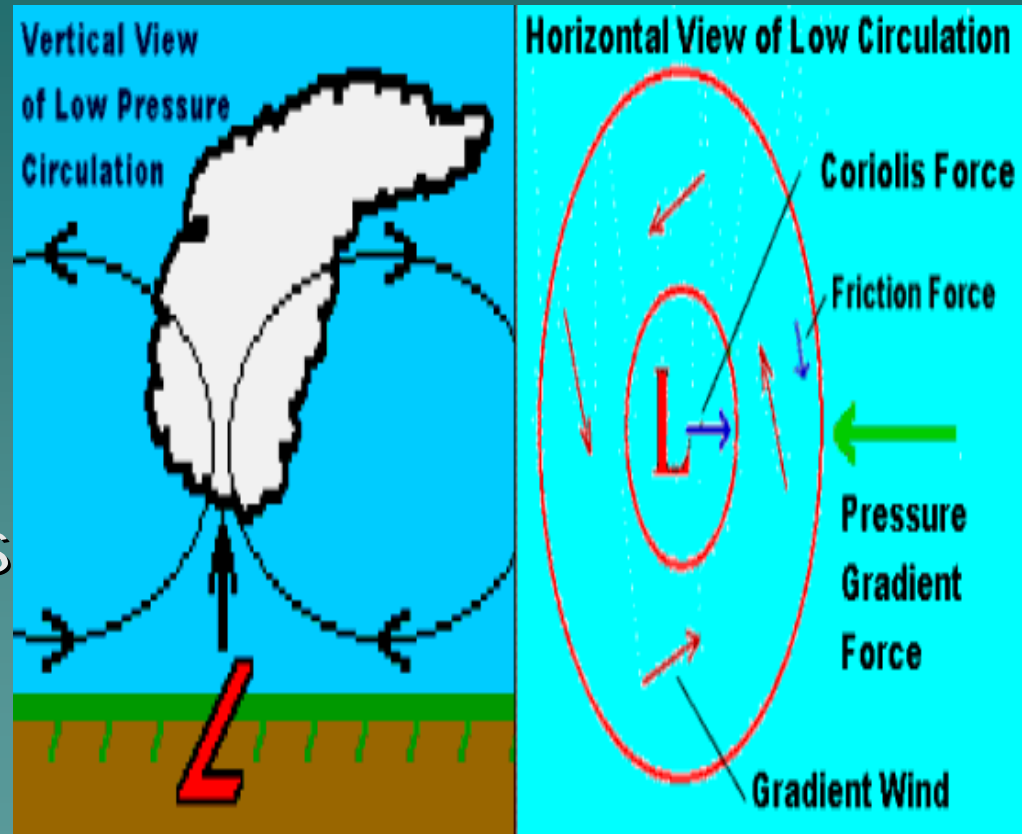


# Depression

2/M John R. Jaromahum

# Depressions

- ◆ or 'lows' play an important part in the weather
- ◆ tending to bring rain and strong winds. Depressions follow a life cycle of about 2-5 days.



