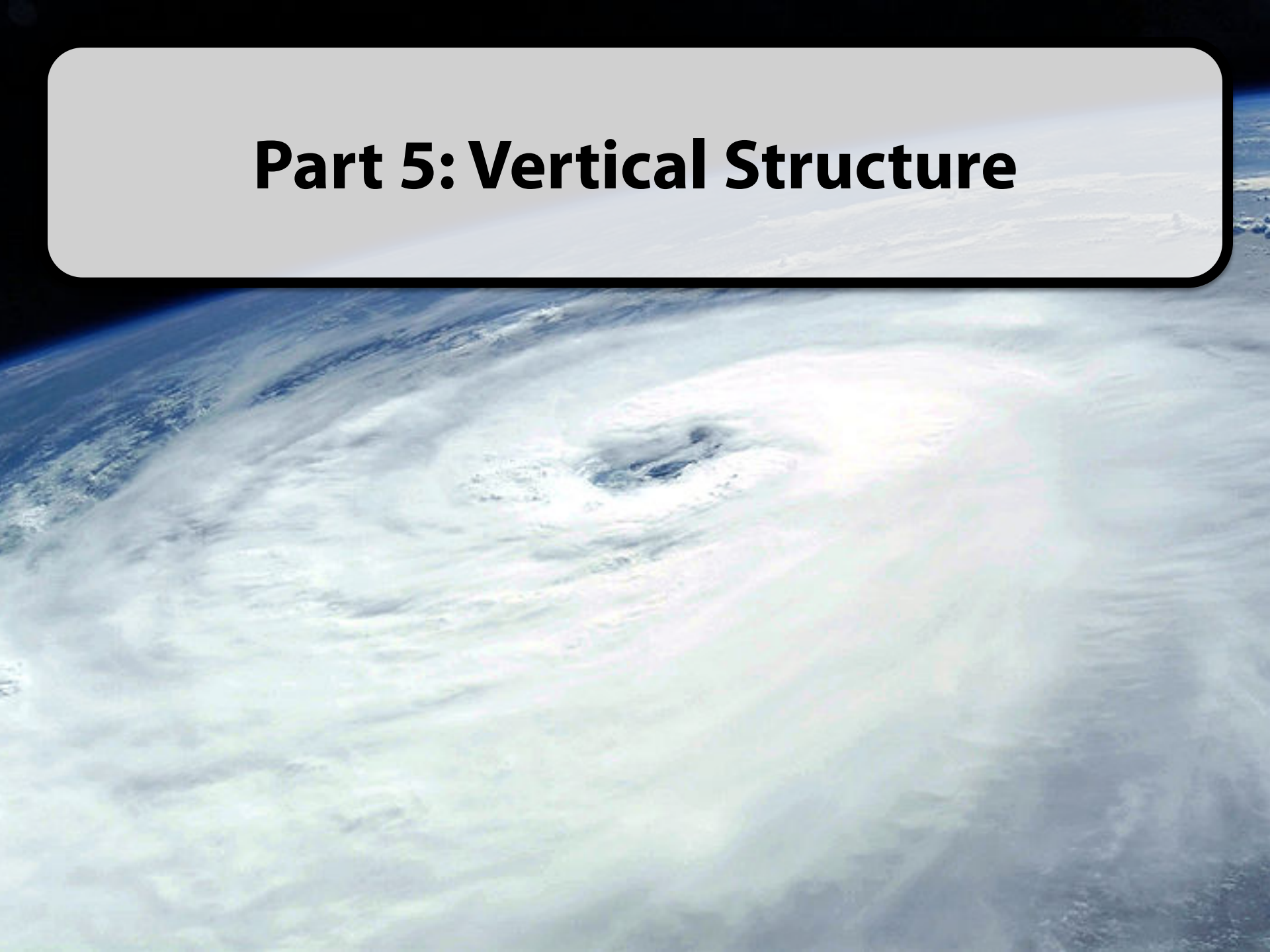
The background of the slide is a vibrant space scene. On the left, a large, dark, textured portion of a planet, likely Earth, is visible. The rest of the background is a deep blue space filled with numerous small white stars and larger, bright blue nebulae or star clusters. The overall lighting is a mix of dark blues and bright, glowing cyan and white light sources.

