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Creating Base Maps Using Global Mapper

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ALASKA SURVEYING & MAPPING CONFERENCE
MARCH 2014

Back to the Base-ics

Raster Blending Techniques and Multi-Image Mashups

What is Raster Blending?

Blending one raster into another so the properties of both are preserved.

Back to the Base-ics

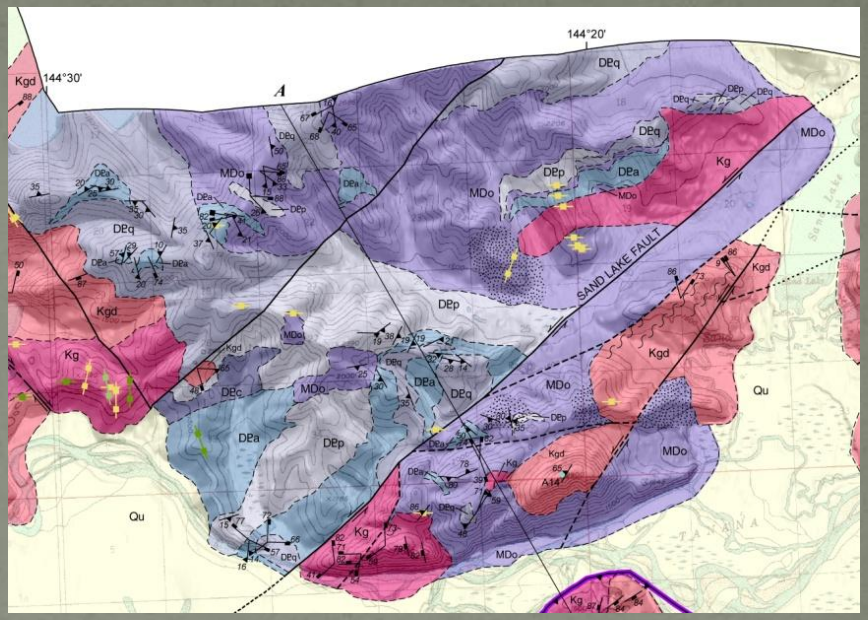
Raster Blending and Multi-Image Mashups

Why Raster Blending?

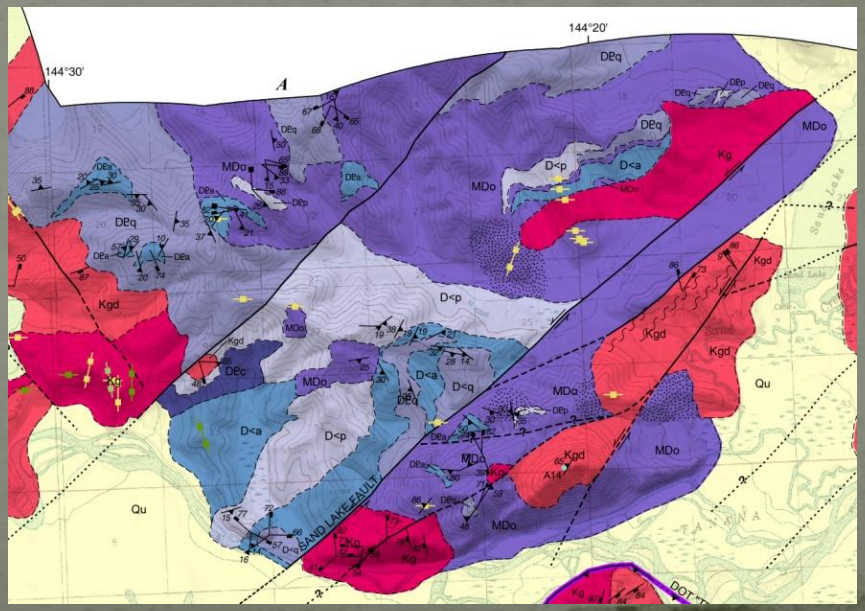
1) To avoid using transparency on geologic maps
2) To balance the shading and topographic base map so they complement the geologic map data

Raster Blending and Multi-Image Mashups

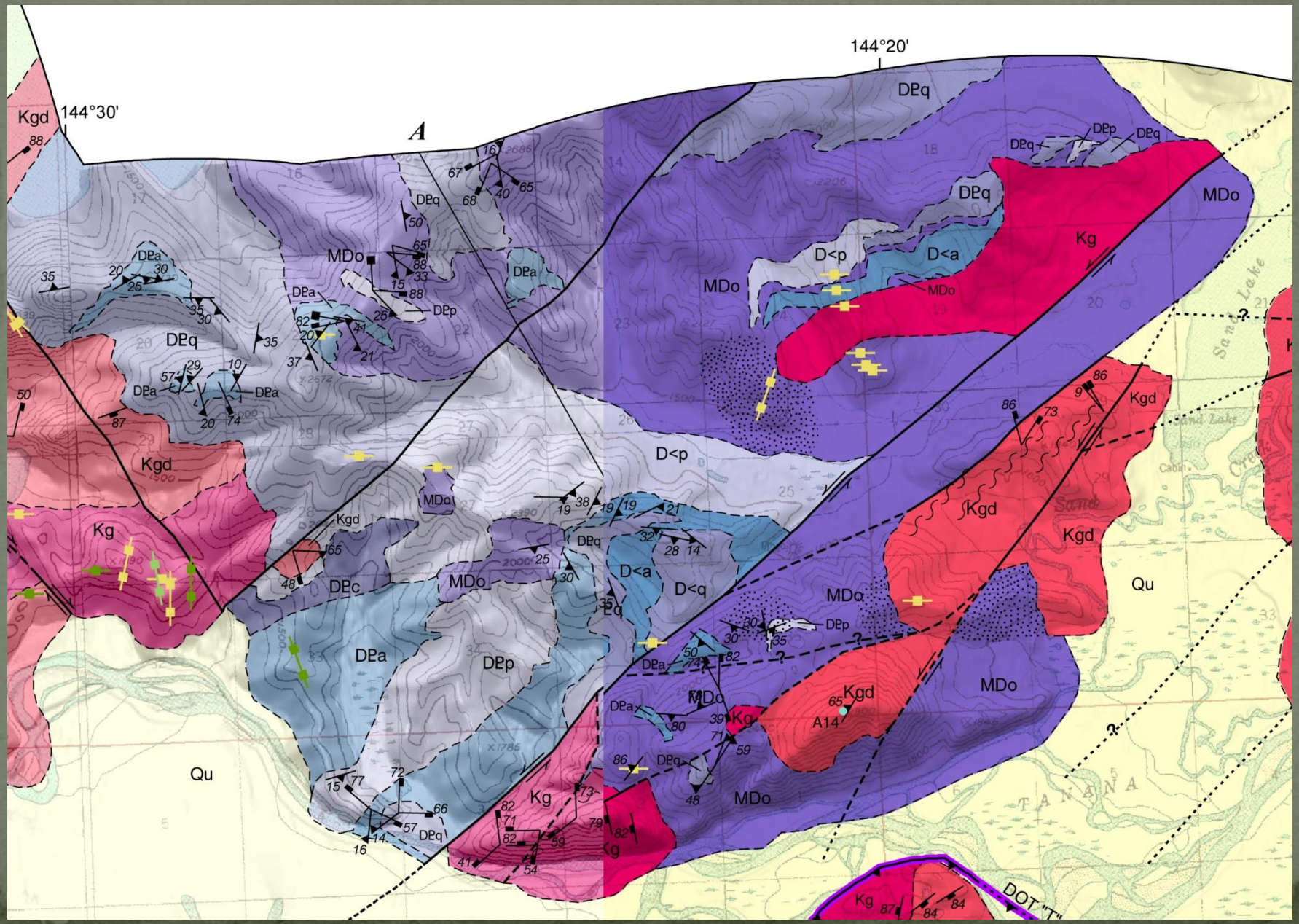
ArcMap Transparency



Global Mapper Blending



Transparent Polygons Raster Blending

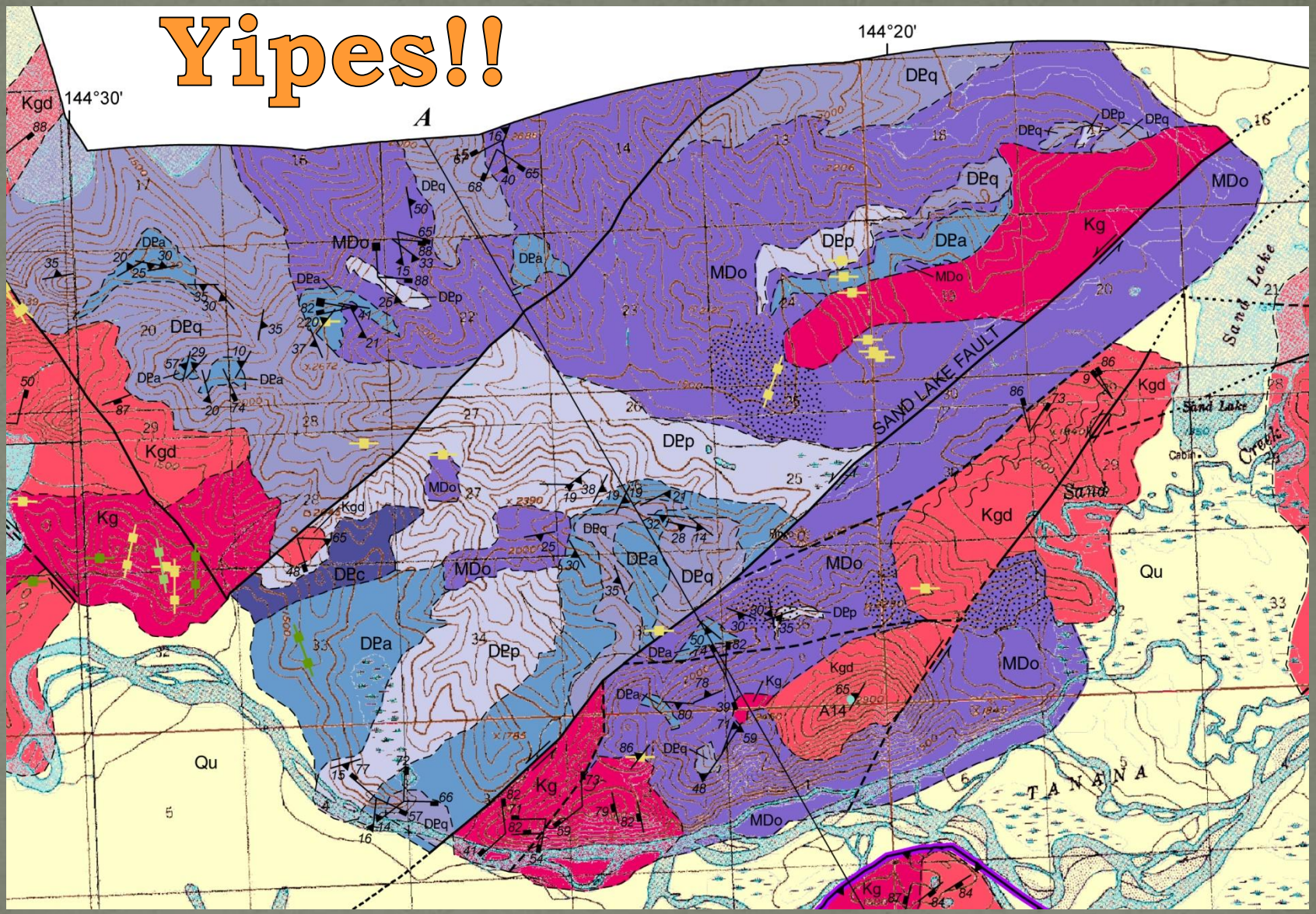


“Why can’t I just put the base map features on top of the map unit polygons?”