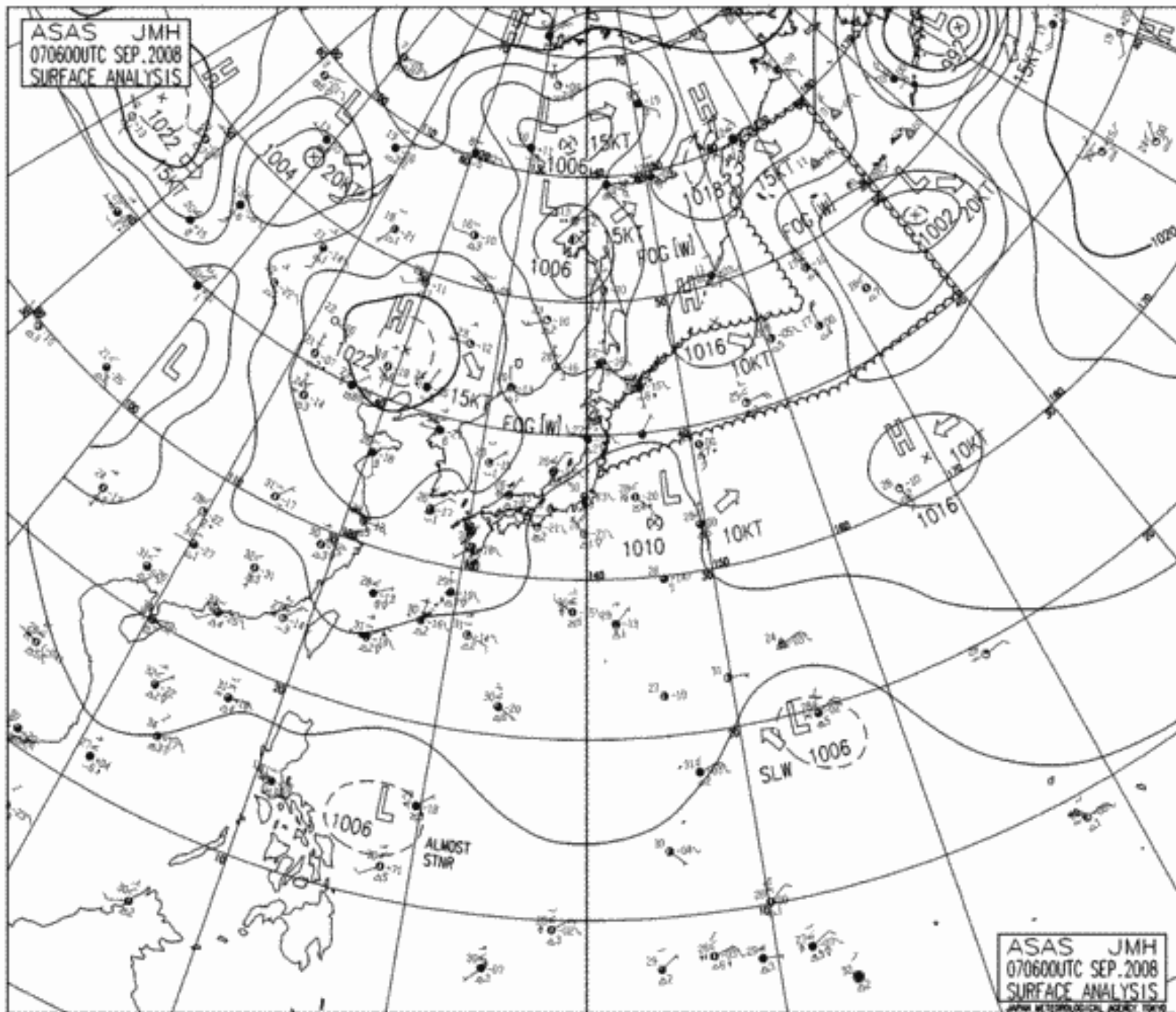
# Depressions

- ◆ Region of low pressure, usually ranging between 950 and 1020 millibars, and which originates along polar fronts. Depressions frequently develop over the oceans in temperate latitudes and travel eastwards to bring cloud and rain to the western edges of the continental landmasses, e.g. the British Isles and Western Europe. A depression may range in size from 150 km to 3000 km and may travel up to 1000 km a day.

# Depression

- ◆ it is another name for an area of low pressure, a low, or trough. It also applies to a stage of tropical cyclone development and is known as a tropical depression to distinguish it from other synoptic features.

