Background Generation of DBCRAS Output Images using McIDAS

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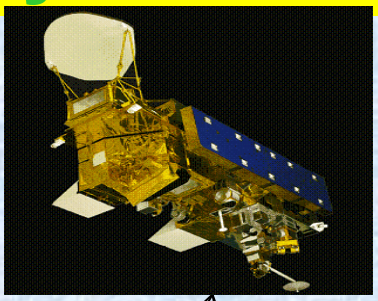
SSEC/CIMSS

(with the help of many)

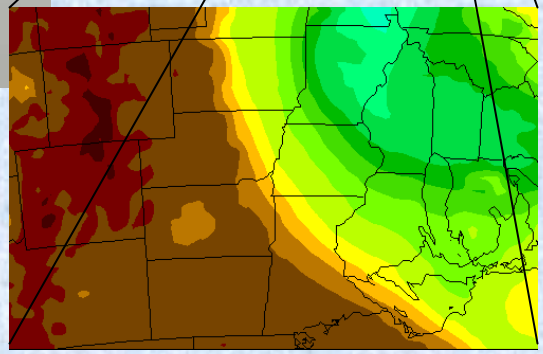
The Cooperative Institute for Meteorological Satellite Studies
University of Wisconsin-Madison

The Players:

MODIS Direct Broadcast Provides data



CRAS takes data and integrates forward in time



McIDAS-V takes GRIB-2 output from CRAS model and creates animated gif imagery suitable for web browsers

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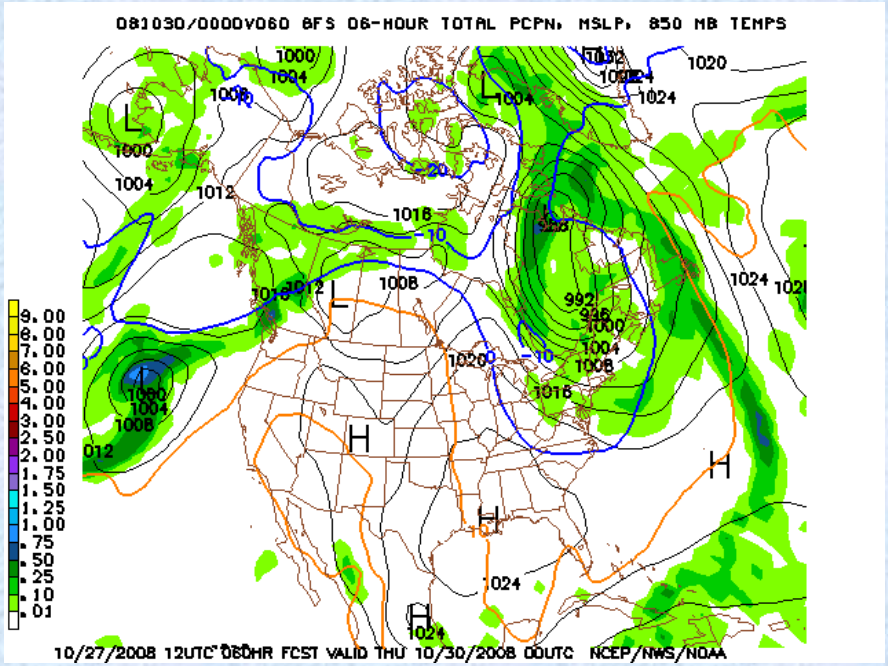
The Supporting Cast:



GFS from NCEP provides initial and boundary conditions

Your linux workstation running cron

Cost to you for data: $0

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How to do this

Download the compiled software and un-tar it

Statically compiled binaries for 32-bit and 64-bit linux machines

↓

Configure your system
(1) Where is the model centered?
(2) Where does the DB data come from?
(3) Generate model topography

This is done once and takes about 30 minutes

↓

Run the model using cron

1-3 h, depending on computer

↓

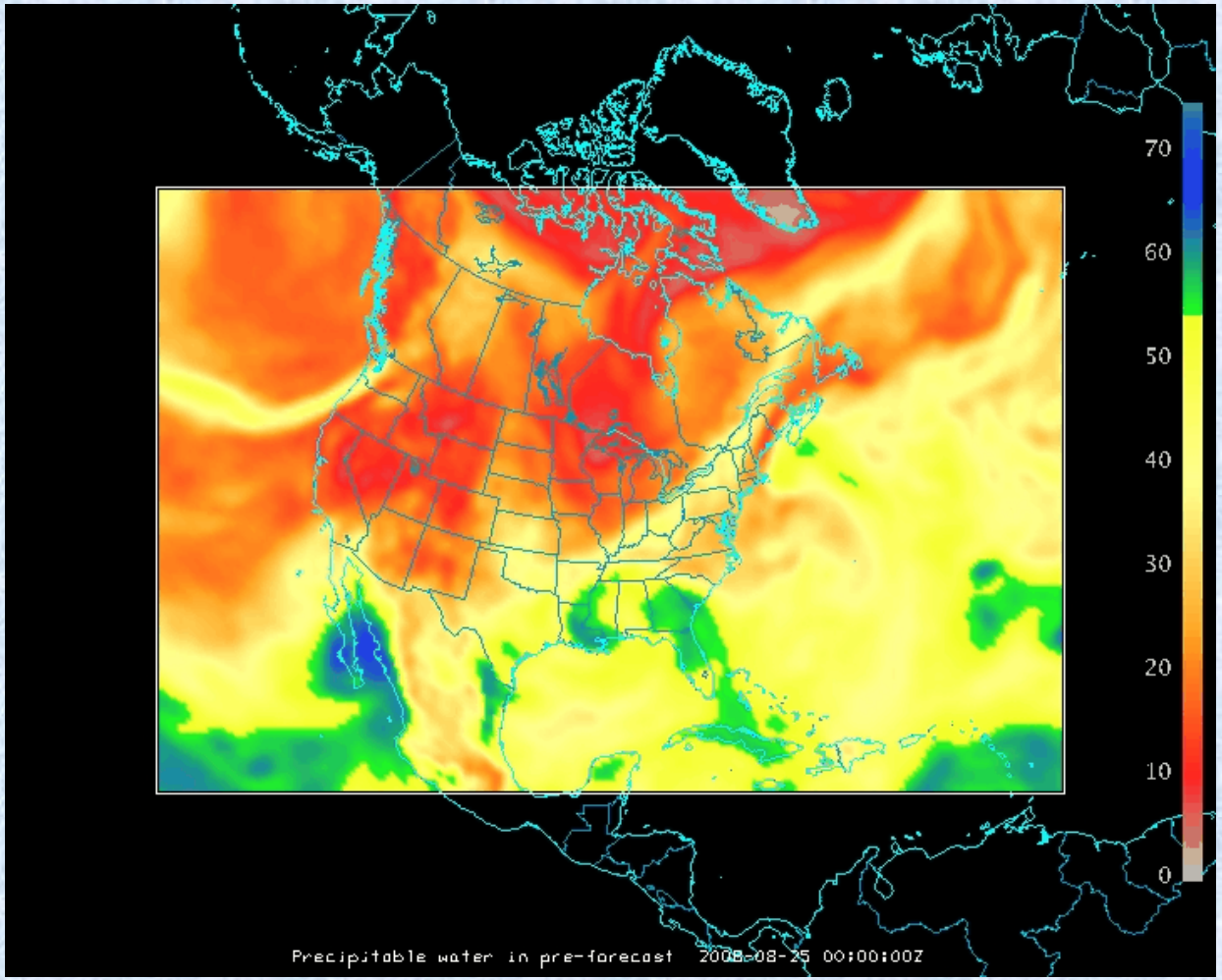
Run the McIDAS-V scripts to generate animated gifs