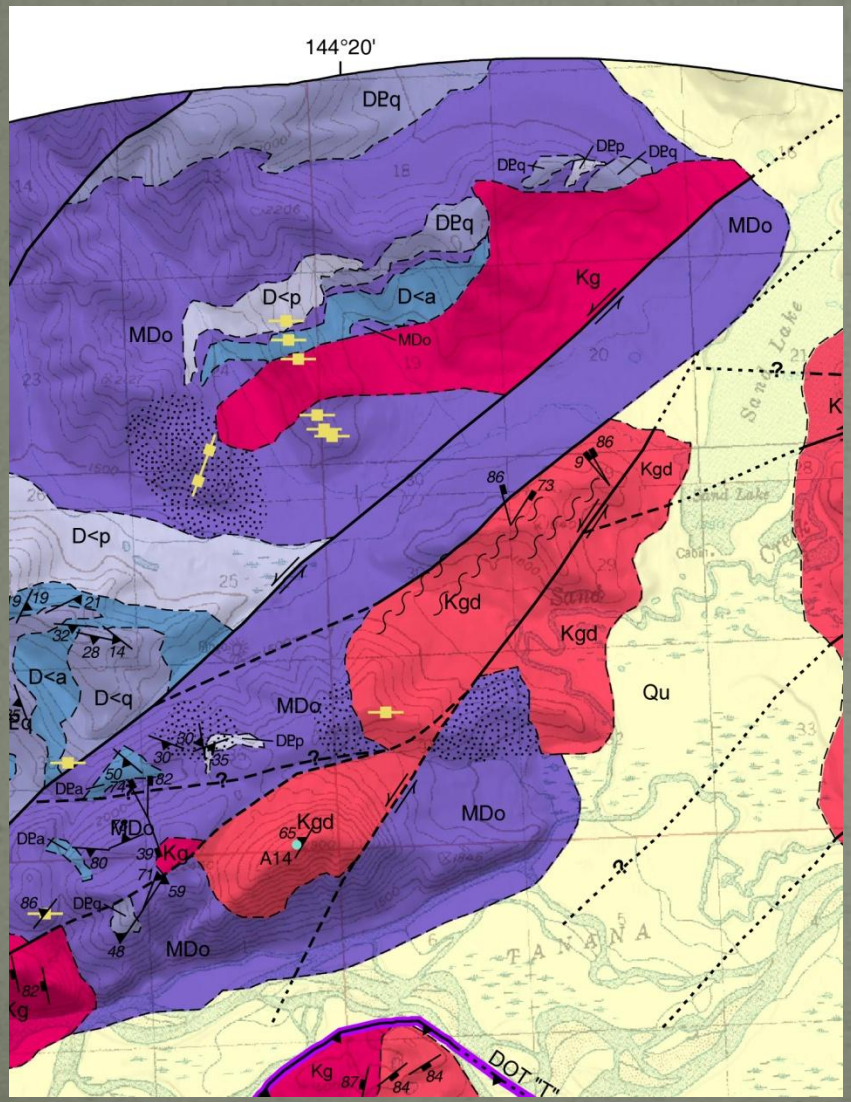
Because….

Base maps belong at the “base” of all other layers!

Yipes!!


144°30'
144°20'
A
Kgd
DPq
DPp
DPa
MDo
Kg
DPc
Qu
SAND LAKE FAULT
Sand Lake
Sand Lake Creek
Cabin
TANANA
A14

Very Impressive…



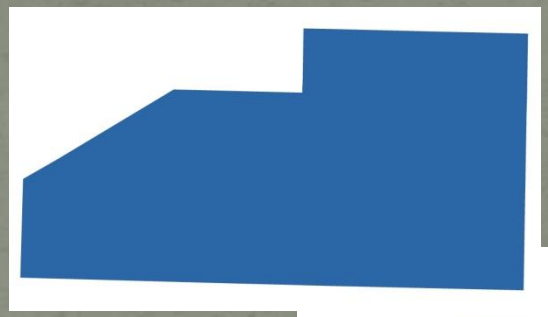
How do you make these!?

By using Global Mapper's raster shading and blending techniques.

Getting Started

What you need

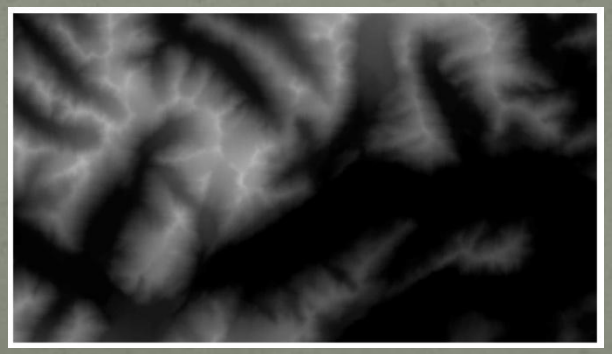
1) Polygon boundary of your map area



Whole area

Large water areas clipped out

2) Elevation data for your project

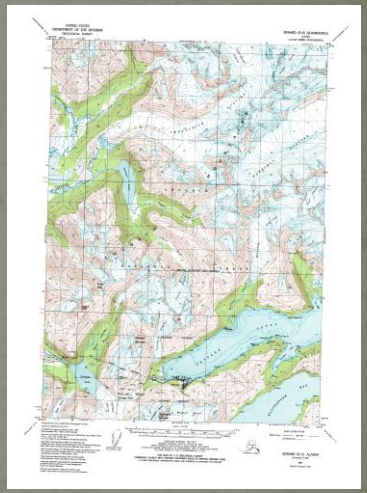


Best available – lowest common denominator

Getting Started

What you need

3) Digital Raster Graphics (DRGs) that cover your map area



4) Global Mapper

Data processing application that offers a wide variety of built in functionality
~ $450

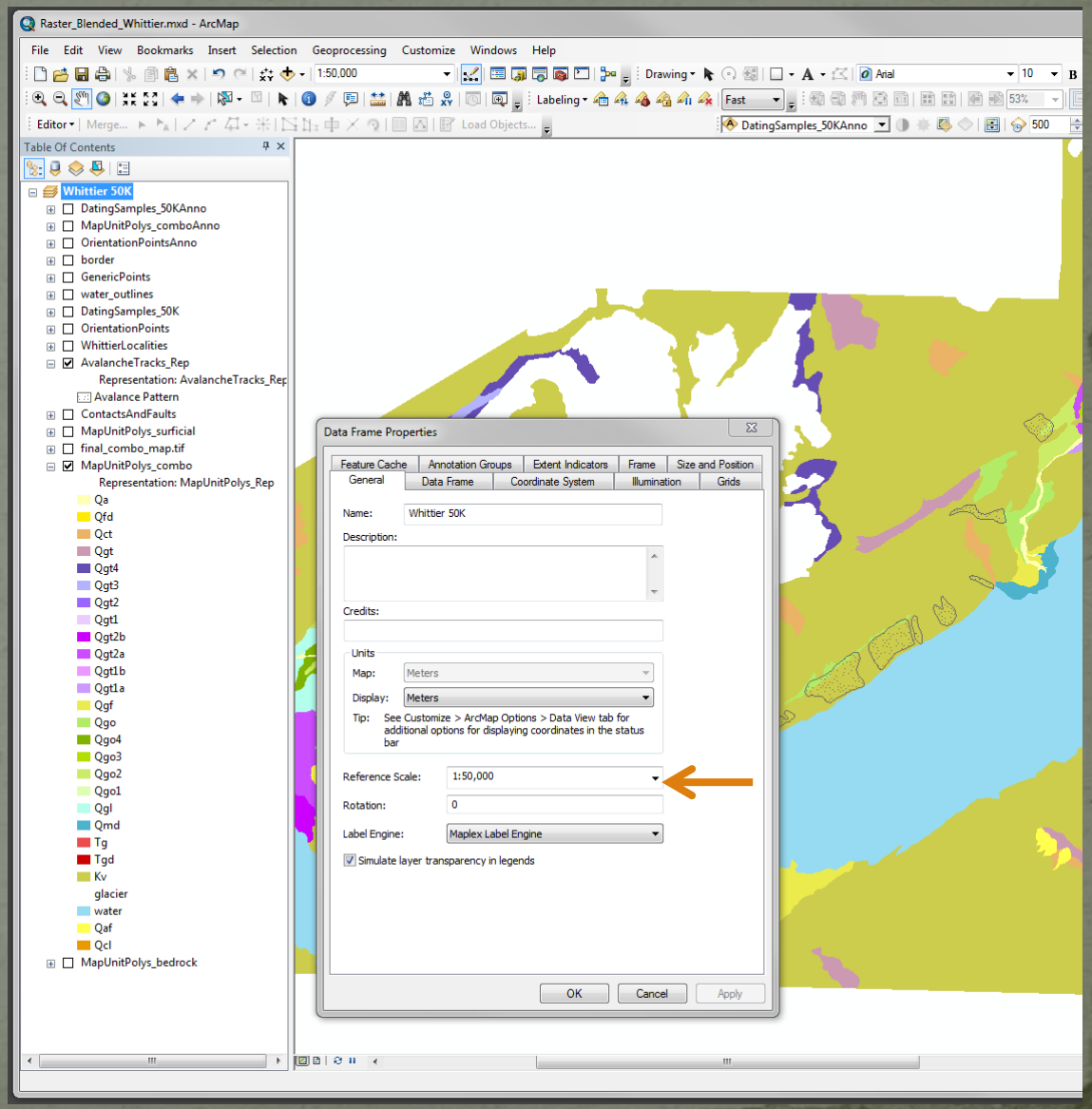
Global Mapper™

Blue Marble Geographics
Mind the Gap Between World and Map

Step 1 – ArcMap Data View

A) Symbolize map unit polygons and convert to cartographic representations
- Patterns should also be stored as representations
- Patterns are optional for inclusion in raster blended image