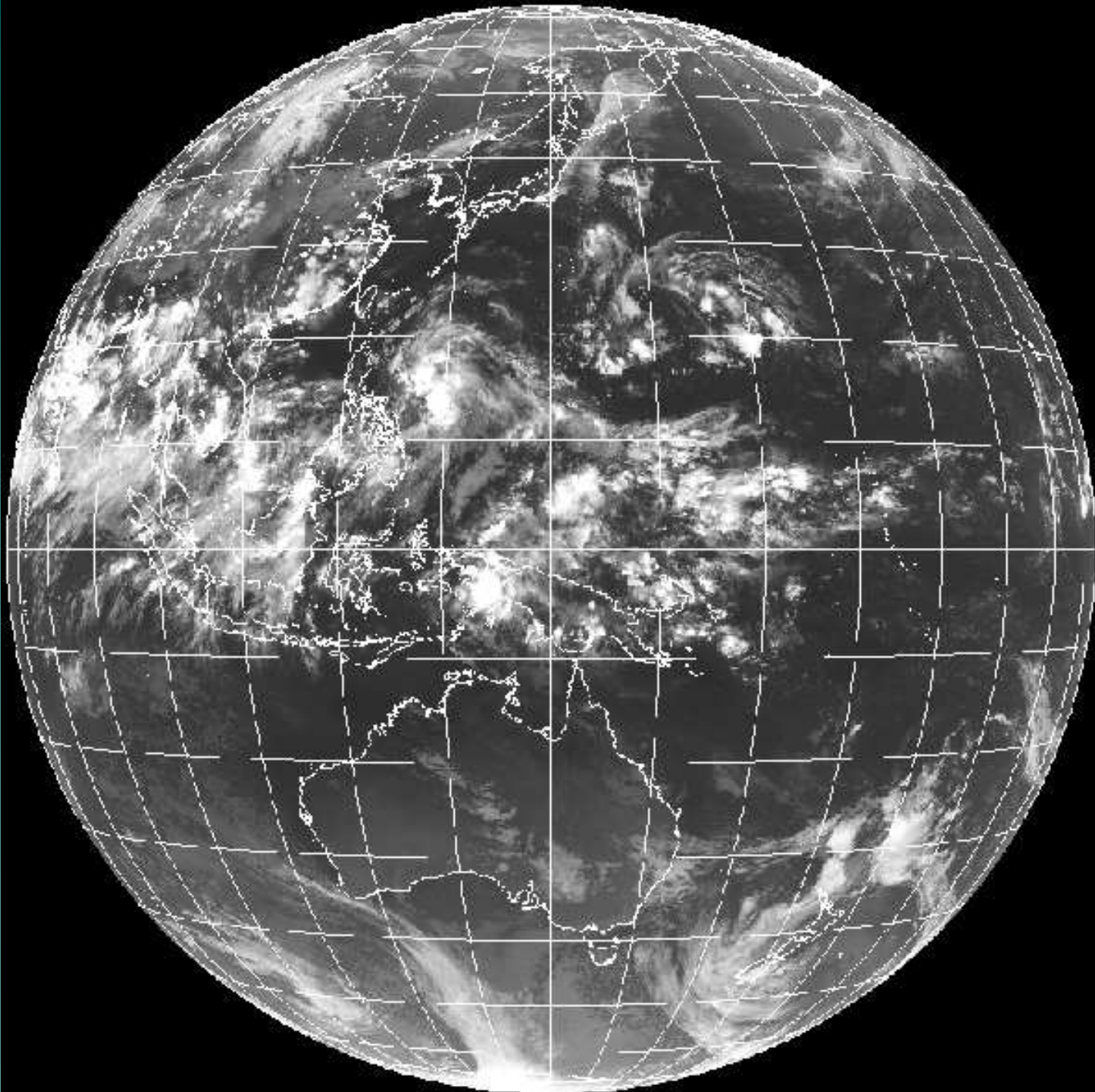
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