xVfb

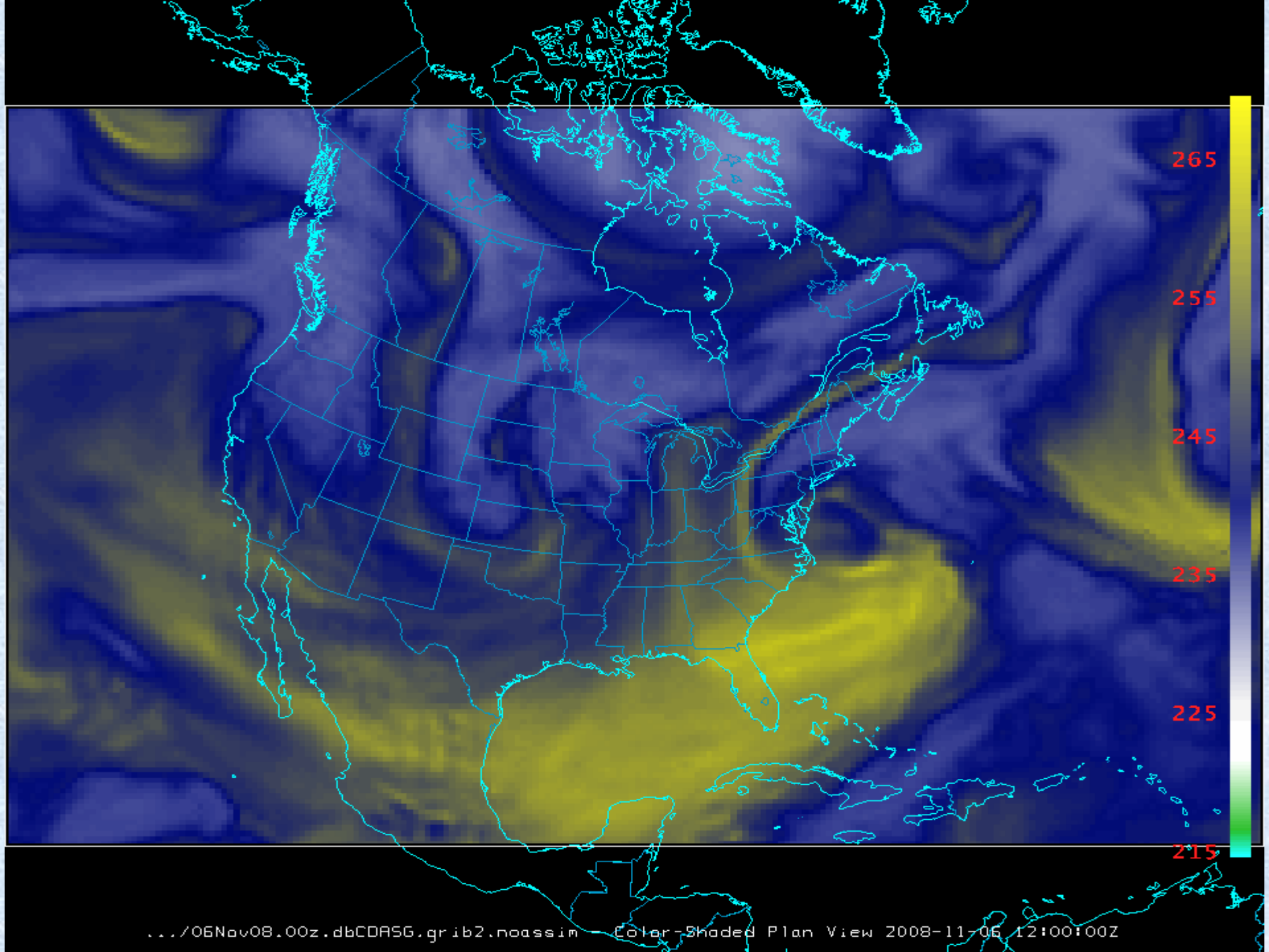
↓

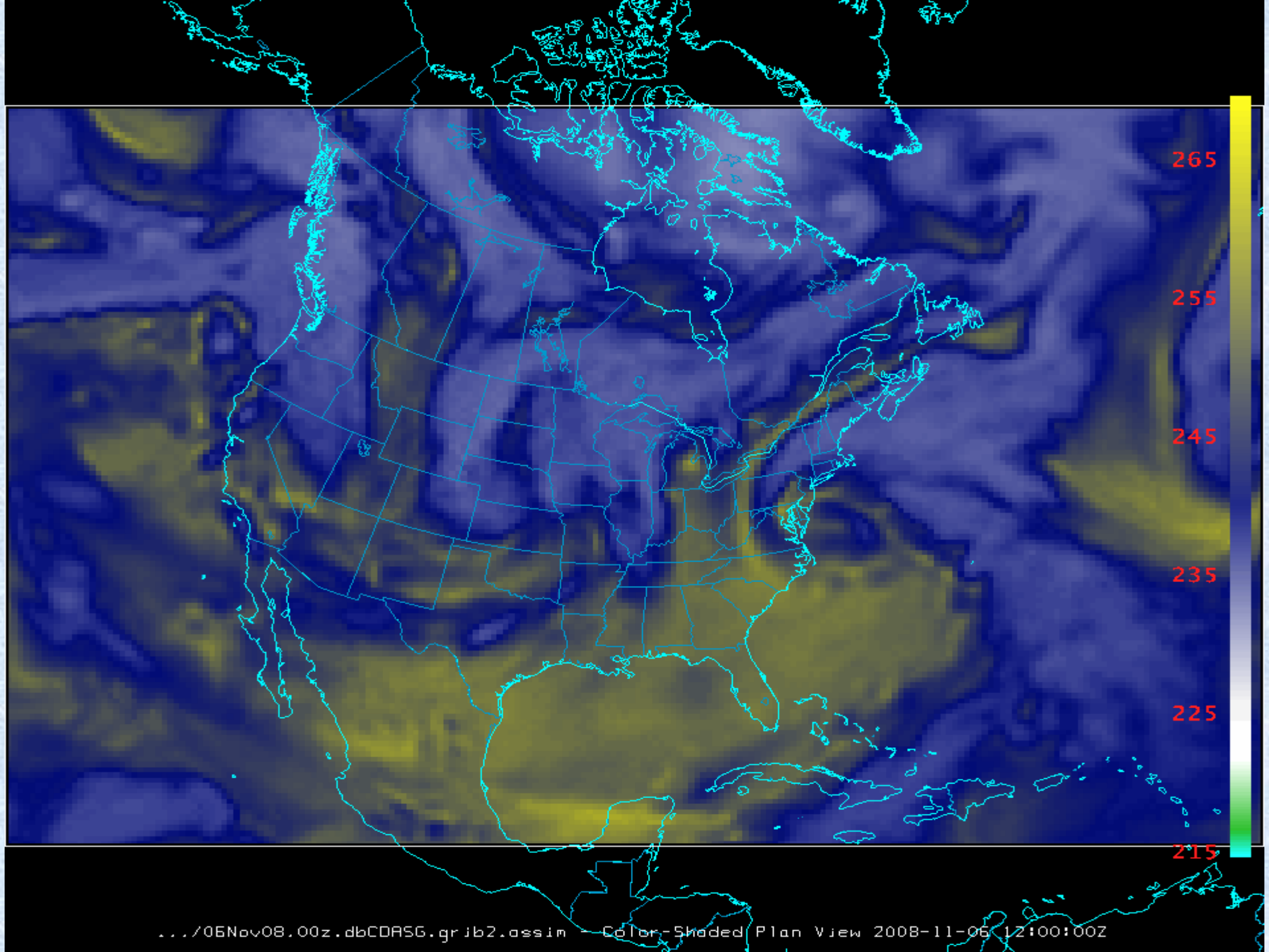
Move the animated gifs to the web for viewing pleasure

MODIS in Direct Broadcast CRAS (DBCRAS)



12-hour loop of total precipitable water (TPW) from the Direct Broadcast CRAS (DBCRAS) spin-up forecast illustrating how MODIS moisture modifies the GFS water vapor in CRAS. Note how MODIS adds detail to the TPW in the vicinity of Tropical Storm Fay. This animation was created using McIDAS-V.


