

Data POINTS

A Newsletter for Users of Golden Software Products

Issue 53

Removing the Map Collar from a DRG File in Didger 3 and Exporting as a GeoTIFF without Losing Resolution

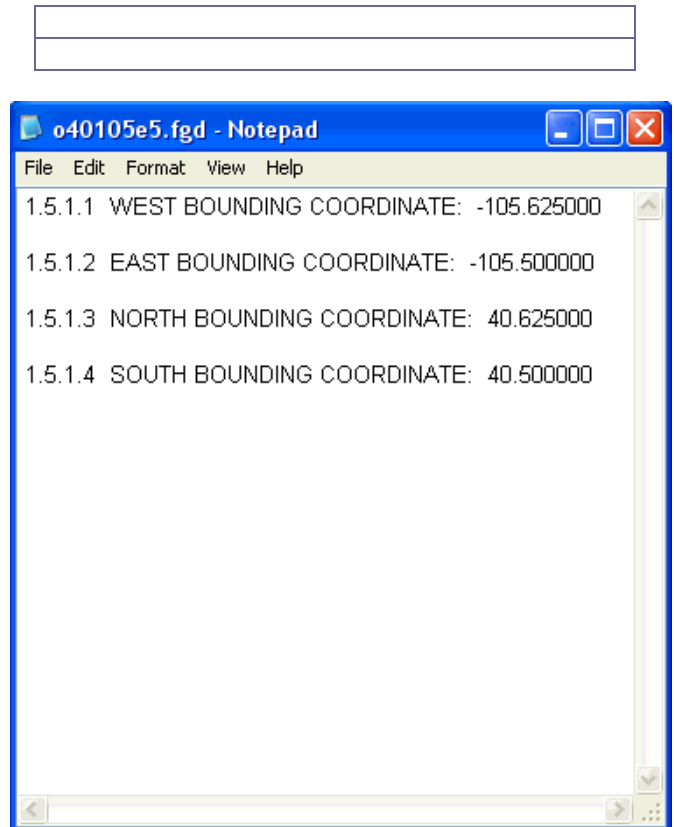
Introduction

One of the many features of Didger 3 is the ability to automatically remove the map collar from a USGS Digital Raster Graphic (DRG) file. DRG files are scanned topographic maps that typically have collars. The map collar is the area around the map that contains information such as projection, quadrangle location, latitude/longitude and UTM tick marks, map scale, etc.

The limits of the collar are stored in an associated FGD file. This FGD file is necessary to use the **Image | Clip Bitmap | Map Collar** command. If your DRG did not come with an FGD file, it is possible to create one manually. Open a text editor, like Notepad, and type in the West, East, North, and South bounding coordinates of the map in the following format. Save the file to your hard drive and rename the extension to *.fgd.

INSIDE THIS ISSUE:

- Page 4** Mapping Election Results with MapViewer 6
- Page 7** Using Surfer and Grapher for Stream Flow Visualization
- Page 9** Program Updates Available
Grapher 5.04 – MapViewer 6.01 – Strater 1.05
- Page 10** Golden Software at AAG 2005!



If you do not have the FGD file for the DRG, you can create one manually by entering in the bounding coordinates of the map in a text editor and saving the file to an FGD extension.

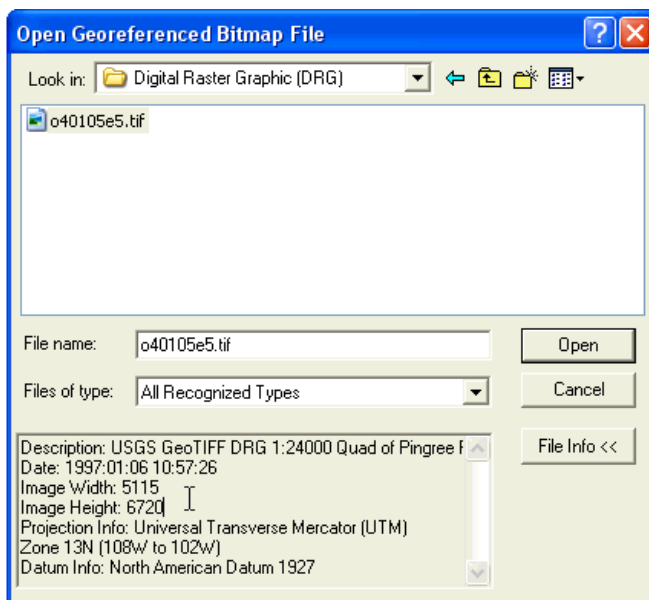
Removing the collar from a DRG with an FGD file is simple. However, Didger will always export georeferenced image files from a vector project at a resolution of 300 dots per inch (DPI). Based on the

