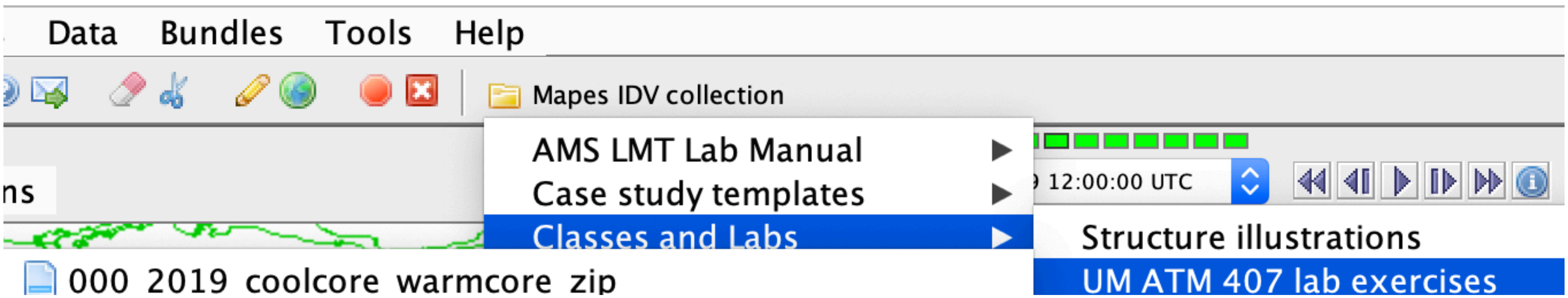
IDV lab assignment -- part 1

- Open Mapes IDV → UM ATM407…
  - 0000_coolcore_warmcore…

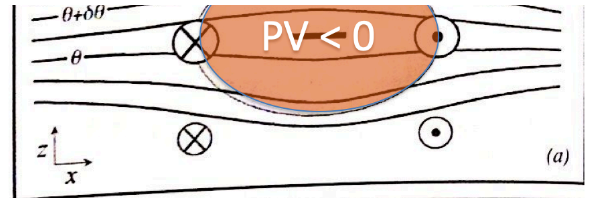


Explore ALL of its displays, at ALL of its times (loop the animation). Learn to use the IDV. The Help menu has pan-zoom help on top. A mouse is a HUGE help for 3D views.

IDV lab assignment -- part 1

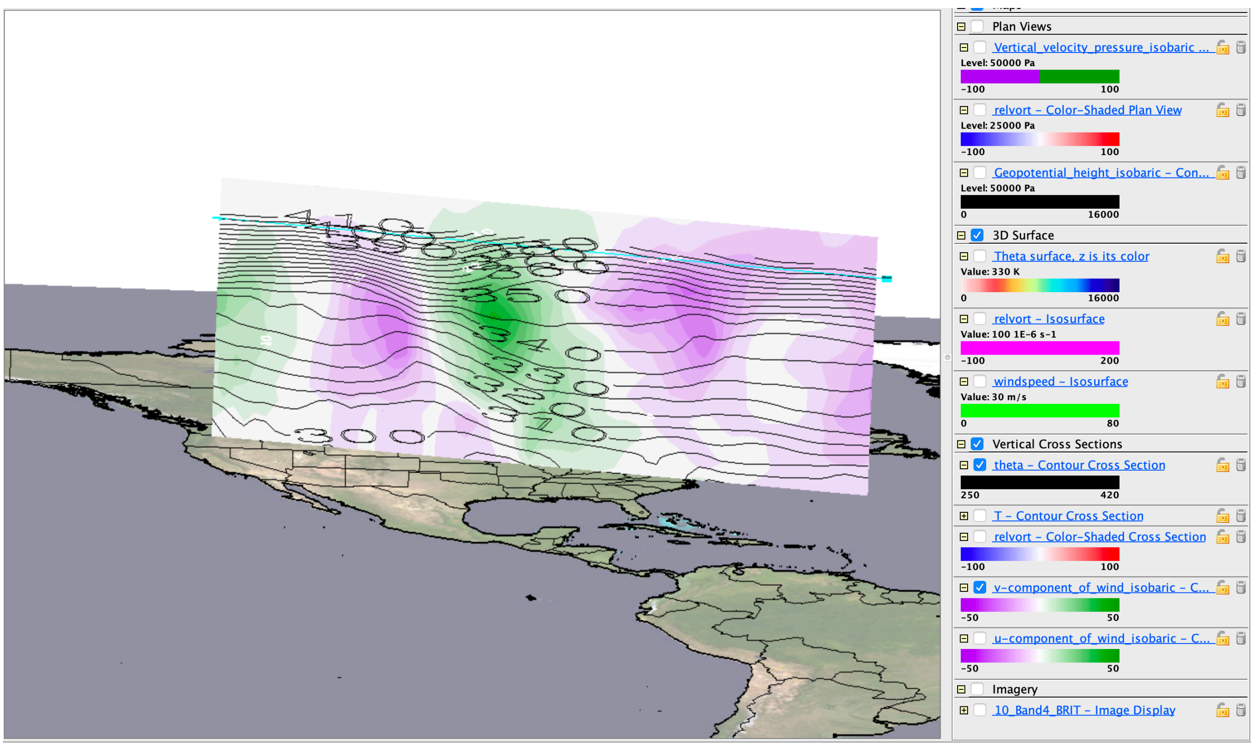
- In the following slides, make and label and explain nice clear illustrations like slides 13-17, but for
  - a warm core anticyclone
  - a warm core cyclone
  - a cool core anticyclone

A warm core anticyclone

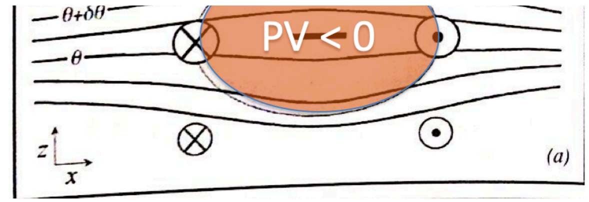


- Where? Describe the situation.

- Cell has warm air depression with -v winds on the right, meaning it is an anticyclone

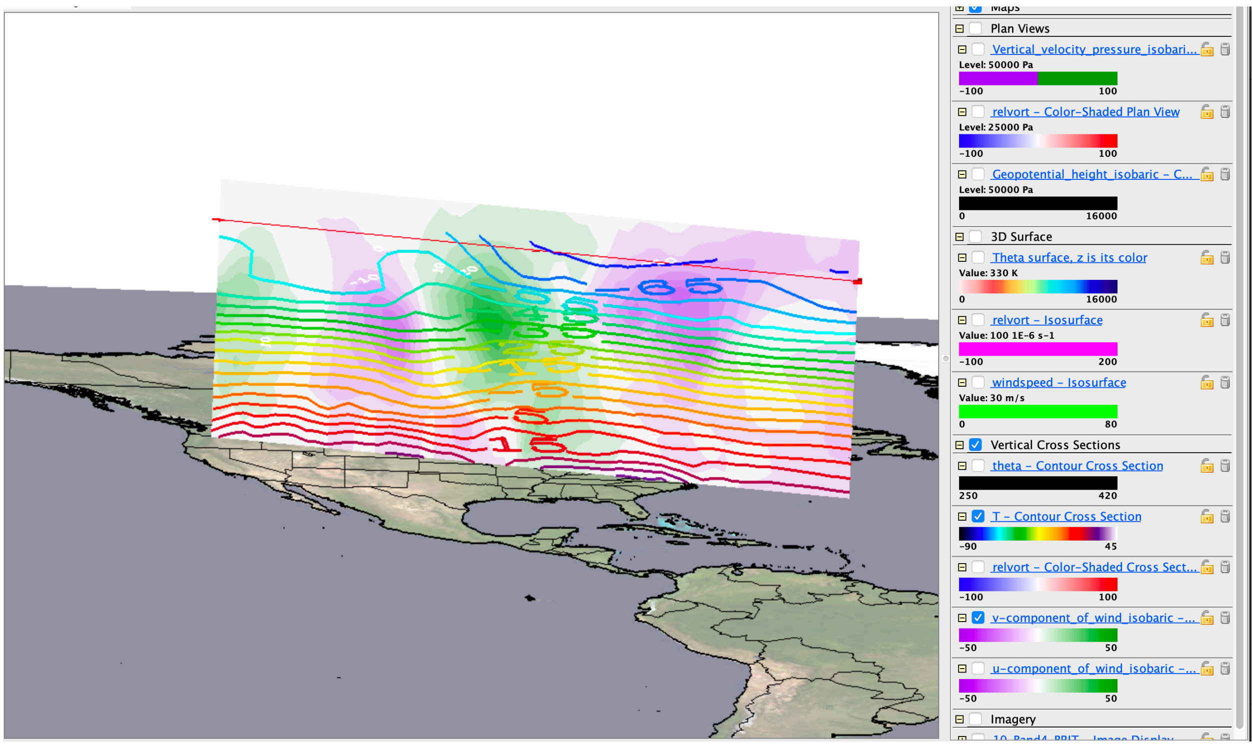


A warm core anticyclone

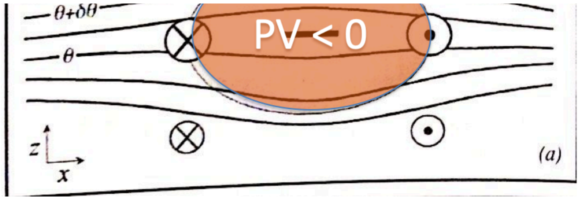


- Where? Describe the situation.

