New Graphics Capabilities in GrADS

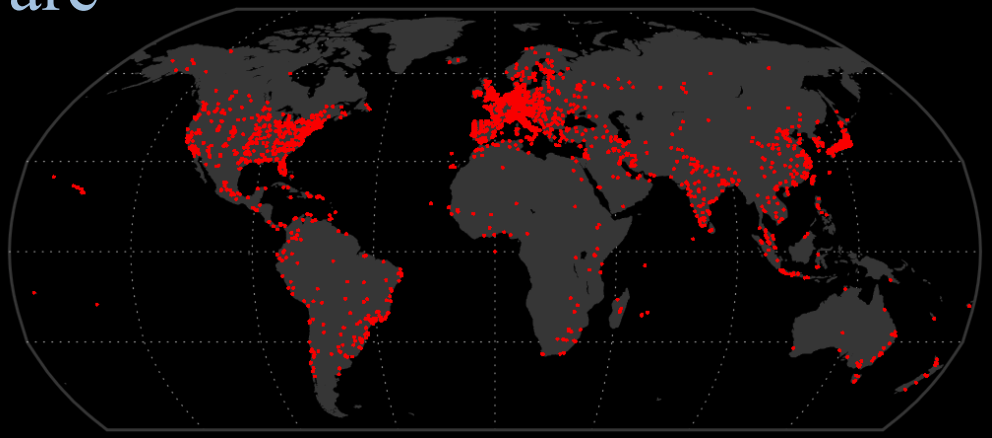
Jennifer Adams
Brian Doty

IGES/COLA
George Mason University, Fairfax VA

What is GrADS?

GrADS is a powerful tool that integrates data access, analysis, and visualization.

- It handles gridded and station data
- It has a programmable interface for scripting
- It runs on Unix, MS Windows, and Mac OS X
- It has a busy users forum with ~1500 subscribers
- It has been under active development since 1989
- It is free, open source software
- It is used worldwide