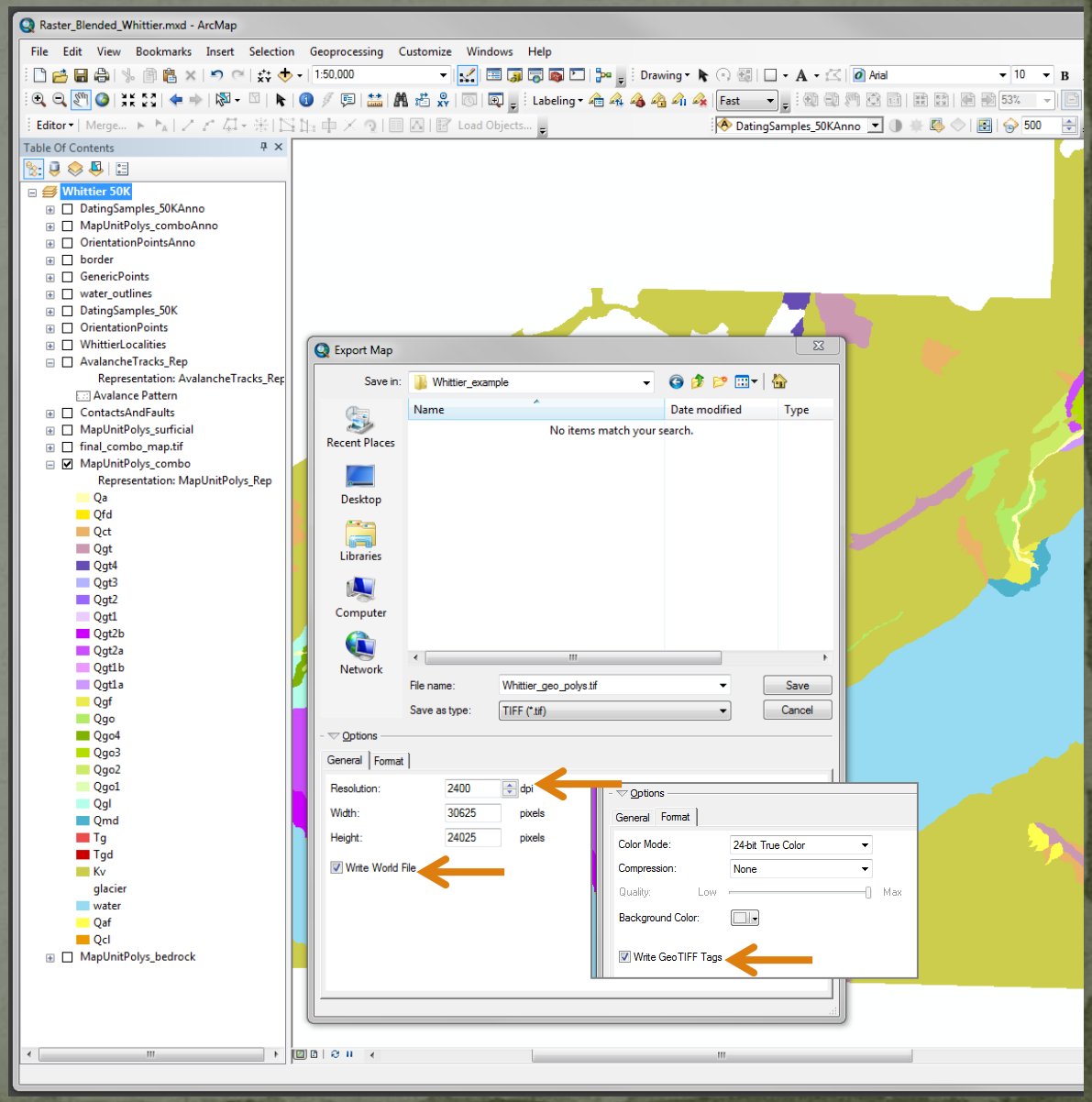
B) Set the data frame reference scale
- Patterns will scale properly at all zoom levels



Step 1 – ArcMap Data View

A) Turn off all layers except for polygon representation layer
- Patterns are optional

B) Export data as a high resolution GeoTiff
- 2400dpi
- Check "write world file" box
- 24-bit true Color
- No compression
- Check "write GeoTIFF Tags" box