- T-contours show extra warm air along the surface below the gap between green and purple.

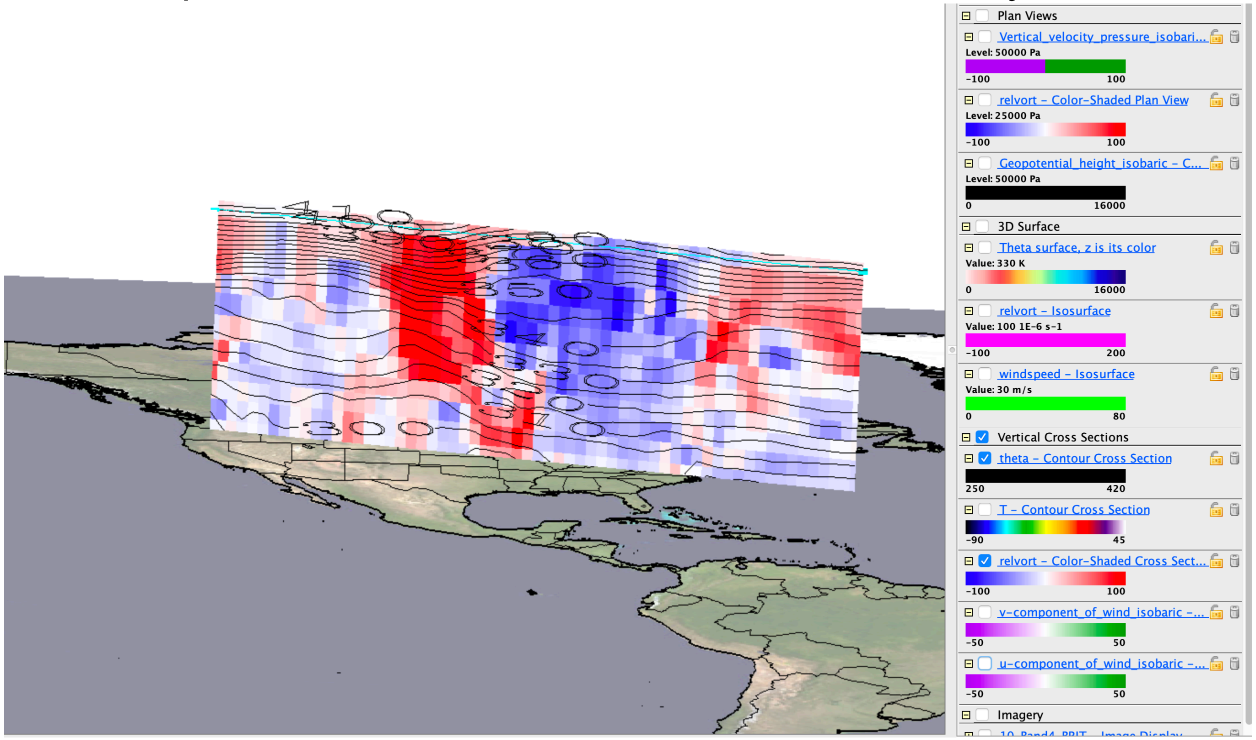


A warm core anticyclone



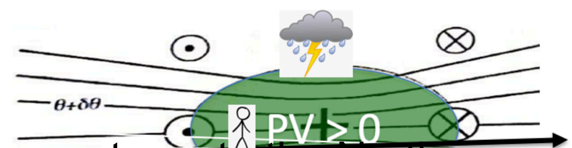
- Where? Describe the situation.

- Depressed theta-contours below the blue anticyclonic mass.

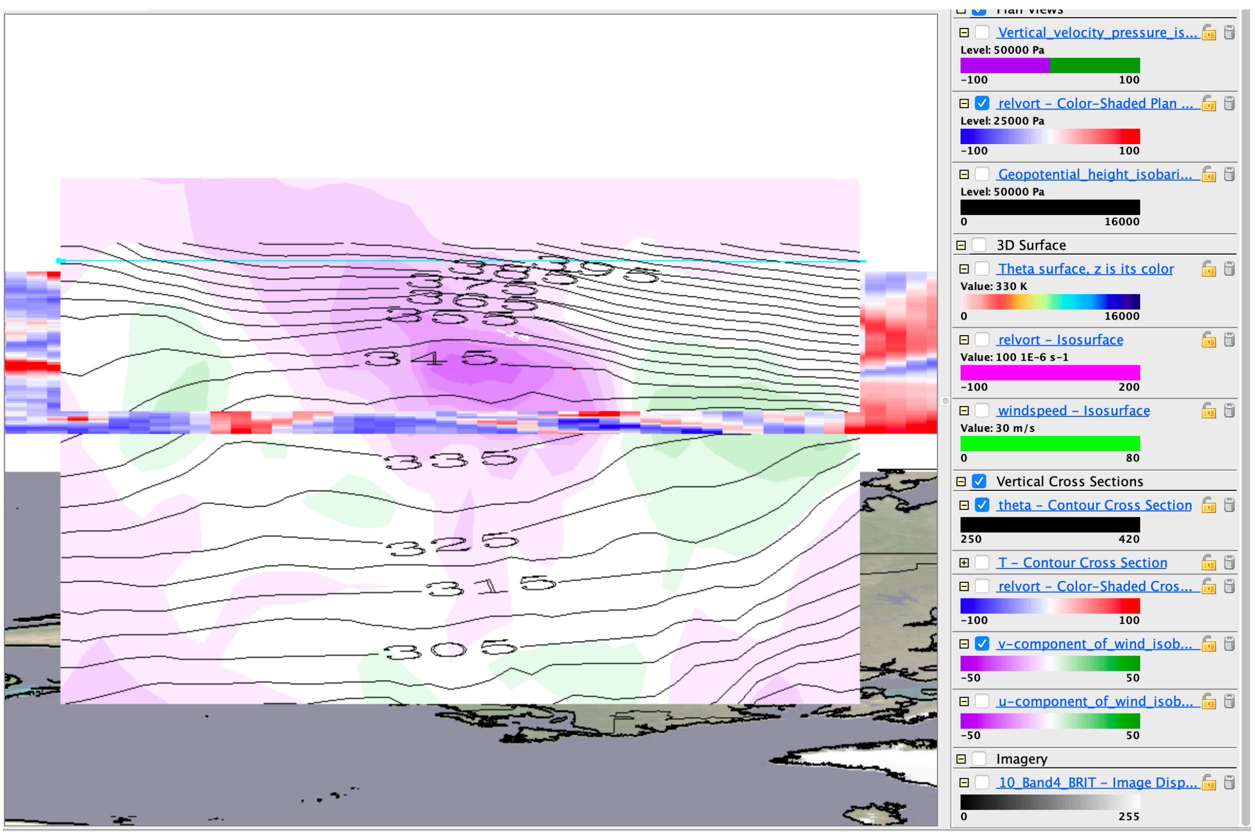


A warm core cyclone

This is called a *warm core cyclone:*

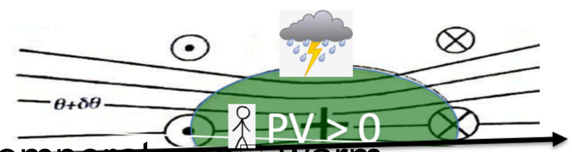


- Where? Describe the situation
- Warmer theta-contours along surface, with cooler surface contours to the North