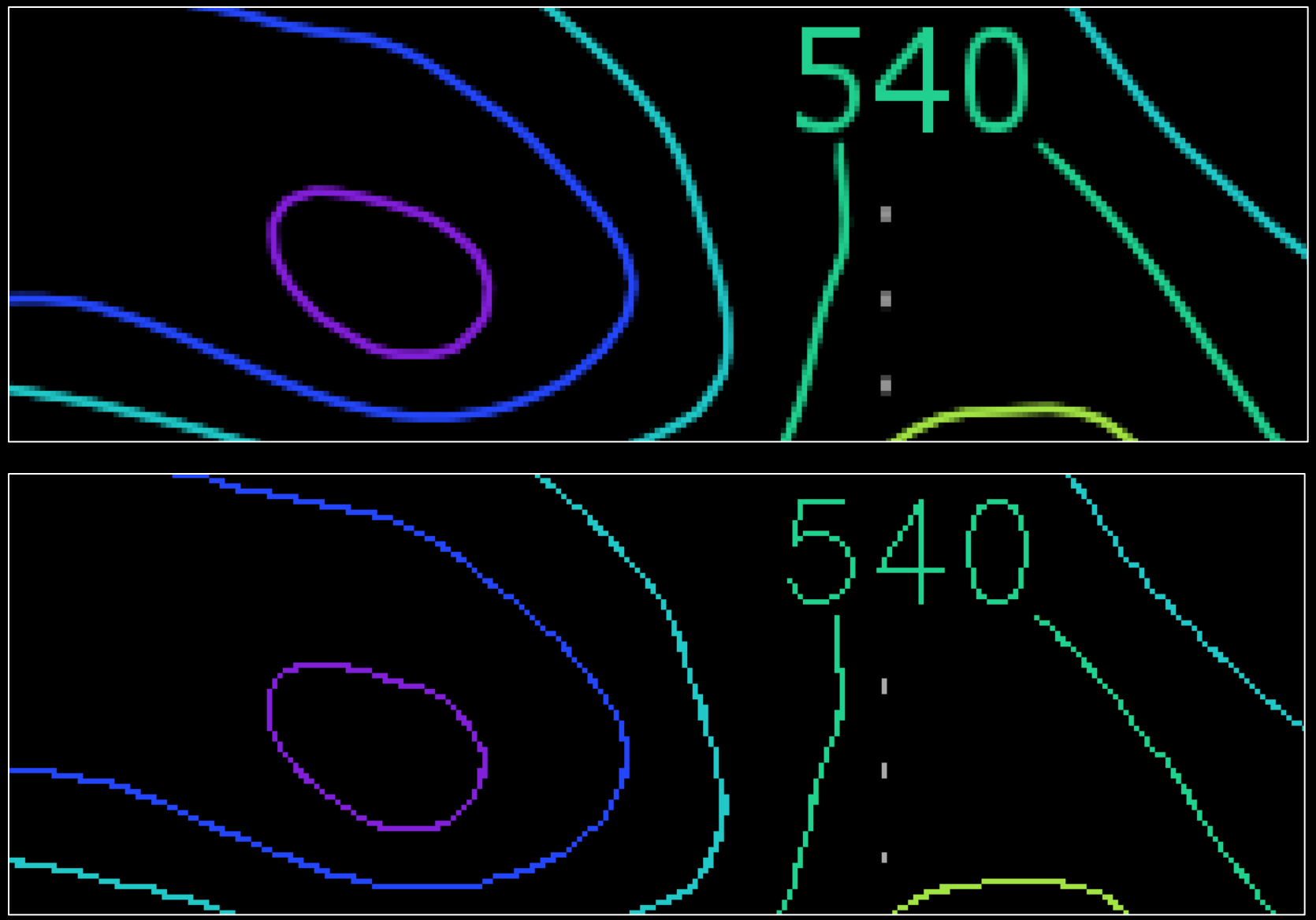
What is New in GrADS v2.1

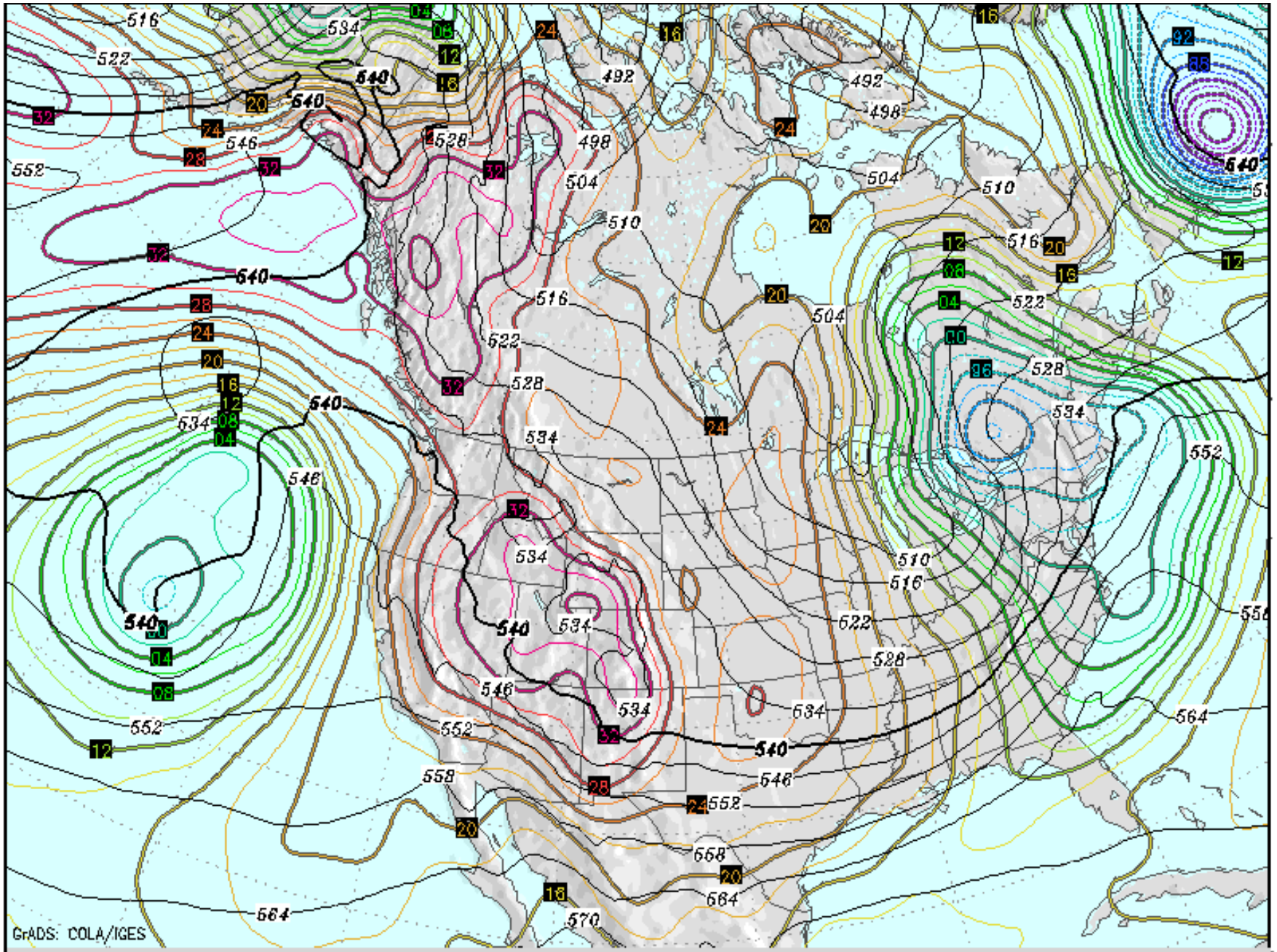
- Fonts
- Anti-aliased line drawing
- Transparent colors
- Pattern filling
- More hardcopy output formats
- Code redesigned for “pluggable” graphics rendering engines

