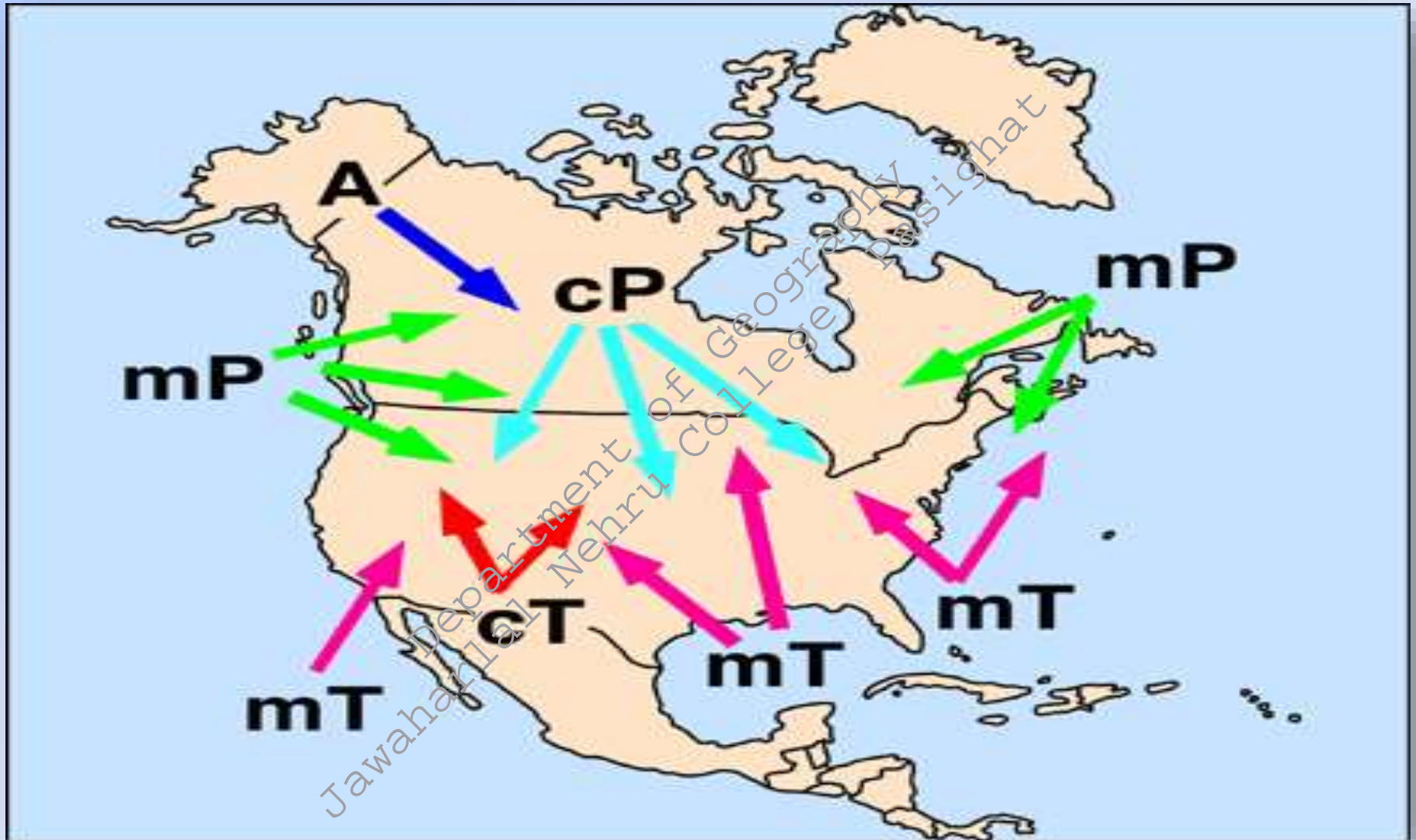


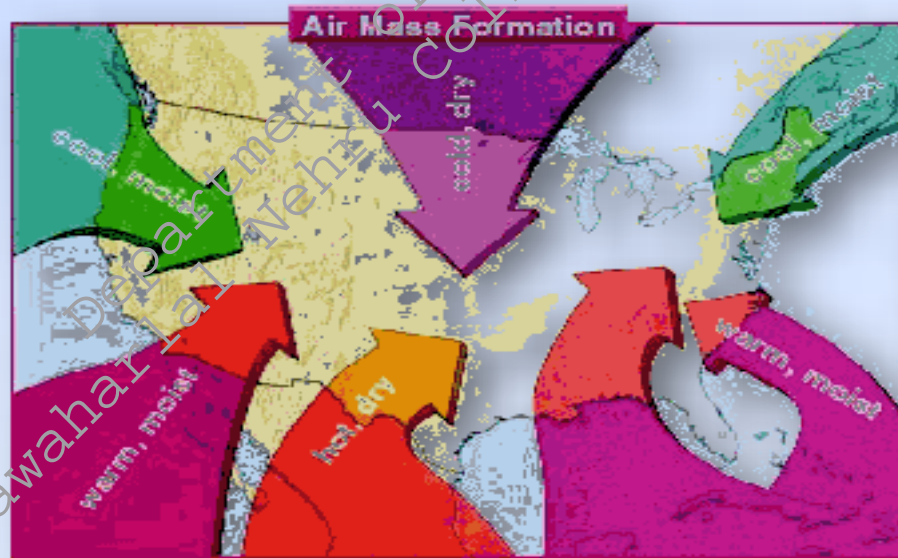
DR K K MISHRA

An air mass is a large body of air that has similar *temperature* and *moisture* properties



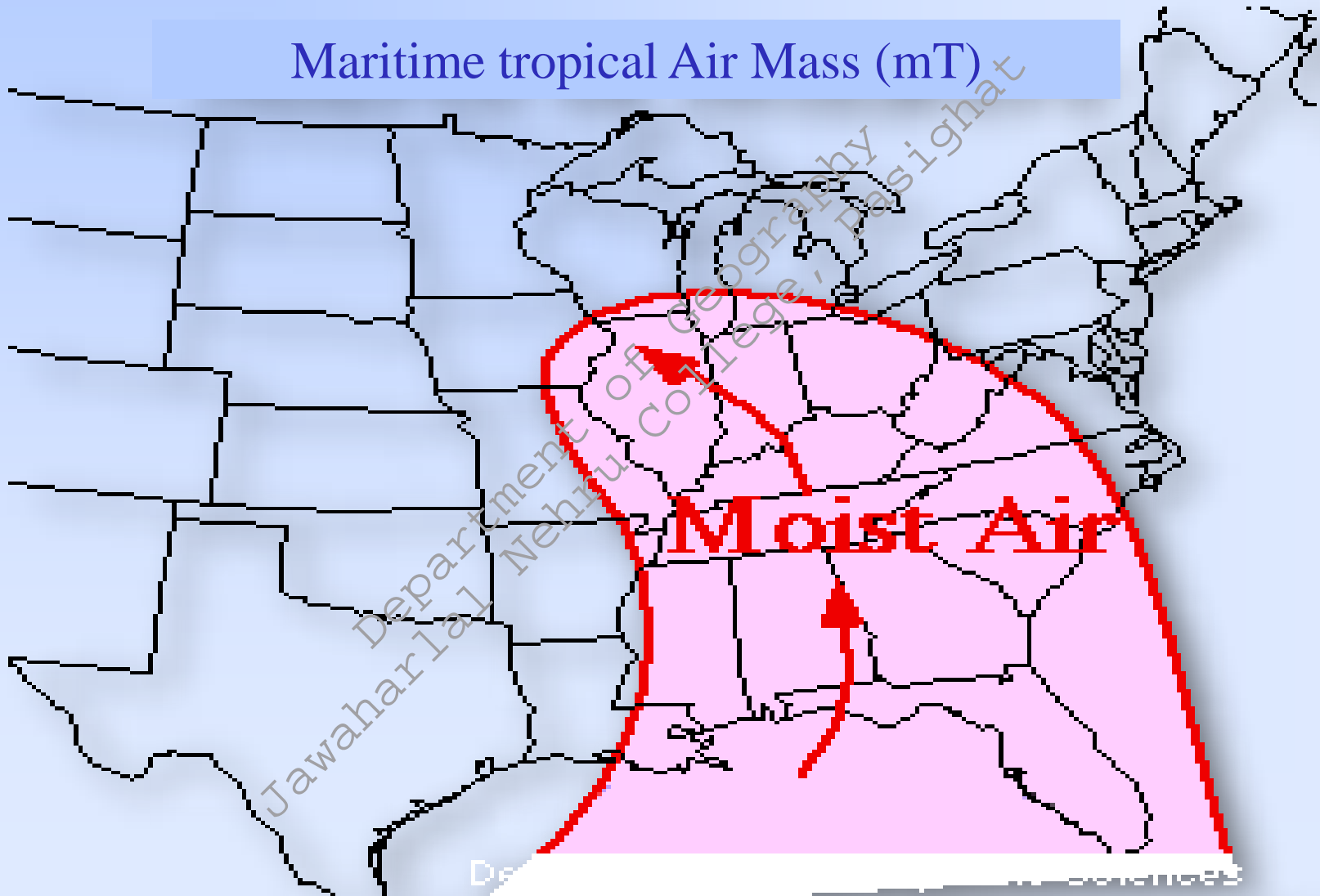
Once air masses move from where they form, their temperature and moisture content change. For example, as a polar air mass moves southward, it encounters warmer land masses and is heated by the ground below. Most air masses collide in the middle of the U.S., producing some violent weather.