Step 2 – Get Elevation Data

USGS The National Map Viewer

http://viewer.nationalmap.gov/viewer/

Choose the best dataset that completely covers your map area

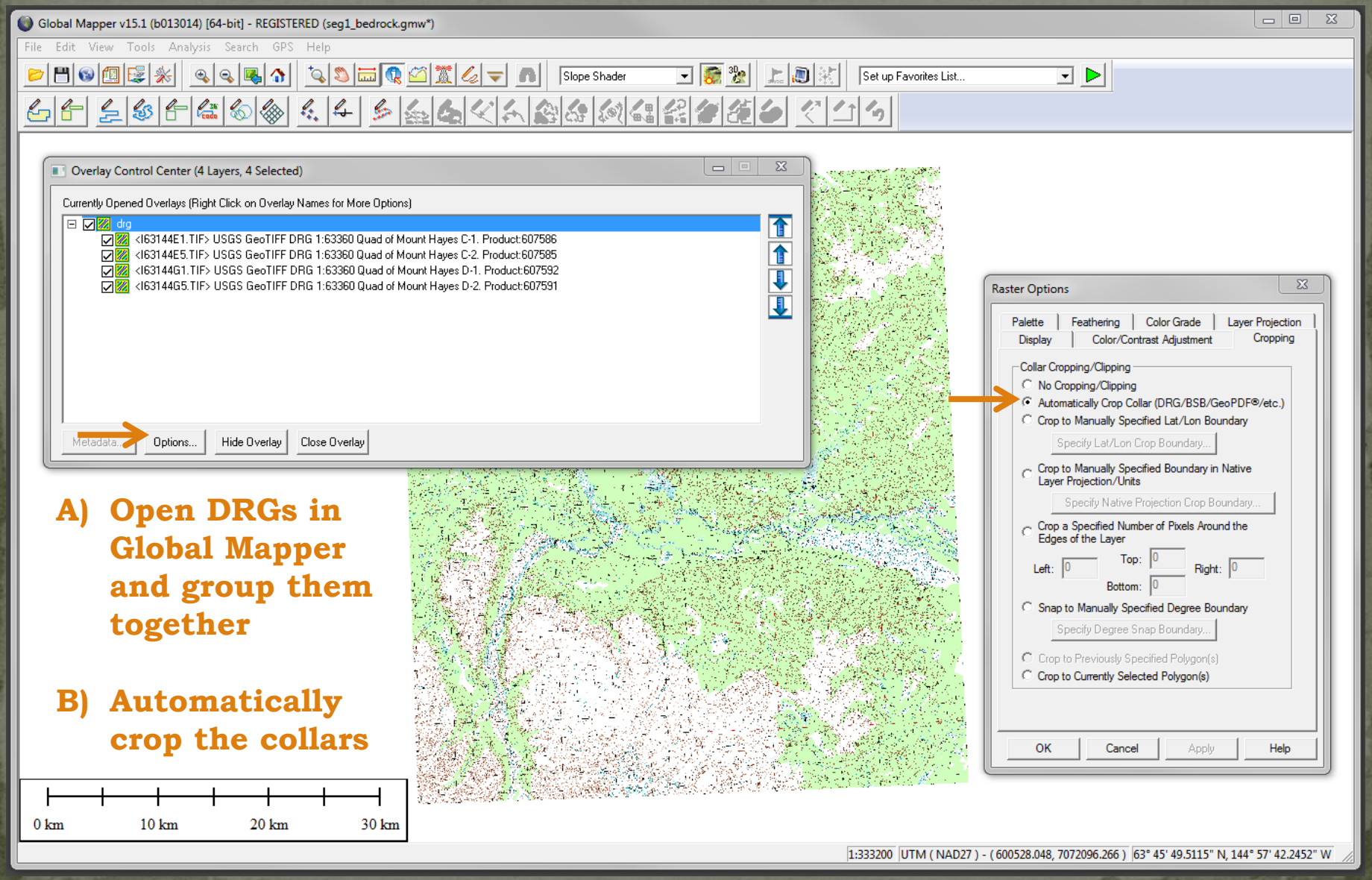
Step 3 – Most Recent Topo DRGs

USGS science for a changing world EarthExplorer

http://earthexplorer.usgs.gov/

Use bulk downloader application for large downloads

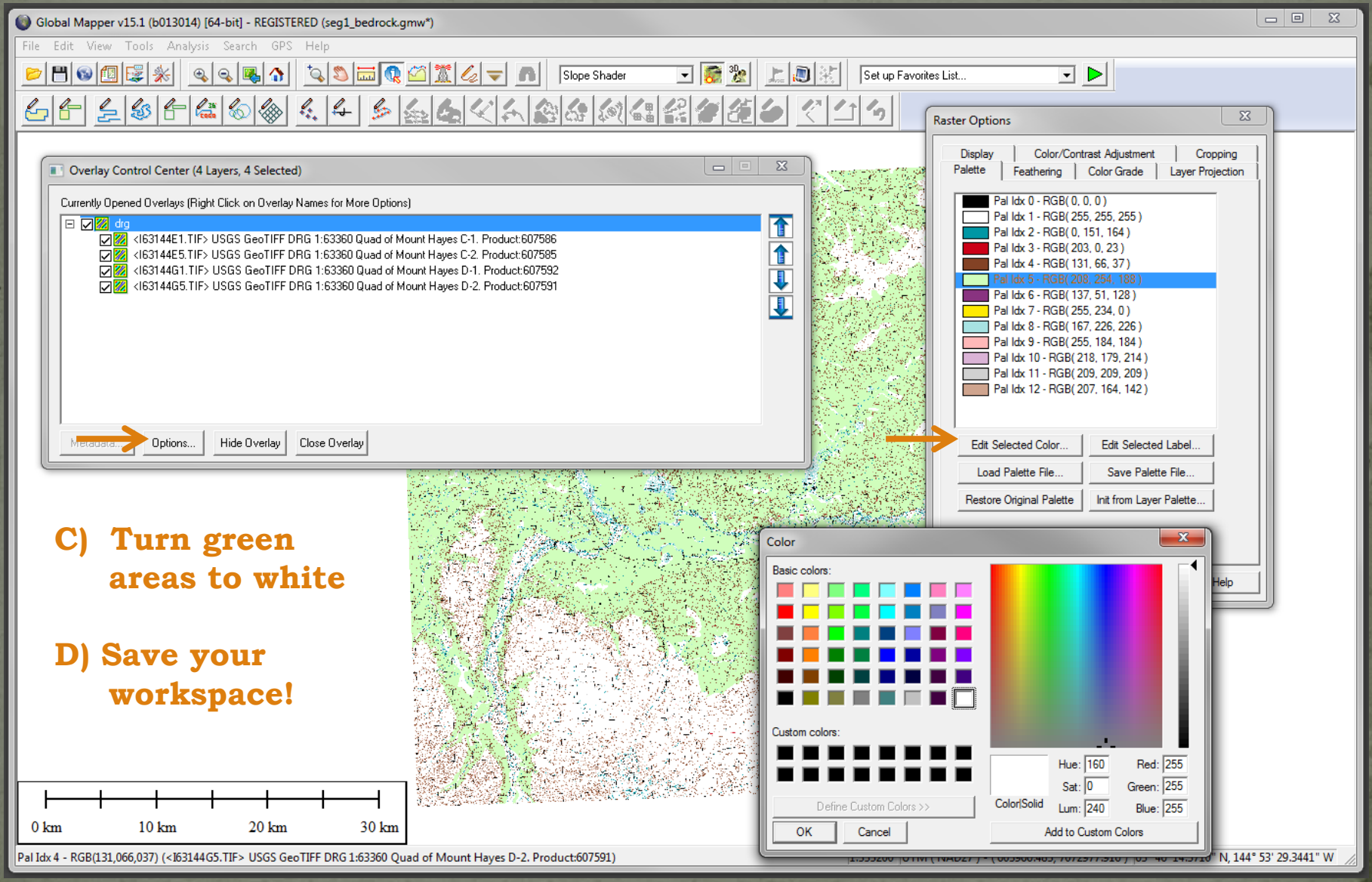
Step 4 – Create Seamless DRG



A) Open DRGs in Global Mapper and group them together

B) Automatically crop the collars

Step 4 continued…



C) Turn green areas to white

D) Save your workspace!

Step 5 – Create Slope-Enhanced Shaded Relief Image

Slope-enhanced shaded relief is superior to standard "hillshades"

- Much better definition of "3-D" terrain
- Clears out the gray from low-angle slopes so map unit colors are not "muddied" by shading

Step 5 – Create Slope-Enhanced Shaded Relief Image

hillshade

Slope-enhanced

Create Slope-Enhanced Shaded Relief Image

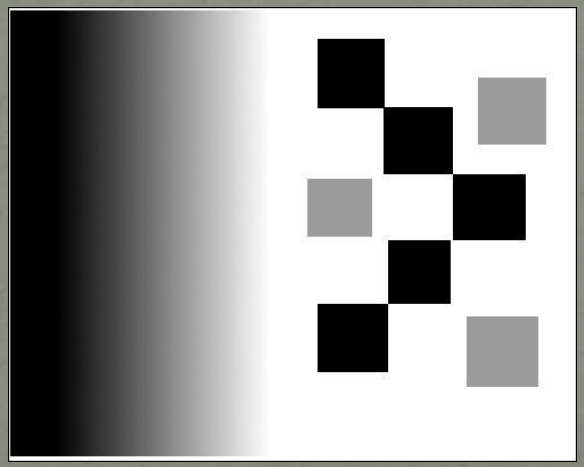
Three parts:

Step 5) Create a hillshade

Step 6) Create a slopeshade

Step 7) Combine (*Screen*) hillshade and slopeshade into a slope-enhanced shaded relief image

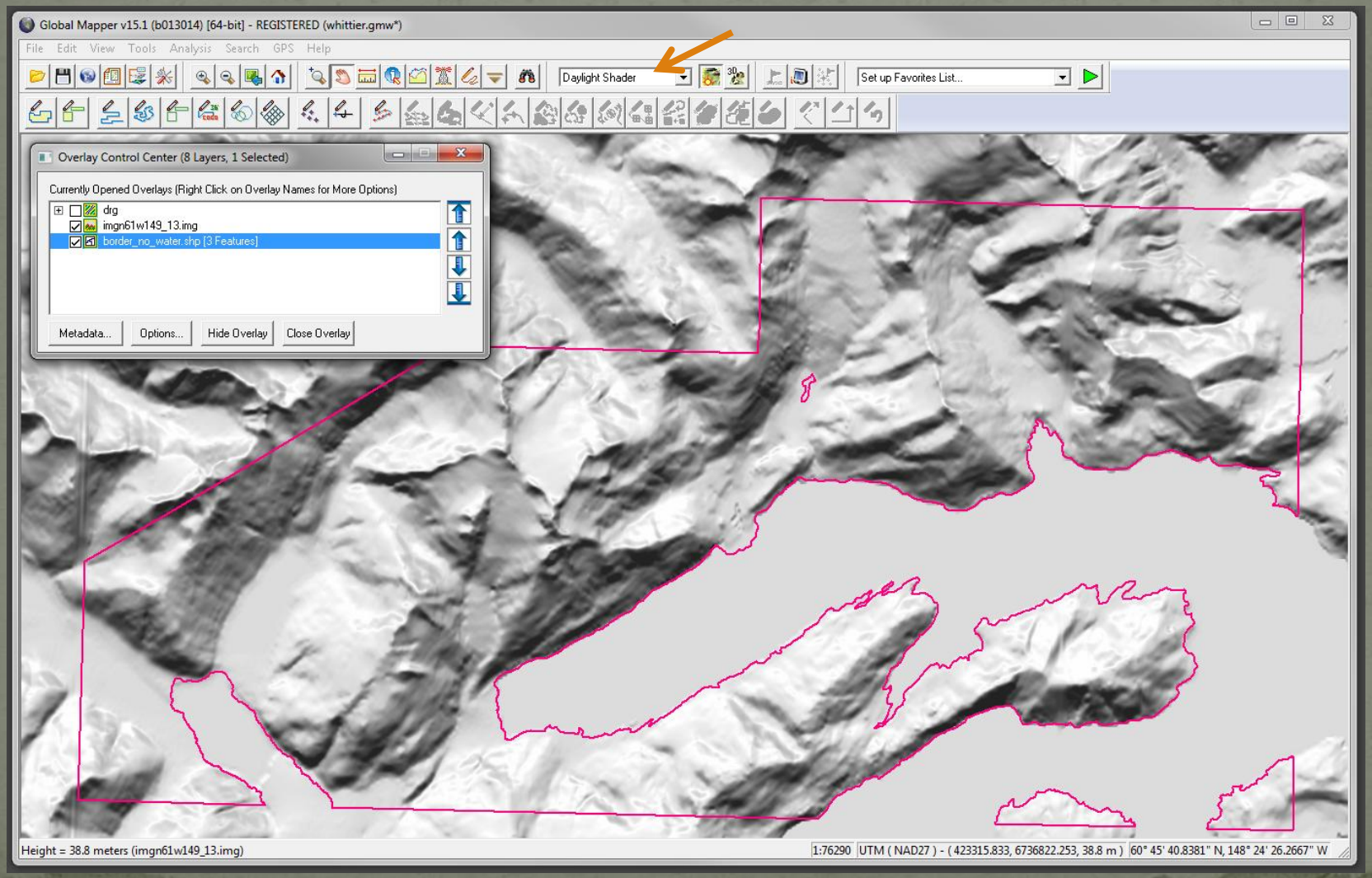
The *Screen* blend mode creates the slope-enhanced effect



Images from: Explaining Blending Modes in Photoshop and GIMP (Multiply, Divide, Overlay, Screen) by Margot Dinardi

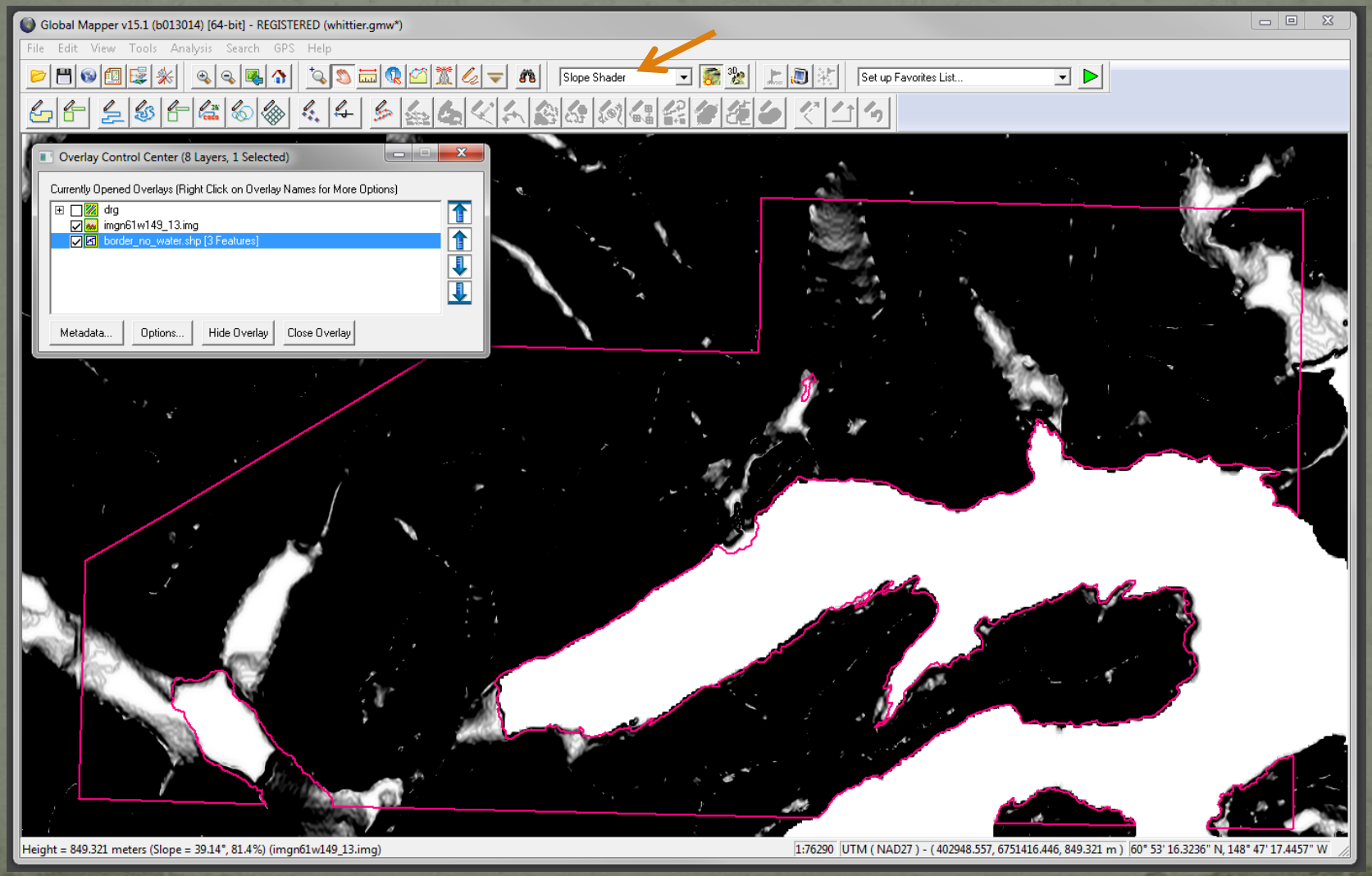
Create Slope-Enhanced Shaded Relief Image

