Graphics & Image Formats

A self-help seminar on dealing with loss, compression, and unplanned pixilation.

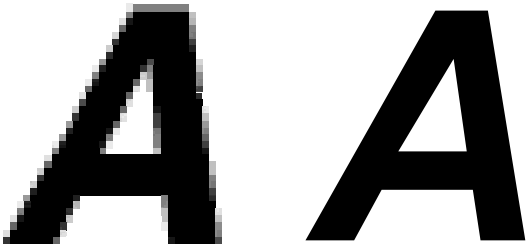
Raster

- Seamless grid of square pixels
- Simple way to define images, but can get very large files
- Can be compressed (trade-off with quality)
- Can be filtered, modified, but difficult.

Vector

- Elements/paths defined by coordinates or formulae
- Simple graphics are very small, but complex graphics can be huge
- Cannot be compressed
- Each element may be edited post-creation.

Raster Vector



Raster (PNG) Vector (SVG)

Different formats are better for different applications.

Raster Vector

Original (No Compression) **Medium Compression** **High Compression**

JPG (3940KB) **JPG (1395KB)** **JPG (460KB)**

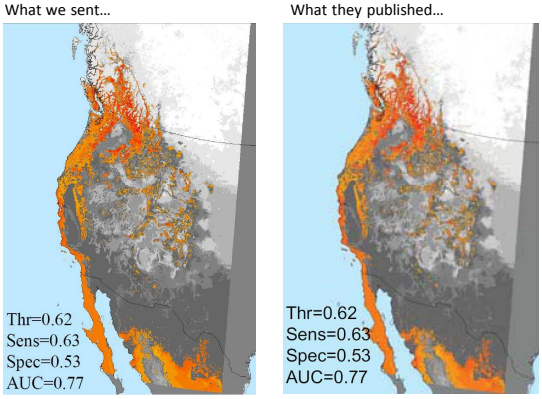
Original (No Compression) **Medium Compression** **High Compression**

JPG (3940KB) **JPG (1395KB)** **JPG (460KB)**

Lesson: do what works for your purposes.

Science!

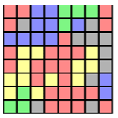
What we sent... What they published...



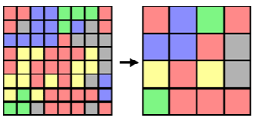
Lossy vs. lossless formats

- Lossy formats (may) sacrifice quality for file size (compression).
- Lossless formats retain ALL the information in the original file (sometimes “raw” or “basic”).
- Lossy formats: JPG,BMP, MP3 (audio), M4A video)
- Lossless formats: JPG, PNG, TIF, WAV (audio)
- Good articles on Wikipedia

Uncompressed:
R, R, B, B, G, G, G, R
R, N, B, B, G, B, N, R
…



Compression:
2R, 2B, 3G, G, R
R, N, 2B, G, B, N, R
…



Compression:
R, B, G, R
2B, R, N
…
(Or it may blend colours)

The trick…

- You can make raster images that are very high quality (lossless or proper compression).
- Use the compression settings that best balance your desired quality with file size.
- The rules of thumb:
  - Photos = rasters
  - Figures = vectors
  - Only compress when necessary
  - When you compress, do it right!

Saving graphics for PowerPoint or Adobe Illustrator

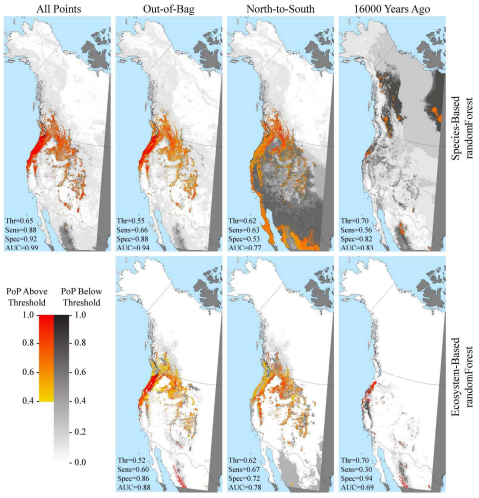
1. Save your R graphic in .EMF or .WMF format
2. Open PowerPoint
3. Drop in the graphic file
4. You must **ungroup** objects to modify them
5. Make desired changes

Saving graphics for Adobe Illustrator

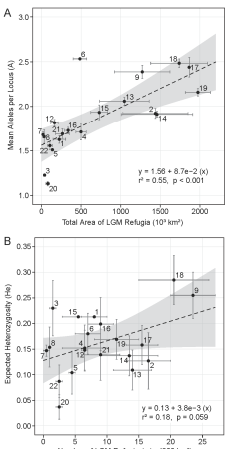
1. Save your R graphic as .PDF format (.EMF & .WMF will also work)
2. Open the file in Adobe Illustrator
3. Select all objects
4. Release the **clipping mask** (=ungroup)
5. Make desired changes
6. Save new file as .PDF or .AI file

Why would you bother with this?

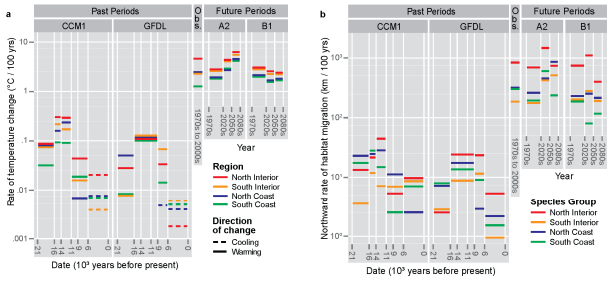
- You just can’t get R to do what you want. (Yes, this actually happens.)
- It’s faster to do it after-the-fact. (But be careful. If your data changes…)
- Making publication- or presentation- or website-specific figures.
- Formatting requirements that R cannot support (thesis, journal, etc.)



