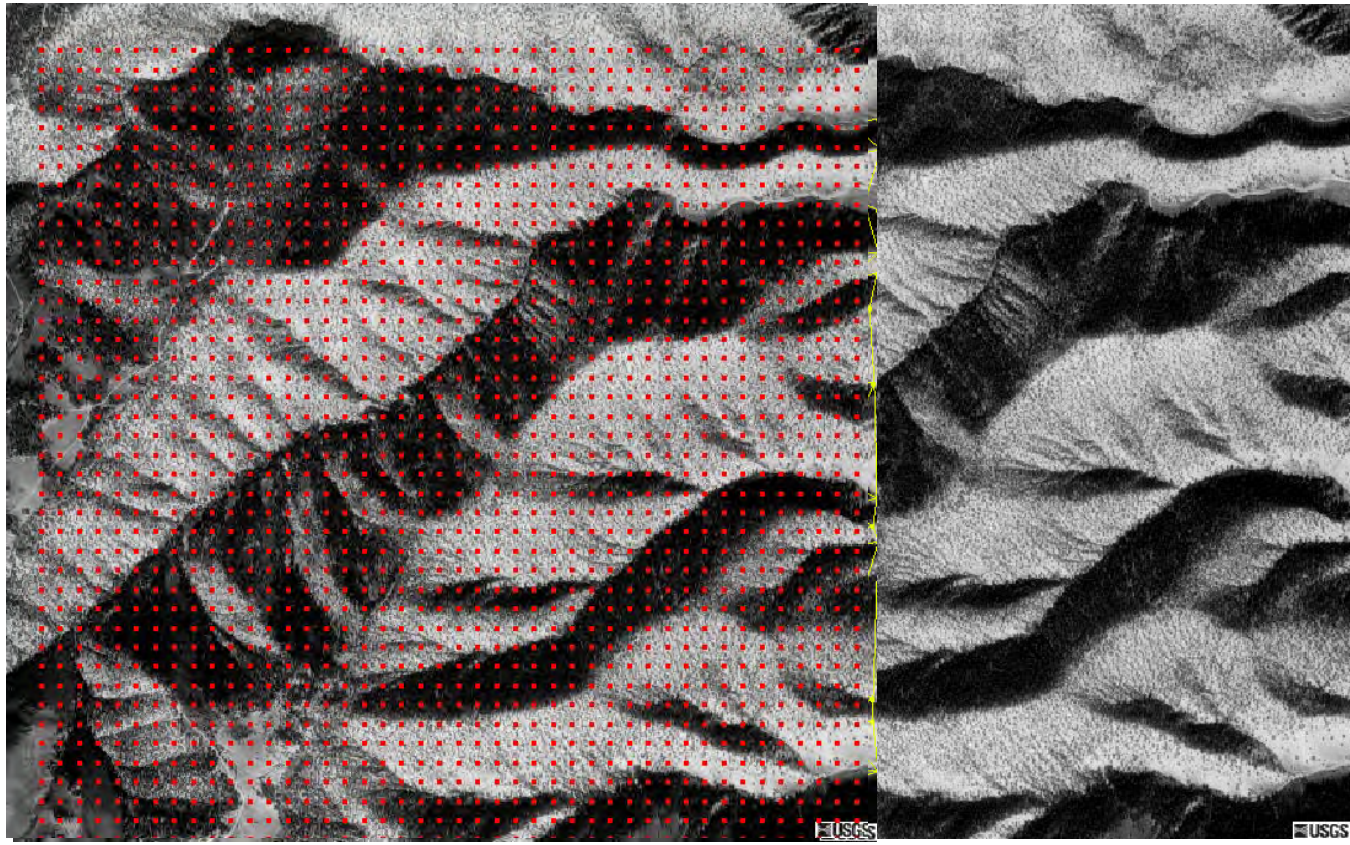
GIS & CAD Data



Elevation Data

Digital Terrain Model

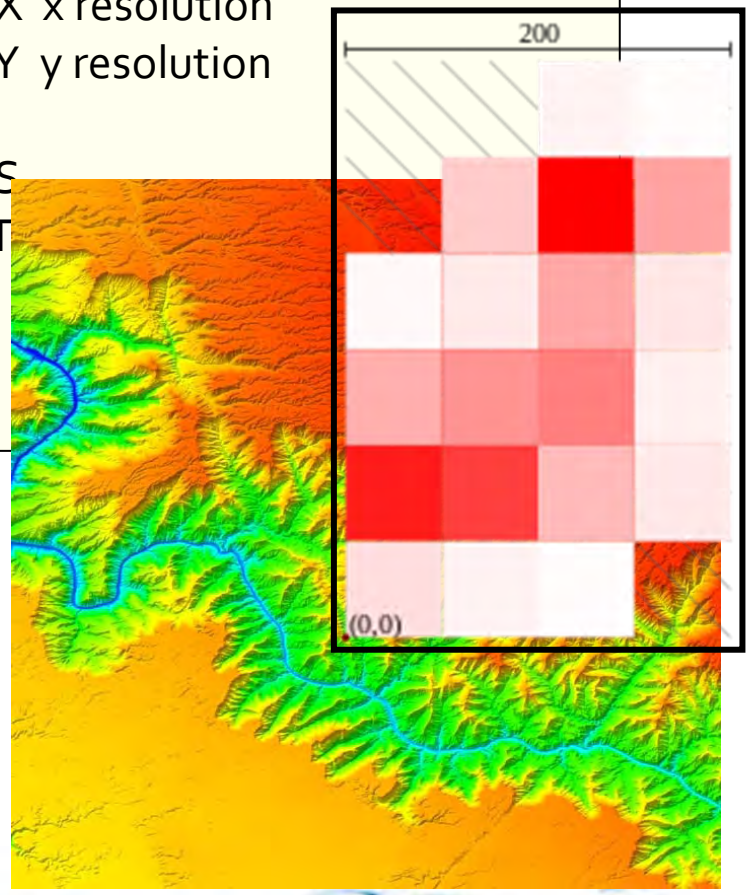
- Digital Representation
  - TINs
  - DEMs
- DEMs used in WMS