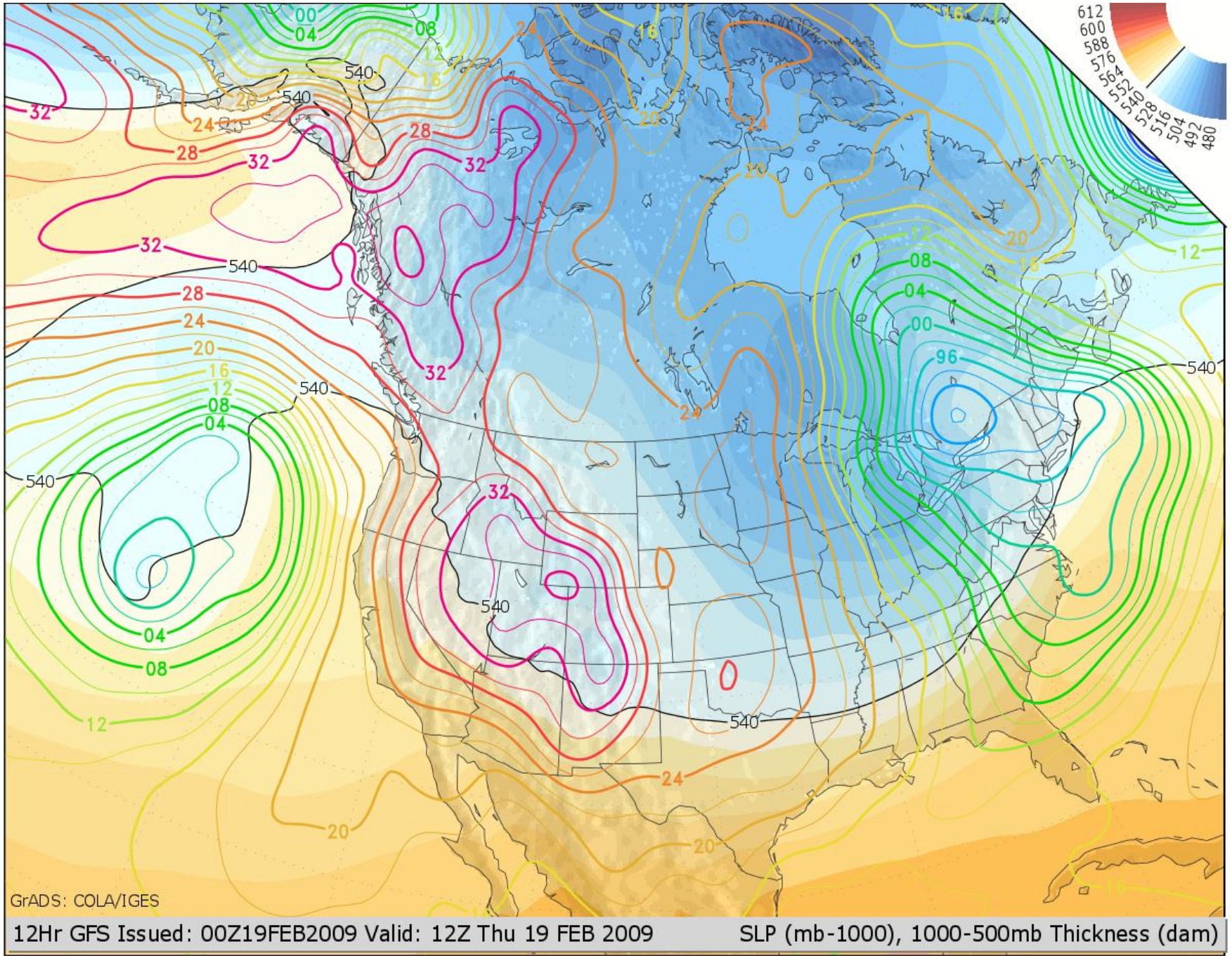
Fonts in GrADS

- Cairo/FreeType supports these font file formats:
  TrueType, Type 1, OpenType, X11 PCF, Windows FNT, et al.
- User defines new fonts with full path to a local font file
- Use 'set hershey off' for generic analogs of Hershey fonts
- Size and position controlled with 'set strsiz' and 'set string'
- Thickness controlled by using a bold version of the font
- Location and appearance of fonts are system dependent