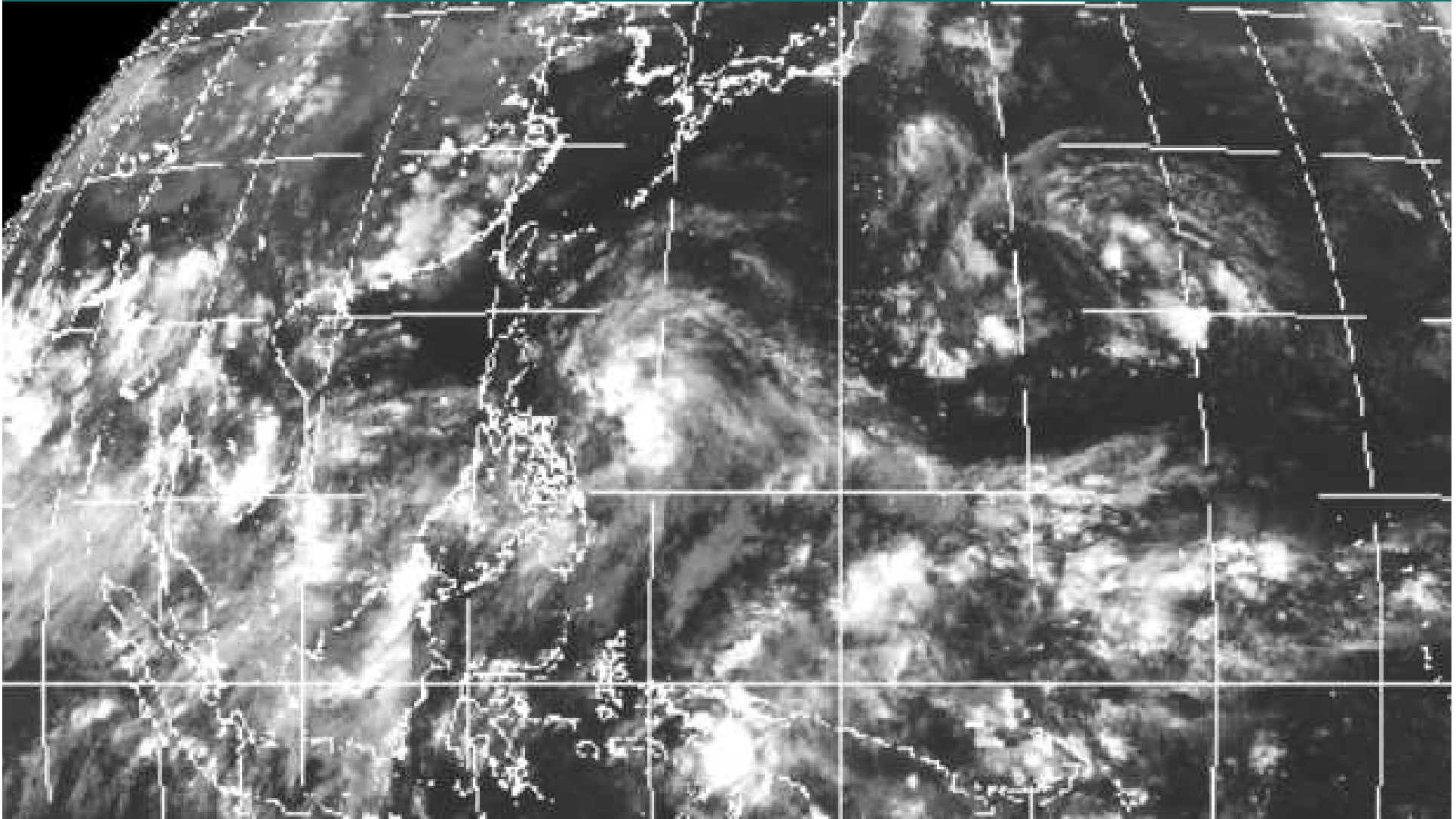