Air Masses

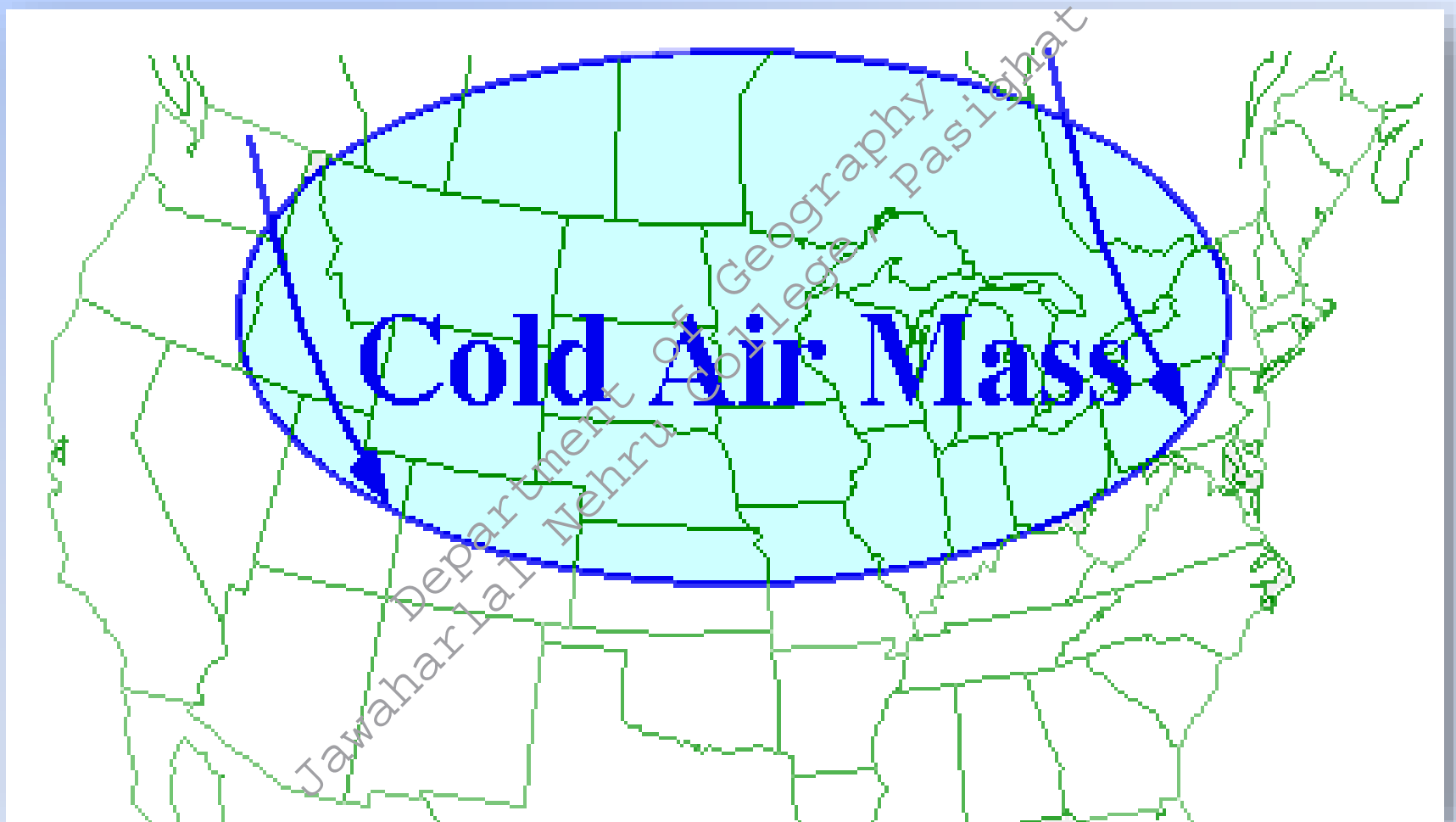


Maritime tropical air masses (mT) form over the warm waters of the tropics and Gulf of Mexico. The northward movement of these air masses brings *warm moist* air into the United States

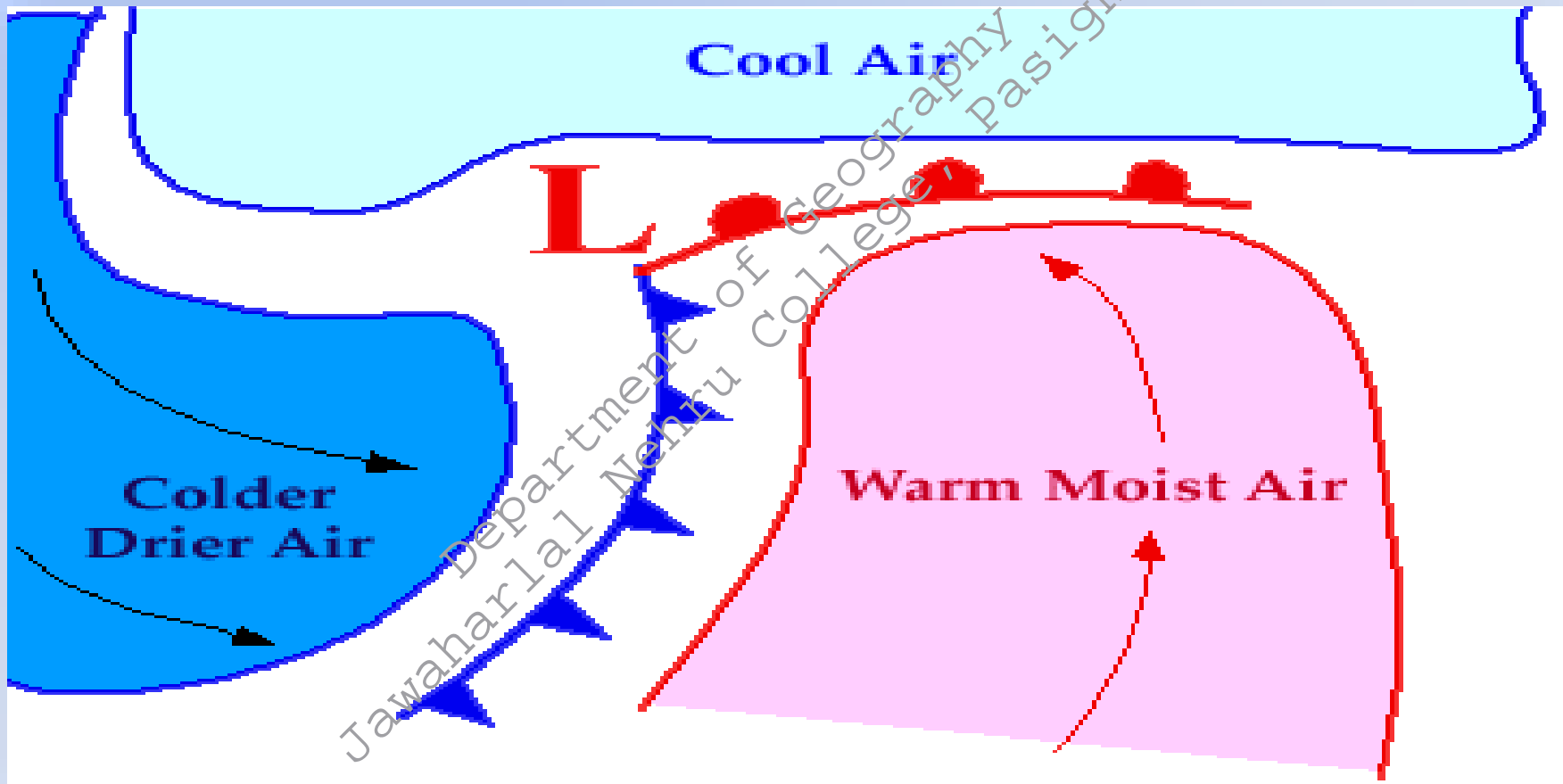
Maritime tropical Air Mass (mT)