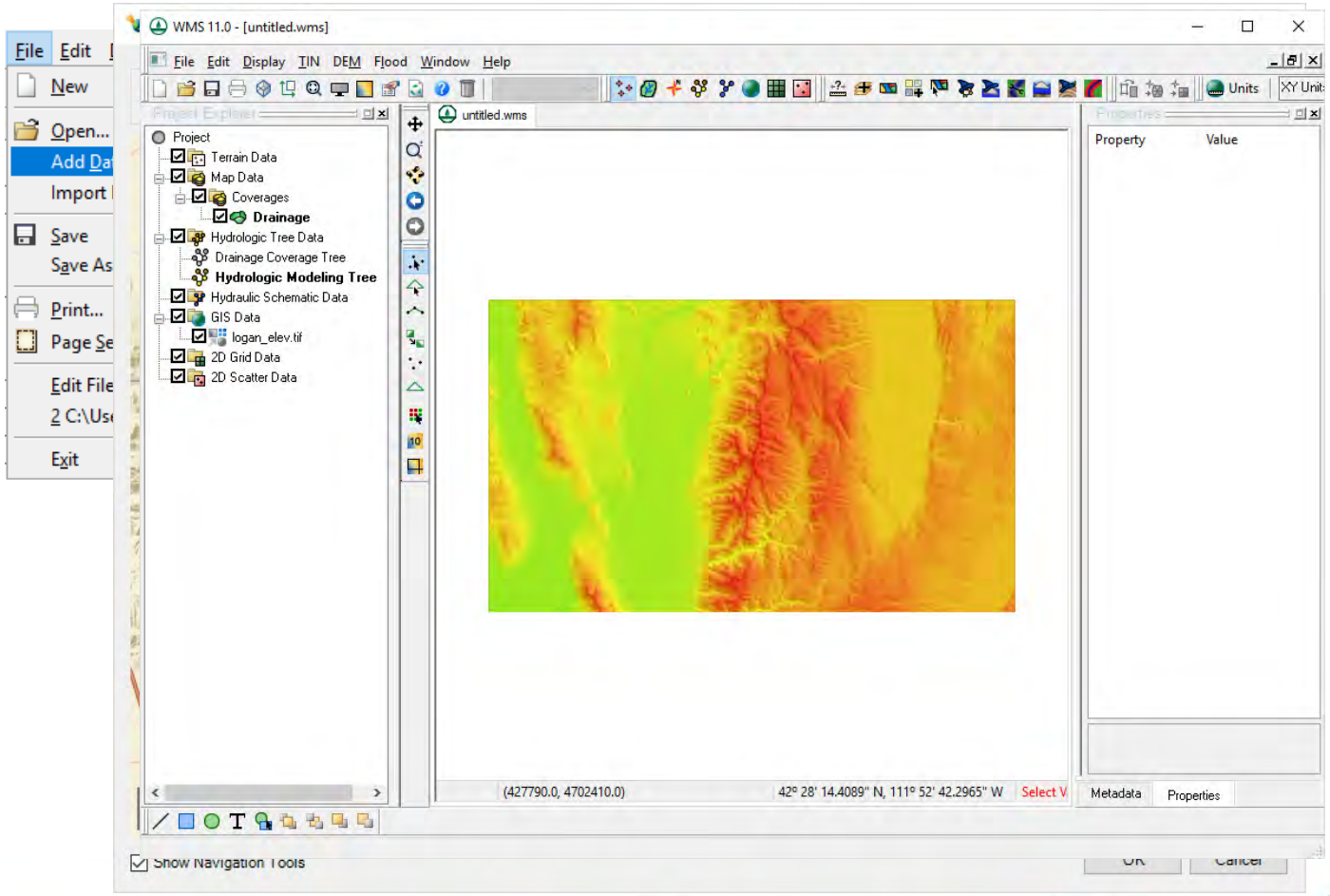
DEMs

- DEM Data
  - Gridded elevation data
  - Less memory
- Formats
  - USGS DEM
  - ArcINFO GRID (.asc)
  - GeoTIFF