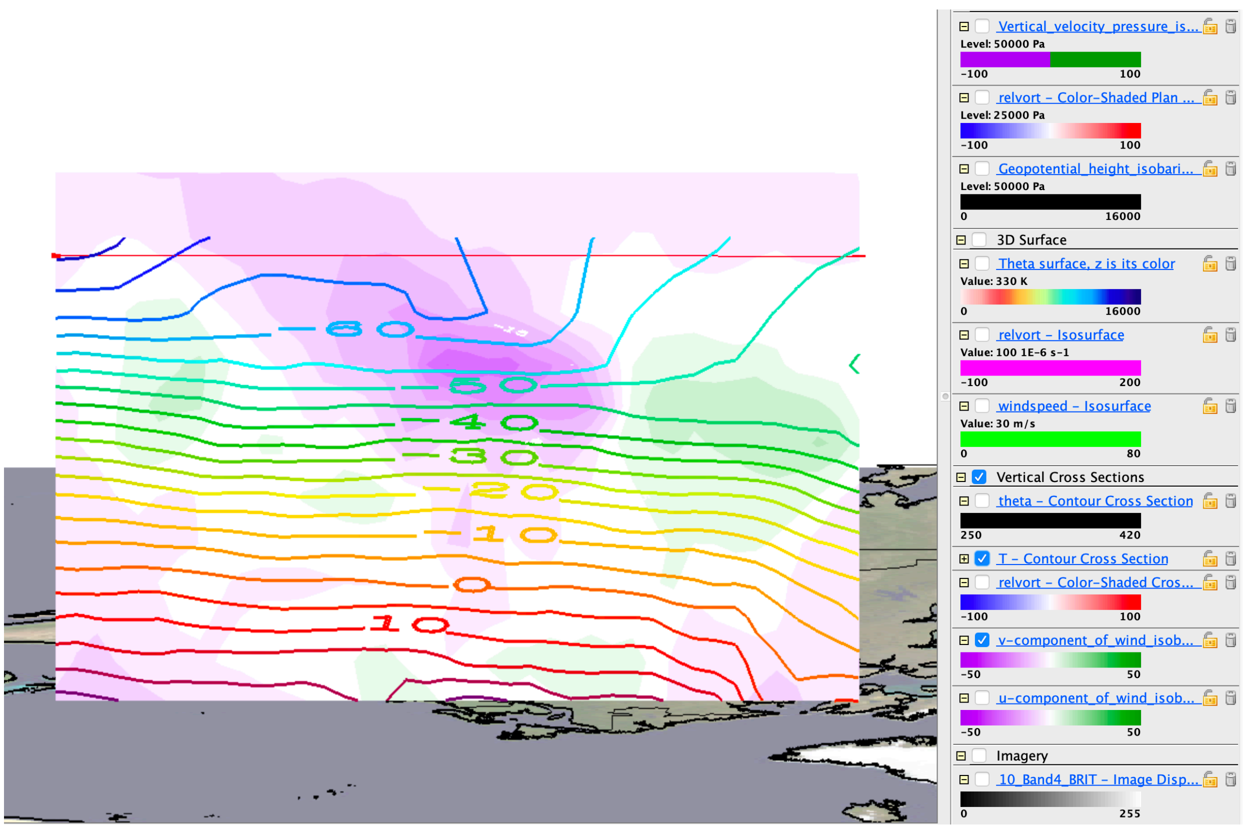


A warm core cyclone

This is called a *warm core cyclone:*

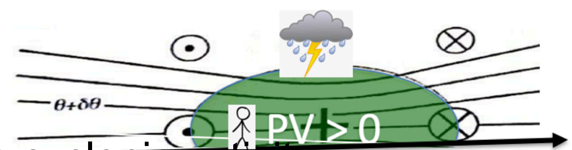


- Where? Describe the situation
- Directly under -v wind velocity mass increased surface temperatures□ warm core