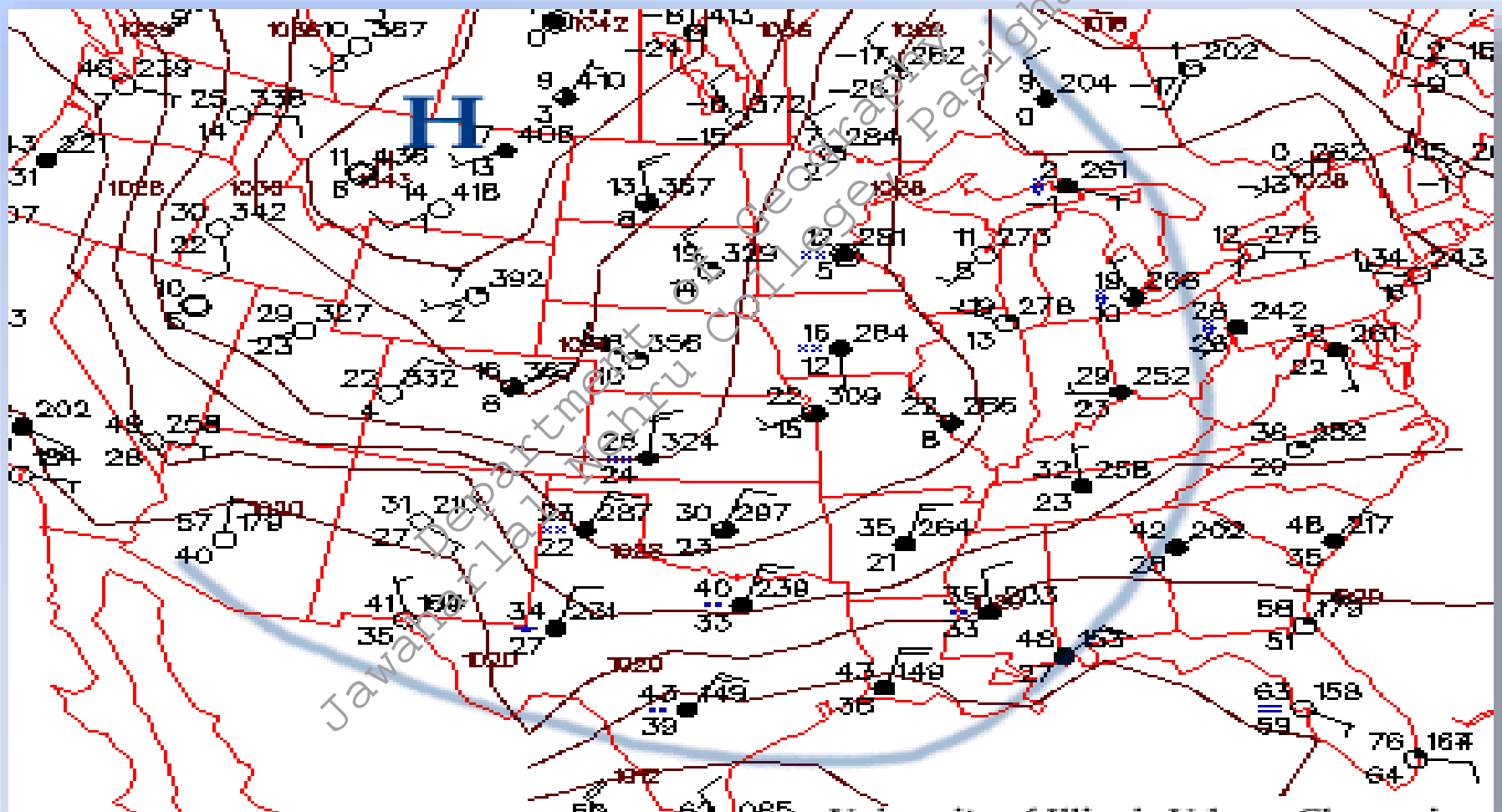
Those who live in the northern United States expect cold weather during the winter months. These conditions usually result from the invasion of cold arctic air masses that form from the snow covered regions of northern Canada.



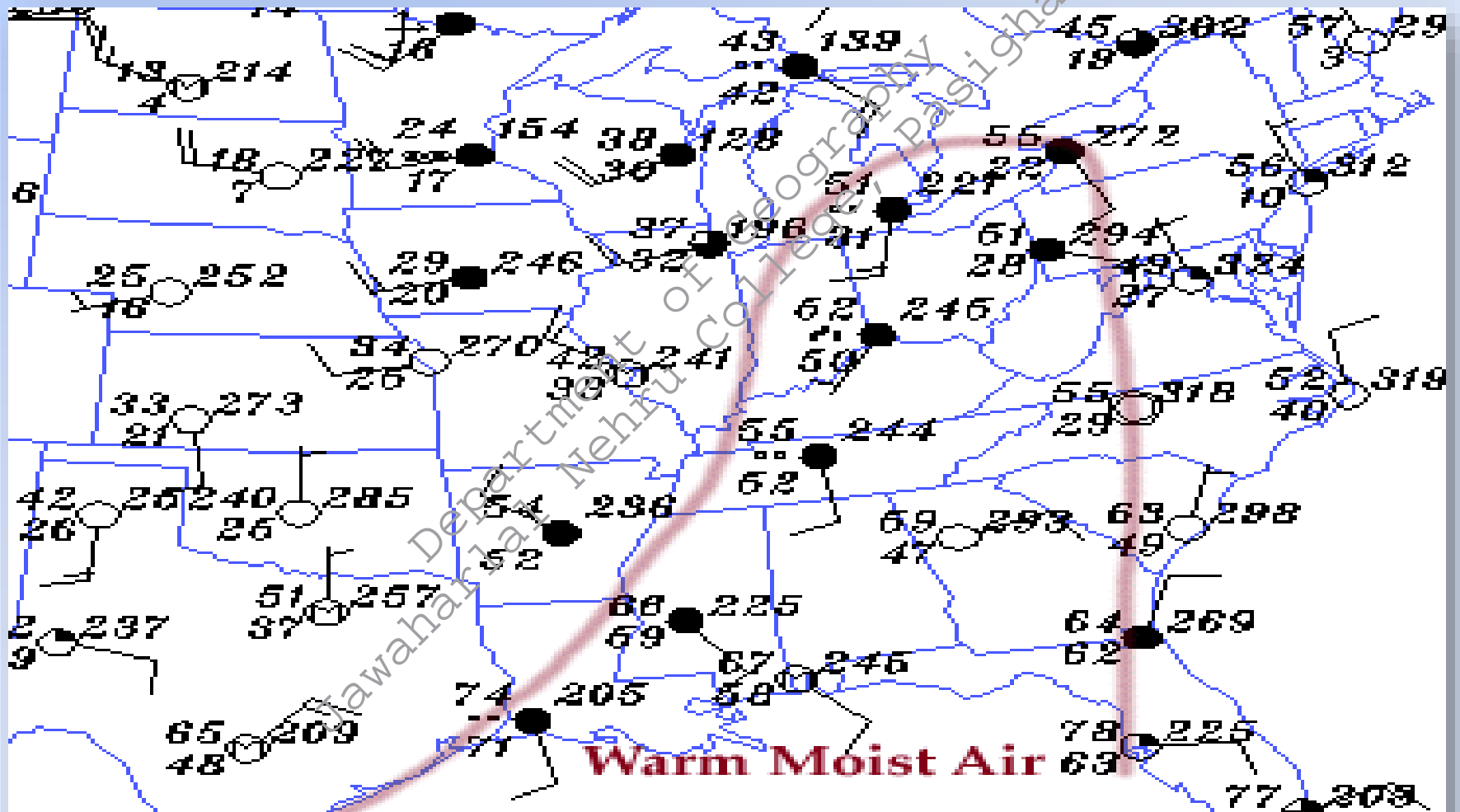
Cold air masses move southward and encounter warm air masses. When these air masses collide, various types of weather will result. The type of precipitation that might result from this collision depends on the air temperature.