Step 5) Create a hillshade



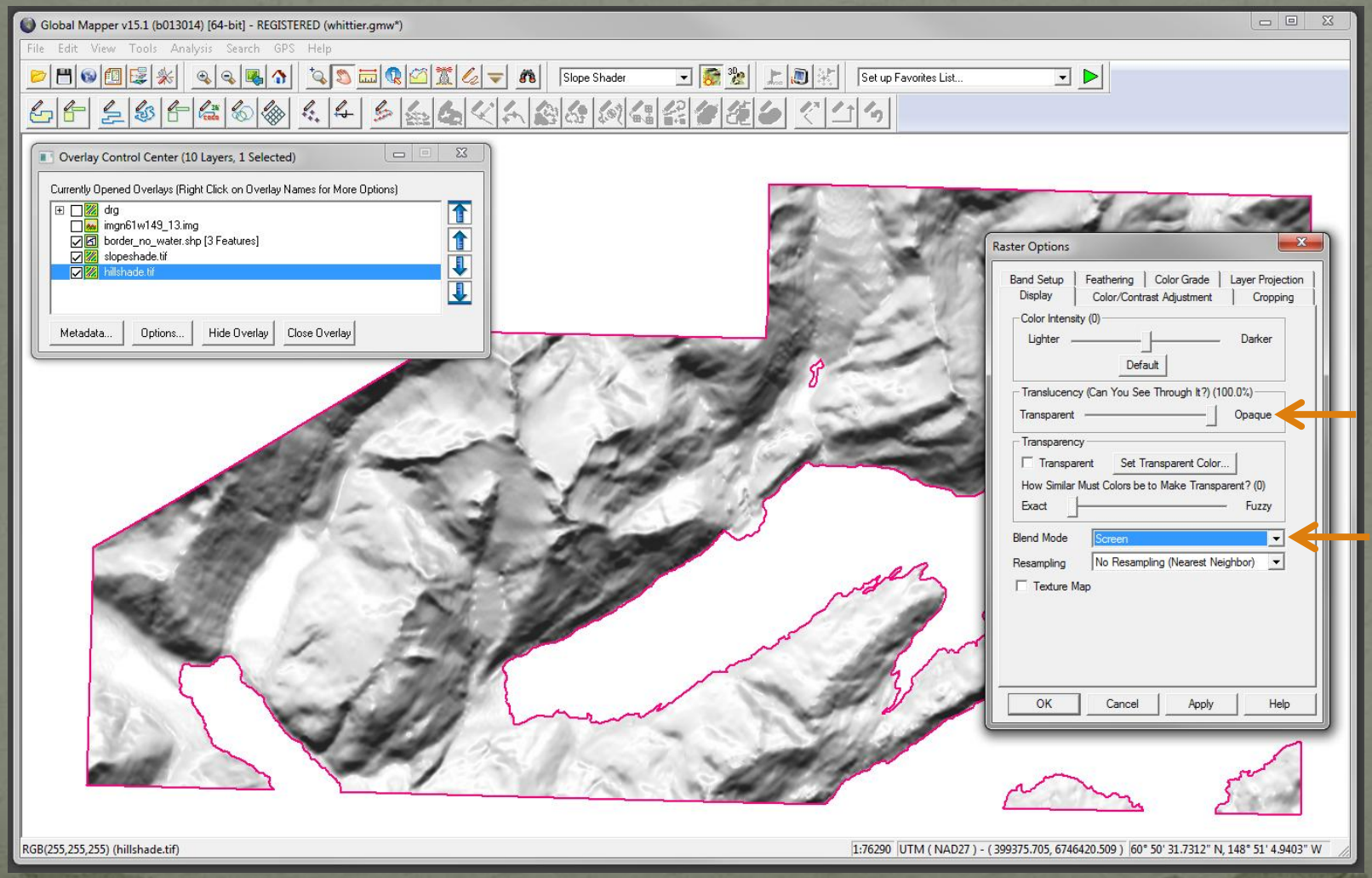
Create Slope-Enhanced Shaded Relief Image

Step 6) Create a slopeshade



Create Slope-Enhanced Shaded Relief Image

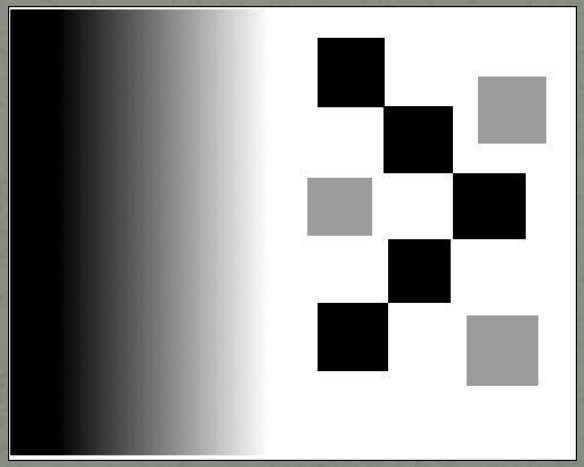
Step 7) Combine hillshade and slopeshade into a slope-enhanced shaded relief image



Step 8 – Create Final Raster Blended Geotiff

Global Mapper Overlay Blending

The *Multiply* blend mode is the most useful option
For blending map images to make image mashups



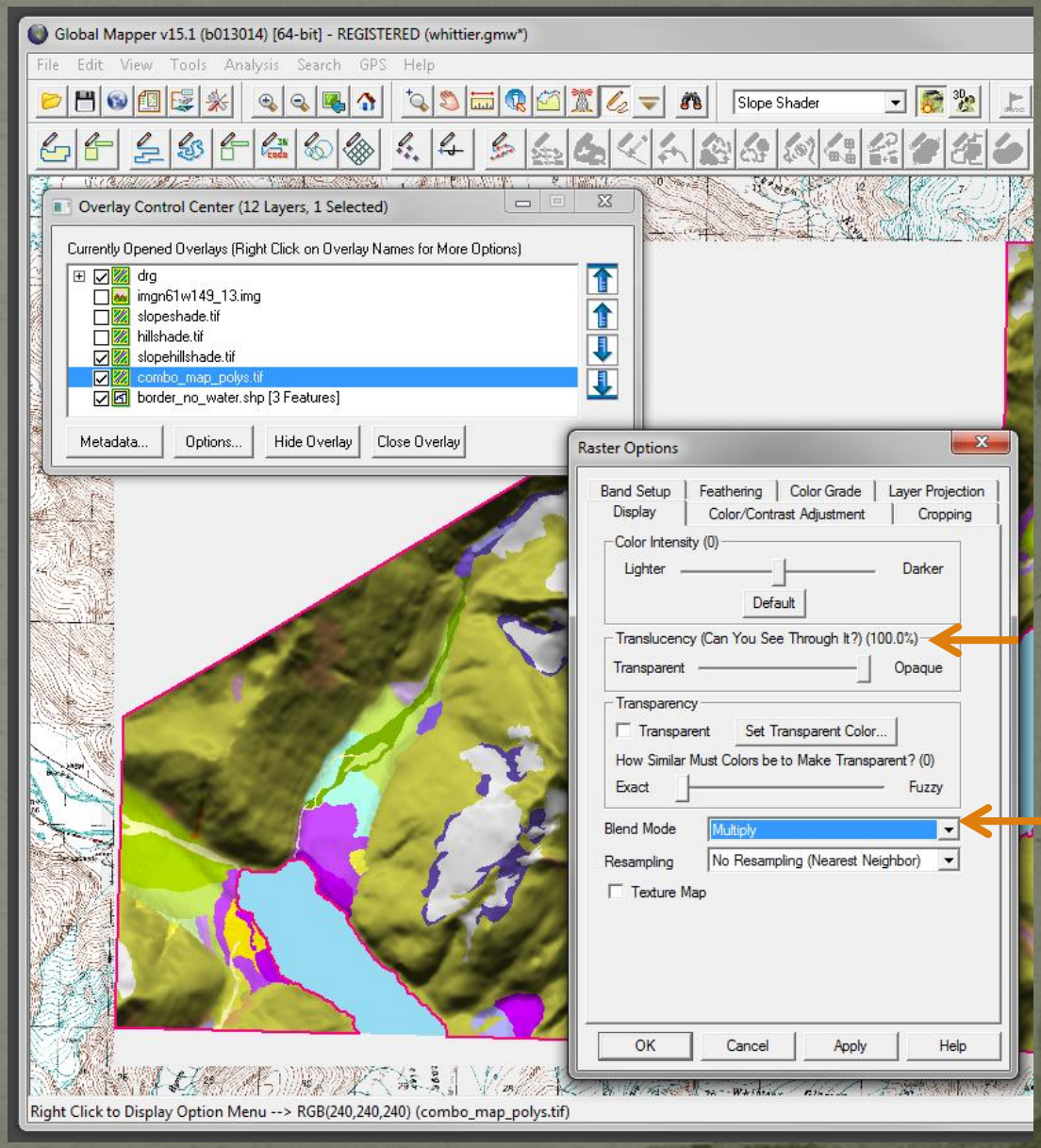
Images from: Explaining Blending Modes in Photoshop and GIMP (Multiply, Divide, Overlay, Screen) by Margot Dinardi