physical size of the vector project, this may result in an exported image that contains significantly fewer pixels than the original image, resulting in a loss of image quality. To export a higher number of pixels and increase the resolution, you must go to **View | Project Limits** and increase the size (length) of the project. Once the project is larger, you can export it to a GeoTIFF and you will retain more pixels and therefore better resolution.

To retain the original resolution of the image, the key is to determine what exactly to enter for the length values. To do that, you can follow these steps:

1 - Import the GeoTIFF, noting the original bitmap dimensions.

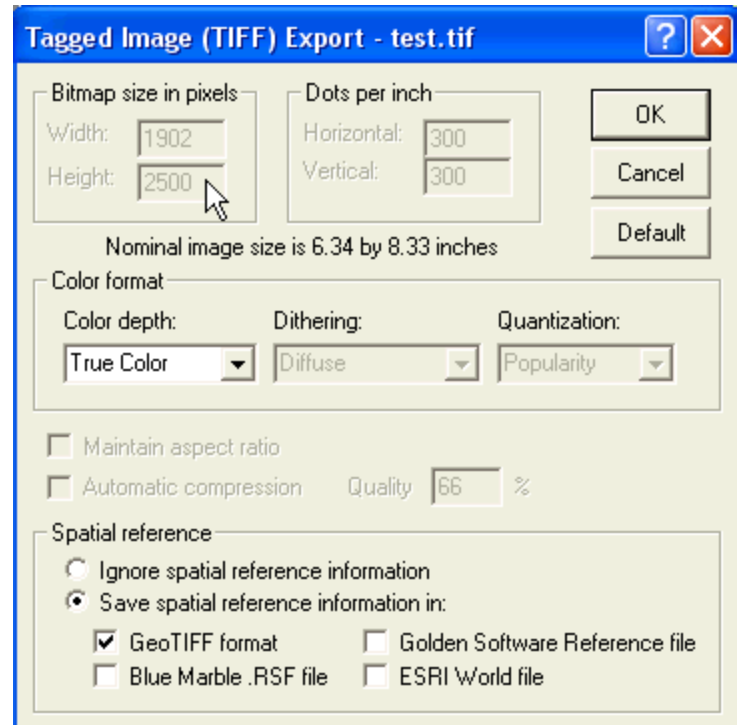
- Go to **File | Import Bitmap | Into Vector Project**.
- Select the DRG file (in TIF format).
- If the File Info is not displayed at the bottom of the dialog box, click the *File Info >>* button.
- Write down the Image Height shown in the File Info display.
- Click *Open*.
- In the **Bitmap Import Options** dialog, choose *Embedded GeoTIFF Parameters* as the *Spatial Reference* and click *OK*.



Select the georeferenced image file, making a note of the Image Height in the File Info section, and click Open.

2 - Determine the default export size in pixels.

- Go to **File | Export**.
- In the **Export** dialog, choose Tagged Image (TIFF) as the Save as type, enter a file name (any file name will do), and click **Save**. This will take you to the **Tagged Image (TIFF) Export** dialog.
- Write down the Bitmap size in pixels for Height that has been calculated by Didger and click *Cancel*. In most cases, the pixel count will be smaller than the original image size as seen in step 1d.