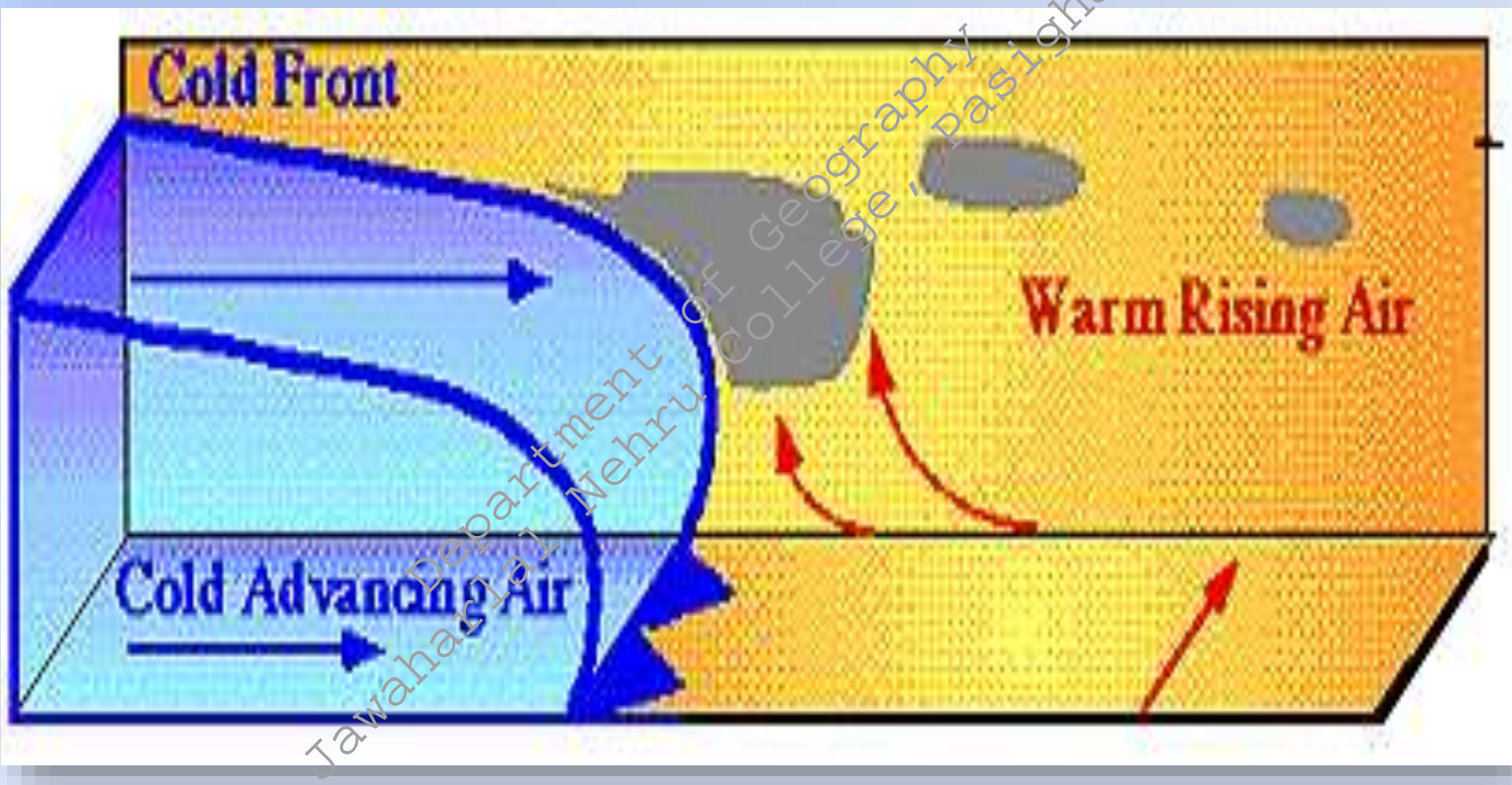
Notice the edge of the cold air mass is shown by the blue line. The center of this air mass is a high pressure center located in northern Montana (indicated by the blue "H").



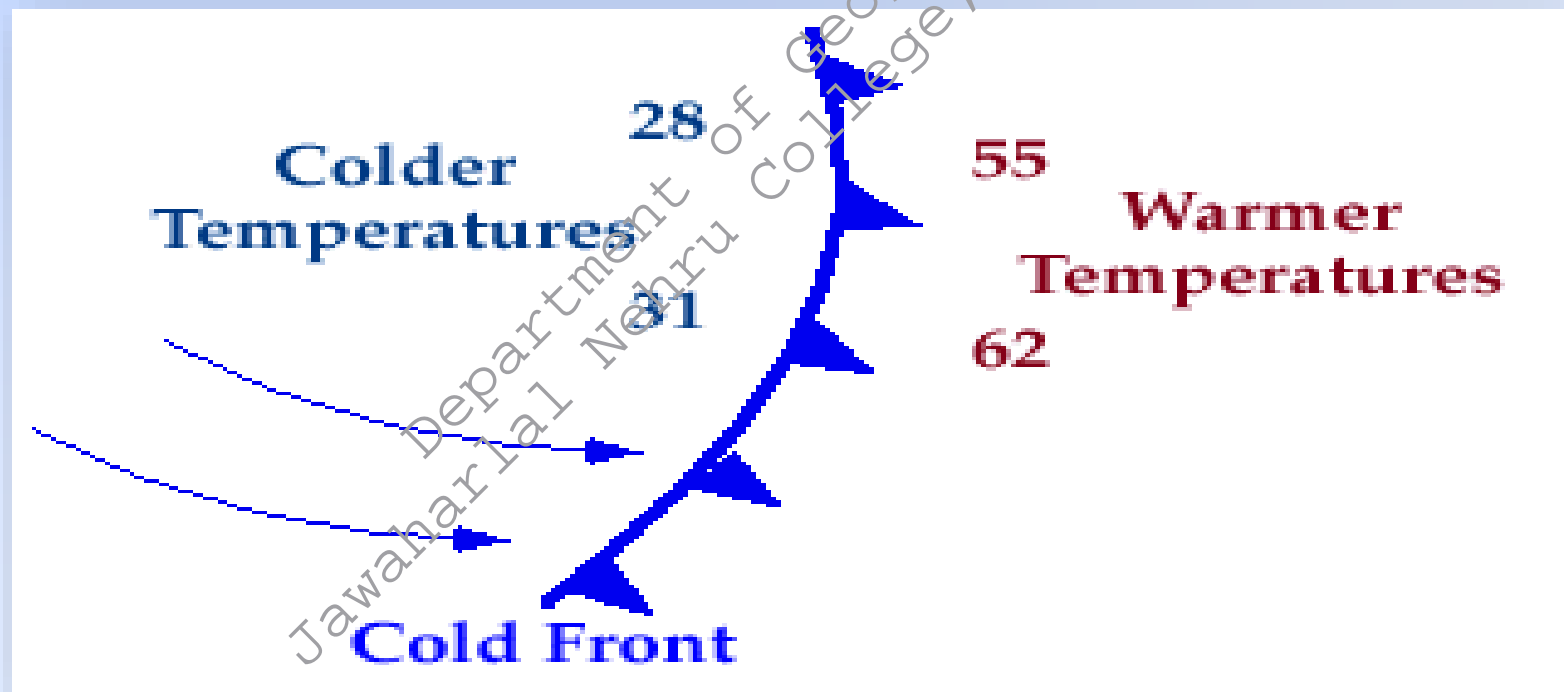
The leading edge of a tropical air mass surging northward is shown by red line. Southerly winds behind the boundary indicate the northward movement of warm moist air.