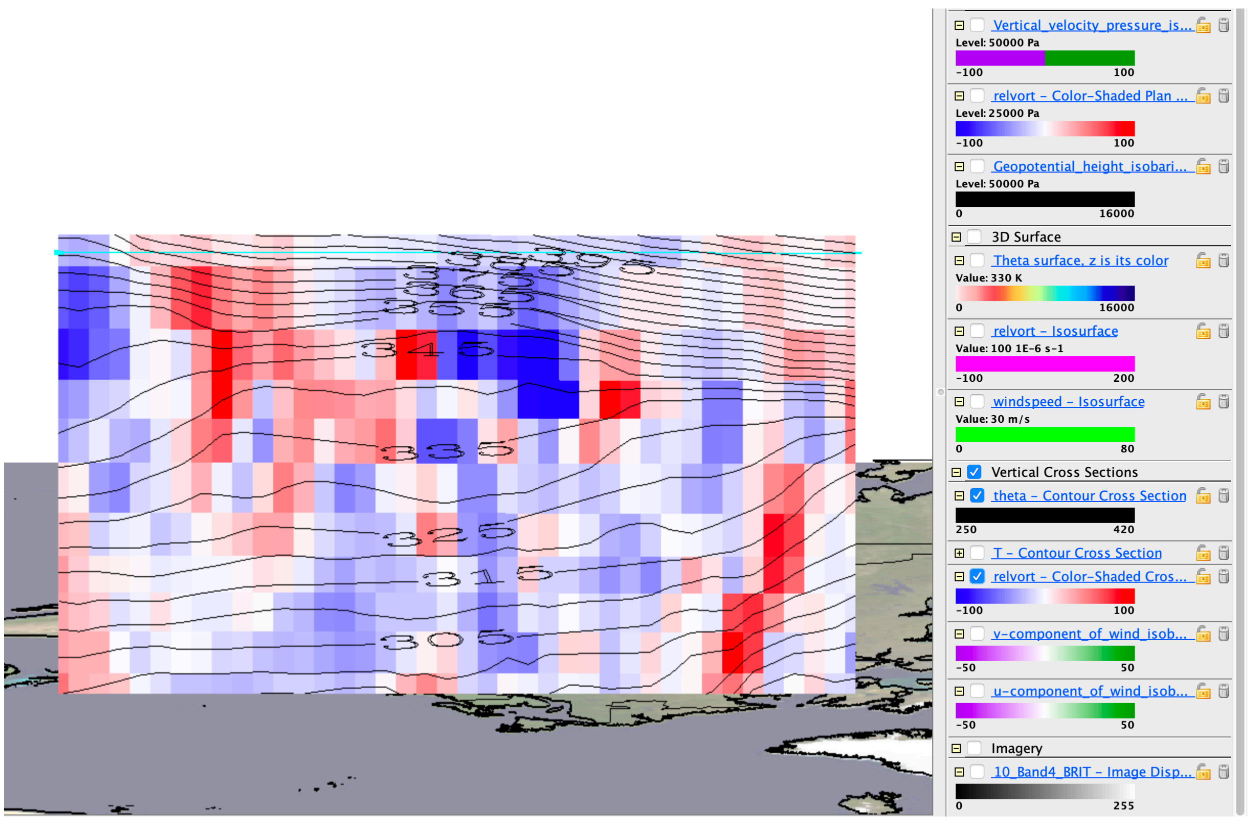


A warm core cyclone

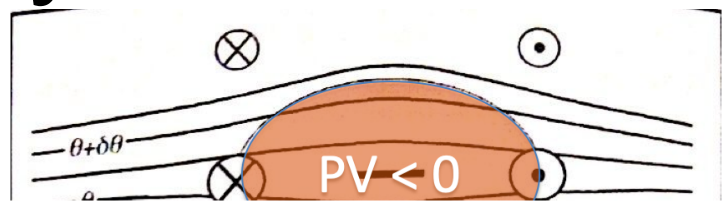
This is called a *warm core cyclone:*



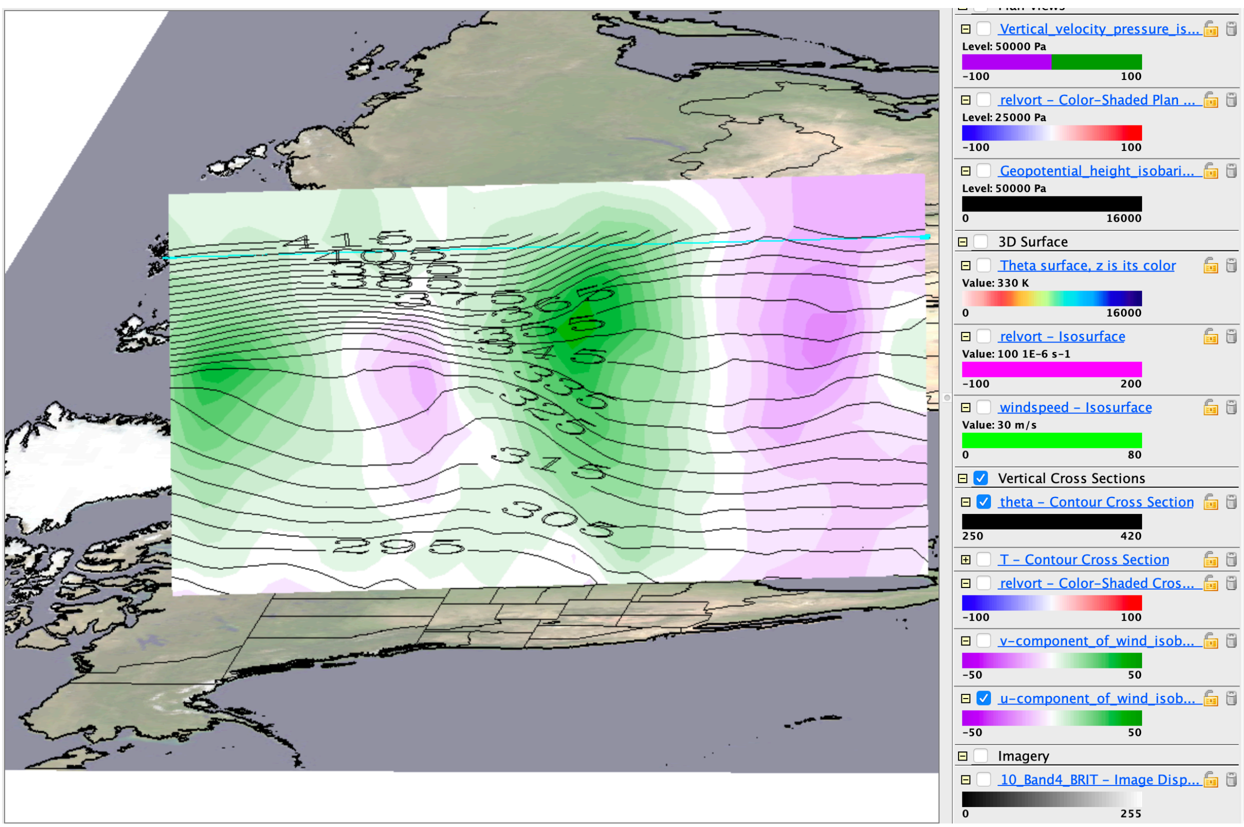
- Where? Describe the situation
- Same patch from increased warming is red which shows cyclonic activity.



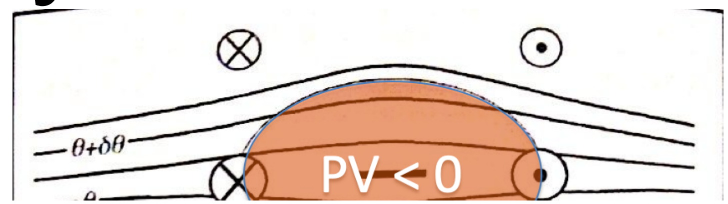
A cool core anticyclone



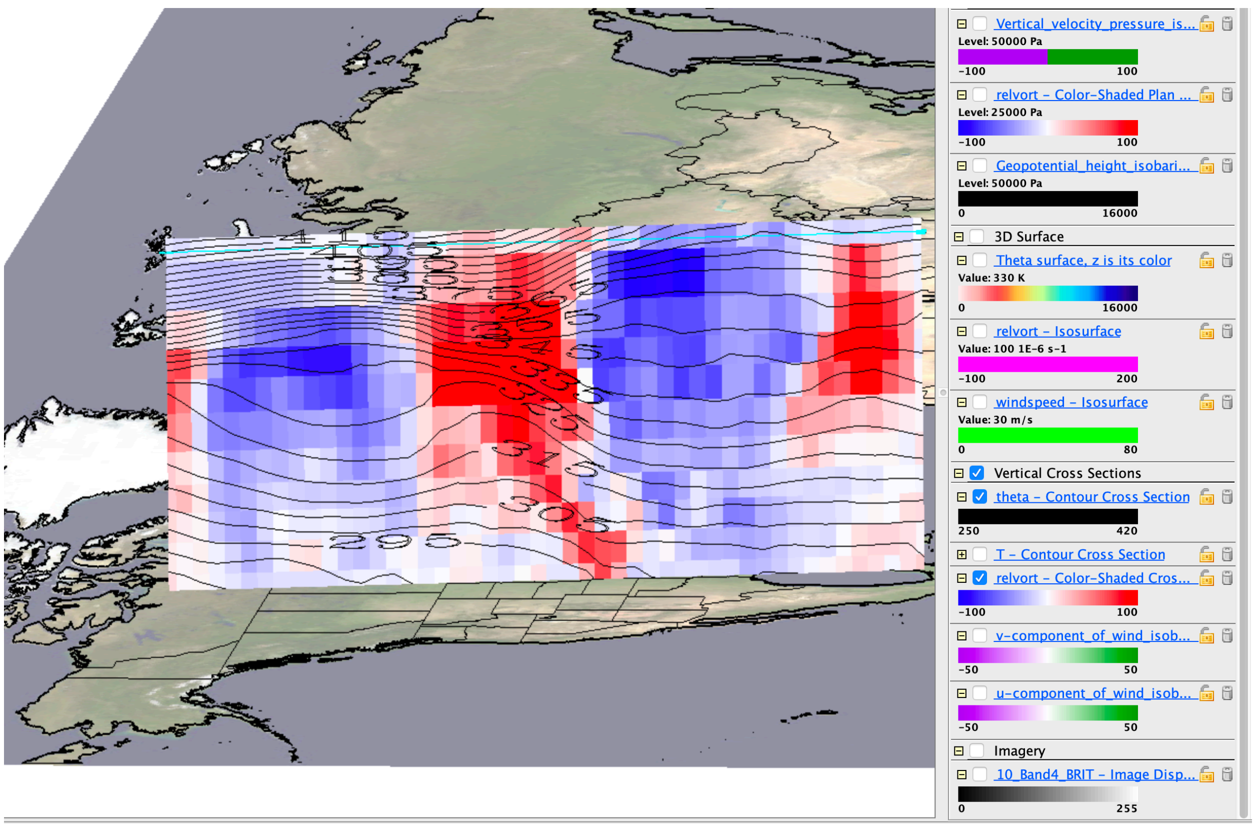
- Where? Describe the situation
- Convergence of theta-contours aloft and colder contours along the surface.



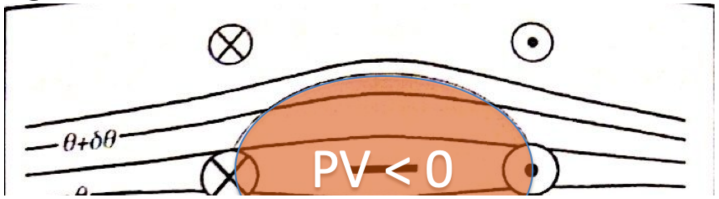
A cool core anticyclone



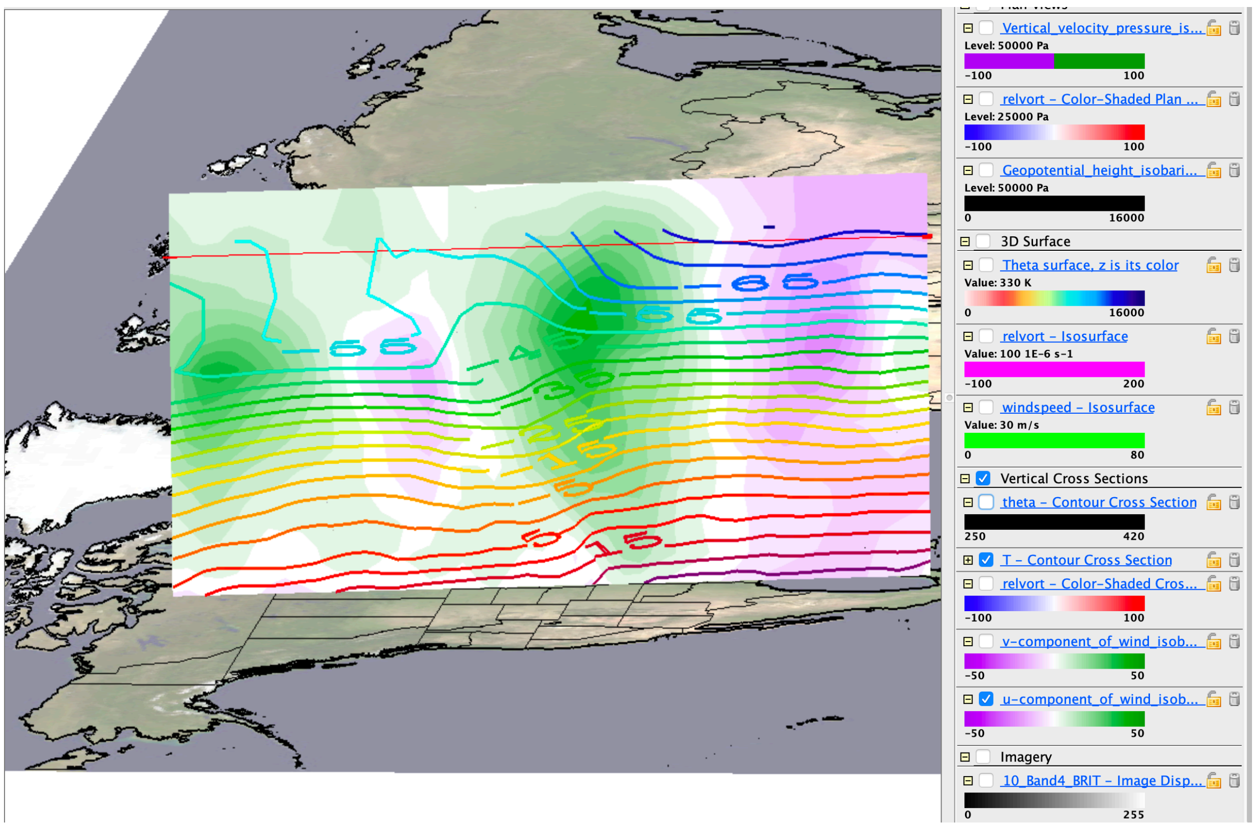
- Where? Describe the situation
- Raised theta-contours near blue anticyclonic mass.