A Rotational View of the Atmosphere

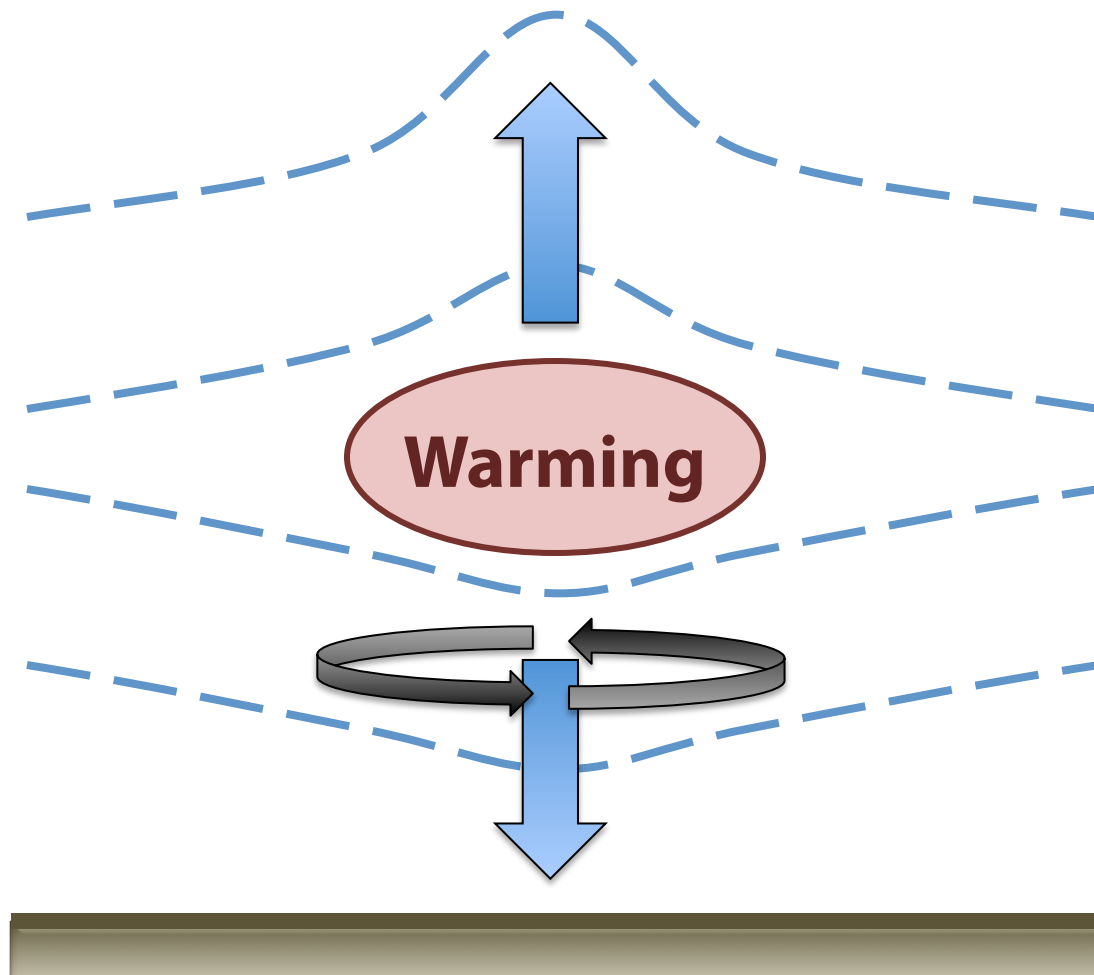
Chapter 4

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Part 5: Vertical Structure



Effect of Warming on Potential Vorticity