  - Numerous others

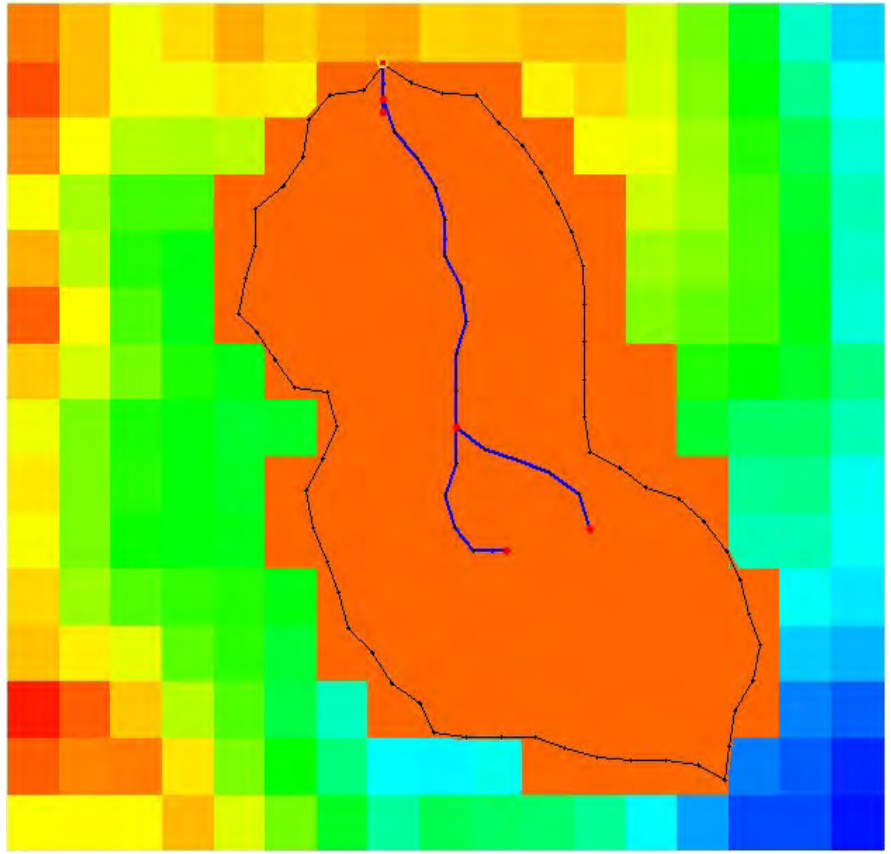
ORIGIN x lower left y lower left
DELTA X x resolution
DELTA Y y resolution
NCOLS
NROWS
ELEVAT
Z11
Z21
Z31