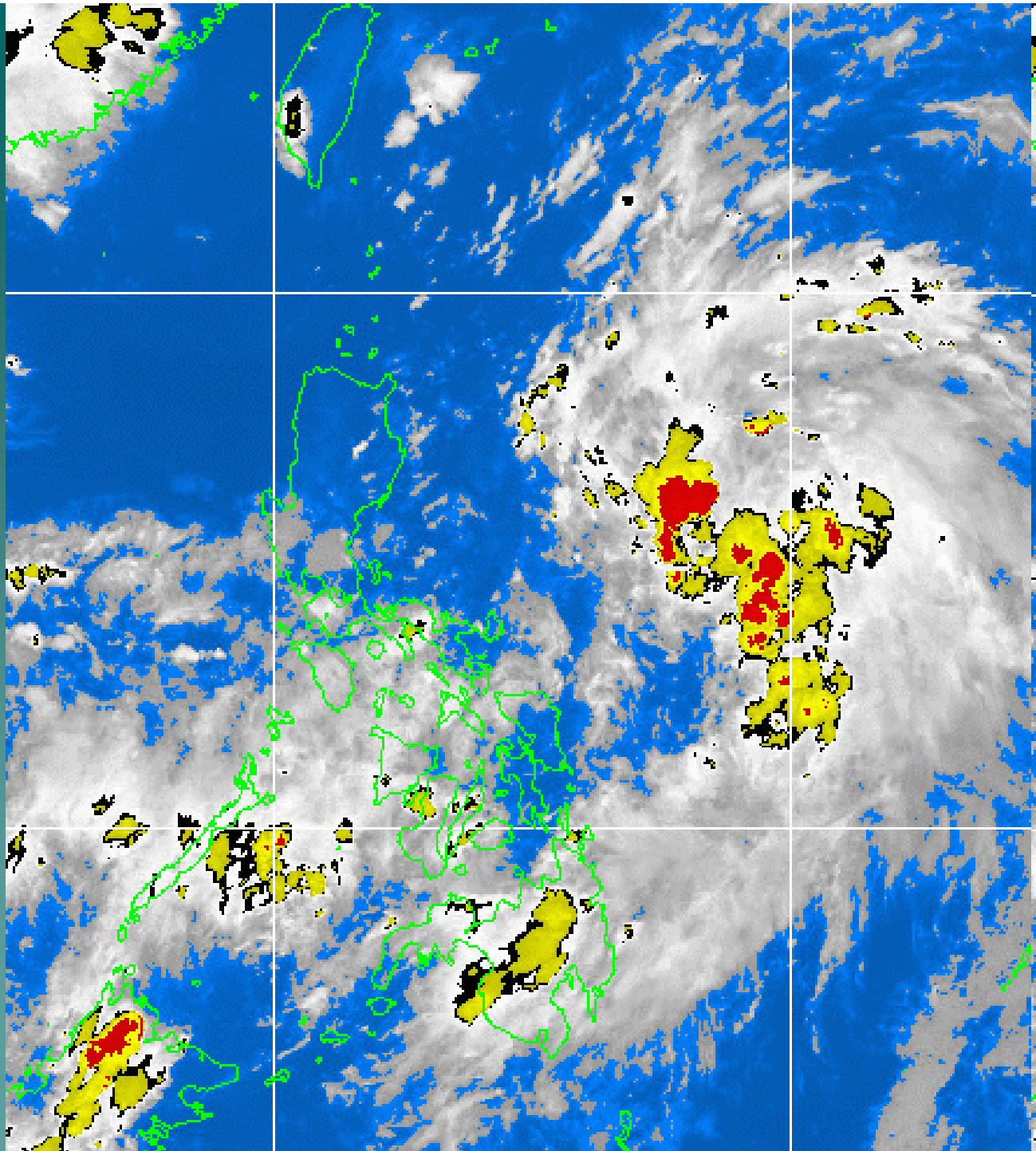
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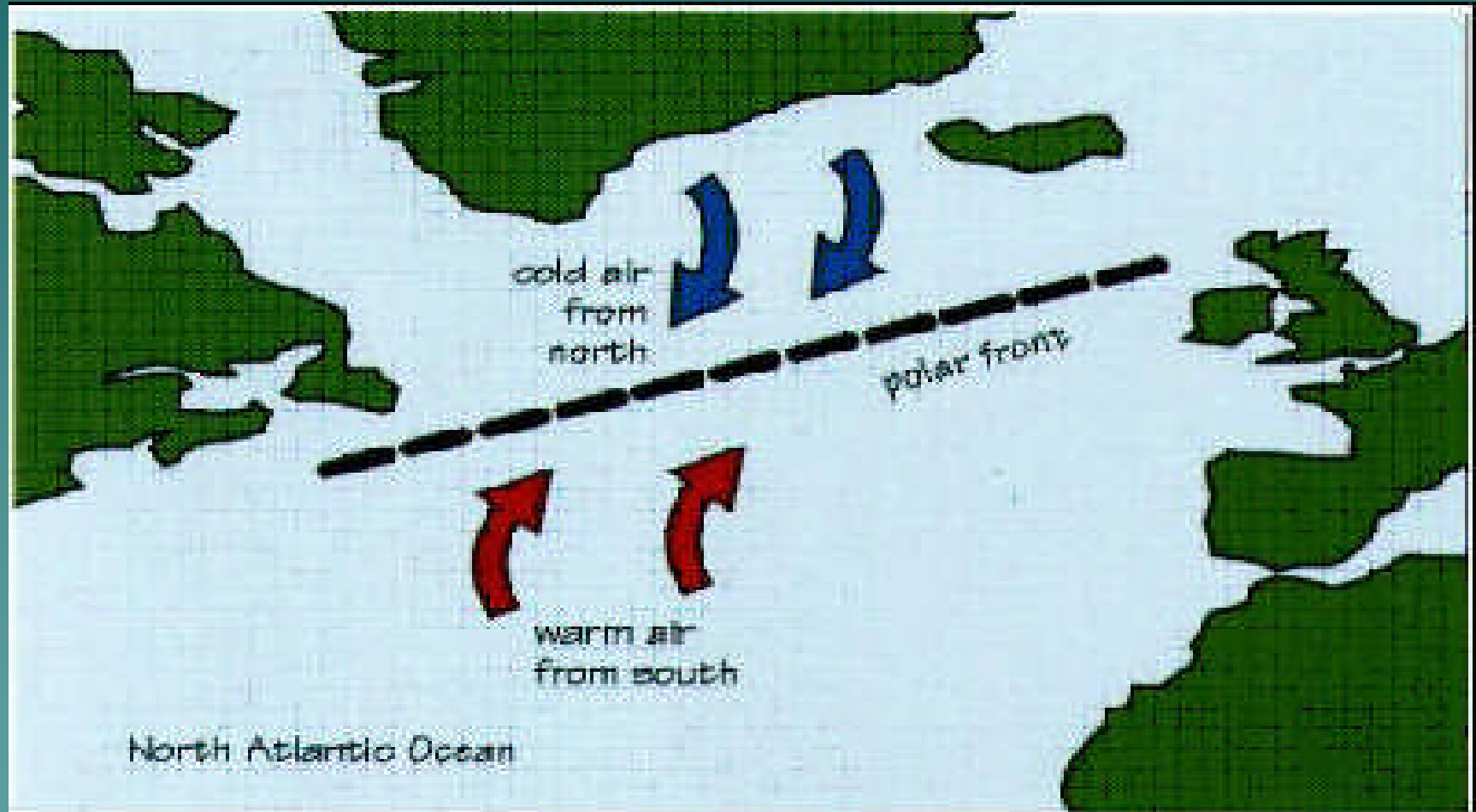