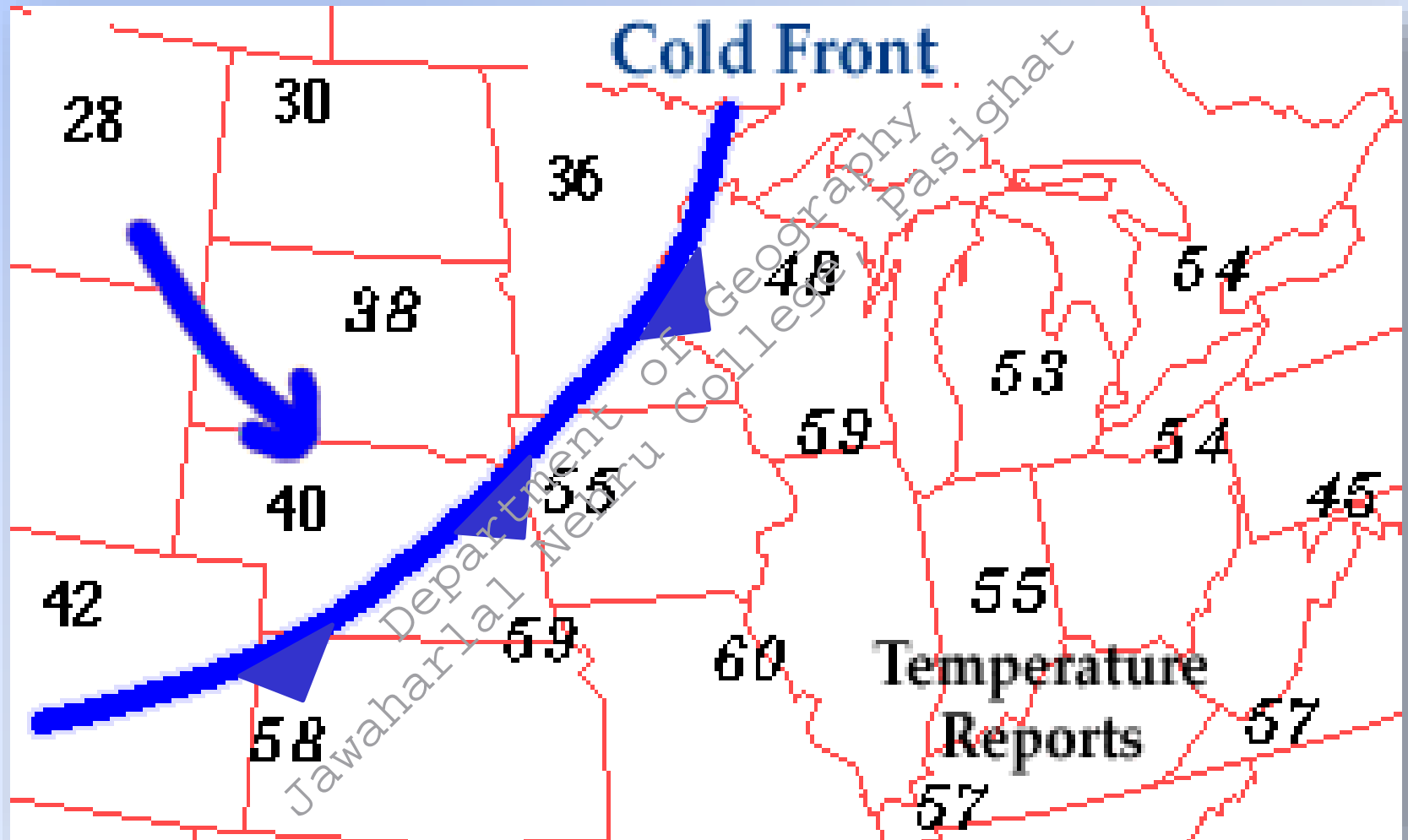
A *front* is defined as the area between two air masses with different properties. Fronts extend not only in the horizontal direction, but in the vertical as well.



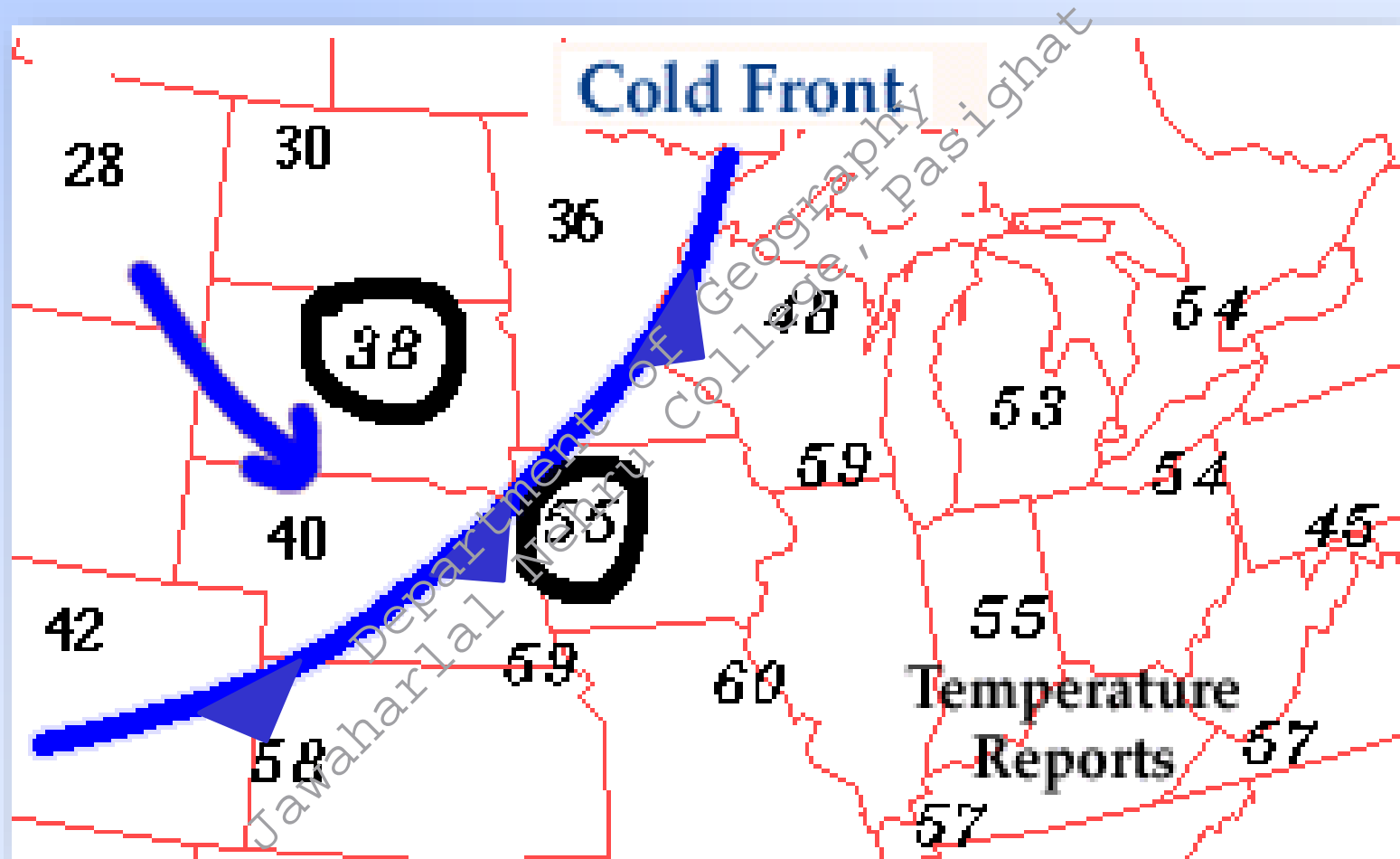
- ❖ A cold front is defined as the area where a **cold** air mass is replacing a **warmer** air mass.
- ❖ Cold fronts move from northwest to southeast. The air behind a cold front is colder and drier than the air ahead of it.
- ❖ When a cold front passes through, temperatures can drop more than 15 degrees within the first hour.