Warming
increases
thickness

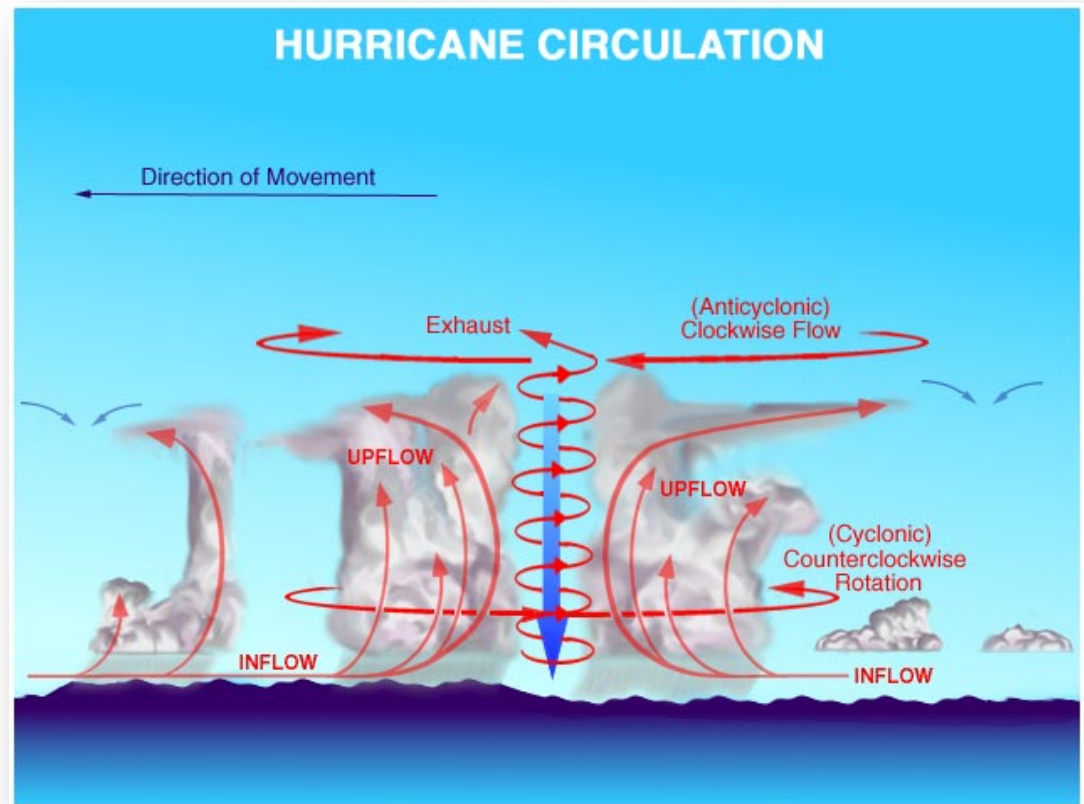
Changes depth
of vortex

Earth's surface

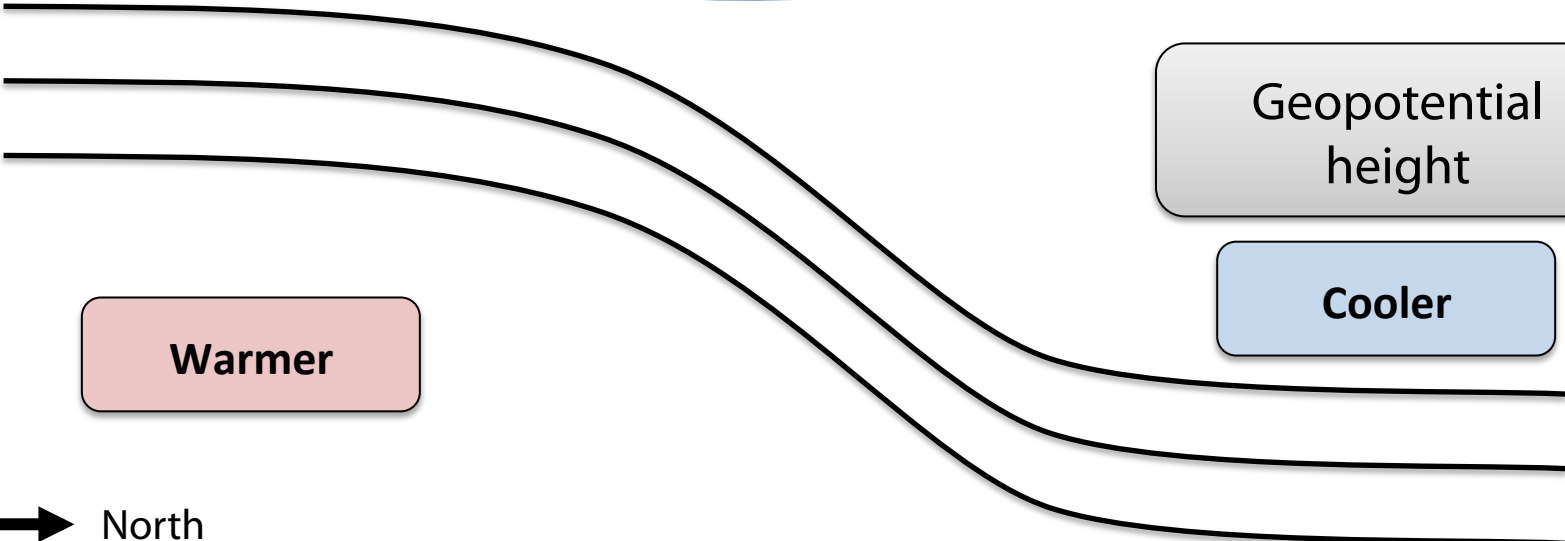
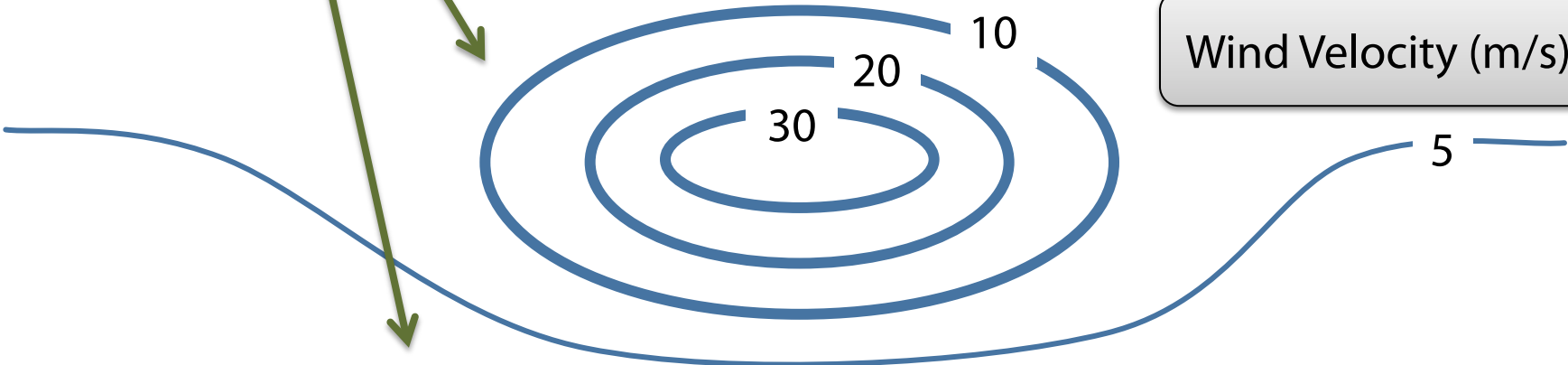
Tropical Cyclones

The release of latent heat of condensation causes intense buoyancy in the eye wall and provides vertical stretching of the vortex tube.

Tropical cyclones still need pre-existing vorticity to start spinning.