DEMs from Get Online Data

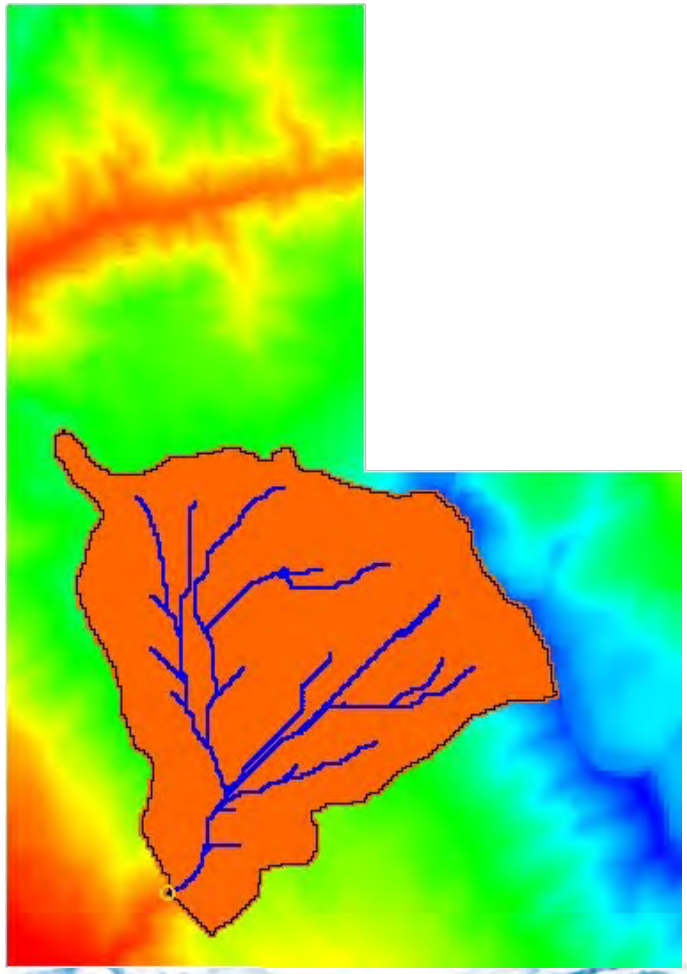


Resolution

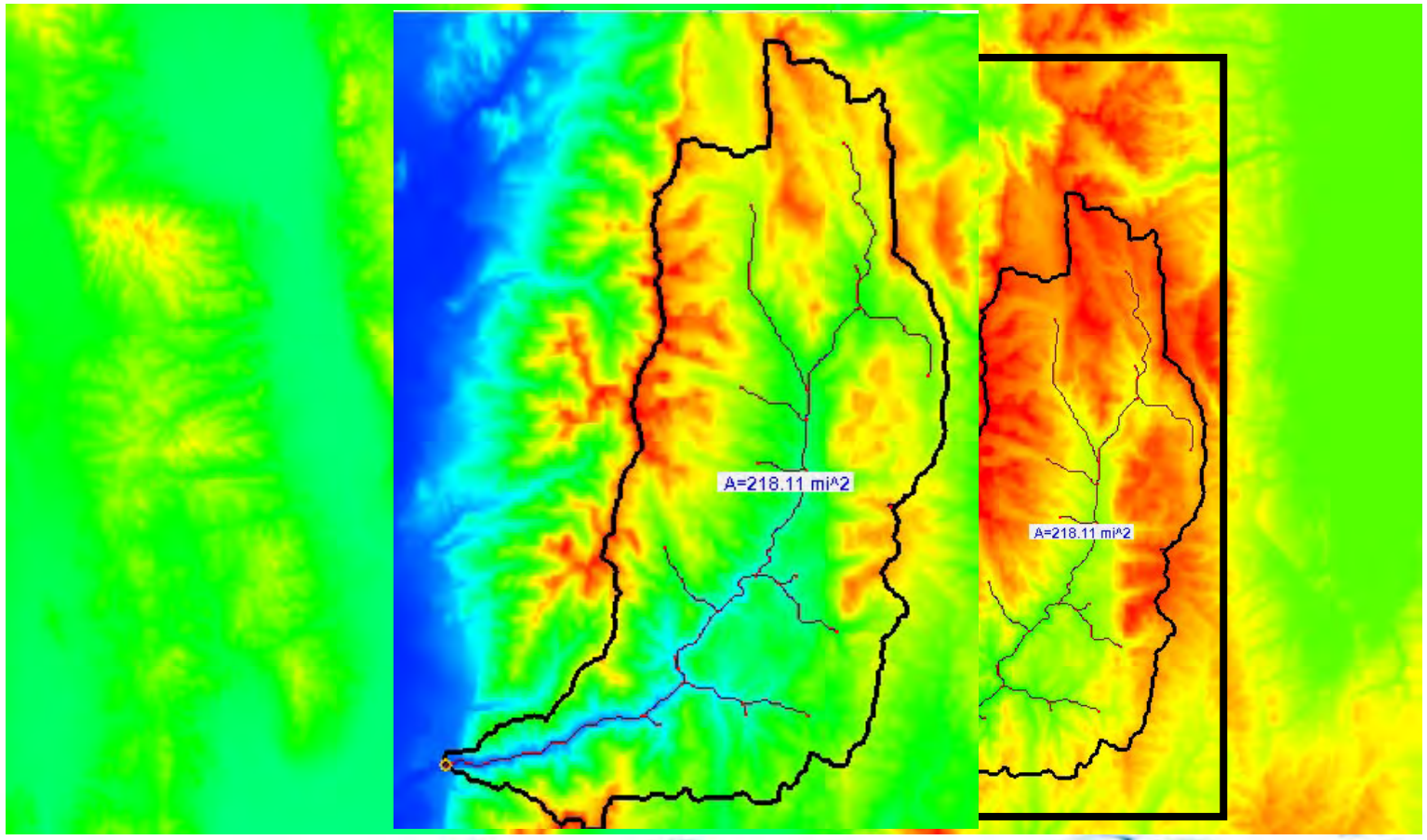


Tiling

- Tiling of DEMS

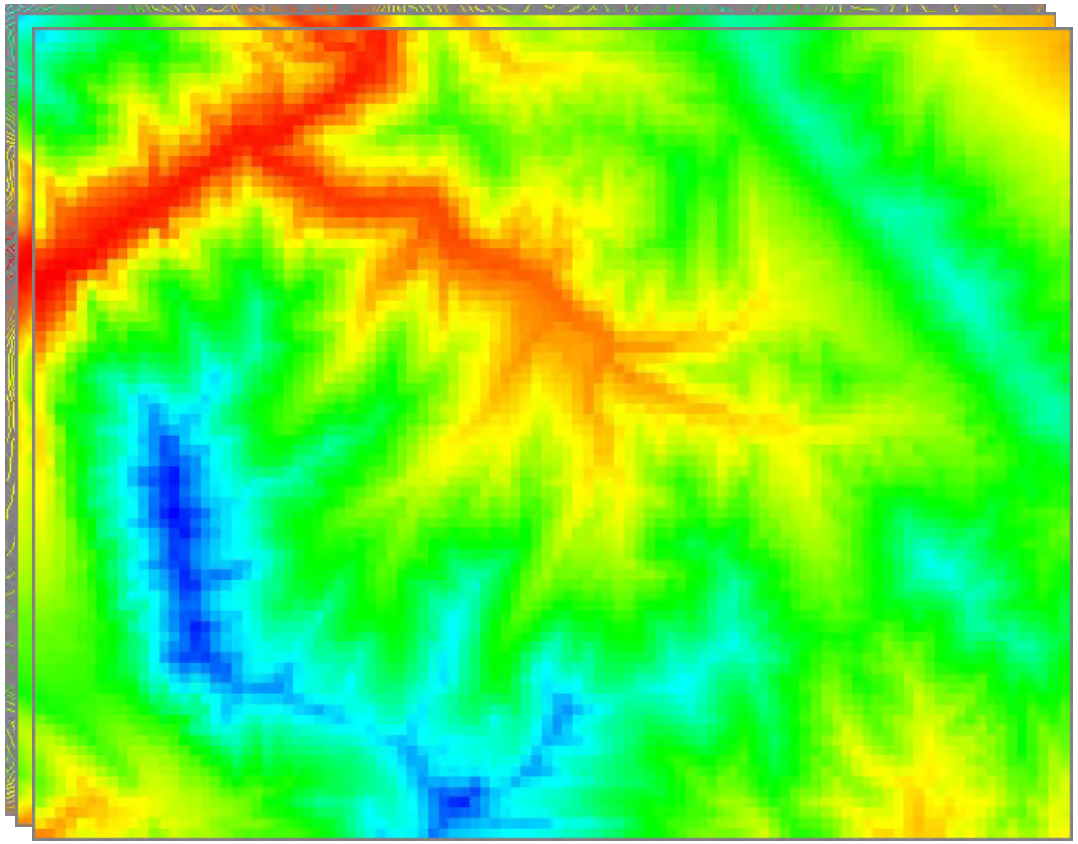


Trimming DEMs



Elevation Display Options

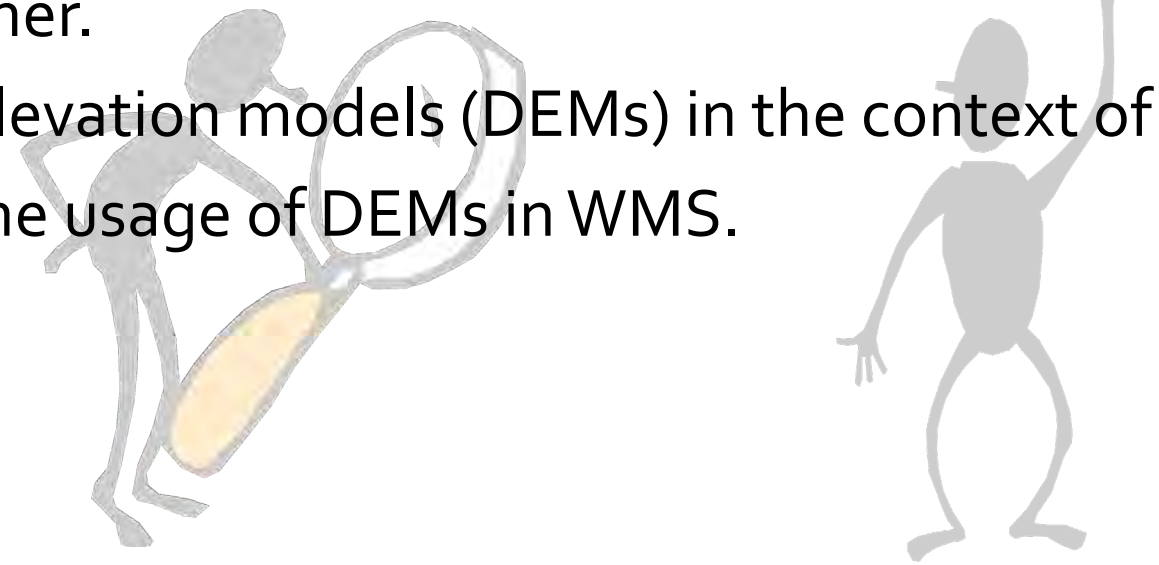
- Contour Options
  - Linear Contours
  - Color Fill Contours
    - Display Step



Demonstration

Review & Discuss

- We are now able to:
  - Define data projections.
  - Assess how to set projections in WMS and how to reproject data from one system to another.
  - Define digital elevation models (DEMs) in the context of WMS.
  - Demonstrate the usage of DEMs in WMS.



Workshop

- Let's practice …
- **Exercises** folder for instructions
- **Background** folder contains the data files required for the exercise.