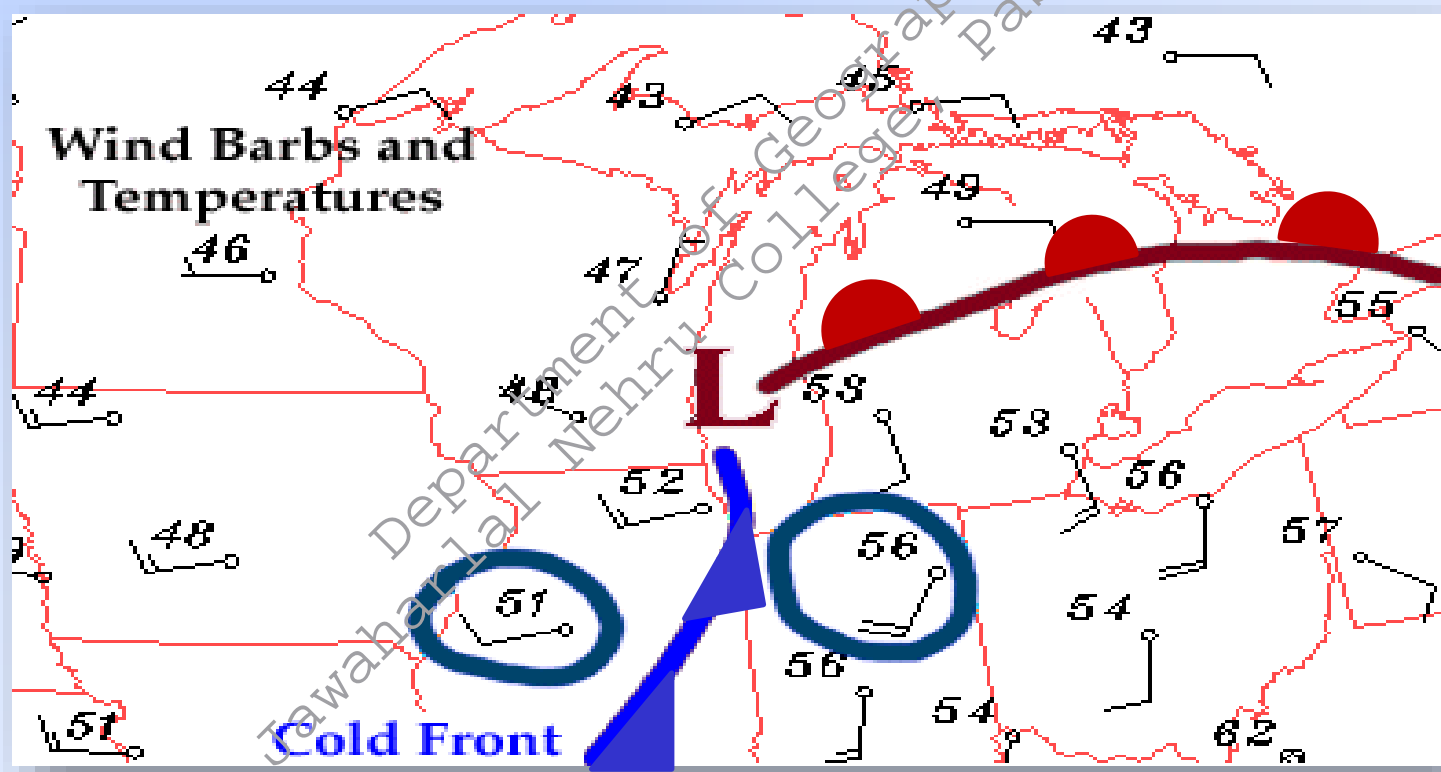
A cold front is represented by a solid blue line with triangles along the front pointing in the direction of movement.



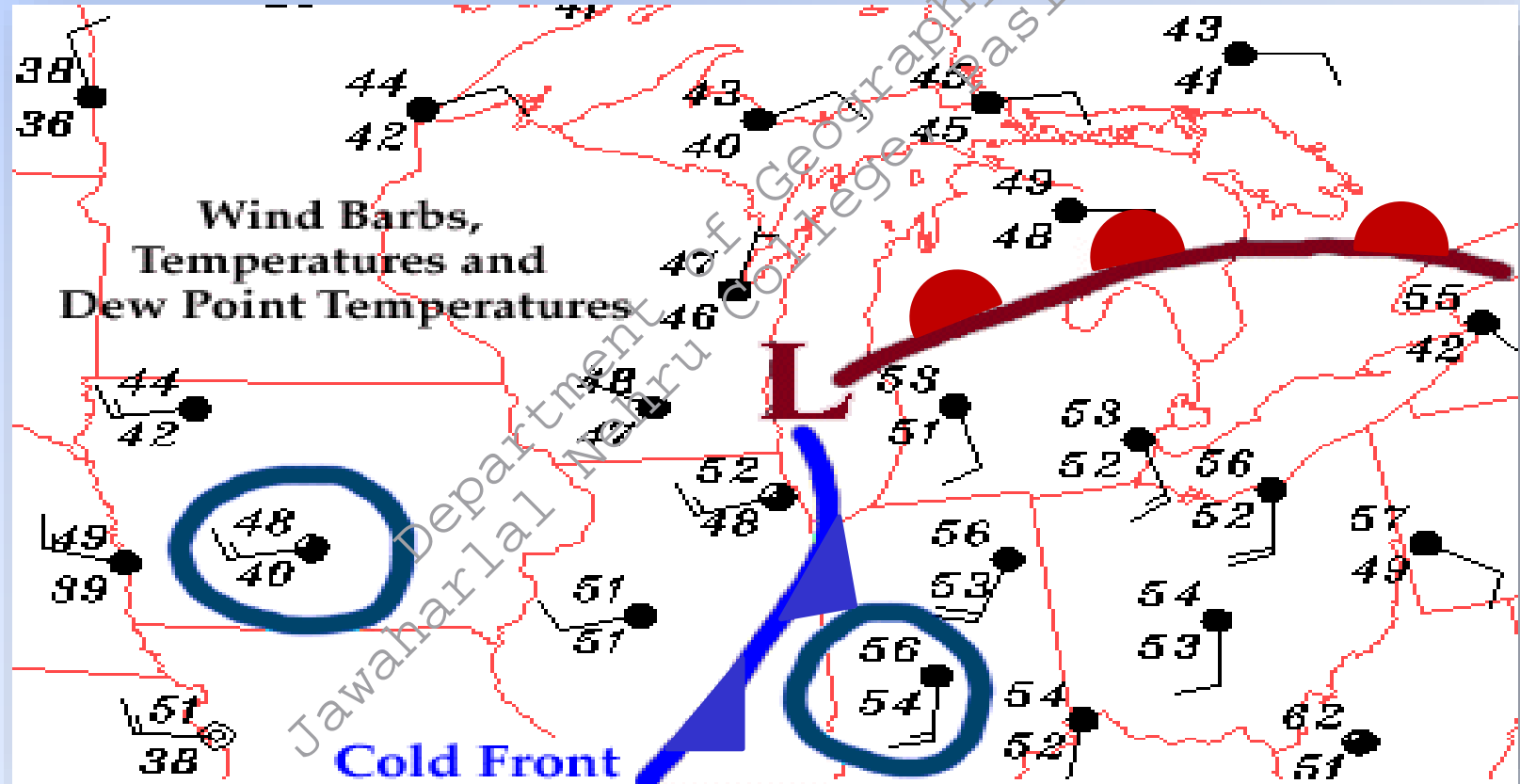
An rapid temperature change over a short distance is a good indicator that a front is located somewhere in between.