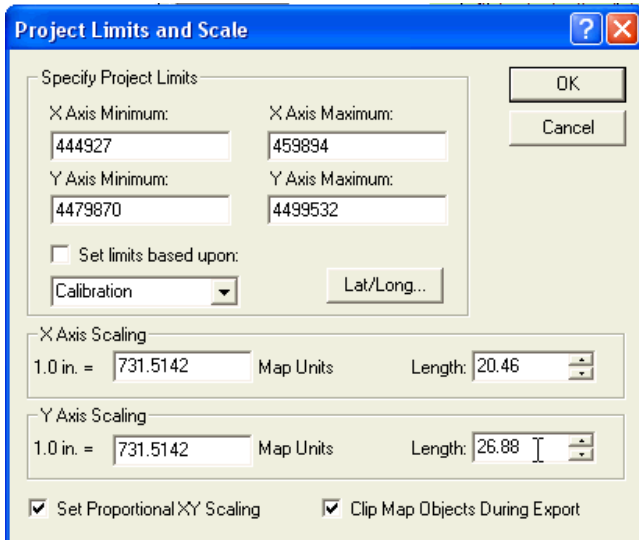
Note the default Height in pixels and then hit Cancel.

3 - Adjust Project Limits and Scale

- Go to **View | Project Limits** to display the **Project Limits and Scale** dialog.
- In the **Project Limits and Scale** dialog, check both check boxes at the bottom next to *Set Proportional X/Y Scaling* and *Clip Map Objects During Export*.
- Calculate the ratio between the original size of the image and the default size of the image Didger was going to export. In this example, the original height was 6720 pixels and the default export height showed 2500 pixels. This gives a ratio of $6720 / 2500 = 2.688$
- Multiple the current Length for the Y Axis Scaling by the ratio calculated above and enter this new Length. In this example, the

original Length is 10.00, so $10.00 * 2.688 = 26.88$. When you enter the new Y Axis Scaling, the Length of the X Axis Scaling automatically updates.

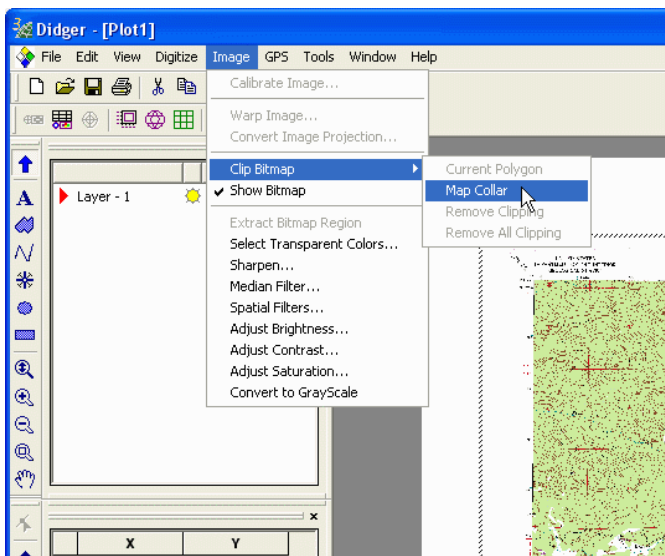
- e. Click OK



Calculate the ratio between the original Image Height in pixels and the default export Height in pixels. Multiply the Y Axis Scaling Length by this ratio and enter in the new number.

4 - Clip the map collar.

