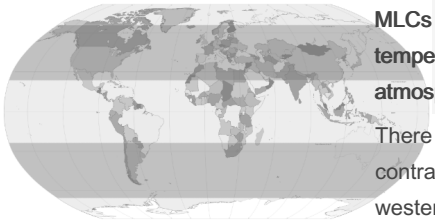
Mid-latitude Cyclones Cheat Sheet

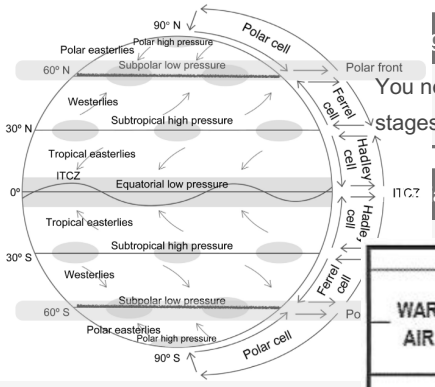
by May100 via cheatography.com/195176/cs/41053/

What are they?



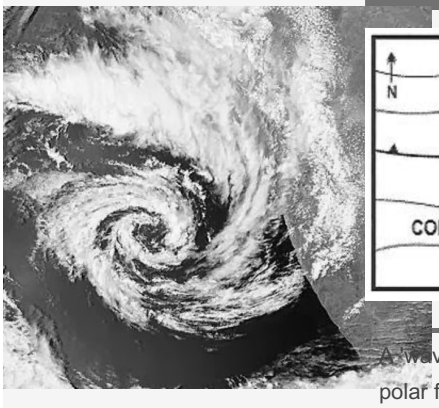
Mid-latitude: 30° to 60° degrees N or S of the equator.
Cyclones: A low-pressure system
They are also called extra-tropical cyclones or frontal depressions

Where to they develop?



Mid-latitude cyclones develop at the polar front, usually over the sea.
The polar front is where the cold polar easterlies meet the warmer westerlies of the subtropics.

Characteristics



- They consist of a pair of fronts (cold/warm) linked to a central

What conditions are necessary for MLC to form?

MLCs are powered by large temperature differences in the atmosphere

There *must* be a large temp contrast between the subtropical westerly and polar easterly air masses - so the polar front develops.

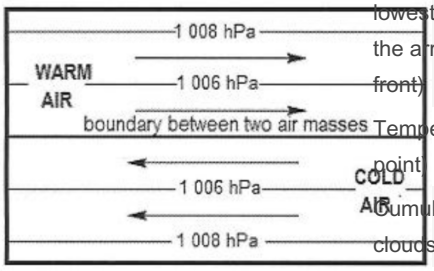
There *must* be disturbances in the jet stream that make the cold air push into the warm air

--> This causes the warm air mass to rise up and over the cold mass and creates a **low-pressure** cell into which the wind spirals

genesis

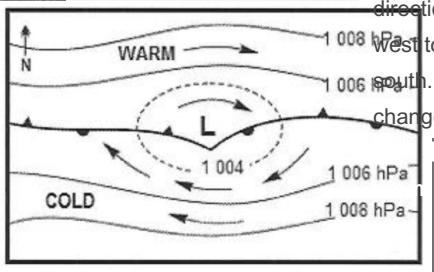
You need to know the four stages

al Stage



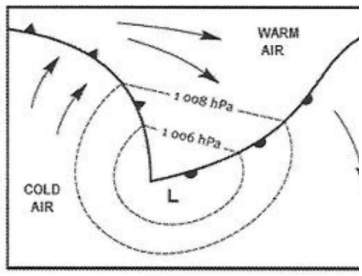
A stationary polar front forms. Wind shears in opposite directions along the front.

2. Development Stage



A 'wave' or a kink forms in the polar front as warm due to a disturbance/friction. Warm air is forced to lift up over cold air. Air

3. Mature Stage



The cold front bends, and a cold and form show develop.
The *cold front* leads the *cold sector* of air which pushes in the direction of the equator.
The *warm front* leads the *warm sector* of air which pushes in the direction of the pole.

Low pressure continues to intensify at the apex of the fronts.

Cold Front Conditions

The air pressure drops to its lowest, and then increases with the arrival of cold dense air (cold front)

Temperature and humidity (dew point) decrease

Cumulus and cumulonimbus clouds form

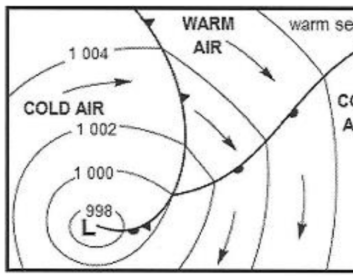
Heavy rainfall (occasionally snow) at the front

Surface wind direction backs (changes) and wind speeds increase

In the Western Cape, the wind direction changes from north-west to west to south-west to south. This is an anti-clockwise change.

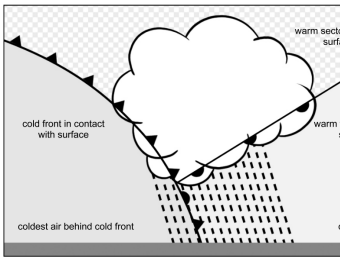
front conditions

4. Occlusion Stage



An occluded front is a combination of a cold front and a warm front.
A combination of a cold front's tight bands of stormy weather and a warm front wide area of cloudiness.

Cold Front Occlusion



Cold front occlusion

Occurs when the coldest air in the MLC is behind the cold front.
The warm front is uplifted along the cold front.
The warm front and its air mass (the warm sector) lose contact with the ground.
The air is forced to rise, cool and condense (clouds form). Rainfall occurs with conditions similar to a cold front.
*The most common form of occlusion

Warm front occlusion

area of low pressure
- They carry a lot of moisture.
-Their winds spiral clockwise in the Southern Hemisphere
- Very large systems: up to 2000km across
- They travel eastwards (with the westerly winds in the westerly windbelt)
- Travel at 10km/h over areas of ±1200km per day
- Takes ±48 hours for the system to pass
- Occur in families of 3-5, and travel between 2-8 days apart

pressure starts to drop and the warm and cold air masses begin to swirl alound the low pressure

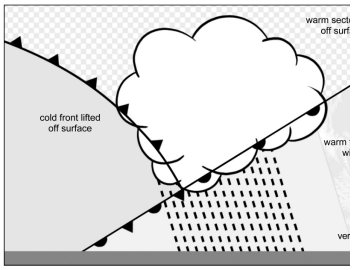
Air pressure drops

Temperature increases and humidity (dew point) increases

Wispy cirrus clouds and stratus clouds form

Gentle rain from nimbostratus clouds

As the front moves on, the weather becomes mild, calm and warm (warm sector)



Warm front occlusion

When the overtaking cold front is lifted by the colder retreating air ahead of the warm front

It occurs when the coldest air is found ahead of the warm front. This causes the cold front to be uplifted along the warm front. The air is forced to rise, it cools, condenses, and clouds form. Rainfall occurs with weather associated with a warm front (temp rise, nimbostratus, continuous/heavy rainfall).