265
255
245
235
225
215
.../06Nov08.00z.dbCDASG.grib2.noaassim Color-Shaded Plan View 2008-11-06 12:00:00Z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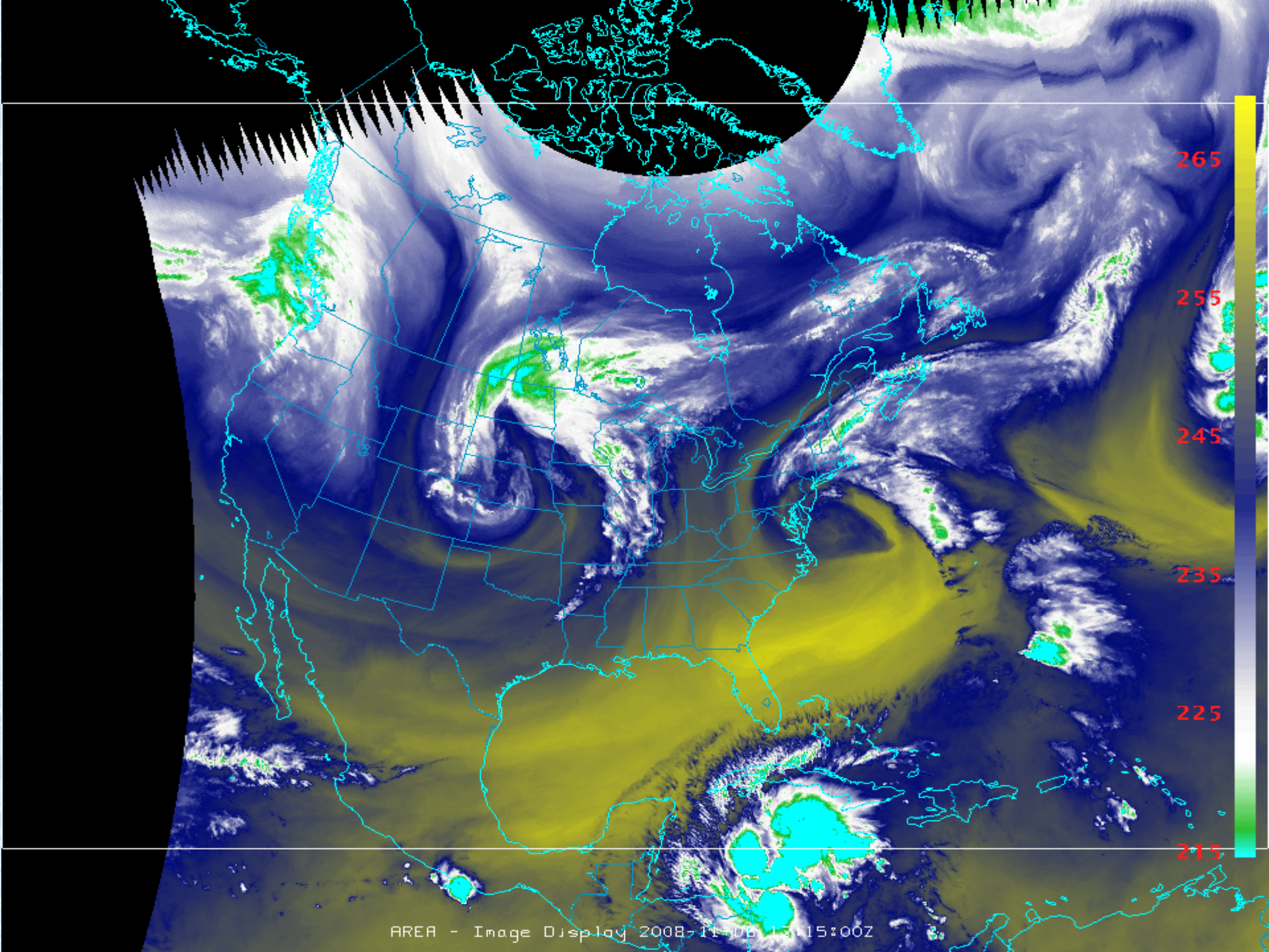
215
../06Nov08.00z.dbCDASG.grib2.assim Color-Shaded Plan View 2008-11-06 12:00:00Z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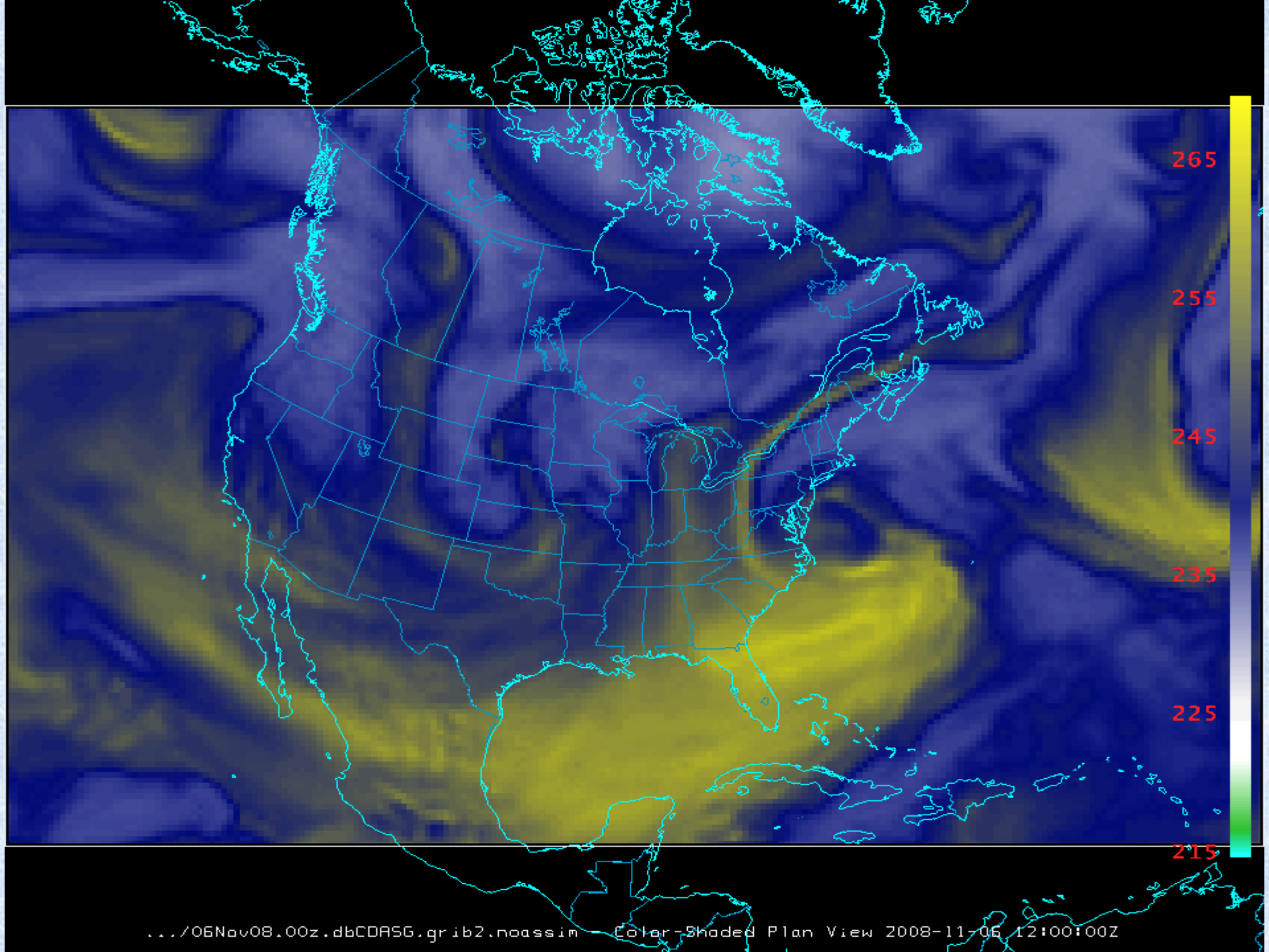
215
AREA - Image Display 2008-11-06 15:00Z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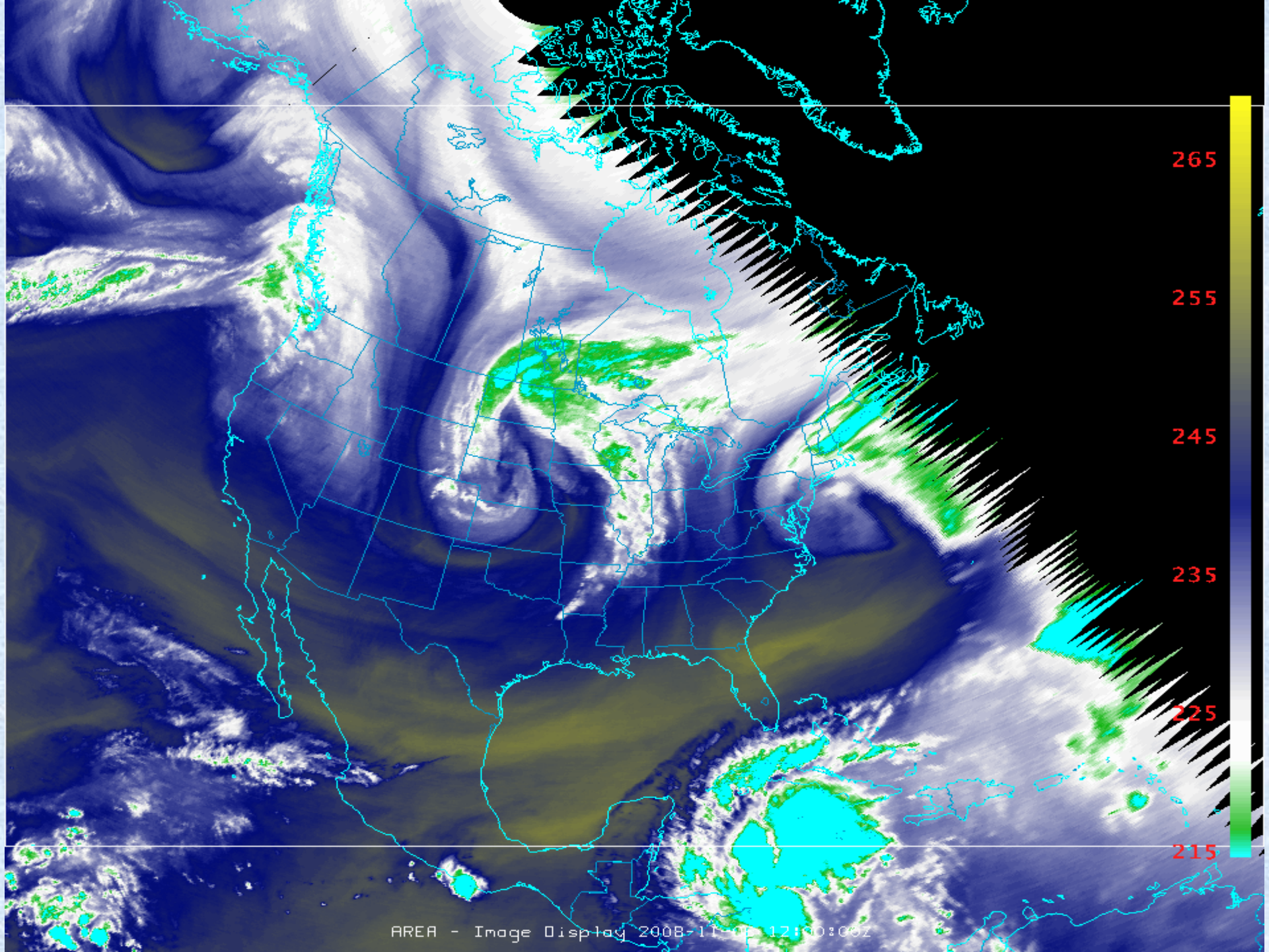
.../06Nov08.00z.dbCDASG.grib2.noaassim Color-Shaded Plan View 2008-11-06 12:00:00Z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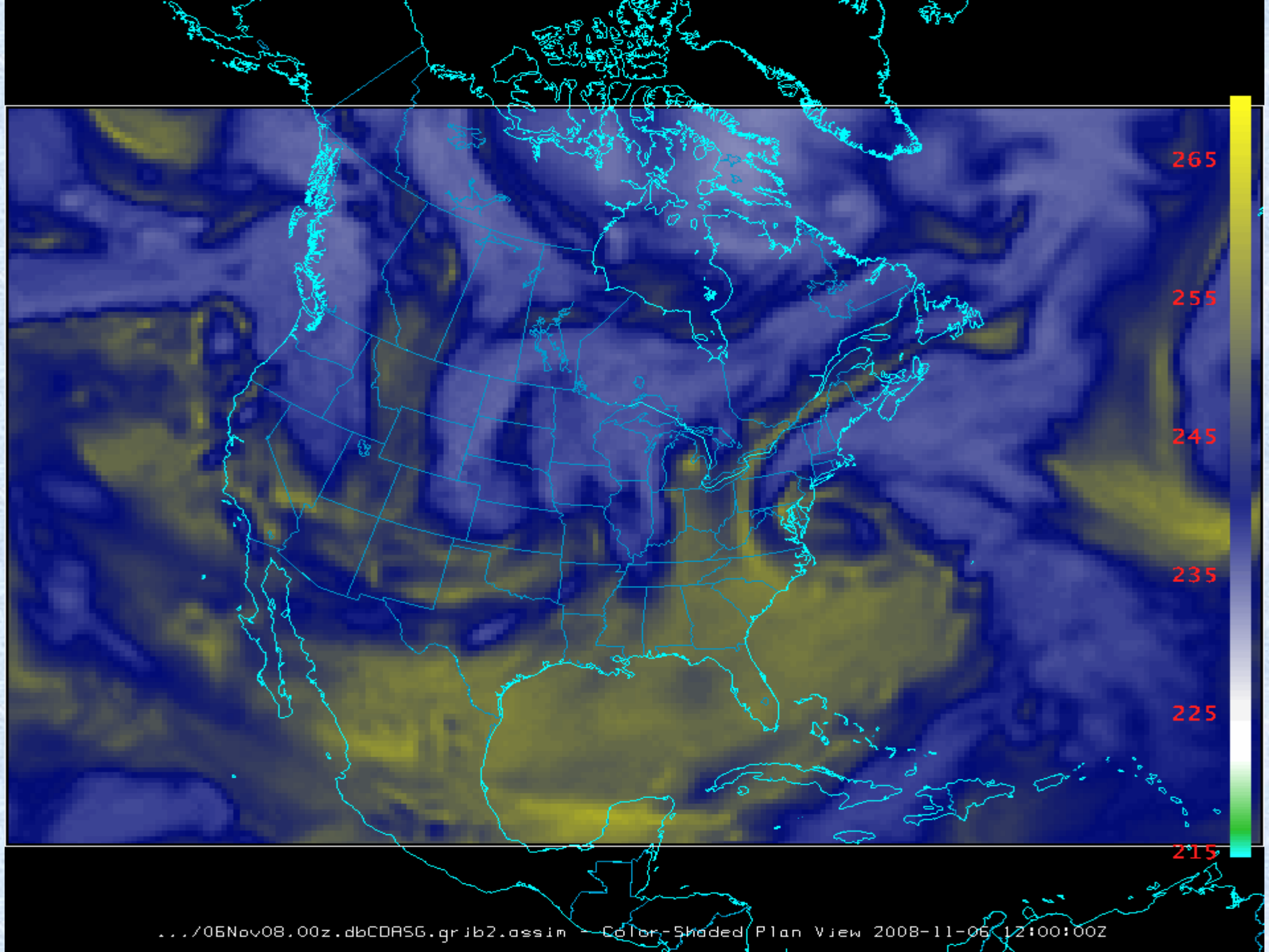
AREA - Image Display 2008-11-0[illegible] 12:00:00Z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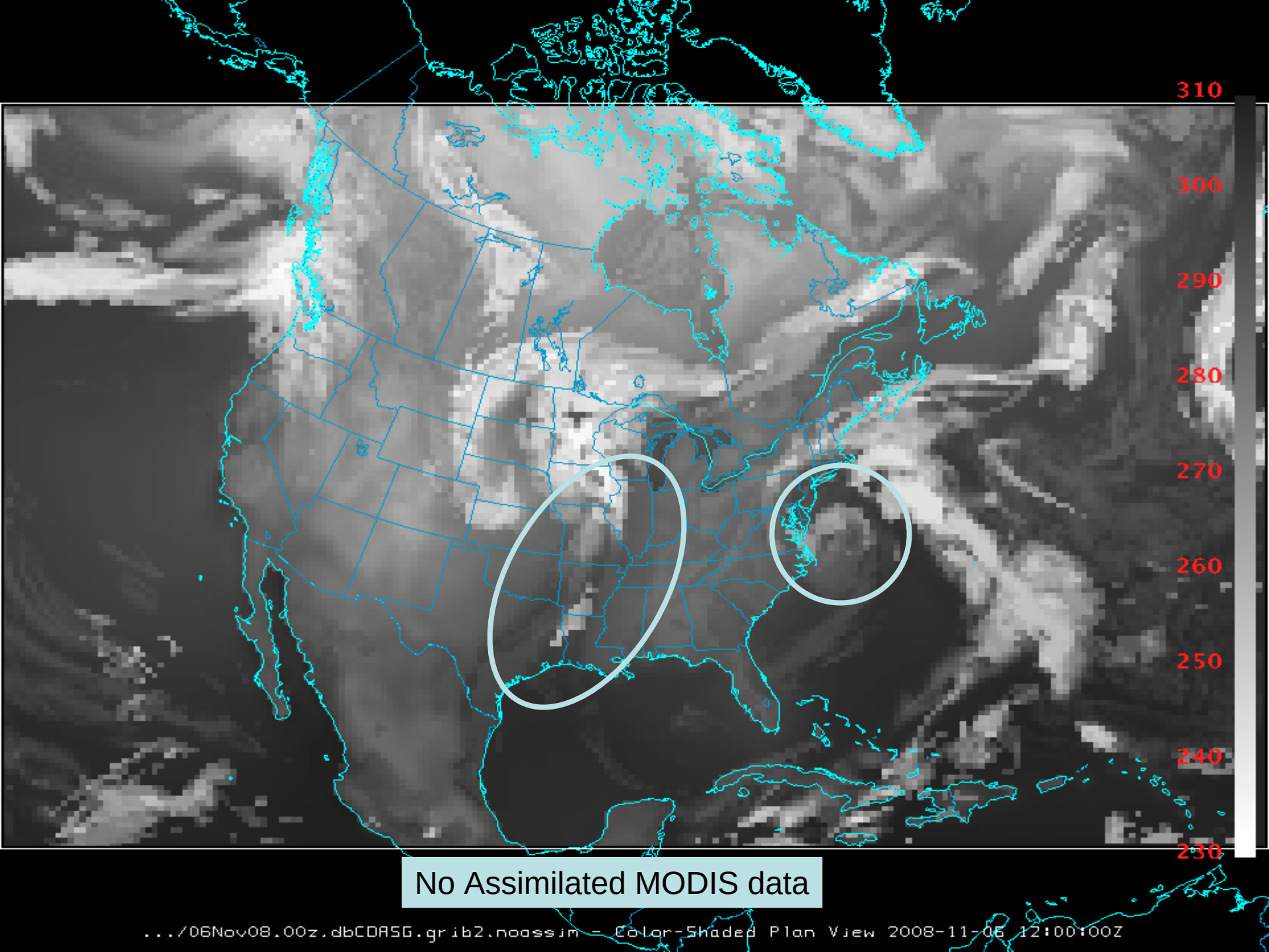
../06Nov08.00z.dbCDASG.grib2.assim Color-Shaded Plan View 2008-11-06 12:00:00Z