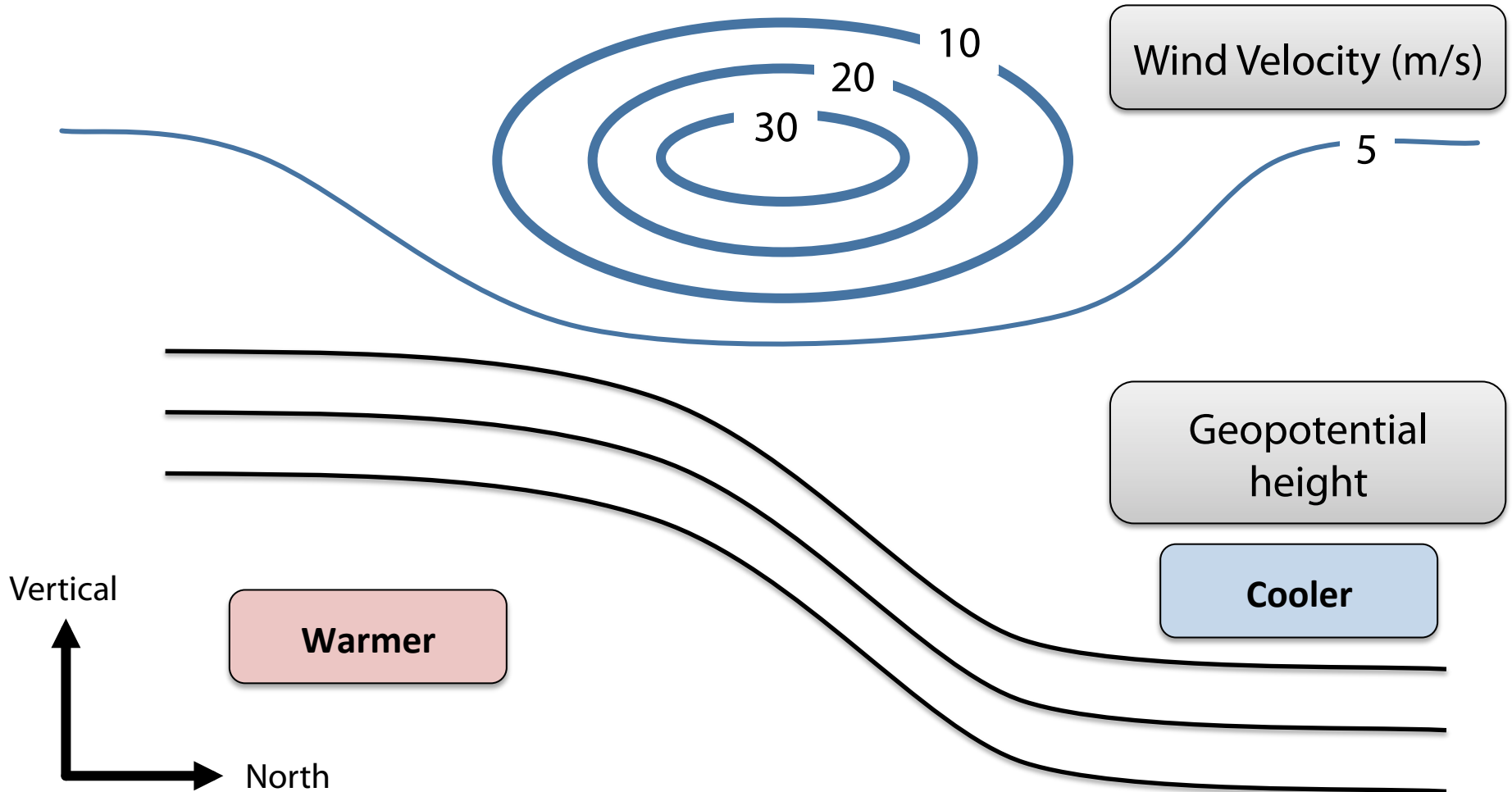


Connected via thermal wind relationship

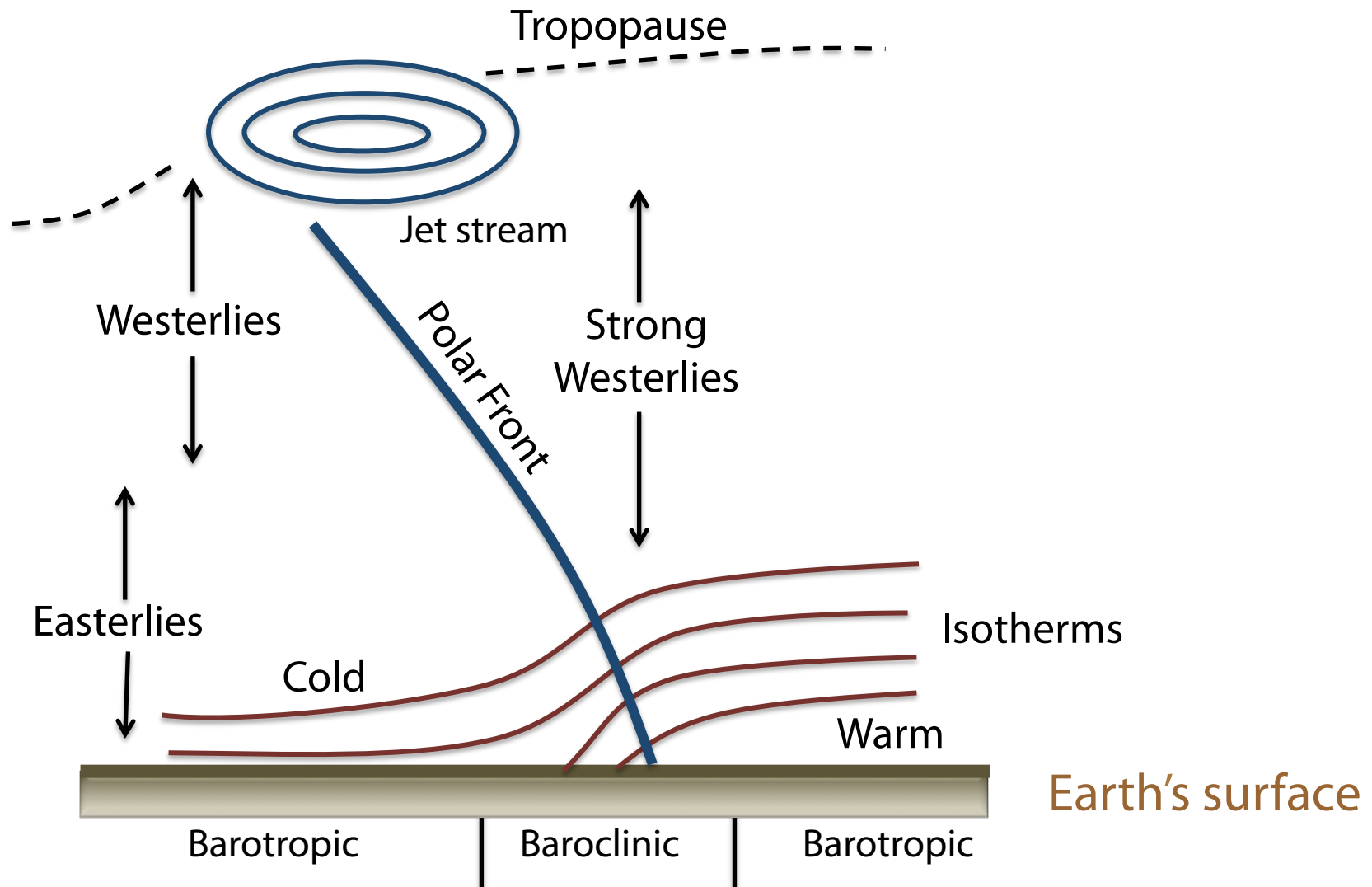


Vertical ↑
North →

Question: Where is the flow more barotropic? Baroclinic?



Idealized Midlatitudes



Concepts

In the mid-latitude atmosphere, these four features are commonly found together:

- The jet stream
- Upper level positive vorticity
- Warm and cold fronts
- Midlatitude cyclones (low pressure systems)

Question: Why might it be the case that these features are coincident?