# Stages of Development

## ◆ 1: Embryo Stage

- ◆ Depressions develop from small waves in the polar front (called frontogenesis). The polar front is where cold air meets warm air, often cold dry polar continental (Pc) air meeting warm moist tropical maritime (Tm) air. convergence of the air masses results in the warmer air being forced up over the colder air in a spiral motion. The upward movement of the air results in 'less' air at the Earth's surface giving an area of below average pressure, known as a 'low'. The wave develops and the kink becomes more pronounced. The developing depression with its warm front and cold front usually moves in a north-westerly direction under the influence of the upper westerlies, ie the front of the polar jet stream.

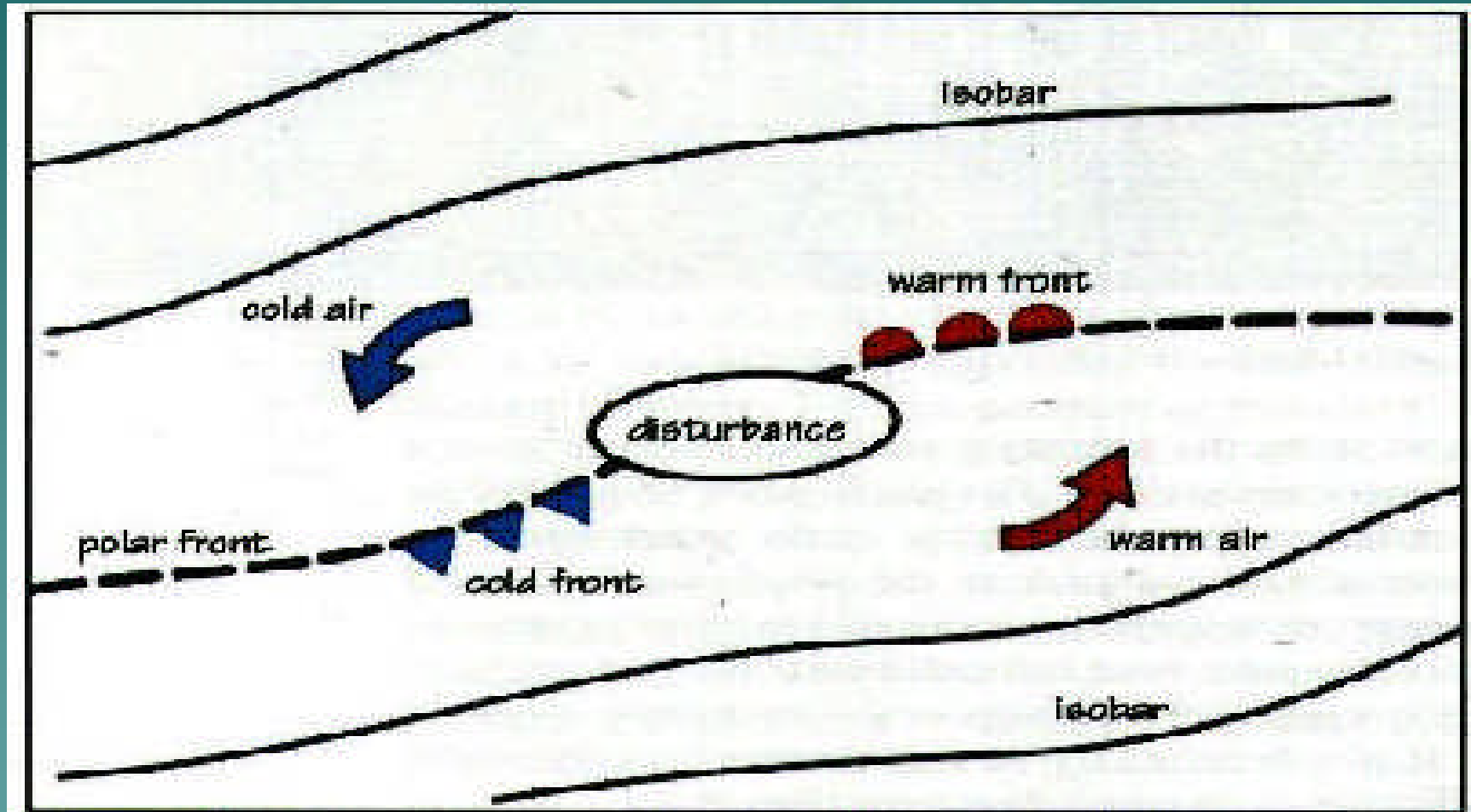
# Stages of Development



# Stages of Development

- ◆ The polar front is a band of cold air formed by the meeting of the cold polar winds with the equatorial warm air. This meeting spawns mid latitude depression. The position of the polar front generally coincides with the meeting of the low surface pressure in the large circulation patterns formed by the Coriolis Effect