A cool core anticyclone



- Where? Describe the situation
- Depressed Temp-contours with warmer surface temperatures to the South

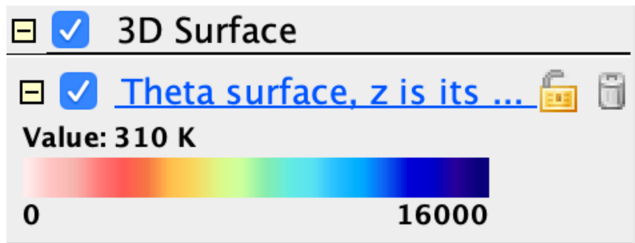


Isentropic surfaces

- Isentrope contours on the cross sections above are *slices of isentropic surfaces*
  - surfaces of constant entropy
    - or potential temperature, or dry static energy $C_pT + gz$
- Let's learn to see isentropic surfaces
- They are almost like *material surfaces*
  - because $D\theta/Dt = 0$ for adiabatic flow
    - *(plus nonadiabatic or "diabatic" complications)*
- Their vertical motion is air vertical motion!
  - the holy grail, for clouds+rain (weather)

IDV Lab assignment part 2

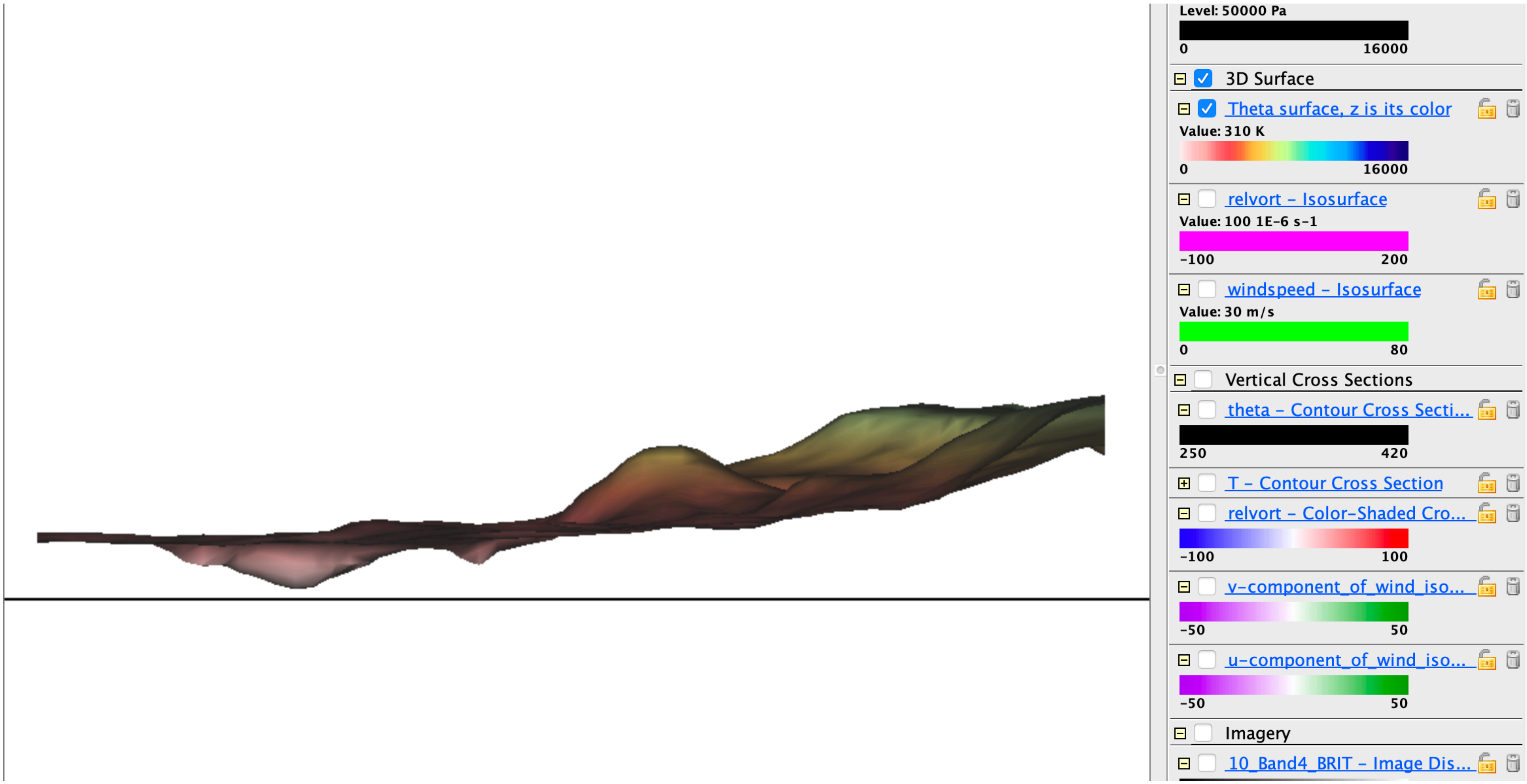
- In the same bundle, activate (check) the display called “Theta surface, z is its color”



- Adjust the value (310K, 330K, 360K)
- Use vorticity isosurfaces and cross sections in an illustrated description of its topography.
  - Is there a mean north-south slope? hint: 
  - What vorticity features (Part I) explain dimples?
  - What vorticity features (Part I) explain peaks?