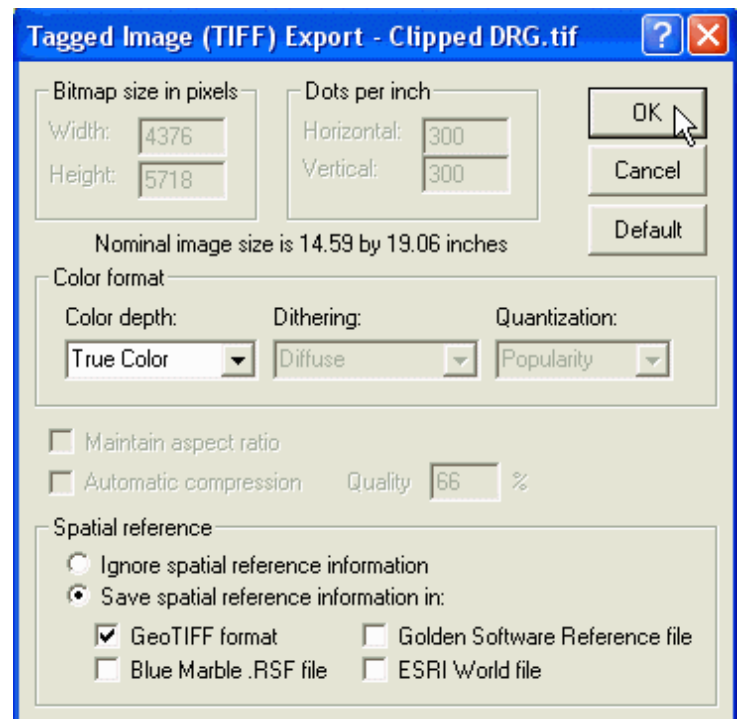
- a. Click on the bitmap to select it.
- b. Use **Image | Clip Bitmap | Map Collar** to remove the collar.



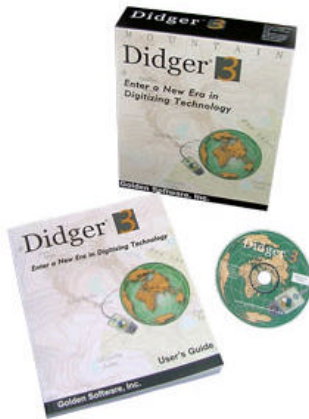
Clip the map collar.

5 - Export the clipped map.

- a. Go to **File | Export**
- b. In the **Export** dialog, choose TIFF as the Save as type, enter a file name, and click Save
- c. In the **Tagged Image (TIFF) Export** dialog box, the Bitmap size in pixels is reported. This number will be slightly smaller than the original because of the clipping. Click OK to save the file.



Export the clipped image.



Mapping Election Results with MapViewer 6

Introduction

The recent national election in the United States highlighted the use of thematic maps and cemented the terms *red state* and *blue state* in the American lexicon. The commonly-shown map of election results by state is easy to make in MapViewer 6. This article will quickly step through making this map, and will then examine some alternatives to address an issue that some people raised after the election.

Creating the Red/Blue Map of Election Results

The type of map where the state is filled with a color based on a data value is known in MapViewer as a hatch map. This type of map is also sometimes called a choropleth, from the Greek words *choros*, meaning "place", and *plethos*, meaning "magnitude" or "value". Like any thematic map in MapViewer, you need two things to make one - a set of boundary objects (the states) and a data file containing the values to be displayed. The objects and the data are linked by the Primary ID (PID) field.

MapViewer comes with many boundary files, some in the Samples folder underneath the installation directory and more on the CD. For our election map, we will use the file US50alb.gsb from the Samples folder for the state outlines. The state area objects have the two-letter state abbreviation as the PID. A data file will need to be created with the election results. It needs a PID column and a data column

indicating which party won that state. We can use a value of 1 for Republican and 2 for Democrat. The data file I created for this example is available at <ftp://www.goldensoftware.ws/public/newsletter/RedBlue.dat>.

RedBlue.dat		
F15		
	A	B
1	PID	Party
2	AK	1
3	AL	1
4	AR	1
5	AZ	1
6	CA	2
7	CO	1
8	CT	2
9	DC	2
10	DE	2

The data needed to make a red/blue election hatch map has a column that matches the PIDs of the states and a column with a numeric value that represents the winner in each state.