Step 8 – Create Final Raster Blended Geotiff

A) Add tiff of geologic units to Global Mapper

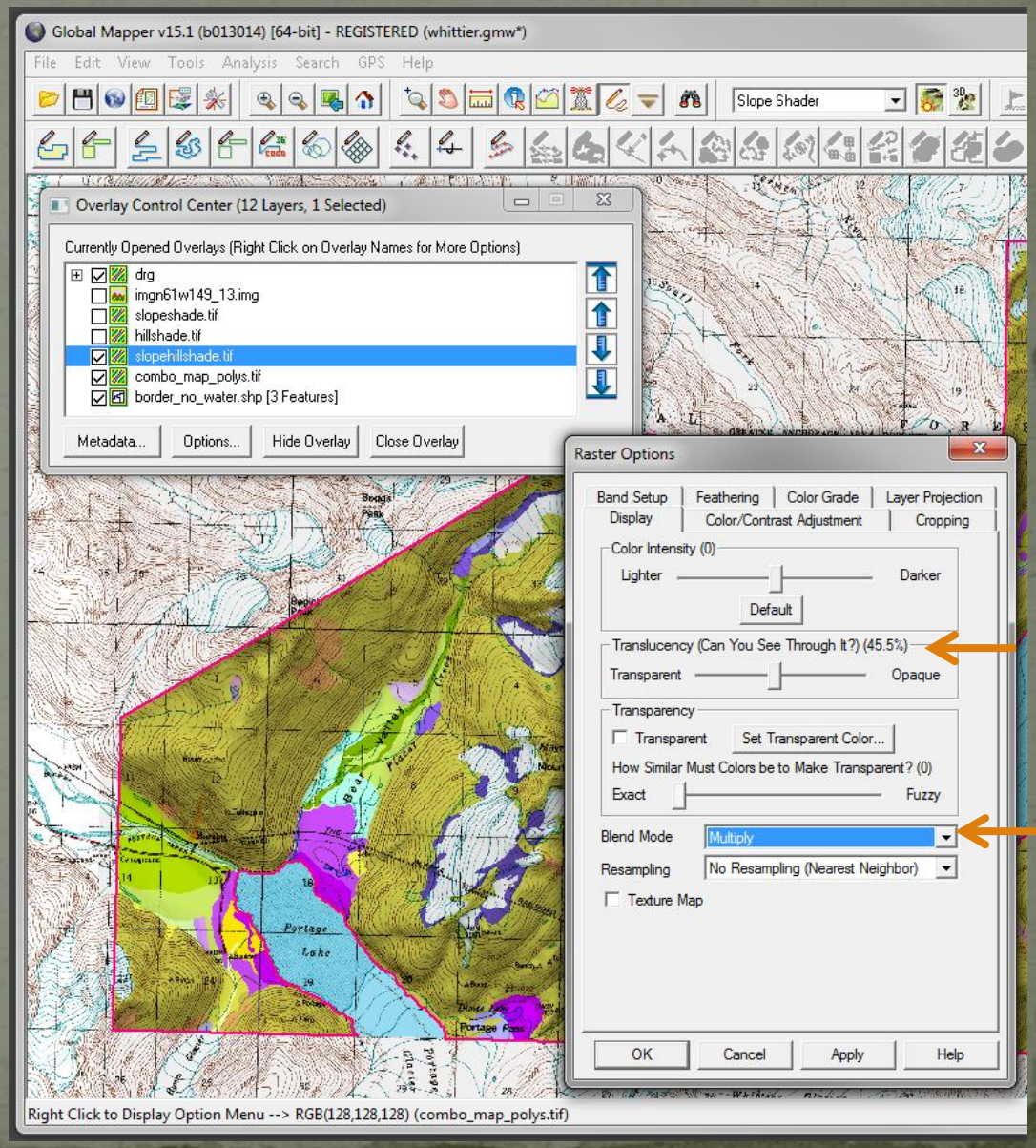
B) Arrange Overlay order
- DRGS from step 4
- Slopehillshade from step 5c
- Geologic units from step 1
- Border polygon shapefile

C) Geologic units Overlay Raster Options
- Translucency: 100% (Opaque)
- Blend Mode: Multiply



Step 8 – Create Final Raster Blended Geotiff

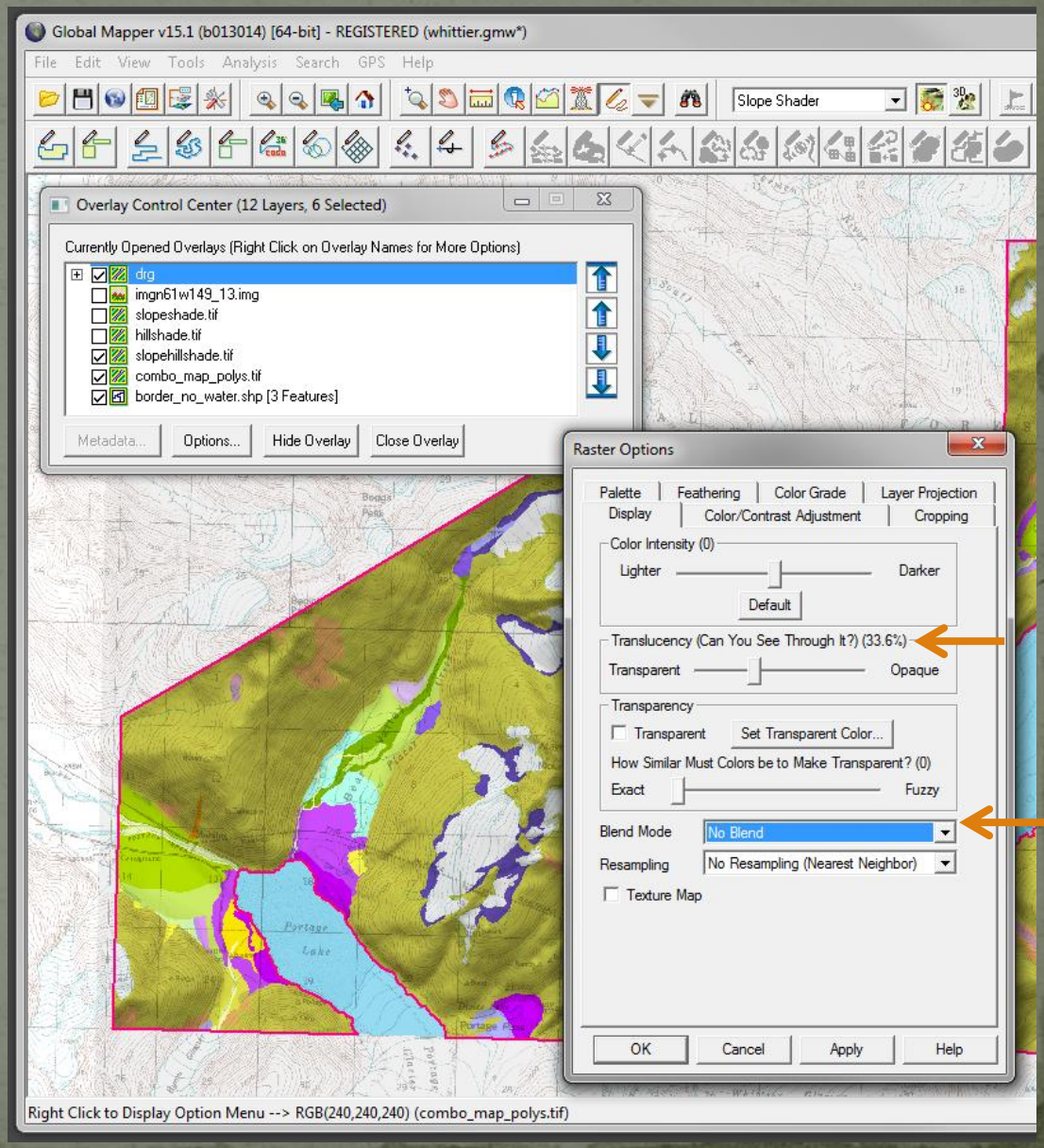
D) Slopehillshade Overlay
Raster Options
- Translucency: 45%
- Blend Mode: Multiply



