METEOROLOGY

TROWAL and Occluded Fronts

Occluded Fronts

Formation

An occluded front occurs when a fast moving cold front catches up with a slower moving warm front.

Cold Front Occlusion

A cold front occlusion occurs when a cold front is colder than the air ahead of the warm front. When this occurs, the cold air replaces the cool air and forces the warm front aloft into the atmosphere.

Warm Front Occlusion

A warm front occlusion occurs when the air ahead of the warm front is colder than the air of the cold front. When this is the case, the cold front rides up and over the warm front.

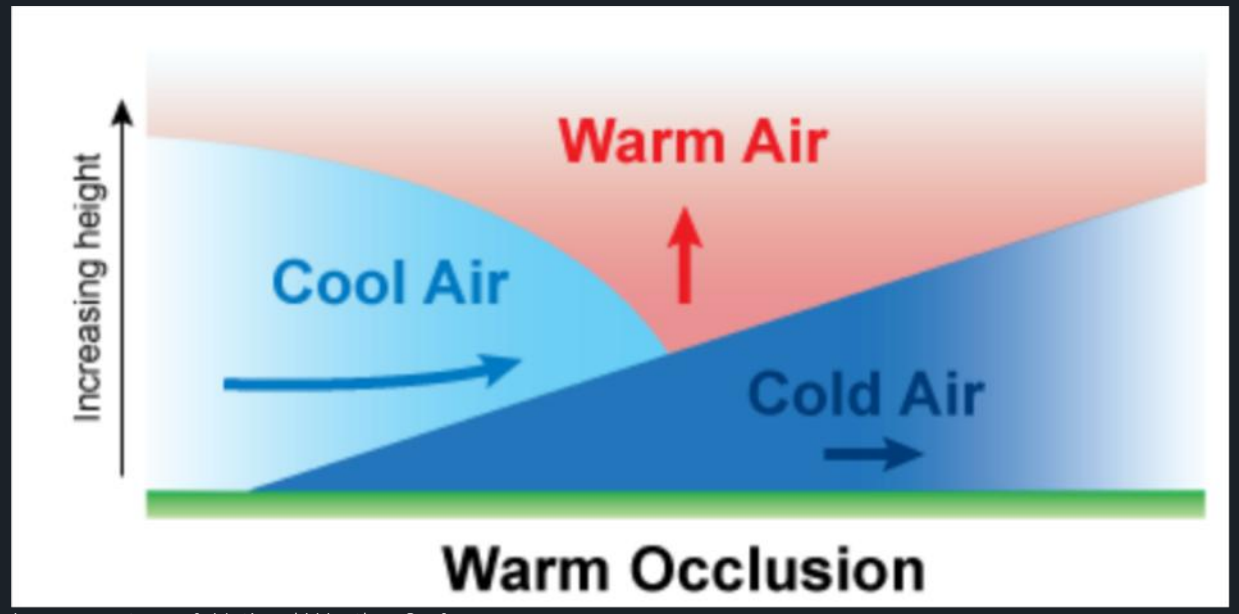

Image courtesy of: National Weather Surface

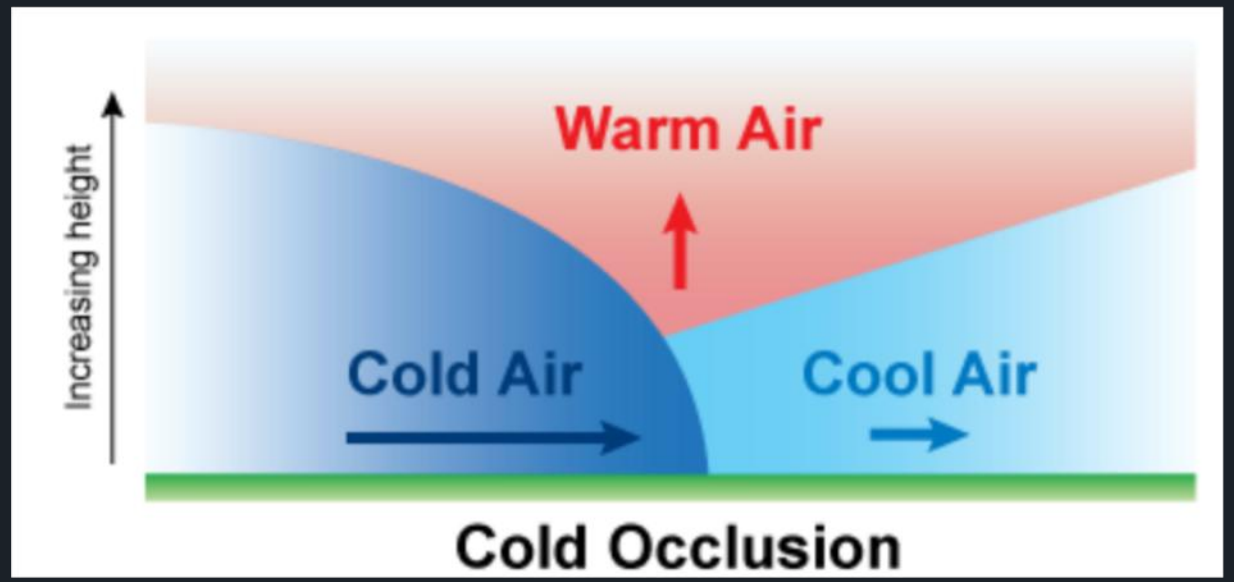

Image courtesy of: National Weather Surface

Trough of Warm Air Aloft

If atmospheric conditions permit, a low pressure area will continue to deepen and as a result, prevailing winds behind a cold will increase, allowing it to converge with a warm front. As the fronts occlude (close together) cold air undercuts warmer air and forces it aloft.

Trough of Warm air Aloft (TROWAL)

A TROWAL is the air forced upwards through the troposphere as a result of an occlusion. In Canada, the TROWAL is depicted on weather charts but in most other countries the occlusion is marked. This is only a matter of convention.

Weather Associated with a Warm Occlusion

If the air forced aloft by the warm front occlusion is unstable, the weather is more severe than the weather found in a cold front occlusion. Embedded thunderstorms, rain, and fog are likely to occur.

Weather Associated with a Cold Occlusion

Typically, the cold front occlusion creates a mixture of weather found in both warm and cold fronts, provided the air is relatively stable.