Do the following steps to make the hatch map:

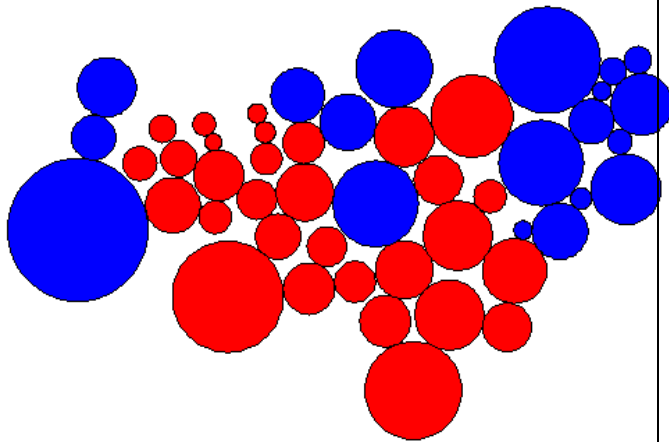
1. In a new, blank map, go to **Map | Thematic Maps | Hatch Map**.
2. In the **Import Boundary File** dialog, choose the file Us50alb.gsb from MapViewer's Samples folder. Check the boxes for *Append image* and *Specify import options* at the bottom and click *Open*.
3. In the **GS Boundary Import Options** dialog, make sure the box for *Areas to curves* is NOT checked and click *OK*.
4. The settings will probably default correctly in the **Import Options**, but make sure that *Create PID* is checked and that it is coming from the Primary field. The correct PID is necessary for the thematic map to be created.

It's important for the PID attribute to be populated from the boundary file.

5. In the **Open Data File** dialog, select the data file shown above and click *Open*.
6. Make the following settings in the **Hatch Map** dialog:
 - o PID: = Column A: PID
 - o Variable: = Column B: Party
 - o Number of classes: = 2
 - o Classification method: = Equal intervals
 - o Draw type: = Hatched area
 - o Give the first class a fill color of red and the second blue.

Check these settings in the **Hatch Map** dialog.

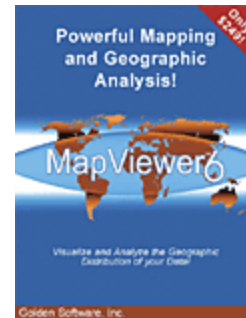
7. Then, click *OK* to create the hatch map



An election map based on cartogram circles can show the results based on population rather than by area.

The hatch map made using the population-based cartogram circles more accurately reflects the

election results. Although the states have been replaced by circles, their relative locations are maintained and the voting patterns are still evident.



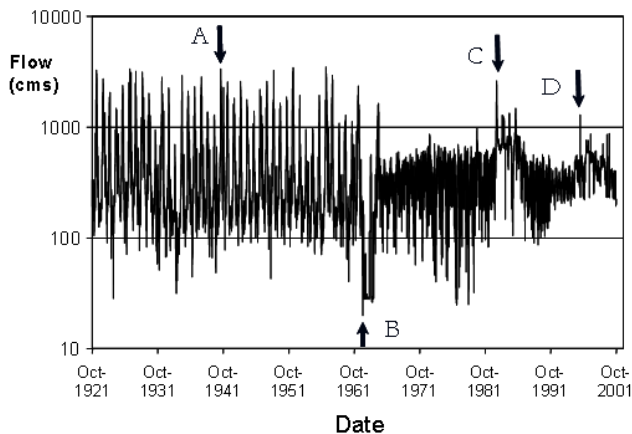
Using Surfer and Grapher for Stream Flow Visualization

Introduction

Richard Koehler, a visiting scientist with the Cooperative Program for Operational Meteorology, Education and Training (COMET[®]), uses Surfer and Grapher to display river flow rates and climatic data sets. His displays make it easier to recognize short- and long-term fluctuations that disrupt the natural processes of a river. Recognizing and identifying artificial fluctuations and disturbances is critical to understanding river systems and developing management efforts to achieve more natural flow regimes. In addition, climatic data for many drainage basins can be displayed in a more effective method for easier comparison between basins.

Working with Large USGS Datasets

Visualizing river records covering 100 years of daily data values can be a problem. Typical methods include line graphs, monthly averages, daily average with extremes, or plotting a small part of the entire record. Grapher does a great job of plotting the data and displaying obvious features and trends.