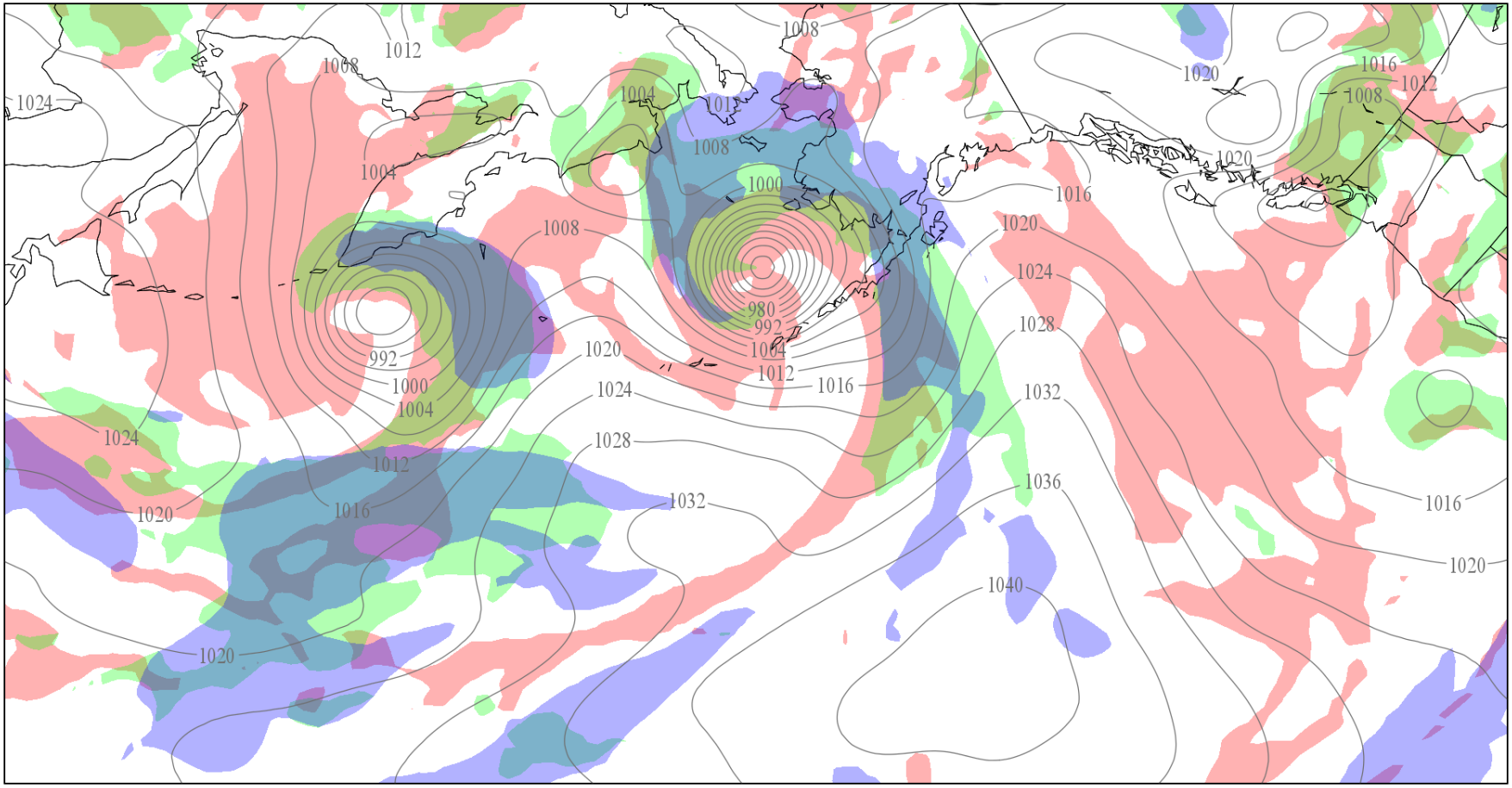
Line Drawing with Anti-Aliasing



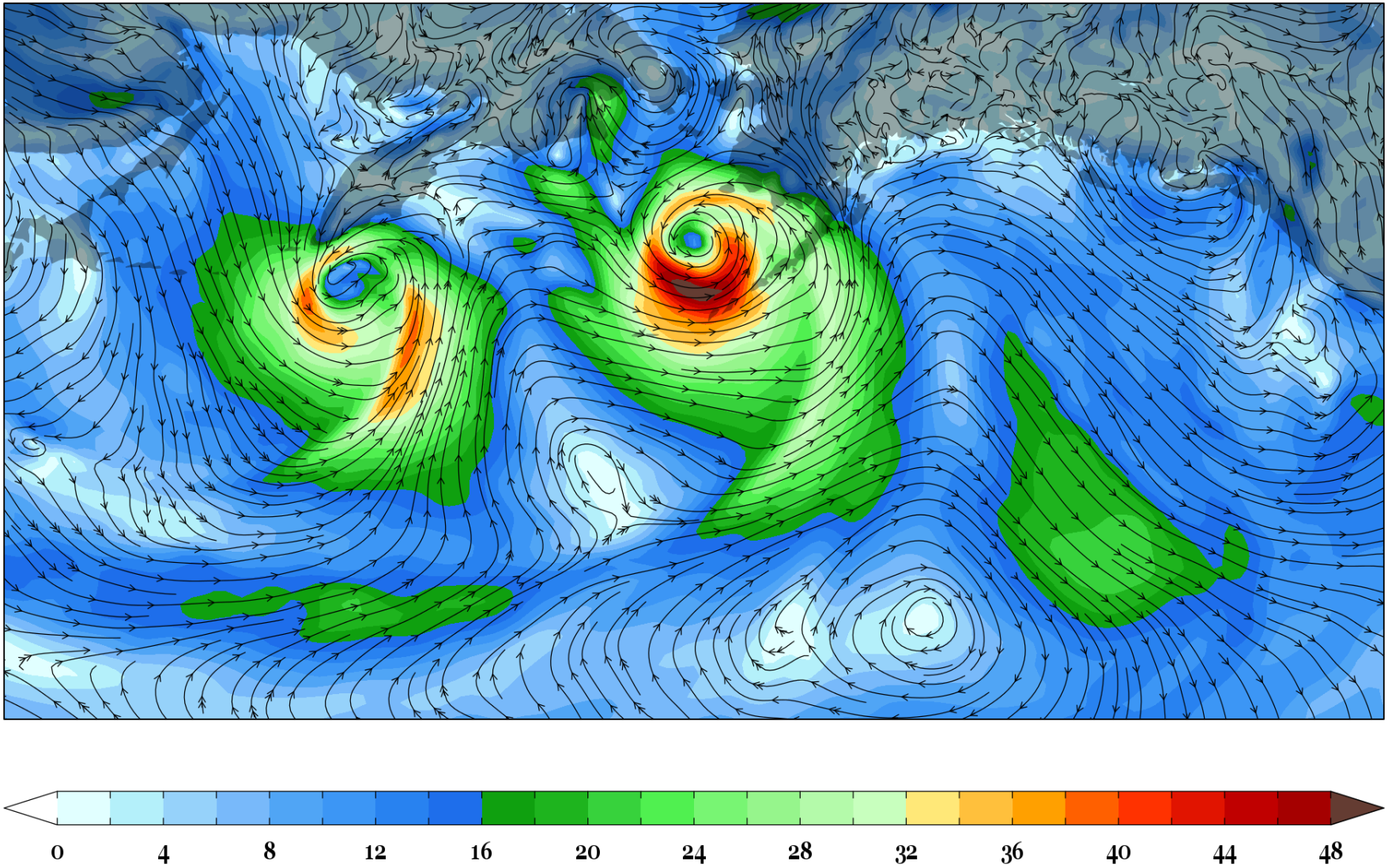

GrADS: COLA/IGES
12Hr GFS Issued: 00Z19FEB2009 Valid: 12Z Thu 19 FEB 2009
SLP (mb-1000), 1000-500mb Thickness (dam)


612
600
588
576
564
552
540
528
516
504
492
480
GrADS: COLA/IGES
12Hr GFS Issued: 00Z19FEB2009 Valid: 12Z Thu 19 FEB 2009
SLP (mb-1000), 1000-500mb Thickness (dam)