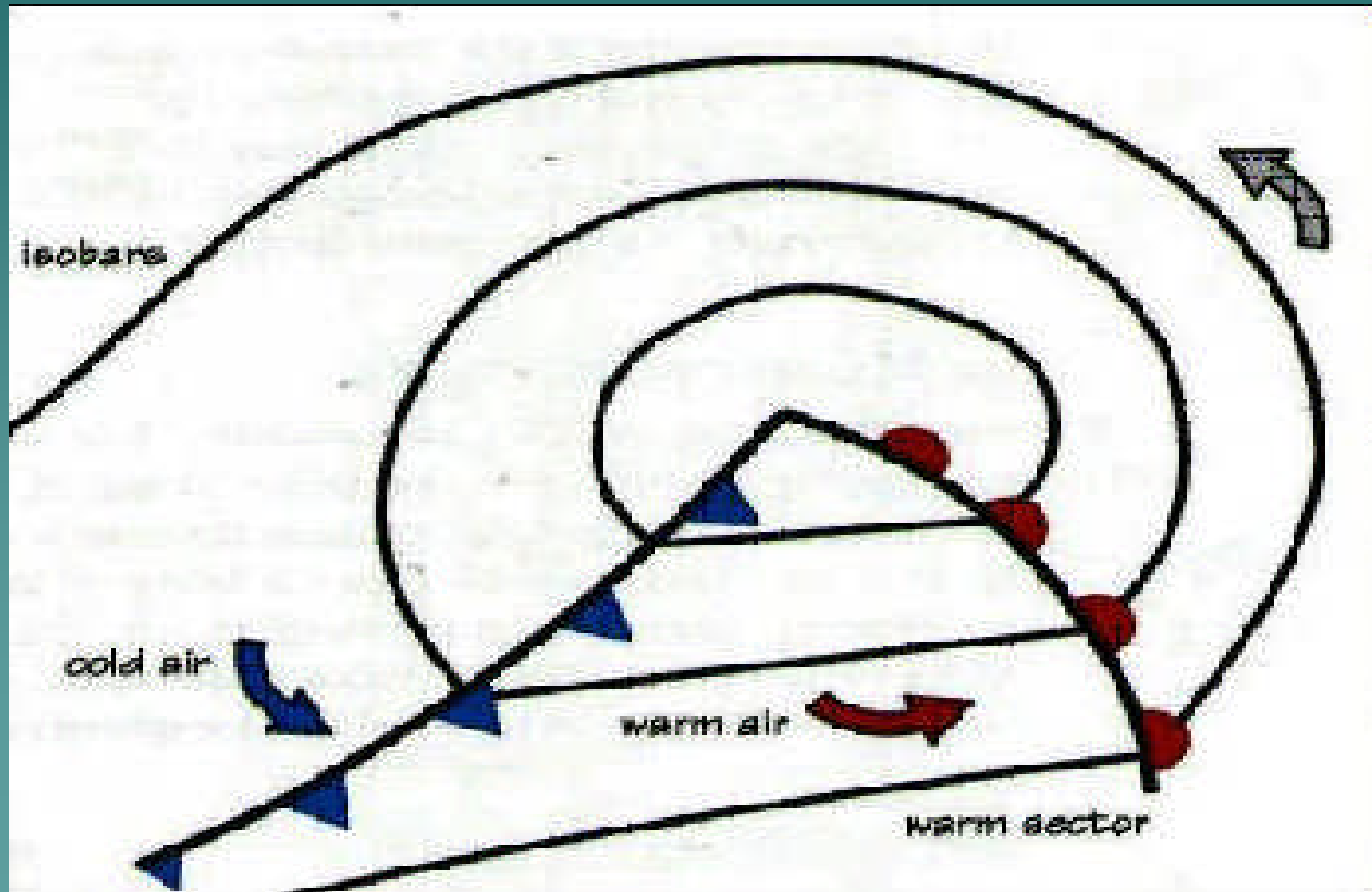
# Stages of Development



# Stages of Development

- ◆ Such a disturbance is known as Baroclinic instability. If this instability is strong enough the front will develop a wave on it, which will grow and intensify. The process of warm air sliding over the top of the cold air will be particularly intense in the area of perturbation so this will lead

# Stages of Development



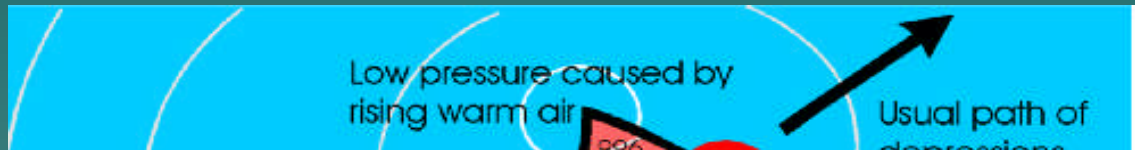


# Stages of Development

- ◆ The fully developed low  
As the warm air slides over the cold air, the baroclinic perturbation begins to grow with intensity and the whole thing turns into a huge vortex with the air being sucked in and then deflected by the Coriolis effect resulting in a n anticlockwise rotation in the northern hemisphere and a clockwise one in the southern hemisphere. This section of the polar front can now be seen to split into a system of individual fronts-The warm front behind which is warm air and the cold front behind which is cold air. The area between these two fronts is called the warm sector and area where the surface winds are strong and blowing in the same direction for some distance.

# Stages of Development

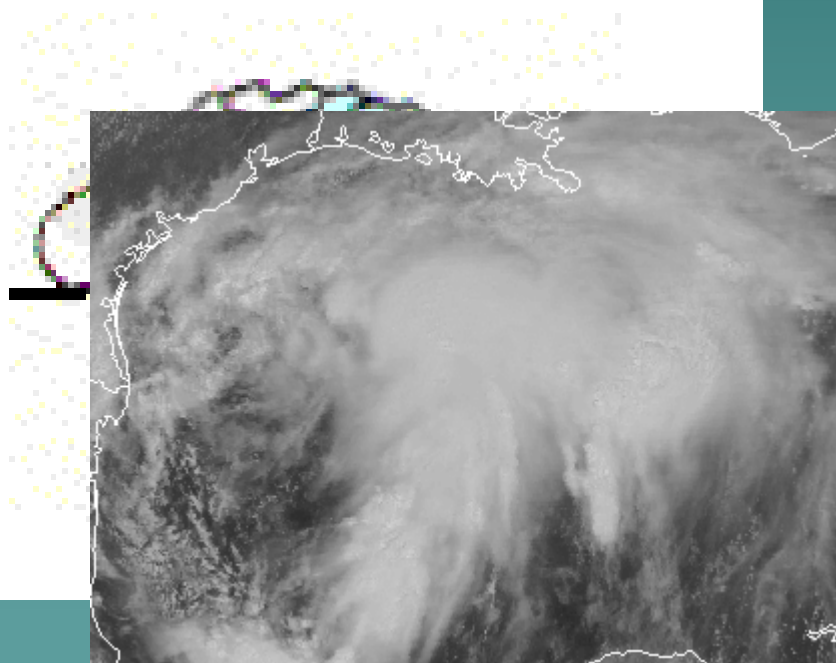
## ◆ 2: Mature Depression



- ◆ A mature depression is recognised by the cold front starting to catch the warm front up. The pressure continues to fall as more and more air is forced to rise. As the pressure falls and the pressure gradient steepens, the inward blowing winds increase in strength. Due to the coriolis force these winds blow anticlockwise.