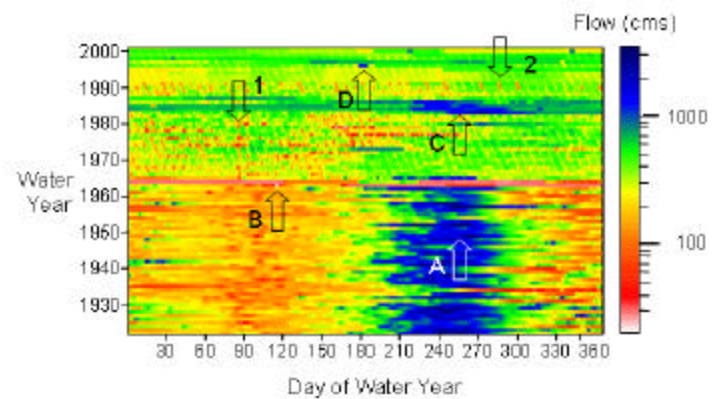
Line graph of stream flows of the Colorado River at Lees Ferry, AZ. Water Year 1921 through 2001.

A = high flow during snowmelt.
B = low flow when Glen Canyon dam closes.

C = 1983 El Nino wet weather cycle.
D = high flow during 1996 artificial Grand Canyon flood.

Raster Visualization of Stream Flow Data

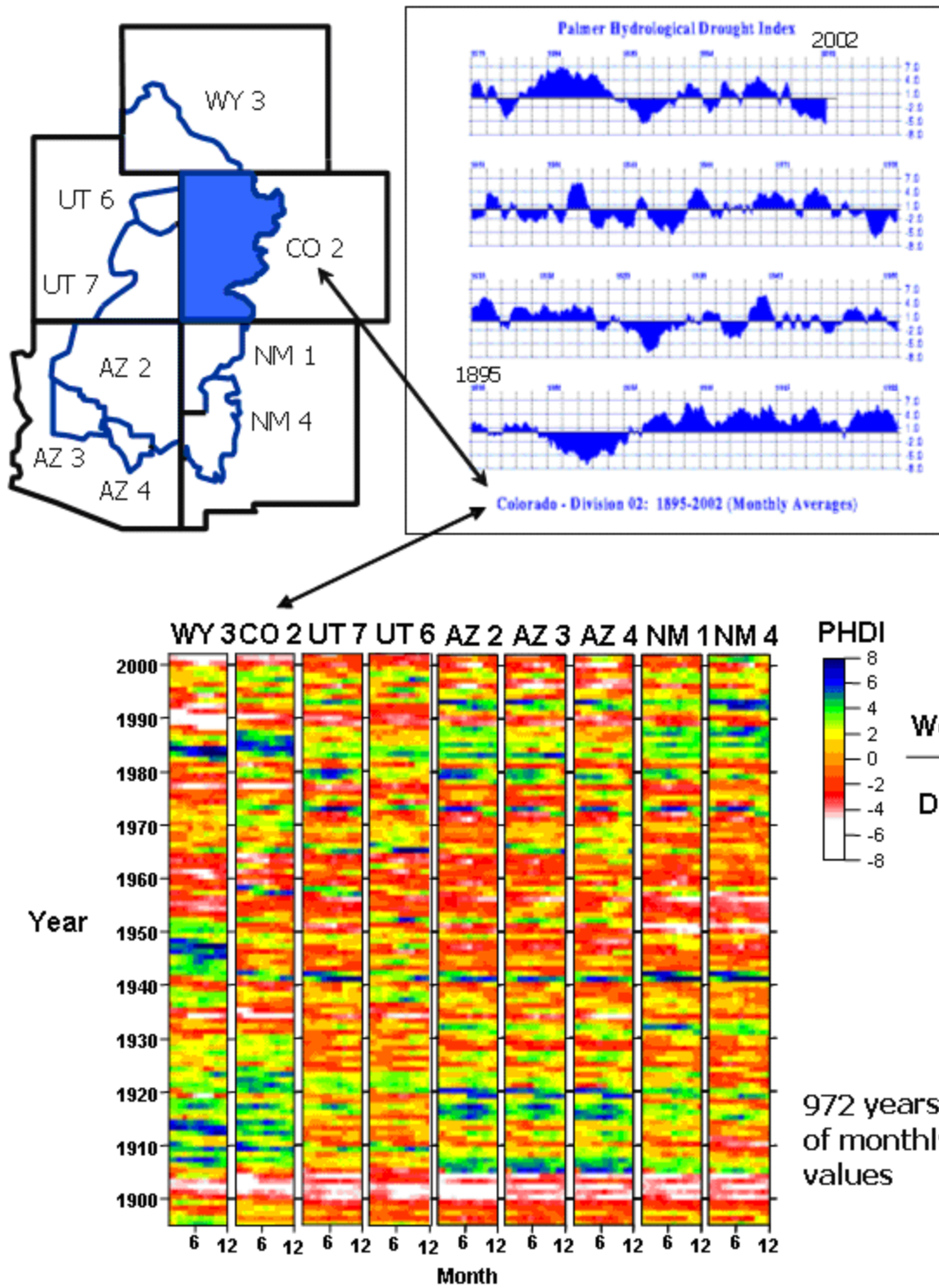
Rick uses Surfer to plot the data using a raster method that he presented in his doctoral thesis at the University of Arizona. He assigns the day of the year to the X axis, the year value to the Y axis, and the log(flow) value to the Z axis. By displaying flow rates with color, and stacking the yearly graphs vertically, similarities between years and anomalous events become more apparent.