Low, Middle, and High Clouds with Sea Level Pressure



850mb Wind Speed with Streamlines

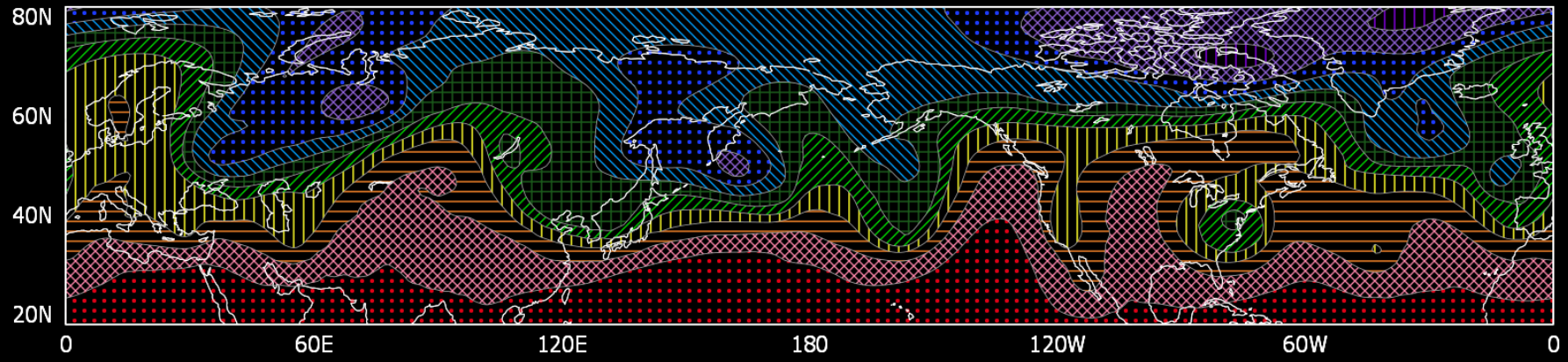


Building Blocks For Pattern Filling

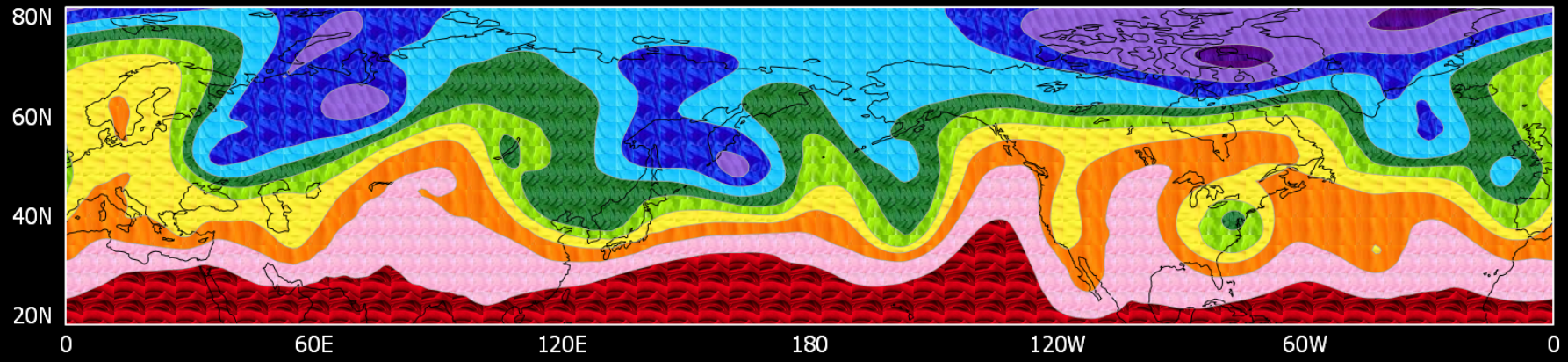
- Small image tiles are created internally on the fly
- Tiles are repeated to create the pattern
- Pattern appearance controlled by:
  - Size and aspect ratio of tiles
  - Line width
  - Size of output image
- Users may also provide a custom image tile

Pattern Filling

A Sample Pattern Fill Plot with Built-In Tiles



A Sample Pattern Fill Plot with Custom Image Tiles



New Hardcopy Output Formats

- Cairo supports:
  - PNG (for images)
  - PS, EPS, PDF, and SVG (for vector graphics)

- New all-purpose printing command: *gxprint*
  - *gxps*, *gxeps*, *gxtran*, *gv32* and *print* are obsolete
  - The GrADS metafile now only an internal metabuffer
  - The *printim* command is an alias for *gxprint*

Learn More About GrADS

Home Page
http://iges.org/grads

Documentation
http://iges.org/grads/gadoc

User's Forum
http://gradsusr.org/mailman/listinfo/gradsusr

The User Interface for Cairo Fonts

```
set font NN file font_filename_with_full_path

set hershey off
```

The User Interface for Transparent Colors

```
set rgb NN red green blue alpha
```

- Alpha values, like RGB values, range from 0 to 255
- Max value for *NN* is now 2047

The User Interface for Pattern Filling

```
set tile N type width height lwid fgcolor bgcolor
set rgb M tile N
```

…or…

```
set tile 0 /full_path_to/filename.png
set rgb M tile 0
```