310
300
290
280
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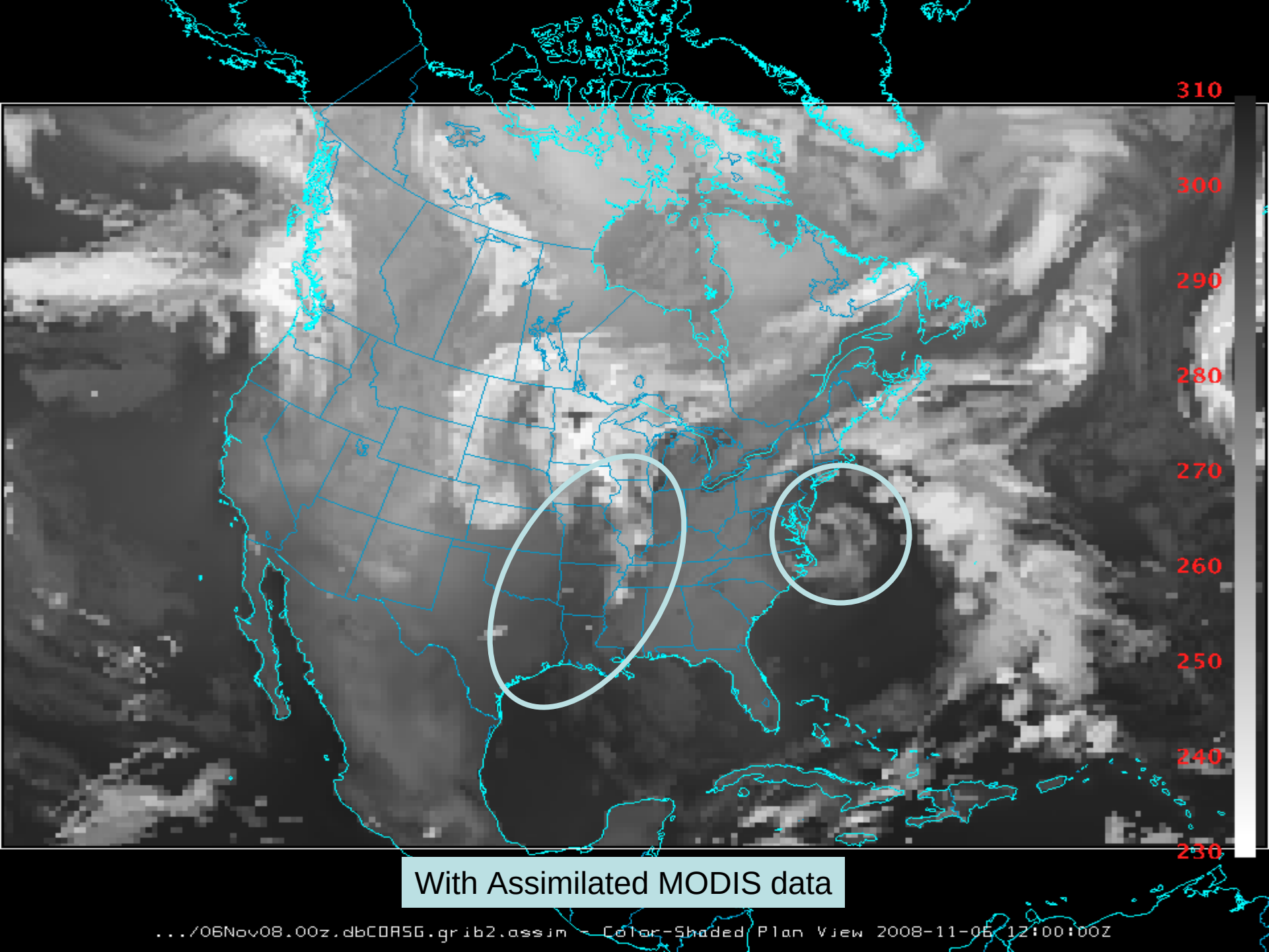
230
No Assimilated MODIS data
.../06Nov08.00z.dbCDASG.grib2.noassim - Color-Shaded Plan View 2008-11-06 12:00:00Z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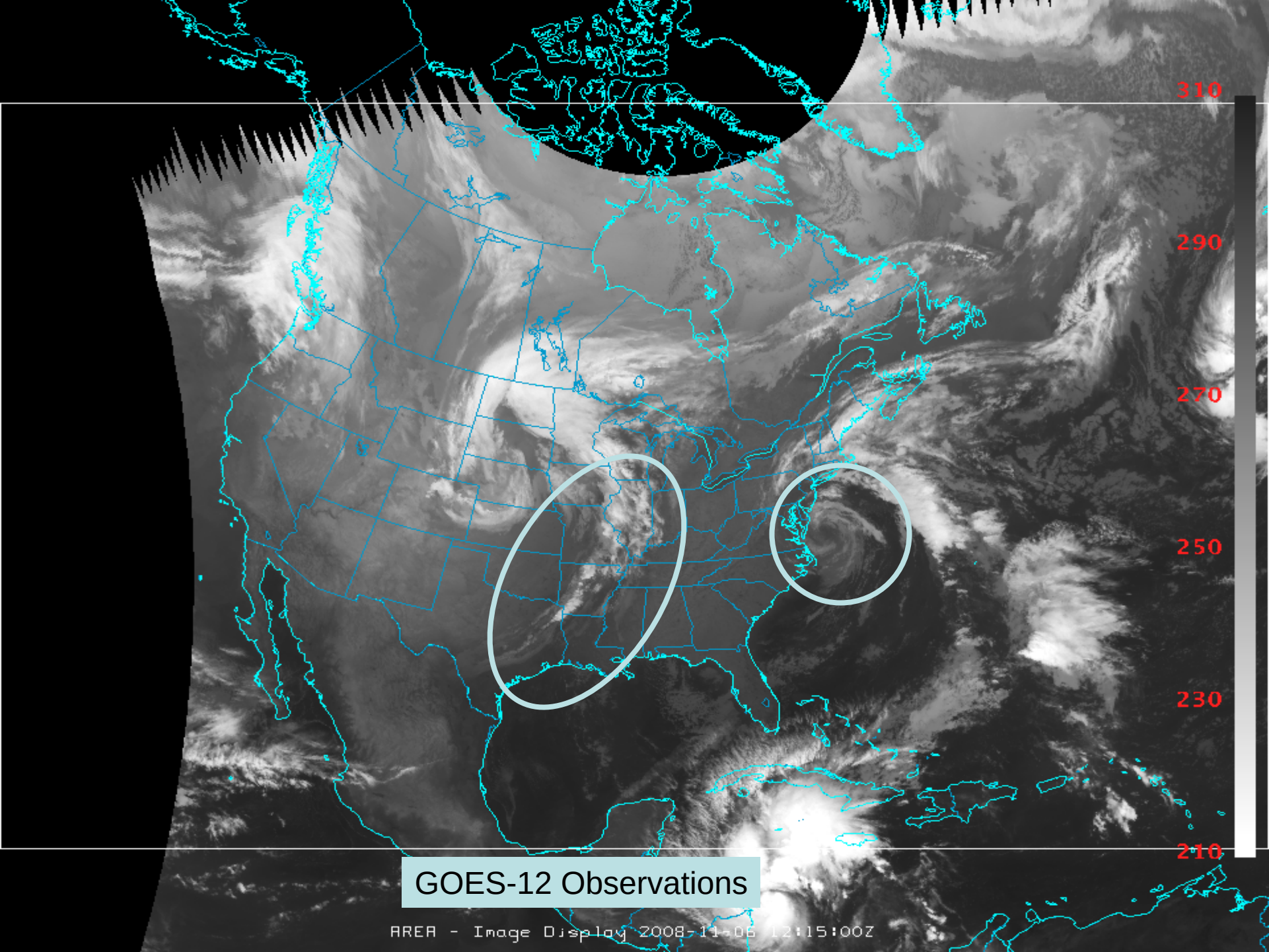
With Assimilated MODIS data
.../06Nov08.00z.dbCOASG.grib2.assim - Color-Shaded Plan View 2008-11-06 12:00:00Z