Mean slope of the 310K isosurface

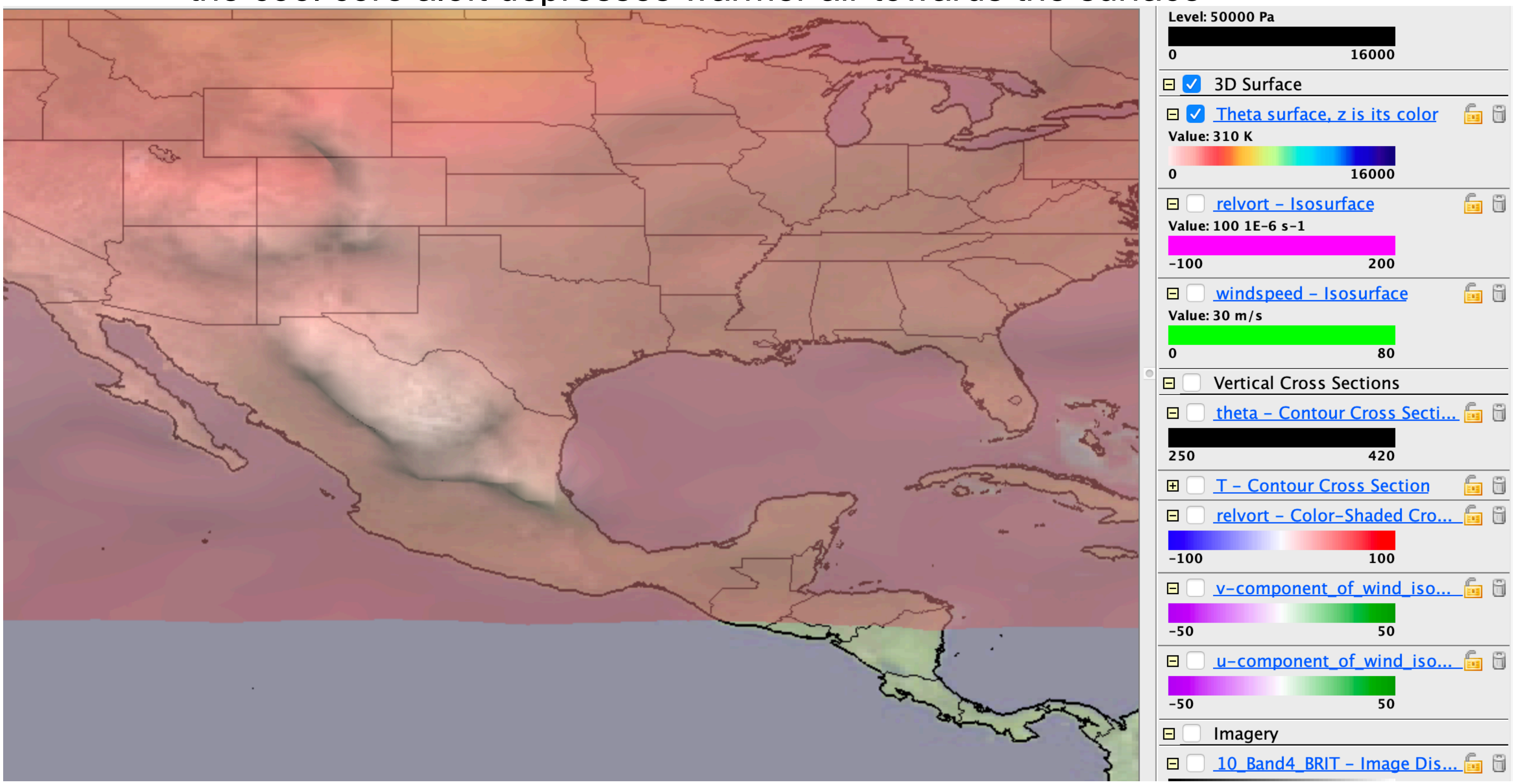
- Positive slope moving Northward



A depression in the 310K surface

Where? Describe the situation

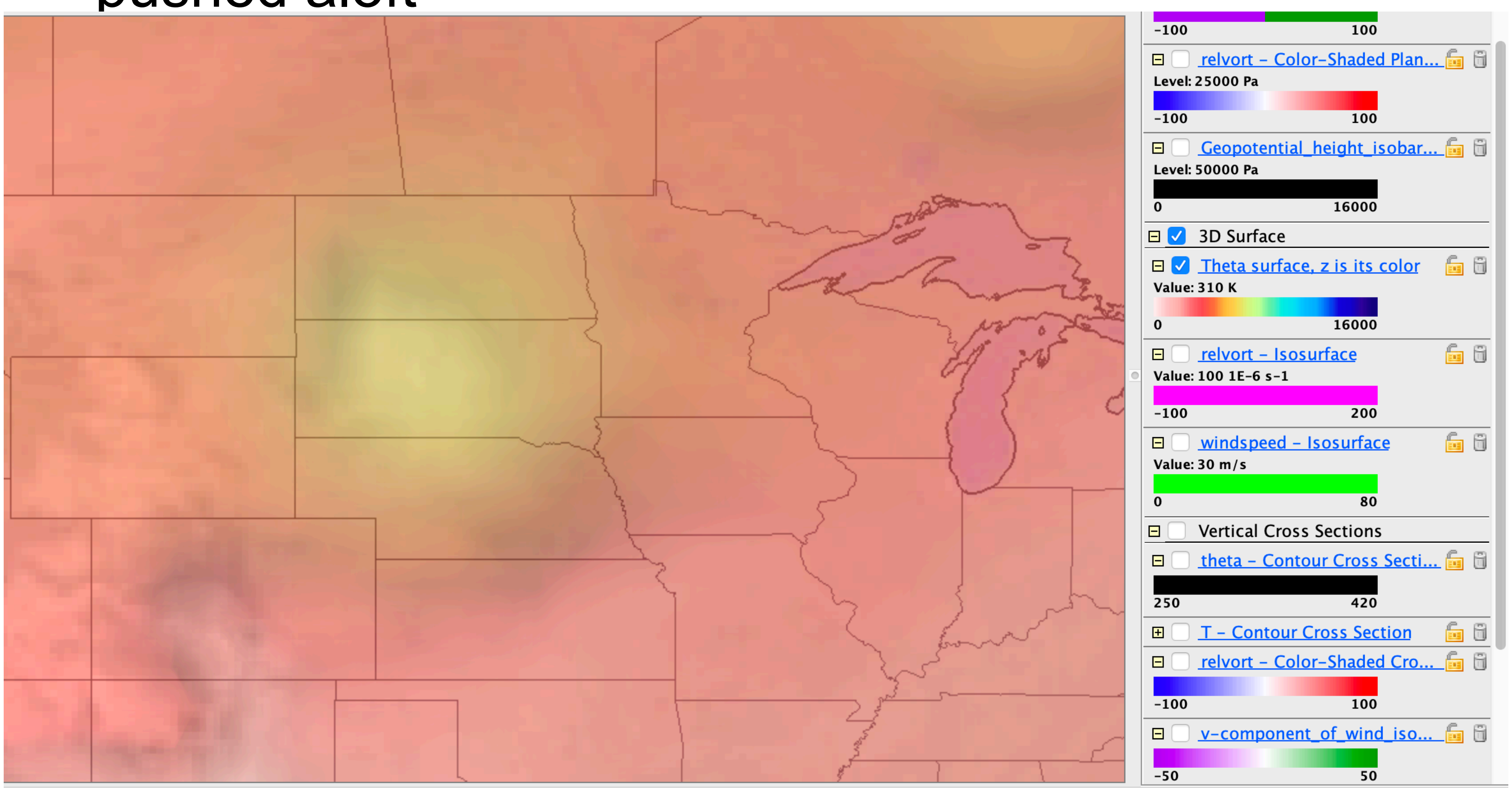
- This would be possible with a cool core cyclone or anticyclone where the cool core aloft depresses warmer air towards the surface