Raster graph of stream flows of the Colorado River at Lees Ferry, AZ. Water Year 1921 through 2001.

A = high flow during snowmelt.
B = low flow when Glen Canyon dam closes.
C = 1983 El Nino wet weather cycle.
D = high flow during 1996 artificial Grand Canyon flood.

1 = low flow during Christmas due to lower demand for power generated by Glen Canyon dam.
2 = repeated low flows during weekend power downturn (Sundays).



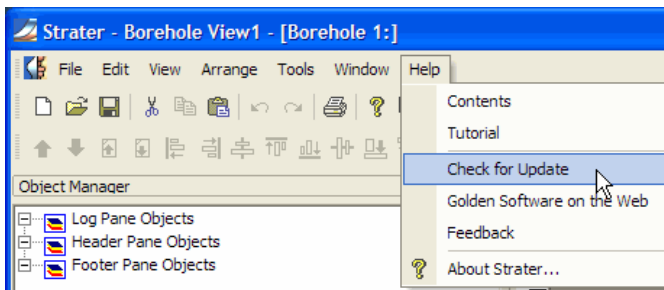
COMET is a program of the University Corporation for Atmospheric Research (UCAR) in Boulder, Colorado.

Program Updates Available Grapher 5.04 – MapViewer 6.01 – Strater 1.05

Program updates are available for Grapher 5, MapViewer 6 and Strater 1. Updates are minor changes to the programs, and are available for free download to owners of the programs. For a list of changes and fixes, refer to the release history pages.

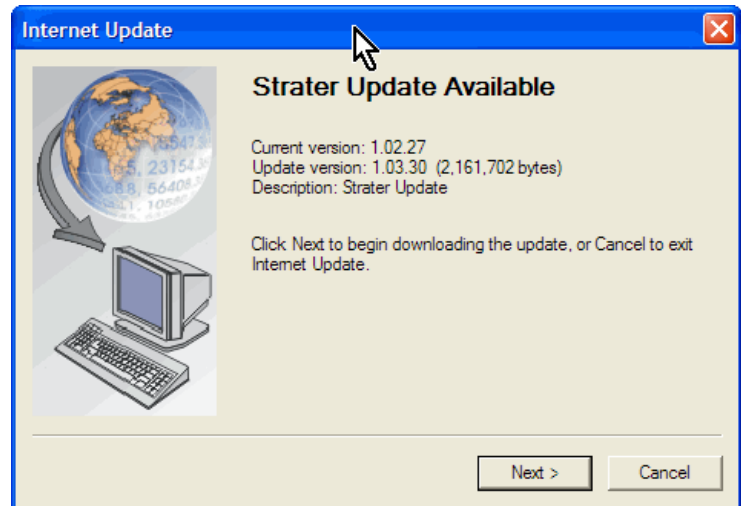
- [Grapher 5 Release History](#)
- [MapViewer 6 Release History](#)
- [Strater 1 Release History](#)

To download the update, start the program and choose **Help | Check for Update** from the main menu.