310
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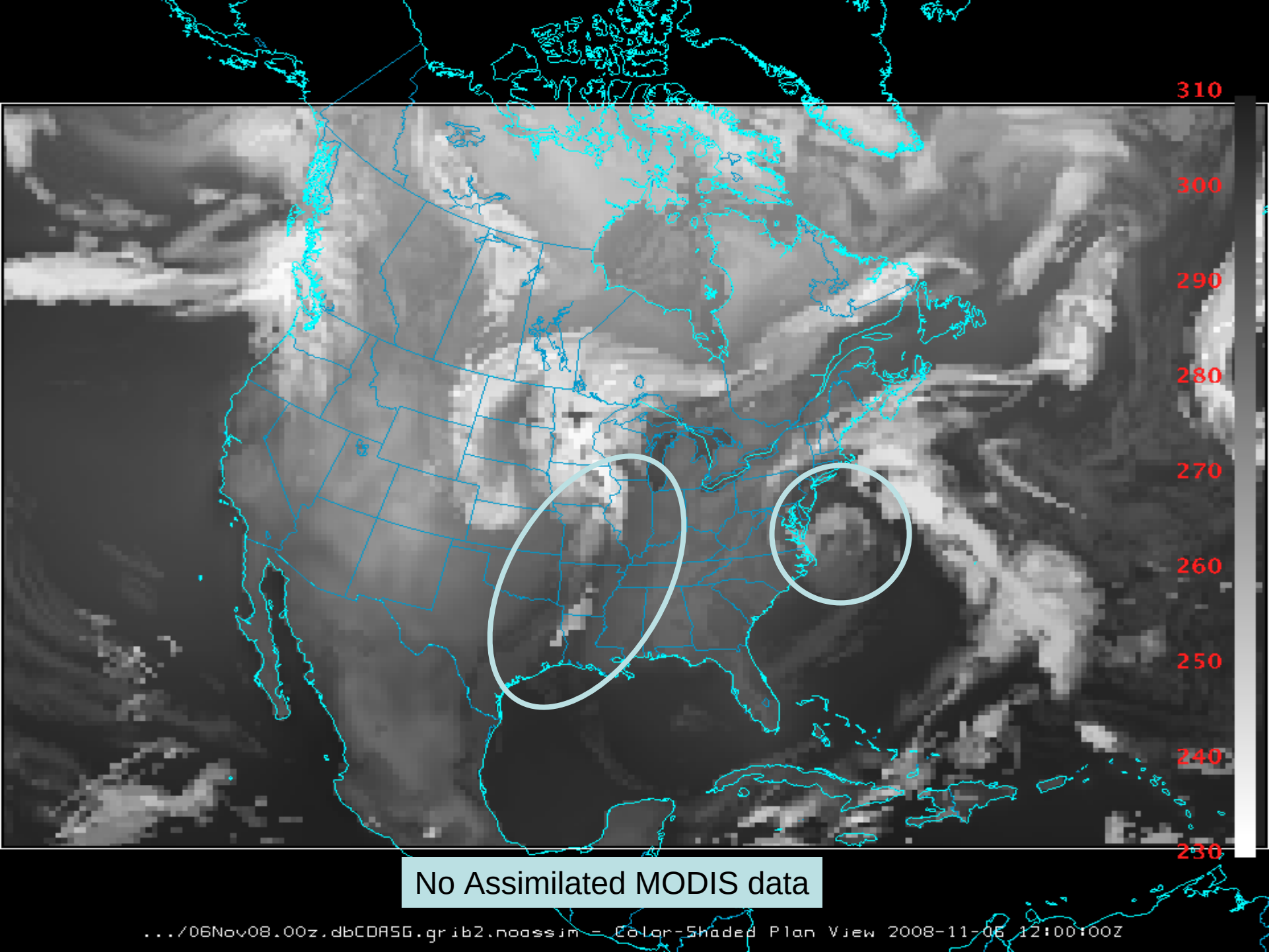
210
GOES-12 Observations
AREA - Image Display 2008-11-06 12:15:00Z