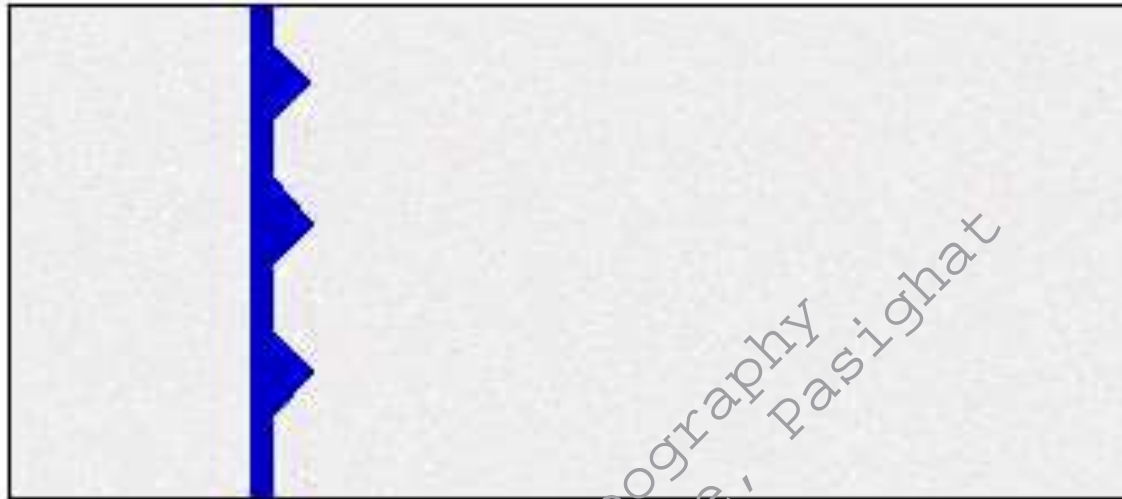
A change in wind direction from one side of the cold front to the other can also indicate where the front is located. Winds ahead of the cold front were generally from south-southwest, while behind the front, winds had shifted around and were blowing out of the west-northwest.



Another indication of a possible front is a change in the relative humidity. The air mass ahead of a cold front is more moist than the air mass behind it. Higher dew points indicate a higher moisture content of the air.