Use **Help | Check for Update** to see if an update is available.

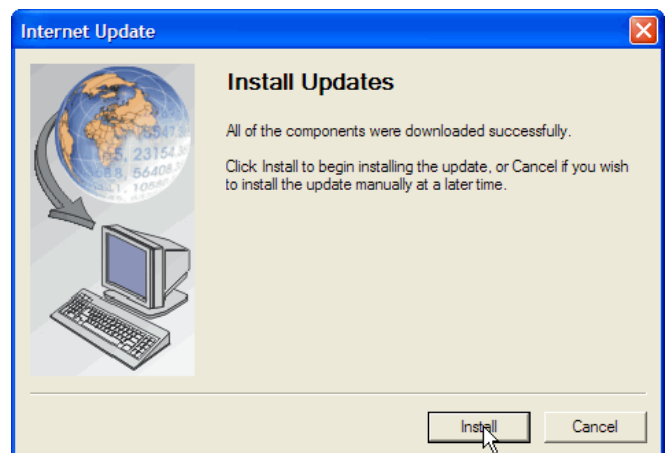
In the **Internet Update** dialog, press the *Next* button once to see if you have the most recent version. Your computer will connect to Golden Software's Internet update server to check your version against the current version. If an update is available, you will see a dialog similar to this:



An update is available! Click Next to begin downloading it.

Click the *Next* button to download the update patch. The updates are several megabytes in size, so it may take several minutes to download, depending on the speed of your Internet connection.

After the file is downloaded, the dialog box will change to an installation dialog. Close the main program (Grapher, MapViewer or Strater) before starting the update installation. Press the *Install* button in the dialog to install the update.



The update has downloaded. Close the main program, then click Install.

When the patch installation has completed, press the *Finish* button. You can then reopen Grapher, MapViewer or Strater and continue with your work. You can verify the version you are running by going to **Help | About**.



Go to **Help | About** at any time to see the version you are running. You can also find your serial number or our phone numbers [here](#).

Some network firewalls and proxy servers prevent communication between your computer and the Golden Software update server. If you have any difficulties with the above steps, manually download the update. Right-click on the link below and choose **Save Target As** to display the **Save As** dialog box. Specify the main application directory. For example, the MapViewer default main directory is c:\Program Files\Golden Software\MapViewer 6\.

- Grapher 5.04
update: [Grapher\(5.04.21\) Patch.exe \(4,513,129 bytes\)](#)
- MapViewer 6.01
update: [MapViewer\(6.01.23\) Patch.exe \(3,210,022 bytes\)](#)
- Strater 1.03
update: [Strater\(1.03.30\) Patch.exe \(2,161,702 bytes\)](#)

After the file is completely downloaded, close the main application (Grapher, MapViewer or Strater). Double-click on the EXE to install the update.

If you have any problems with the update, please contact us at

- graphersupport@goldensoftware.com
- mapviewersupport@goldensoftware.com
- stratersupport@goldensoftware.com

Golden Software at AAG 2005!



Golden Software invites you to stop by booth #300 this year at the **AAG 101st Annual Meeting and Exposition**, April 5-8 at the Adams Mark Hotel in Denver, CO.

Founded in 1983, Golden Software is a pioneer in producing cost effective, easy-to-use scientific software. Golden Software develops five scientific software packages:

- **Surfer:** contour and 3D surface mapping
- **Stater:** well log and borehole plotting
- **Grapher:** 2D/3D graphing
- **MapViewer:** thematic mapping and spatial analysis
- **Didger:** digitizing and coordinate conversion

The Annual Meeting of the Association of American Geographers is a professional and scholarly meeting of over 4000 attendees. Nearly 3000 attendees present their research in over 700 sessions scheduled throughout the meeting.

Stop by our booth and see how our software can help you!



Booth #300