310
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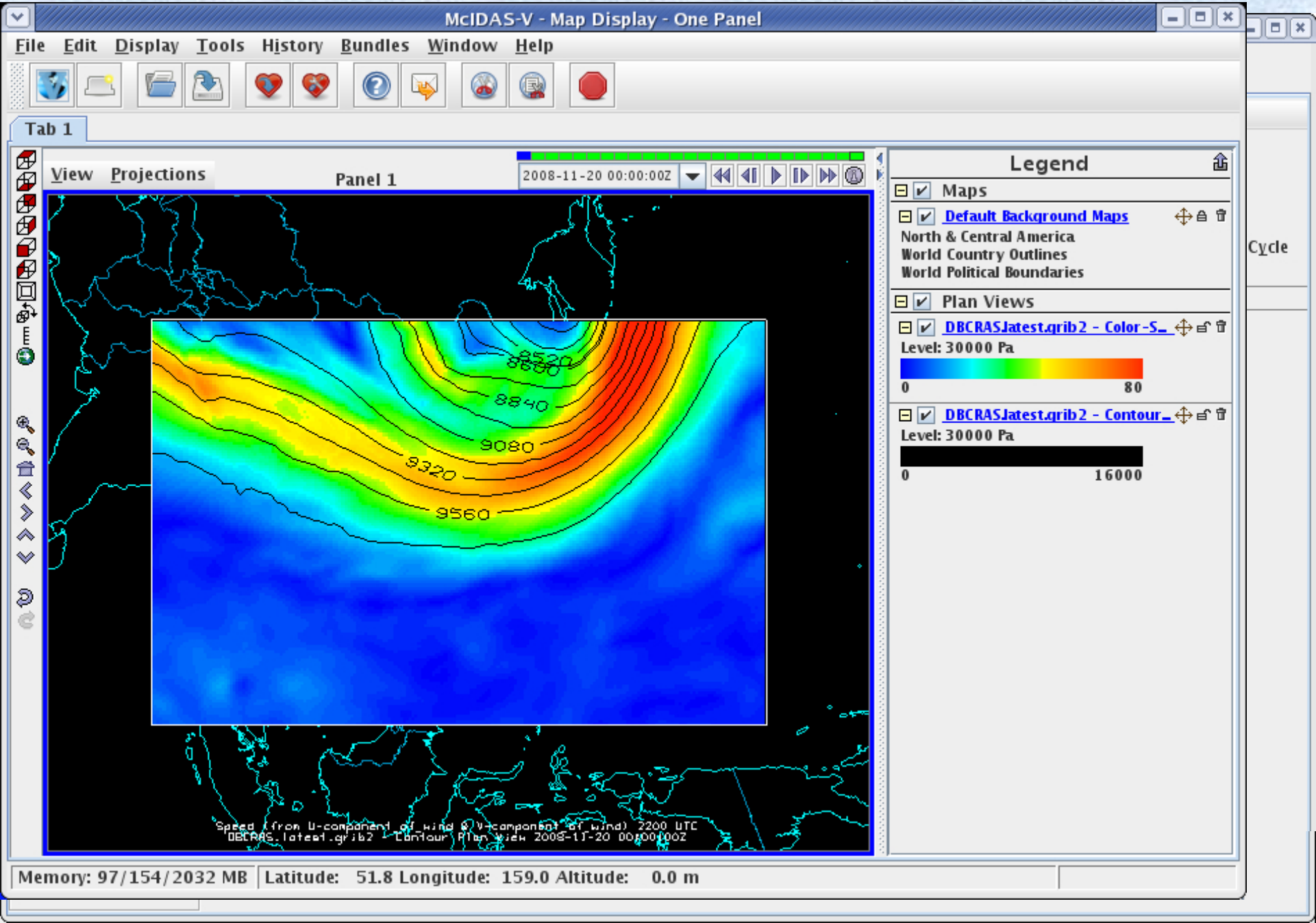
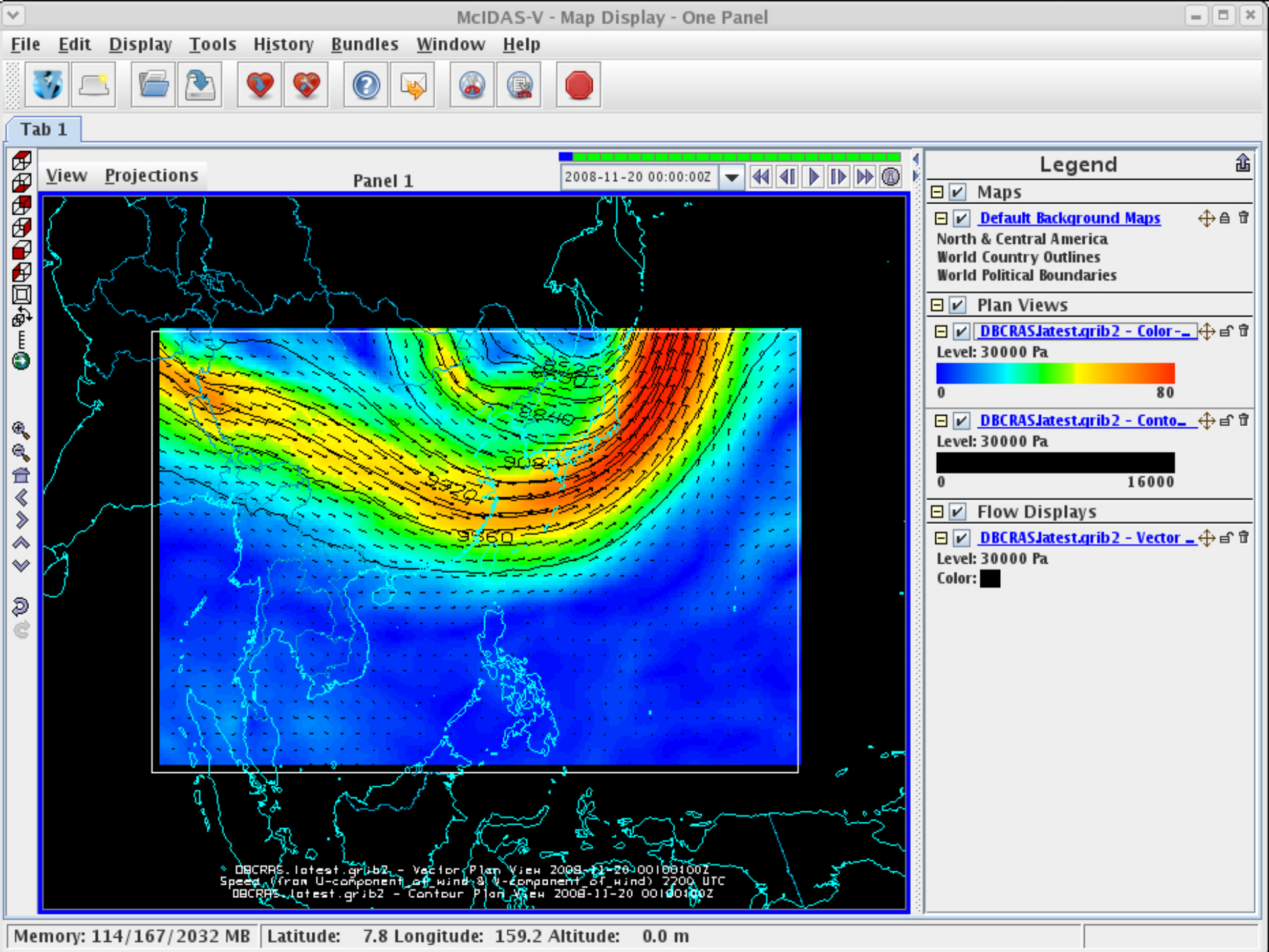
230
No Assimilated MODIS data
.../06Nov08.00z.dbCDASG.grib2.noassim - Color-Shaded Plan View 2008-11-06 12:00:00Z

