Midlatitude Cyclones mix different air masses.

The Wave Cyclone Model
(Norwegian model)

- Stationary Front
- Nascent Stage
- Mature Stage
- Partially Occluded Stage
- Occluded Stage
- Dissipated Stage
Cyclone Development begins with a stationary front.

Nascent stage of Cyclone Development.

Birth and adolescence.

Mature stage of Cyclone Development.

Adulthood.
Mature Wave Cyclone

The Partially Occluded Stage begins when the cold front starts to overrun the warm front.

Middle age

Partially occluded wave cyclone

- Cold-occluded front
  - Approach brings weather sequence like a warm front
  - Frontal passage brings weather more like a cold front

- Warm-occluded fronts also possible
The Occluded Stage is characterized by more warm air being pushed aloft and the size of the warm air wedge at the surface decreases significantly.

Over the Hill

The final decay stage of the cyclone. The warm air is isolated aloft with cold air beneath.

Death

What maintains the surface low?
Imagine a surface low forming below an upper level low.
Actual vertical structure:
Upper level low is tilted westward with height with respect to the surface.

UPPER LEVEL DIVERGENCE INITIATES AND MAINTAINS A SURFACE LOW.

A look at the large scale:
Where is upper level divergence most likely to occur?

Cyclone development:
Strong north south gradient=passage of a shortwave trough
Can lead to rapid cyclogenesis via baroclinic instability