# Stages of Development

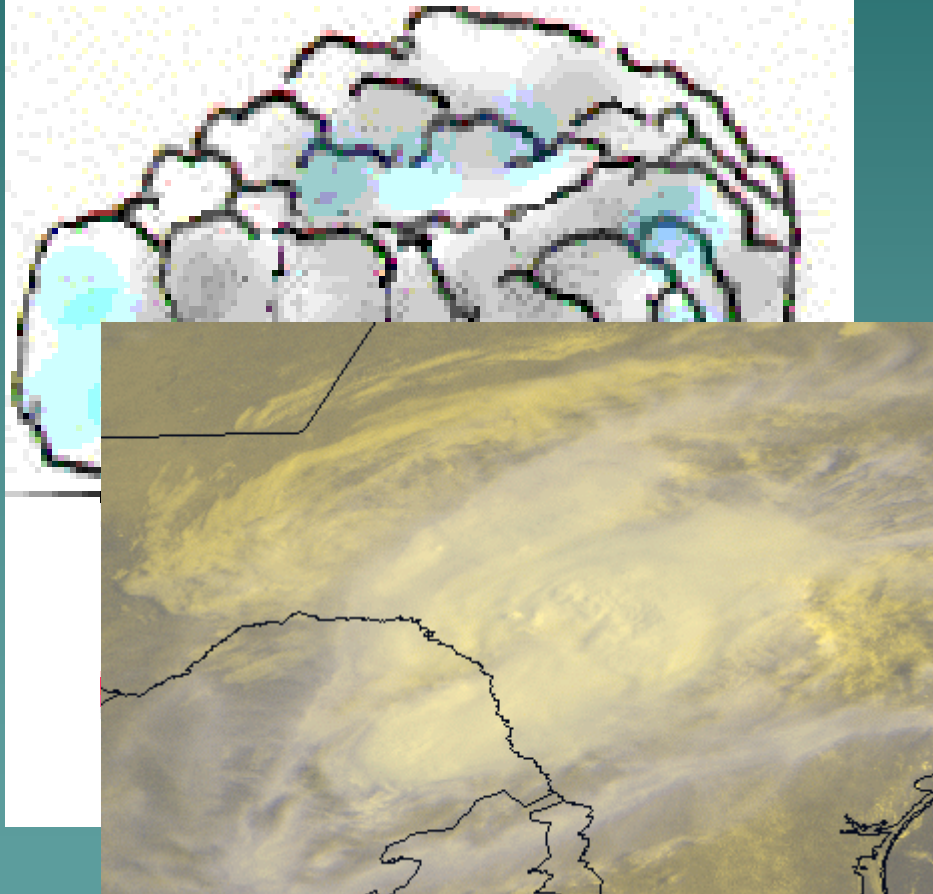
## Depression



- ◆ Once a group of thunderstorms has come together under the right atmospheric conditions for a long enough time, they may organize into a tropical depression. Winds near the center are constantly between 20 and 34 knots (23 - 39 mph).

# Stages of Development

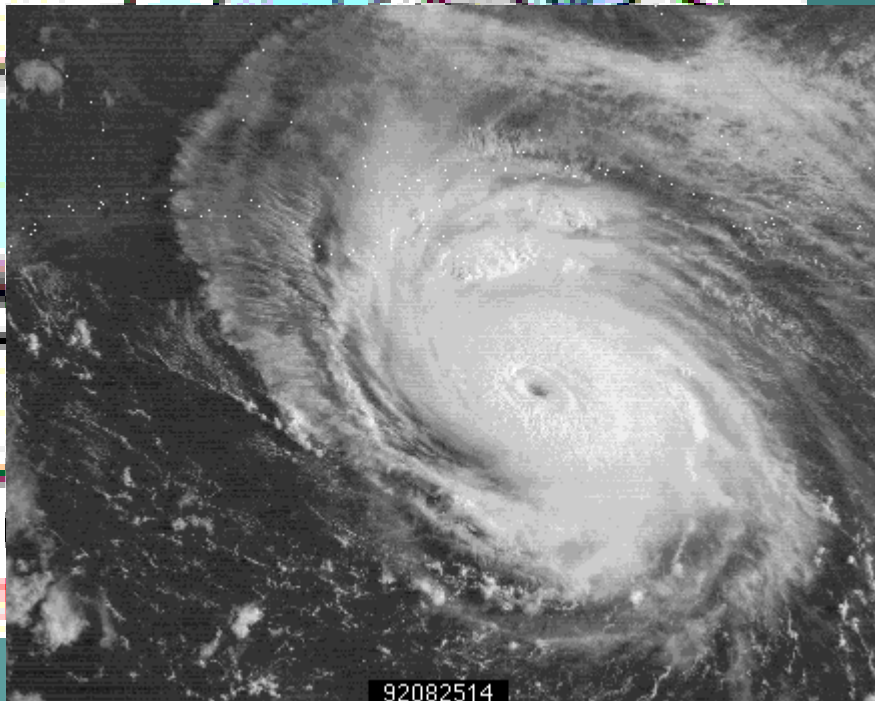
## Tropical Storm



- ◆ Once a tropical depression has intensified to the point where its maximum sustained winds are between 35-64 knots (39-73 mph), it becomes a tropical storm. It is at this time that it is assigned a name. During this time, the storm itself becomes more organized and begins to become more circular in shape -- resembling a hurricane.

# Stages of Development

Hurricane



- ◆ As surface pressures continue to drop, a tropical storm becomes a hurricane when sustained wind speeds reach 64 knots (74 mph). A pronounced rotation develops around the central core.