Step 8 – Create Final Raster Blended Geotiff

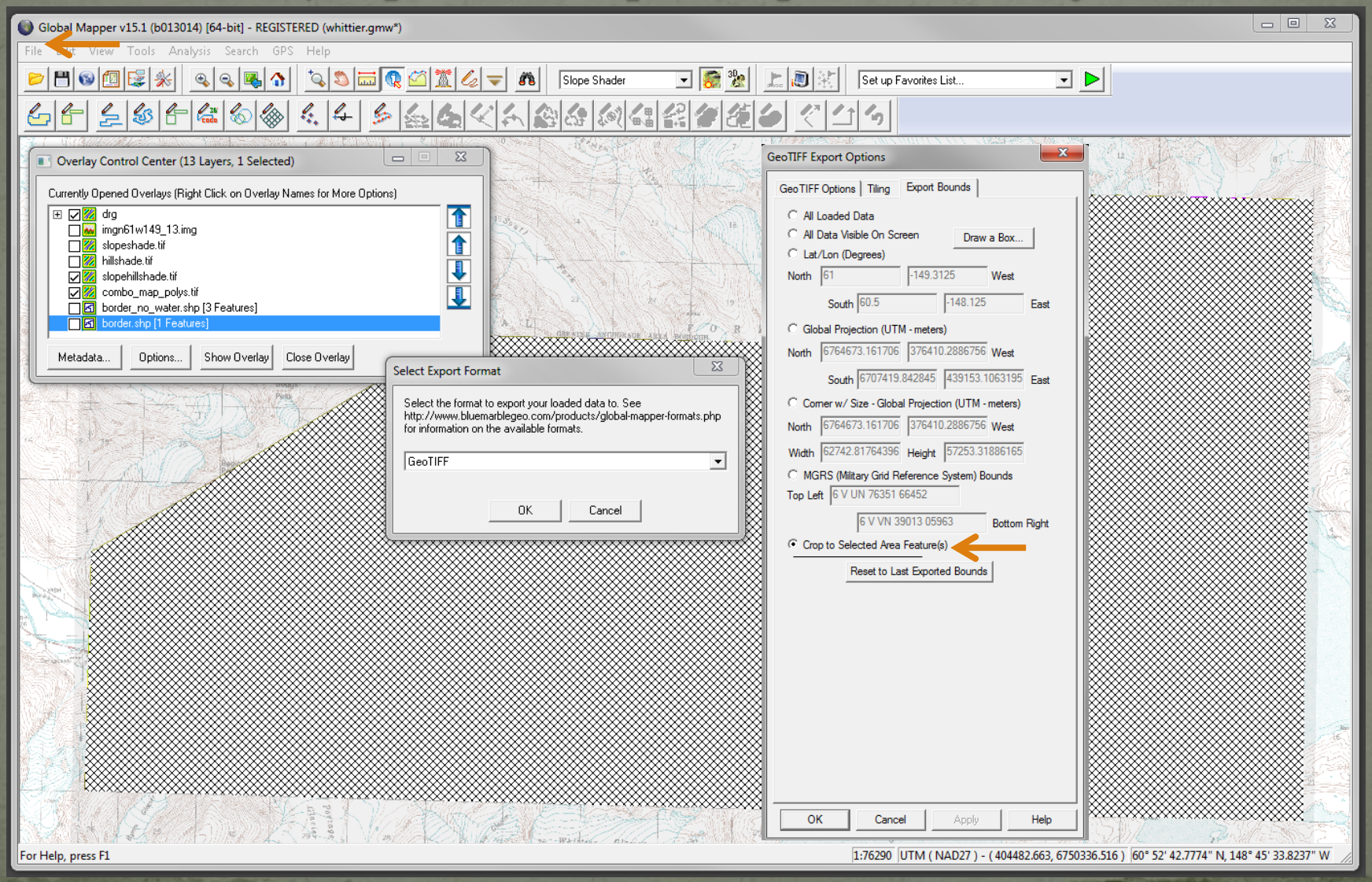
E) DRG Overlay Raster Options

- Translucency: 33%
- Blend Mode: No Blend

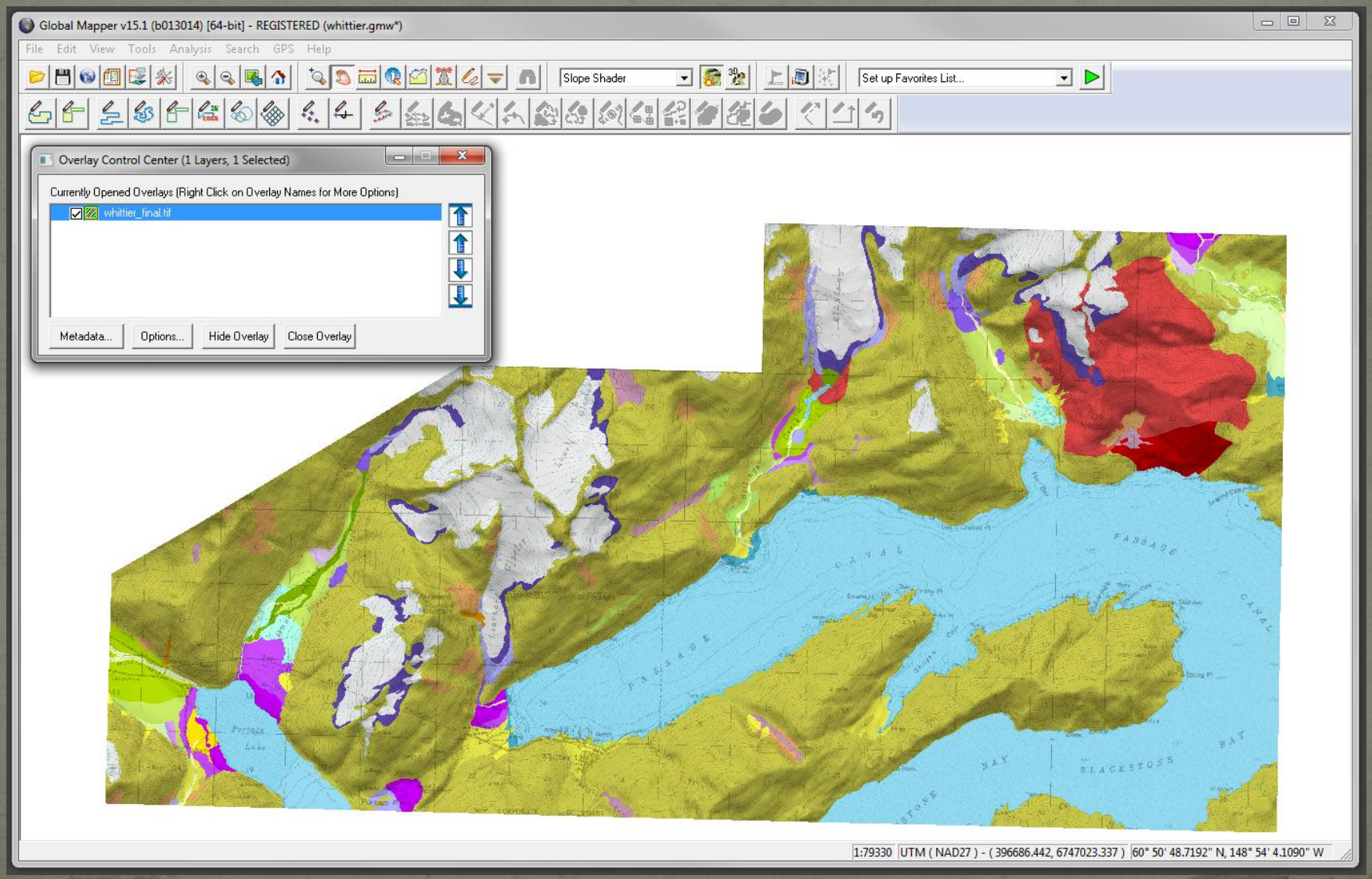


Step 8 – Create Final Raster Blended Geotiff

E) Export and crop to map area boundary

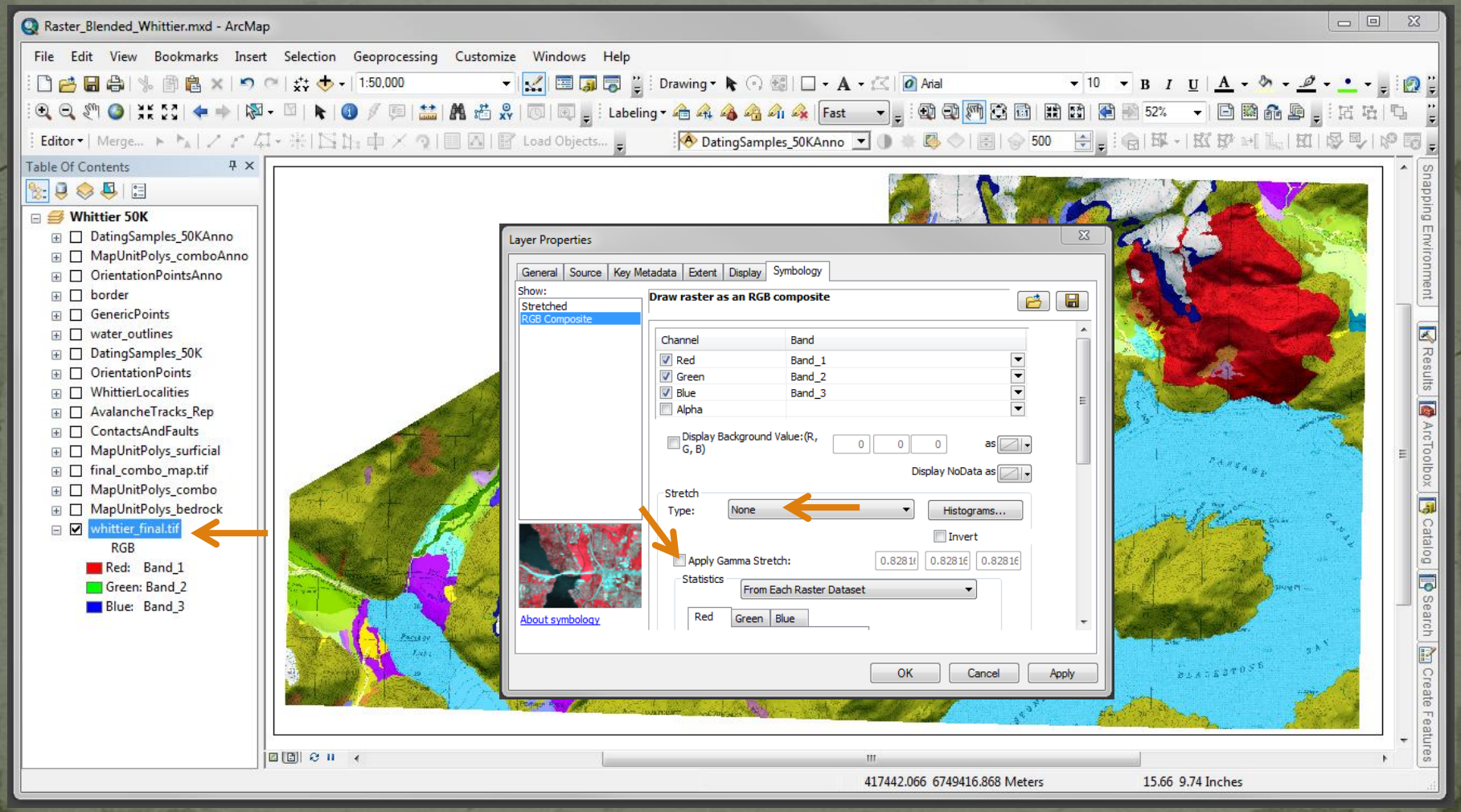


The final Geotiff in Global Mapper



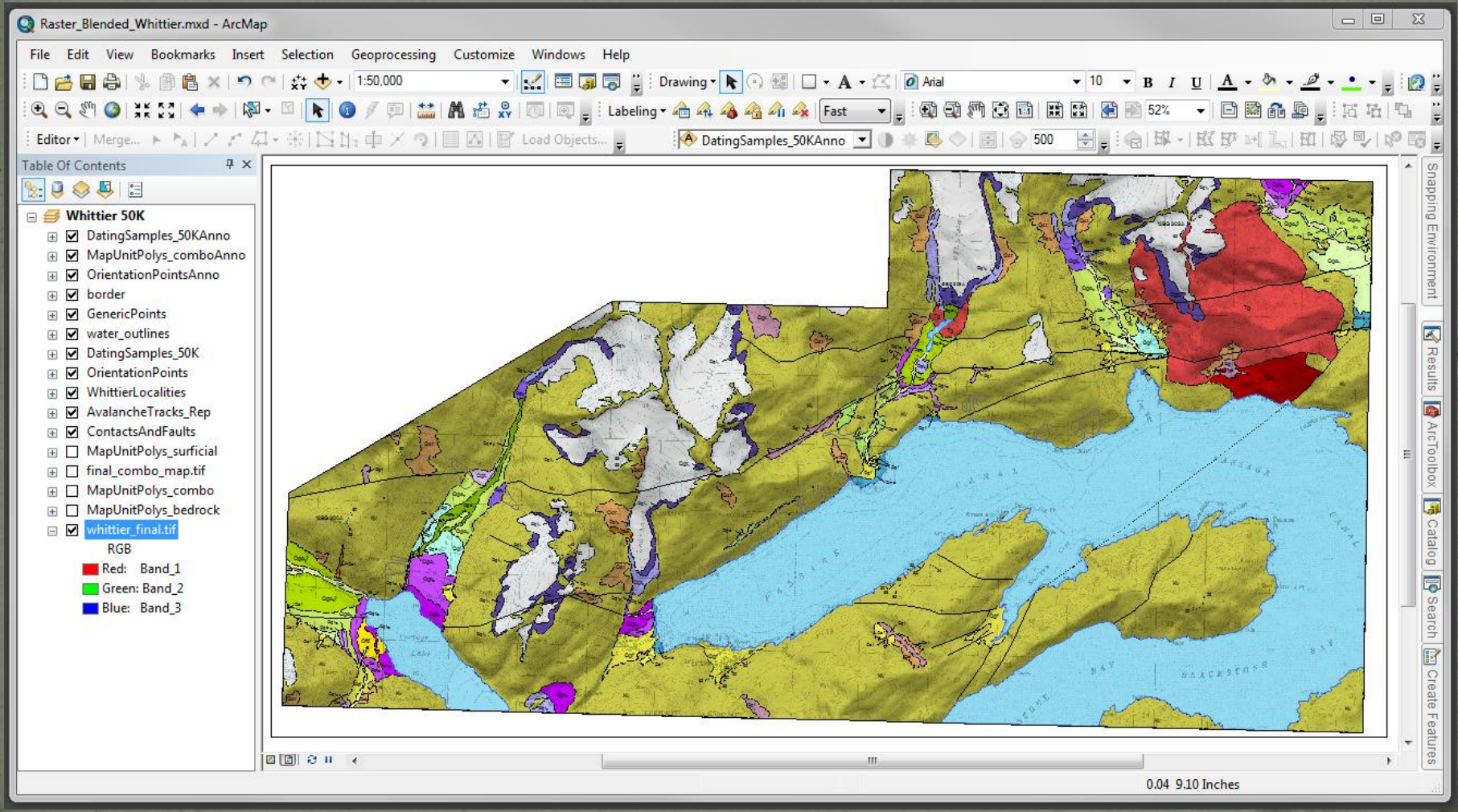
Step 9 – Put it all together in ArcMap

Bring final Geotiff into ArcMap – OMG CRAZY COLORS!!!