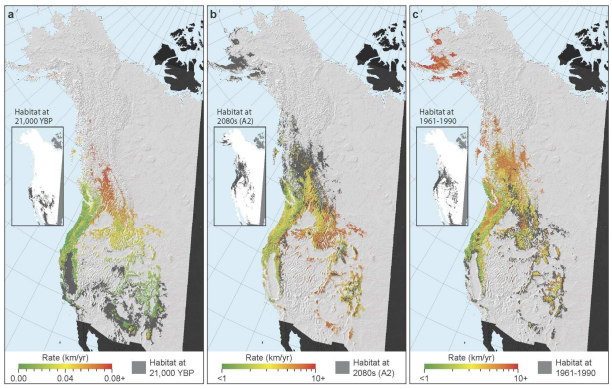
R plot
ArcGIS
Illustrator

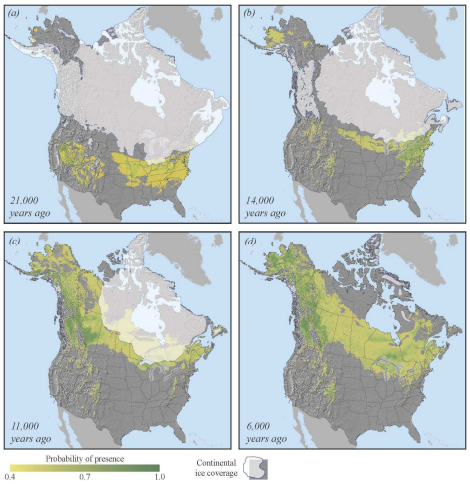


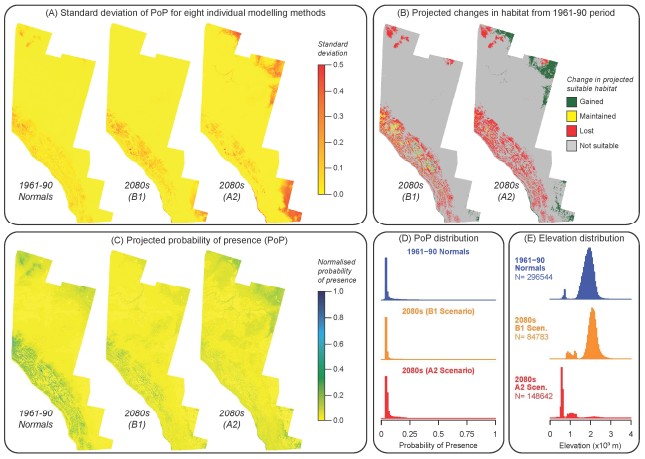
ggplot2
Illustrator



ggplot2
Illustrator







A word on integrity

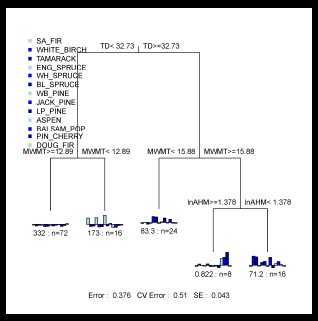
Be careful…

Make sure you are changing your graphic only for clarity or aesthetics.

Do not manipulate your data.

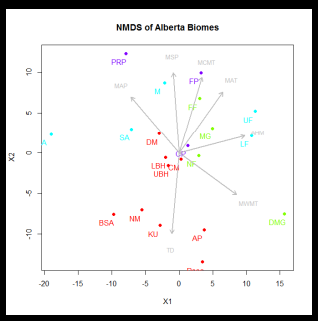
This would be serious scientific misconduct.

MRT Example

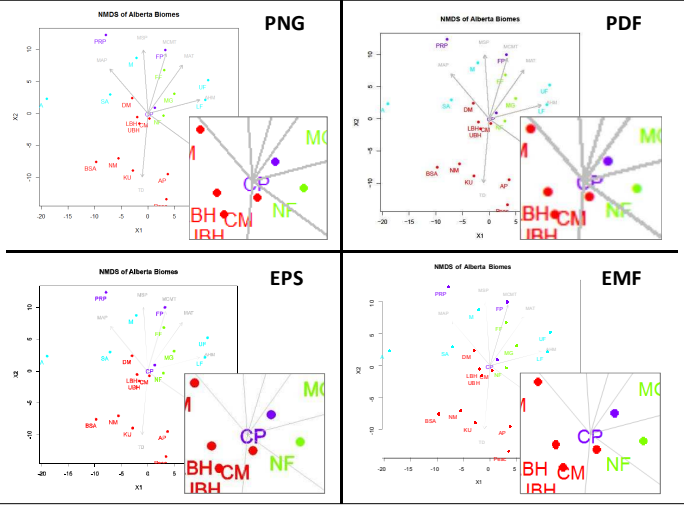


- We'll clean this one up in Adobe Illustrator
- PDF of the MRT provided on the course website

NMDS Example



- Complete the NMDS plotting example in the lab
- Files (R code and data) are on the course website



Editing (EPS vs. EMF)