Task

- Model runs every day at 12 hours
  - cron entry
  - Output to generically named file
  - grib2 files
- Take model output and automatically generate imagery
  - Feasible because data location is known
- Present looping information


McIDAS-V - Map Display - One Panel
File Edit Display Tools History Bundles Window Help
Tab 1
View Projections
Panel 1
2008-11-20 00:00:00Z
8520
8680
8840
9080
9320
9560
Legend
Maps
Default Background Maps
North & Central America
World Country Outlines
World Political Boundaries
Plan Views
DBCRASJatest.grib2 - Color-S...
Level: 30000 Pa
0
80
DBCRASJatest.grib2 - Contour...
Level: 30000 Pa
0
16000
Memory: 97/154/2032 MB
Latitude: 51.8 Longitude: 159.0 Altitude: 0.0 m


McIDAS-V - Map Display - One Panel
File Edit Display Tools History Bundles Window Help
Tab 1
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Panel 1
2008-11-20 00:00:00Z
Legend
Maps
Default Background Maps
North & Central America
World Country Outlines
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Plan Views
DBCRASJatest.grib2 - Color-...
Level: 30000 Pa
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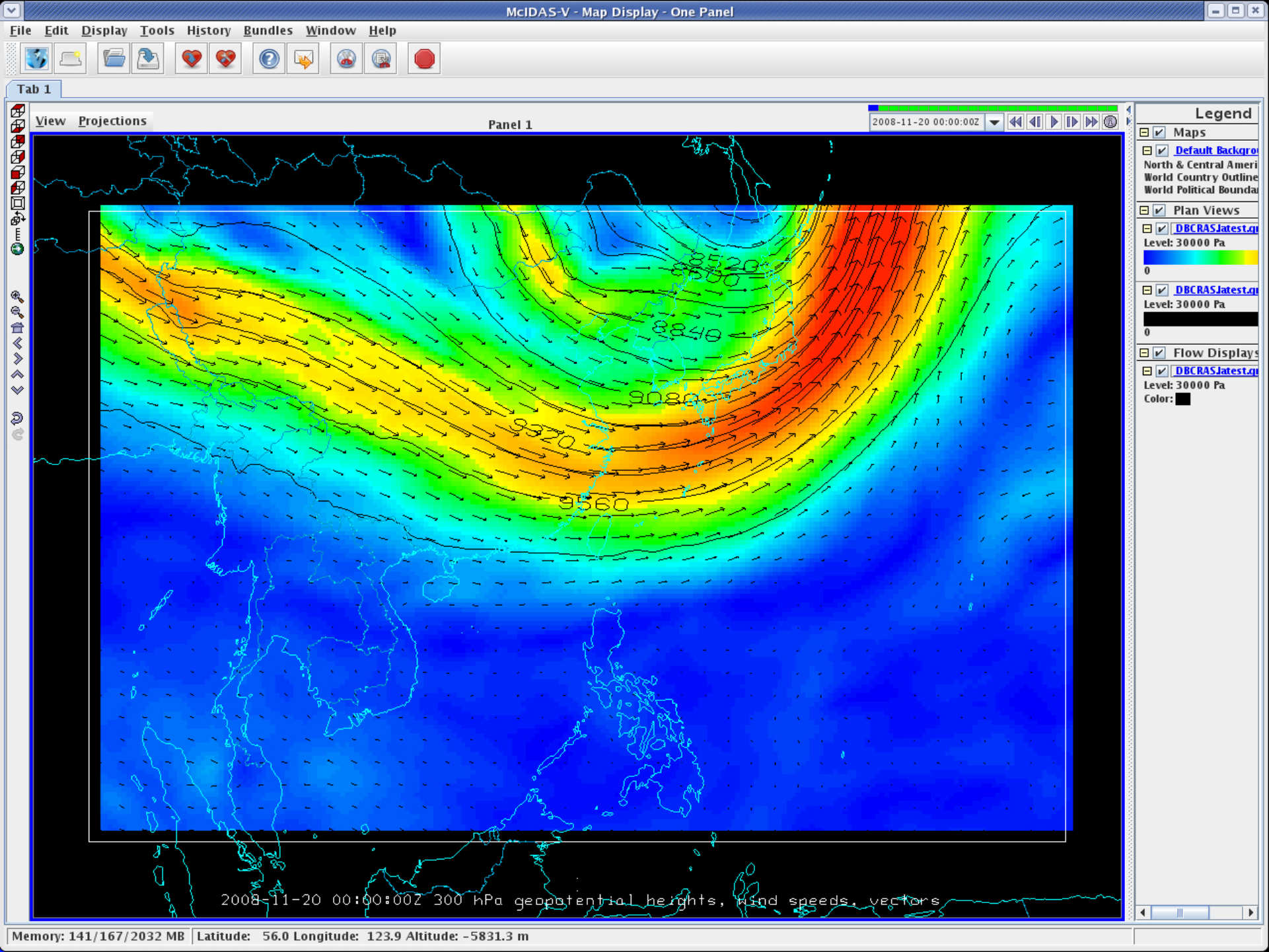
16000
Flow Displays
DBCRASJatest.grib2 - Vector ...
Level: 30000 Pa
Color:
DBCRAS_latest.grib2 - Vector Plan View 2008-11-20 0010010OZ
Speed (from U-component_of_wind & V-component_of_wind) 2200 UTC
DBCRAS_latest.grib2 - Contour Plan View 2008-11-20 0010010OZ
Memory: 114/167/2032 MB
Latitude: 7.8 Longitude: 159.2 Altitude: 0.0 m


McIDAS-V - Map Display - One Panel
File Edit Display Tools History Bundles Window Help
Tab 1
View Projections
Panel 1
2008-11-20 00:00:00Z
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North & Central Ameri
World Country Outline
World Political Bounda
Plan Views
DBCRASJatest.gr
Level: 30000 Pa
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Flow Displays
DBCRASJatest.gr
Level: 30000 Pa
Color:
8520
8550
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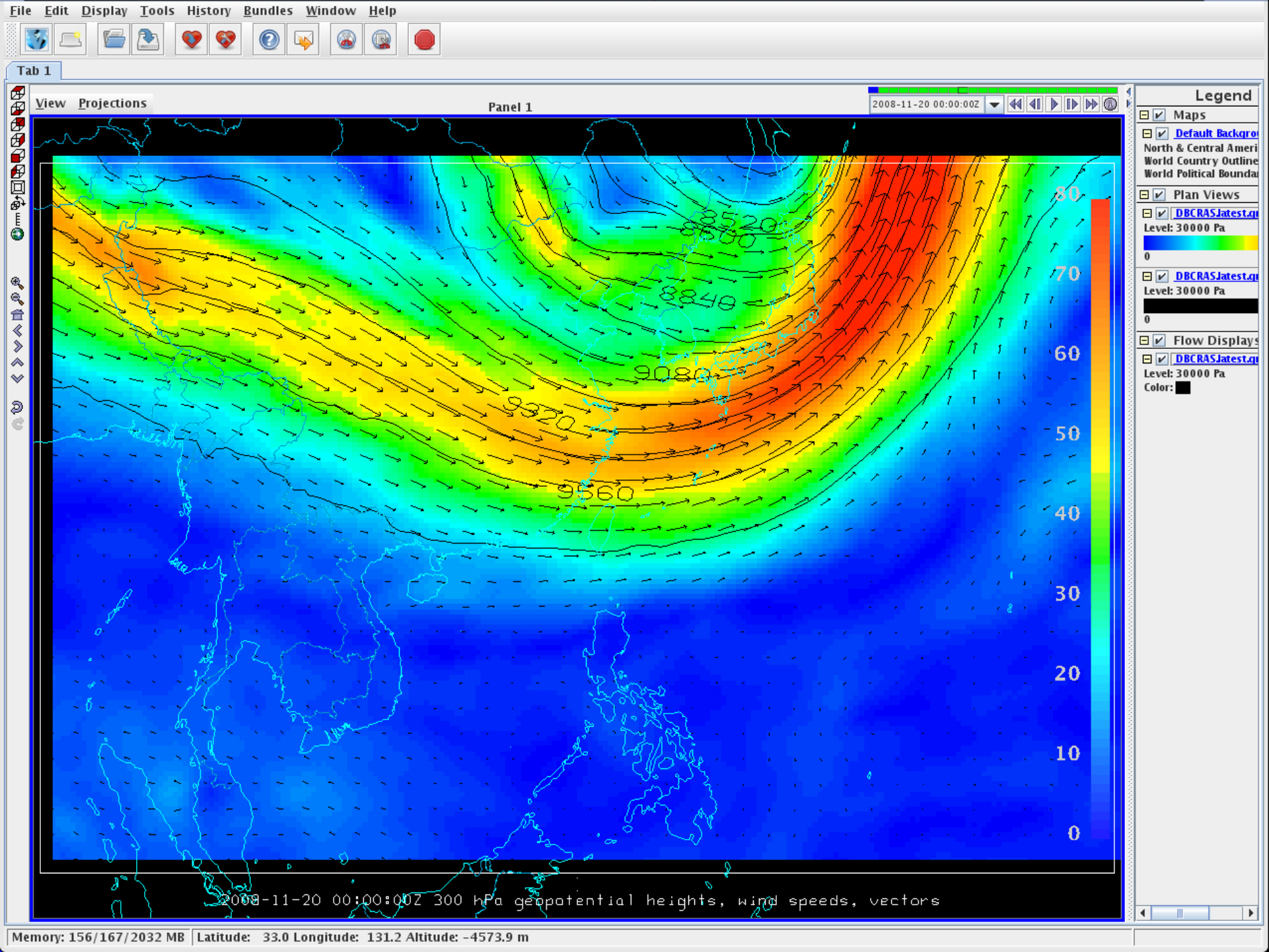
9080
9320
9560
2008-11-20 00:00:00Z 300 hPa geopotential heights, wind speeds, vectors
Memory: 141/167/2032 MB
Latitude: 56.0 Longitude: 123.9 Altitude: -5831.3 m