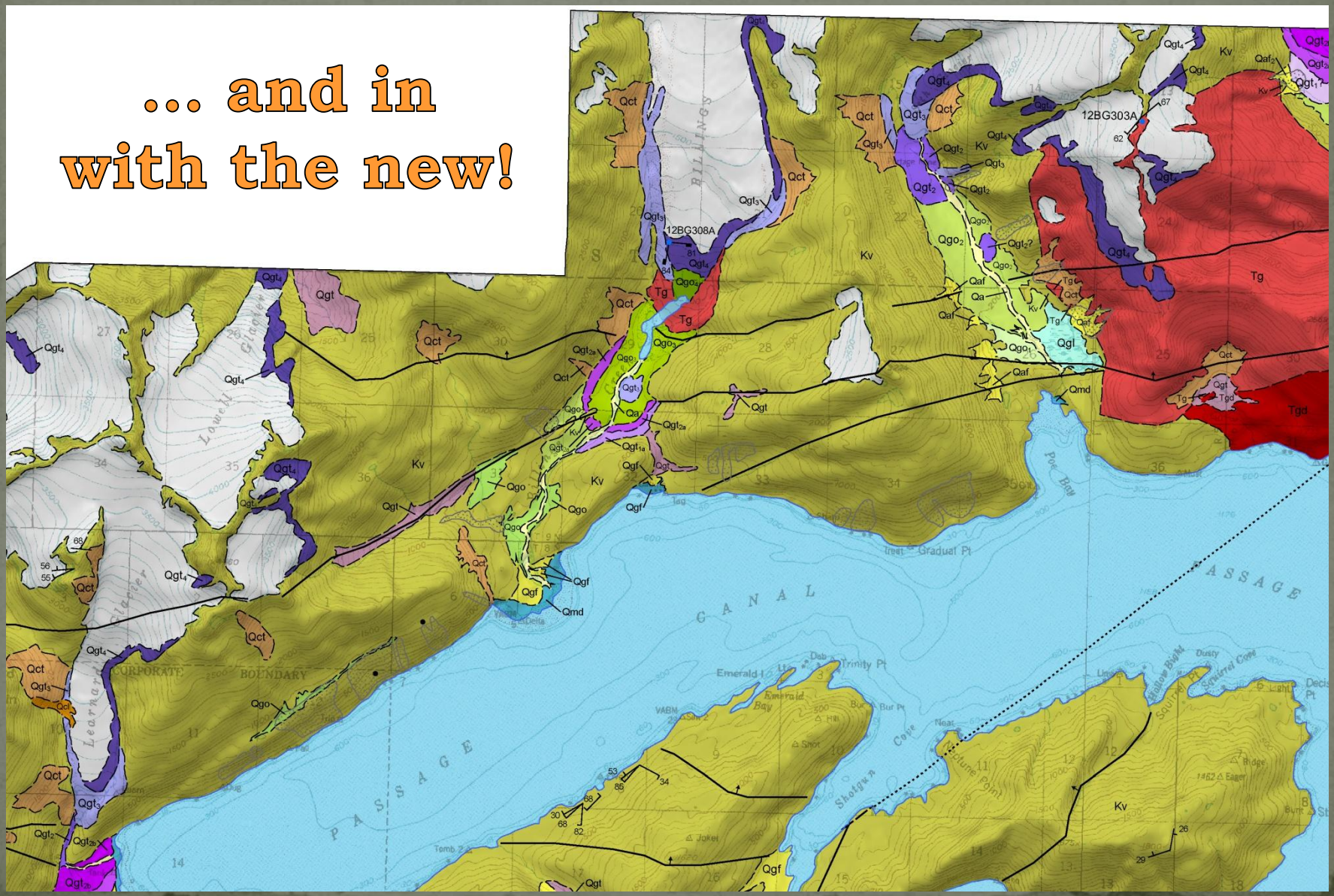


Step 9 – Put it all together in ArcMap

Arrange and turn on layers for final layout



The final verdict…



Resources

Global Mapper
http://www.bluemarblegeo.com/products/global-mapper.php

USGS National Map Viewer
http://viewer.nationalmap.gov/viewer/

USGS Earth Explorer
http://earthexplorer.usgs.gov/

Explaining Blending Modes in Photoshop and GIMP (Multiply, Divide, Overlay, Screen) by Margot Dinardi
http://emptyeasel.com/2008/10/31/explaining-blending-modes-in-photoshop-and-gimp-multiply-divide-overlay-screen/

Questions?

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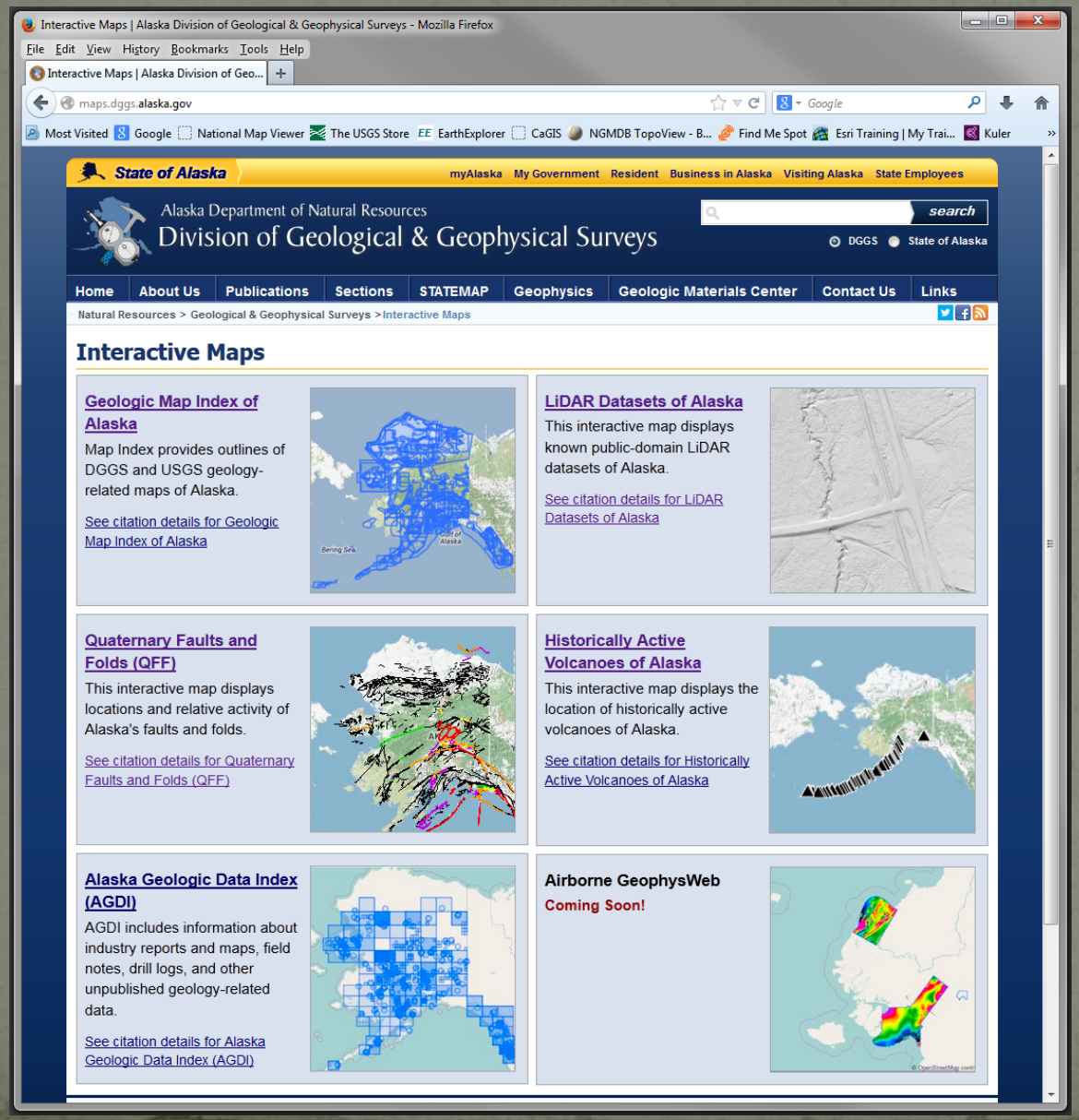
http://www.dggs.alaska.gov/

Special thanks to
Kent Brown
Utah Geological Survey

DGGS Online Map applications

www.dggs.alaska.gov

http://maps.dggs.alaska.gov/



Interactive!

Geo Maps!

LiDAR!

Volcanoes!

Faults!

Geophysics!

Seriously this time!
April 9th at AMA

LiDAR Datasets in Alaska

This interactive map was designed to view known public-domain LiDAR datasets in Alaska. The map offers zoom and scroll options, and multiple base map layers. We provide an easy point and click interface to download the digital data.

Explanation of icons on this page:

Information Tool: Single click to get information about a survey area.
Area of Interest Tool: Use this tool to define an area and download compressed point cloud data.
Full screen mode: Toggles map using entire browser window.

For more download options, full citation information, WMS feed information, and metadata, go to: http://www.dggs.alaska.gov/pubs/id/25239

Please Note: The LAS files included in downloaded items have been compressed using LASzip. LASzip is an open-source, lossless compression for LiDAR point-cloud data in the LAS format that provides significant file size reductions. To uncompress the .laz files in your download package, you can use the laszip tool linked below, or download the latest version directly from laszip.org

laszip.exe 2.1.0 (for Windows)