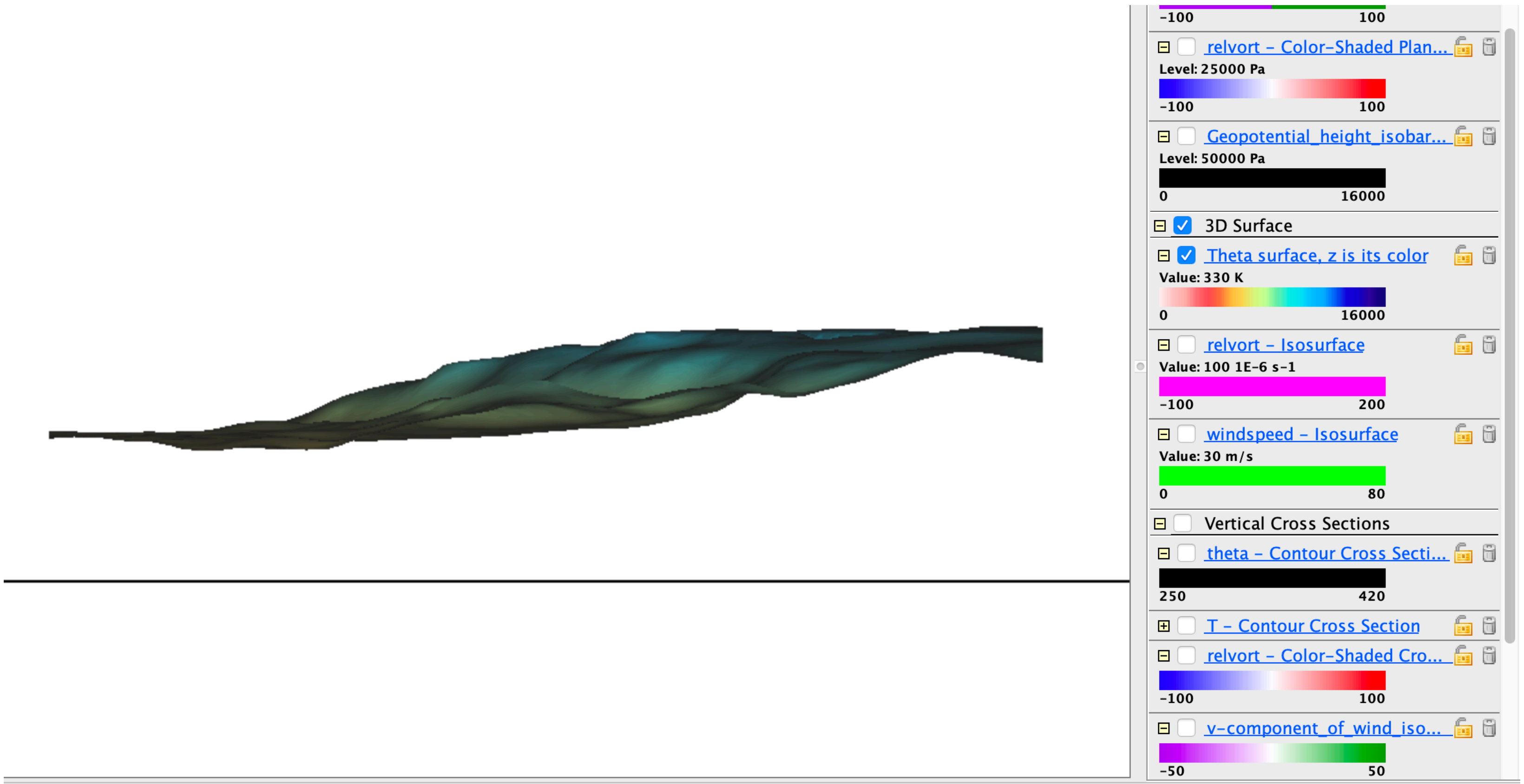
A peak on the 310K isosurface

Where? Describe the situation

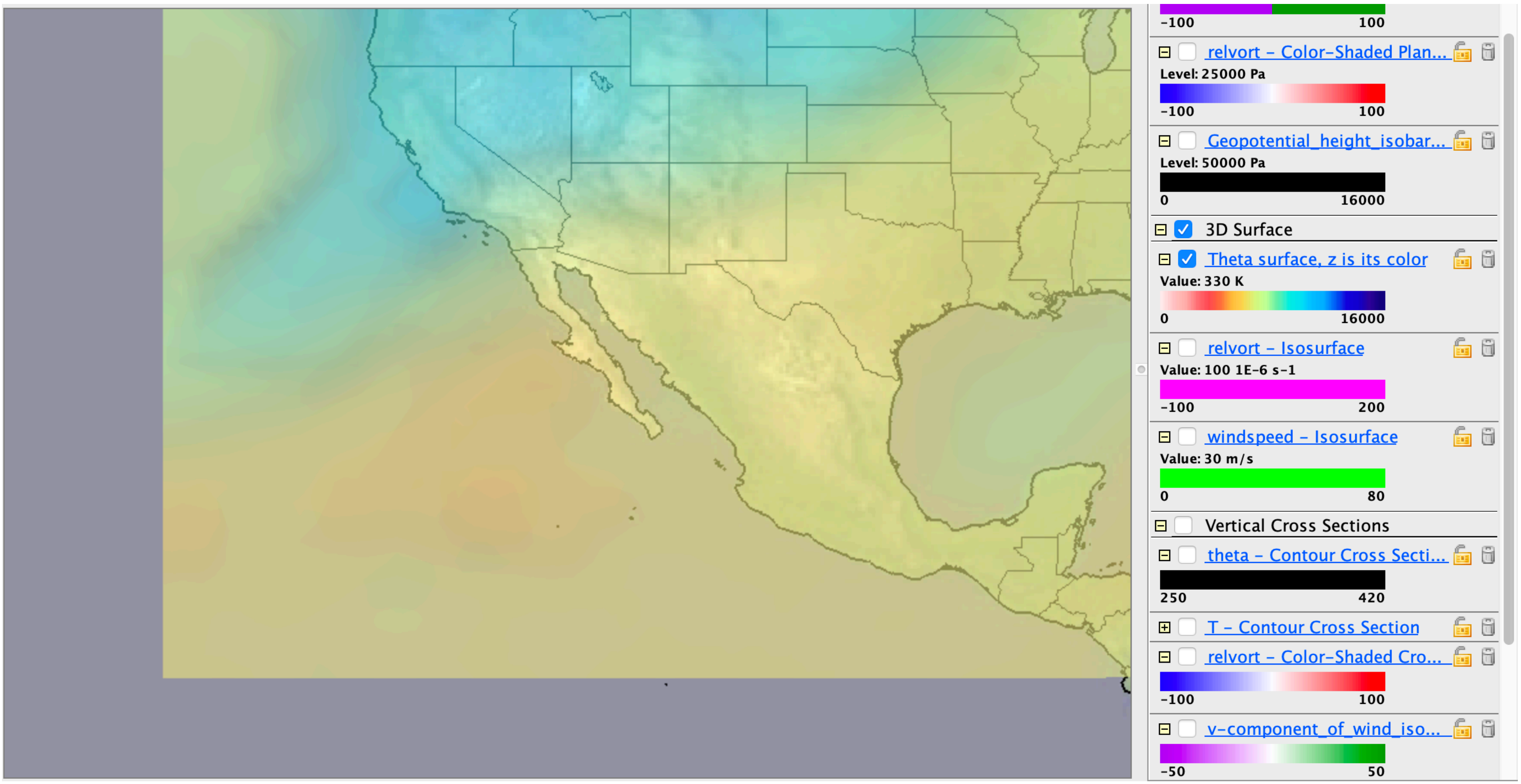
- This is possible with a warm core cyclone where the the cooler air is at the surface and warmer air is pushed aloft