Cold Front



Top View

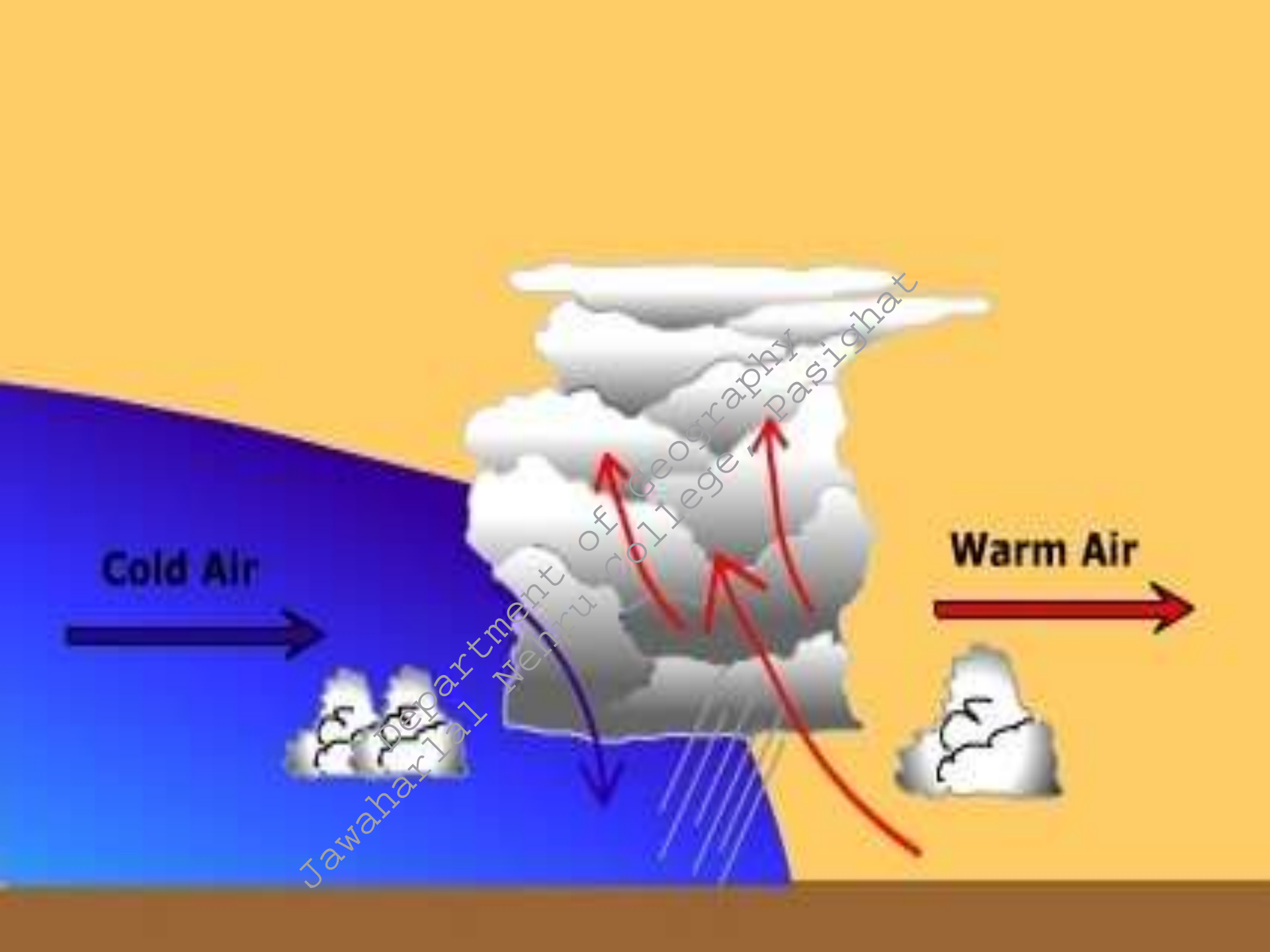


Side View

Cold

Warm

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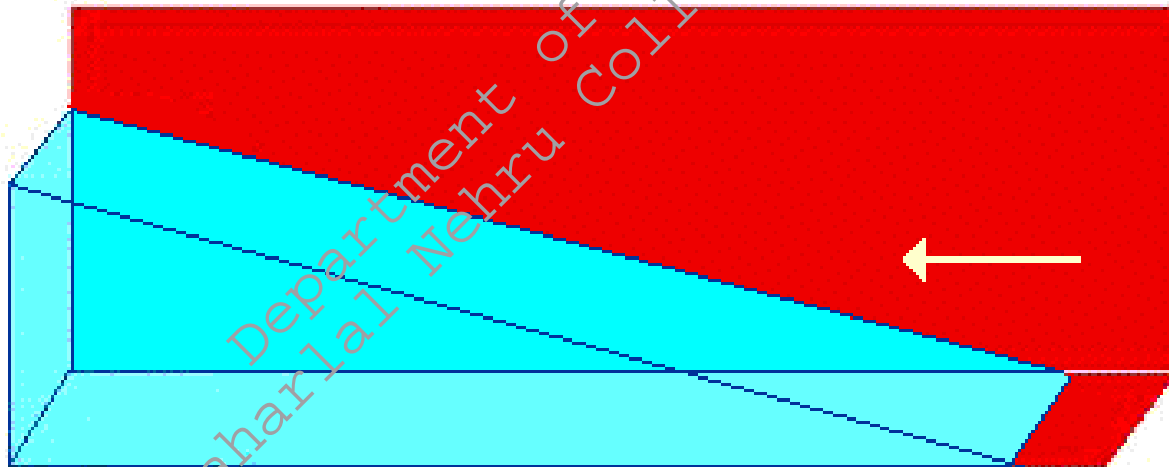


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Warm Front



Top View

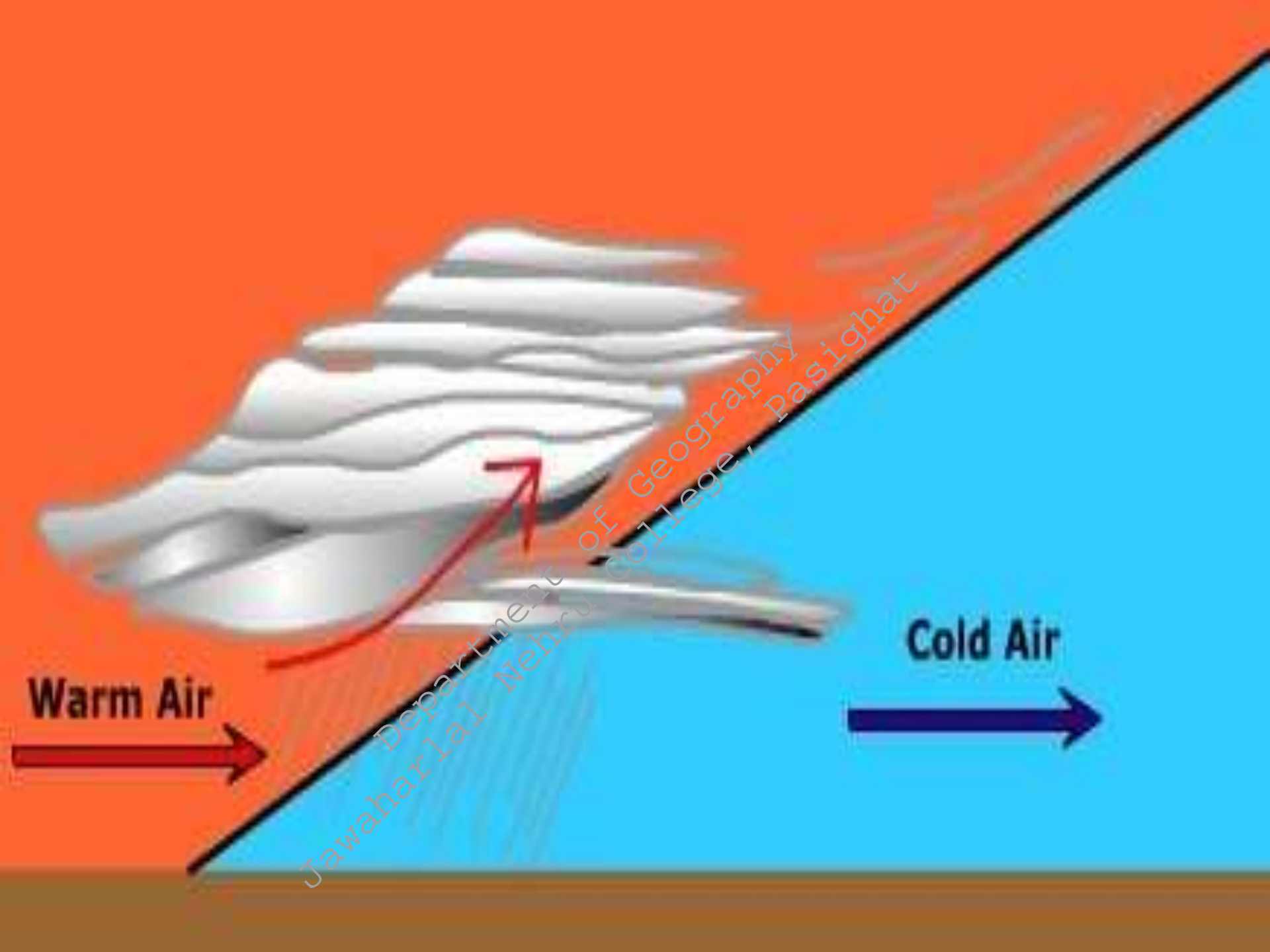


Side View

Cold

Warm

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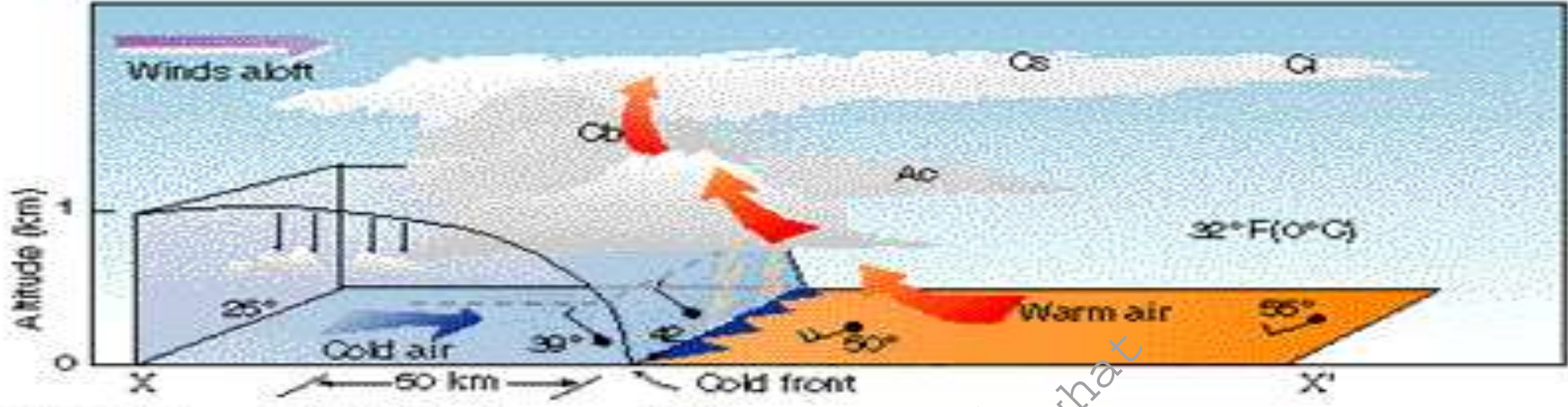
**Advancing cold
air mass.**

**As rising air
cools, it can
condense
into clouds,
precipitation.**

Warm air

**As front
advances,
warm air is
pushed upward.**

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	Before Passing	While Passing	After Passing
Winds	south-southwest	gusty; shifting	west-northwest
Temperature	warm	sudden drop	steadily dropping
Pressure	falling steadily	minimum, then sharp rise	rising steadily
Clouds	increasing: Ci, Cs and Cb	Cb	Cu
Precipitation	short period of showers	heavy rains, sometimes with hail, thunder and lightning	showers then clearing
Visibility	fair to poor in haze	poor, followed by improving	good, except in showers
Dew Point	high; remains steady	sharp drop	lowering