File Edit Display Tools History Bundles Window Help
Tab 1
View Projections
Panel 1
2008-11-20 00:00:00Z
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North & Central Ameri
World Country Outline
World Political Bounda
Plan Views
DBCRASJatest.gr
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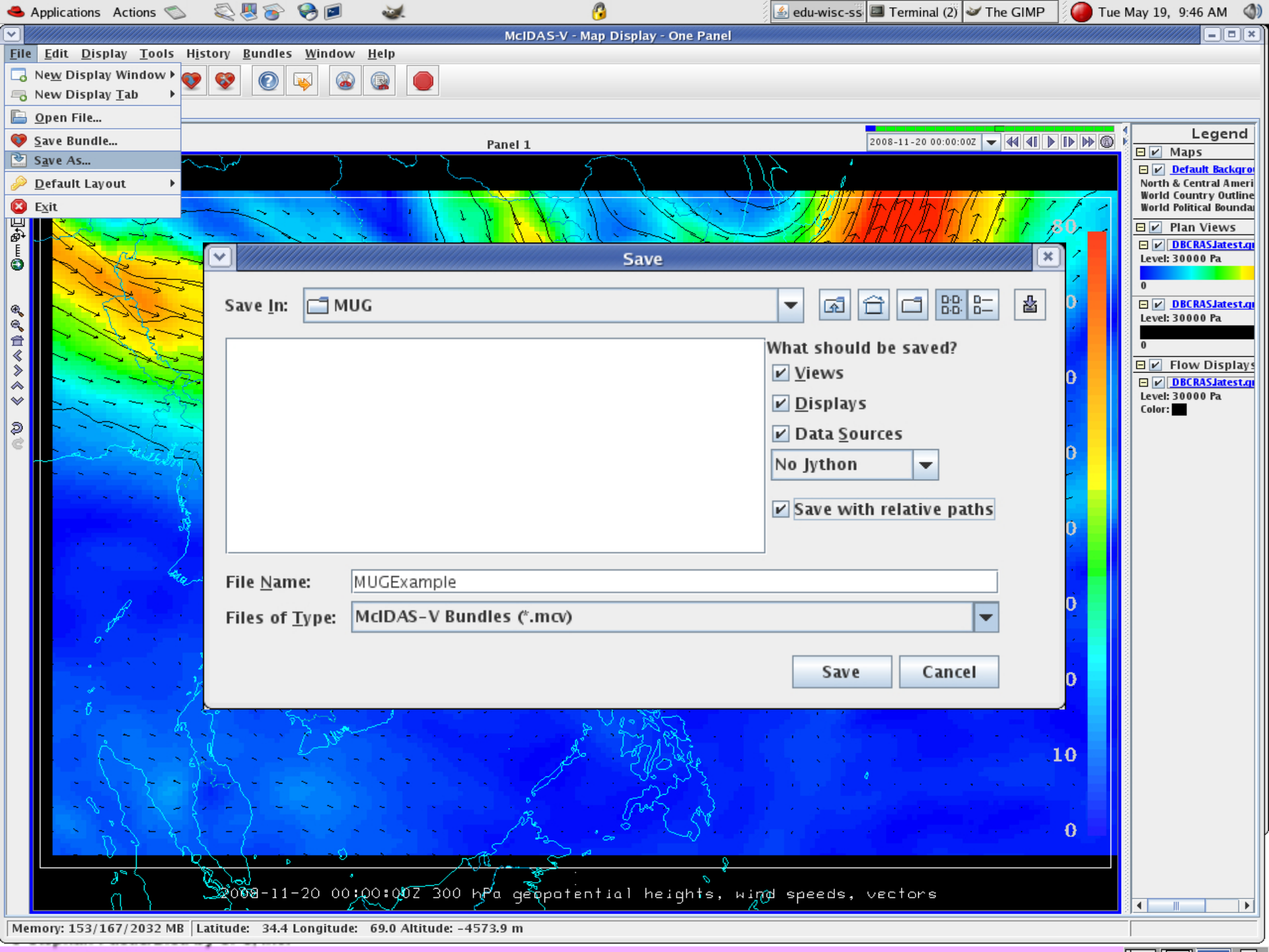
2008-11-20 00:00:00Z 300 hPa geopotential heights, wind speeds, vectors
Memory: 156/167/2032 MB
Latitude: 33.0 Longitude: 131.2 Altitude: -4573.9 m


Applications Actions
edu-wisc-ss
Terminal (2)
The GIMP
Tue May 19, 9:46 AM
McIDAS-V - Map Display - One Panel
File Edit Display Tools History Bundles Window Help
New Display Window
New Display Tab
Open File...
Save Bundle...
Save As...
Default Layout
Exit
Panel 1
2008-11-20 00:00:00Z
Legend
Maps
Default Backgro
North & Central Ameri
World Country Outline
World Political Boundai
Plan Views
DBCRASJatest.gr
Level: 30000 Pa
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DBCRASJatest.gr
Level: 30000 Pa
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Flow Displays
DBCRASJatest.gr
Level: 30000 Pa
Color:
Save
Save In: MUG
What should be saved?
Views
Displays
Data Sources
No Jython
Save with relative paths
File Name: MUGExample
Files of Type: McIDAS-V Bundles (*.mcv)
Save
Cancel
2008-11-20 00:00:00Z 300 hPa geopotential heights, wind speeds, vectors
Memory: 153/167/2032 MB
Latitude: 34.4 Longitude: 69.0 Altitude: -4573.9 m

To run, set environment variables

export DBCRAS_HOME= /home/scottl/DBCRAS/dbCRAS

export LOCAL_ANC_DIR= ${DBCRAS_HOME}/ancillary

export REMOTE_ANC_DIR= ftp://ftp.ssec.wisc.edu/pub/eosdb/ancillary

export USE_UW_MOD06MOD07=YES

export PATH= .:${DBCRAS_HOME}/bin:${DBCRAS_HOME}/scripts:${PATH}

DBCRAS install includes this environment-setting file

crontab entry calls:

```
#!/bin/csh
${DBCRAS_HOME}/McIDAS-V/runMcV -islfile
   ${DBCRAS_HOME}/McVscripts/SaveWV.py
${DBCRAS_HOME}/McIDAS-V/runMcV -islfile
   ${DBCRAS_HOME}/McVscripts/SaveMSLP.py
${DBCRAS_HOME}/McIDAS-V/runMcV -islfile
   ${DBCRAS_HOME}/McVscripts/SavePW.py
${DBCRAS_HOME}/McIDAS-V/runMcV -islfile
   ${DBCRAS_HOME}/McVscripts/Save300.py
${DBCRAS_HOME}/McIDAS-V/runMcV -islfile
   ${DBCRAS_HOME}/McVscripts/Save500.py
```

python scripts

```
setOffScreen(0)
loadBundle("../McIDAS-V/Vector_Speed_300hPa_Large.xidv")
pause()
writeMovie("../images/Vector_Spd_300mov.gif")
writeImage("../images/Vector_Spd_300pix.png")
```

Notes

- Xvfb – virtual frame buffer – may be needed to create graphics images when things are run in background
- There can be conflicts between xVfb and java-3d on some operating platforms
- After making the graphics, automatically move them to the net for viewing
- http://www.ssec.wisc.edu/~kathys/dbcras

Summary

- ftp://ftp.ssec.wisc.edu/pub/kathys/DBCRAS
  - get DBCRAS_v1.0.tar.gz
  - get 00README_DBCRAS.txt

- Direct Broadcast CRAS:
  - Provides for regional NWP capabilities
  - Uses MODIS from local Direct Broadcast
- McIDAS-V can display the gif imagery or loops

- It's all free.

http://cimss.ssec.wisc.edu/cras/