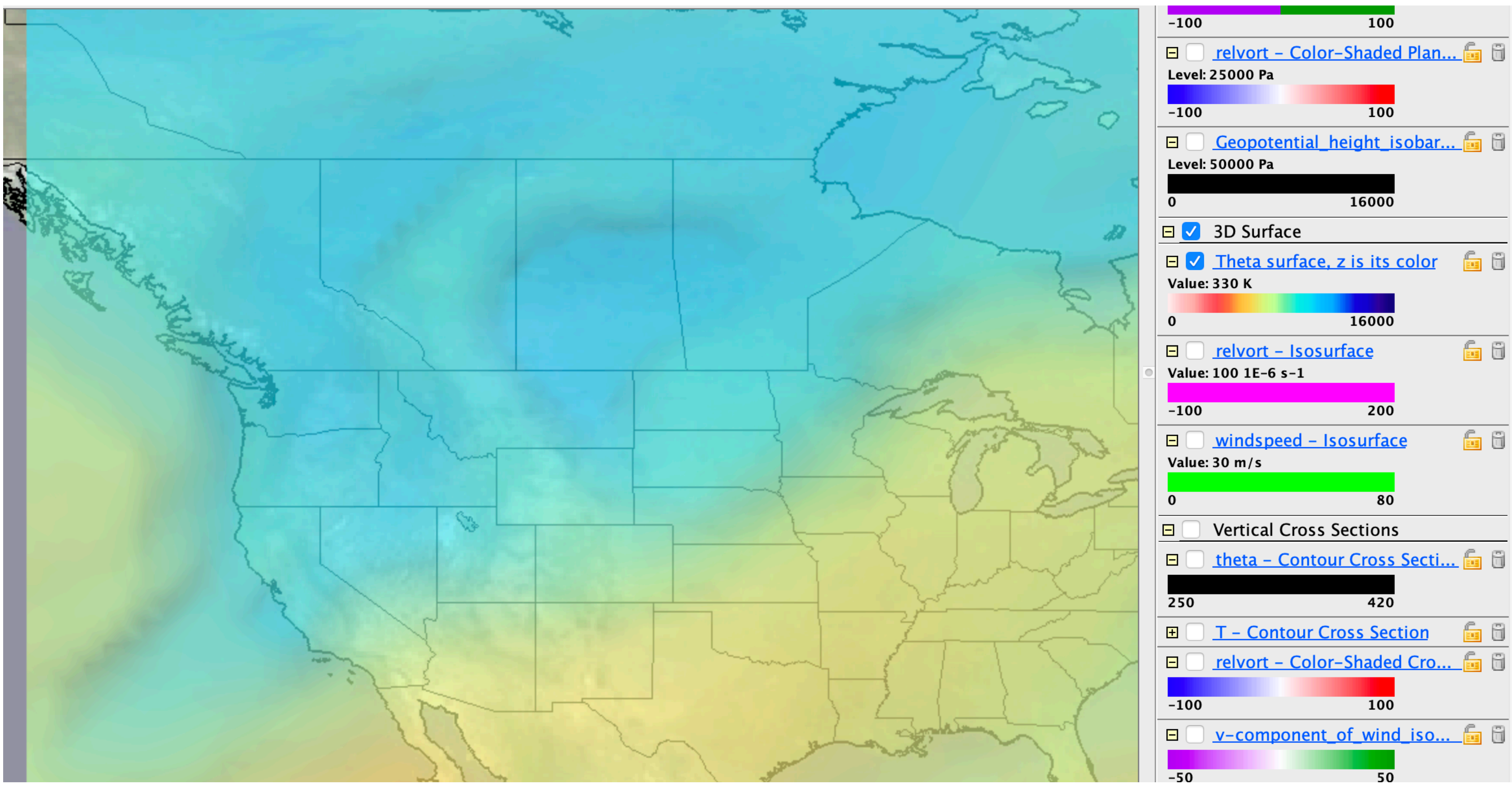
Mean slope of the 330K isosurface



A depression in the 330K surface

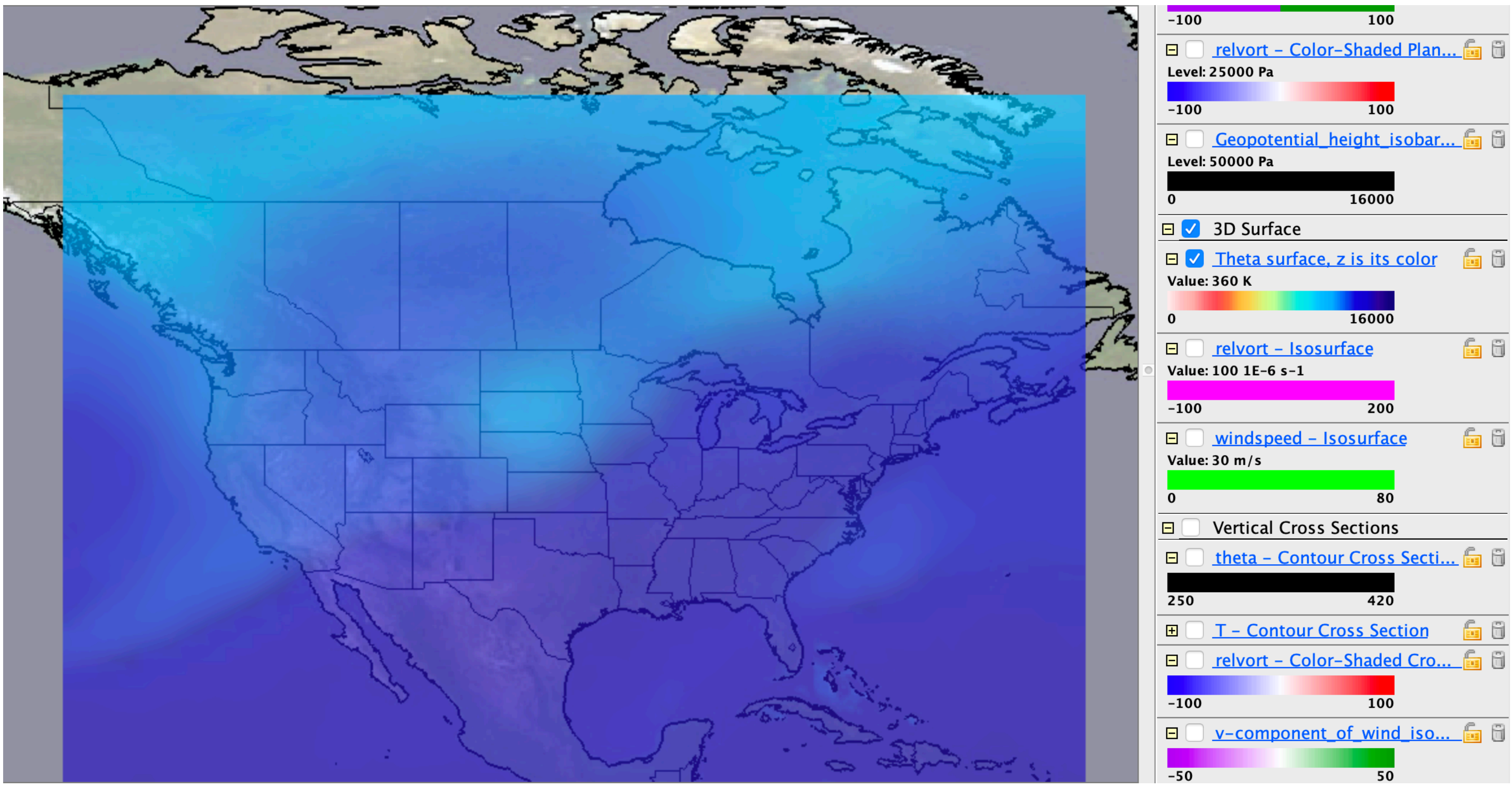


A peak on the 330K isosurface

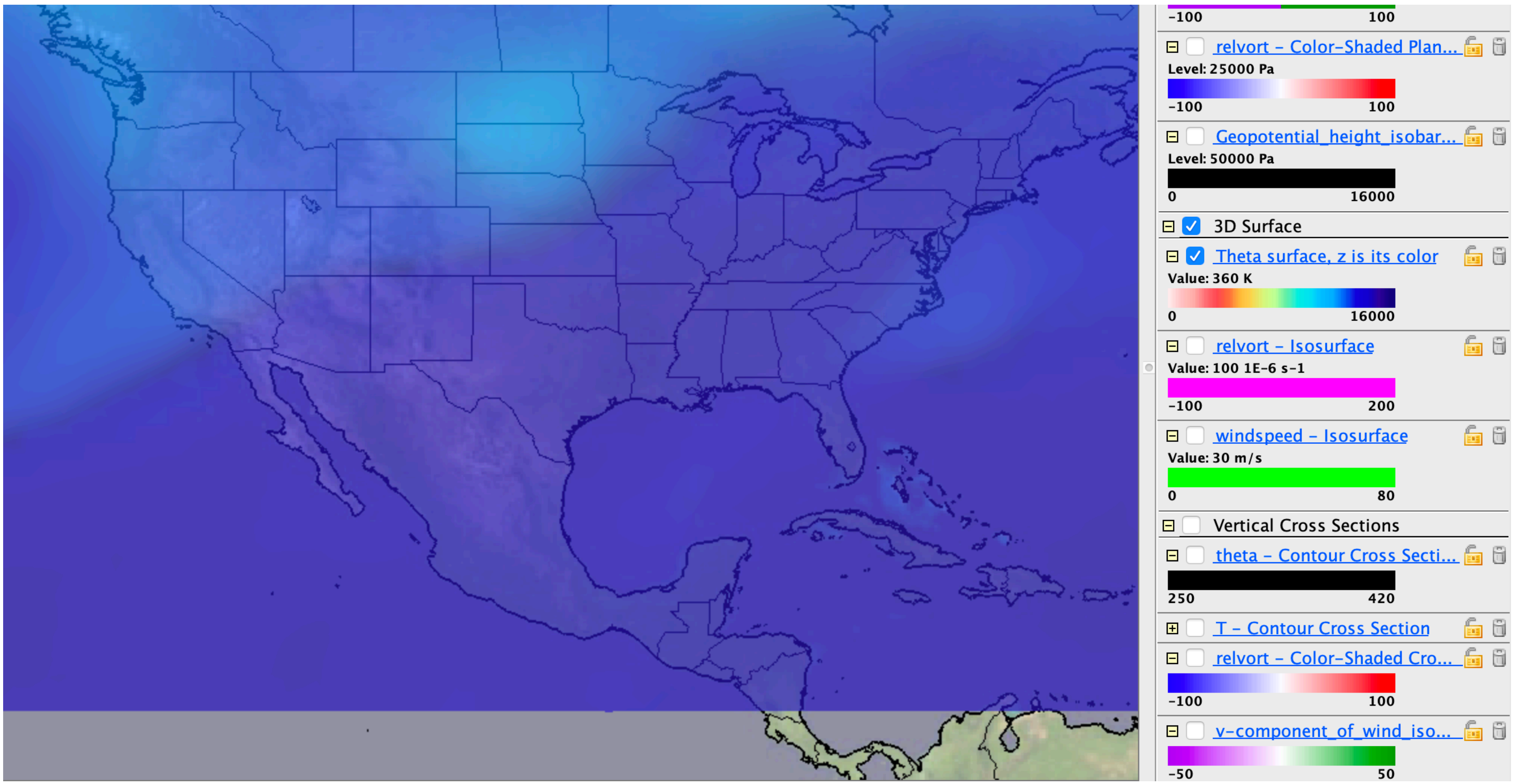


Mean slope of the 360K isosurface

A depression in the 360K surface



A peak on the 360K isosurface



Use the Print facility of Powerpoint

- to put a PDF of this into your class Github repository

- so we can look them over in class