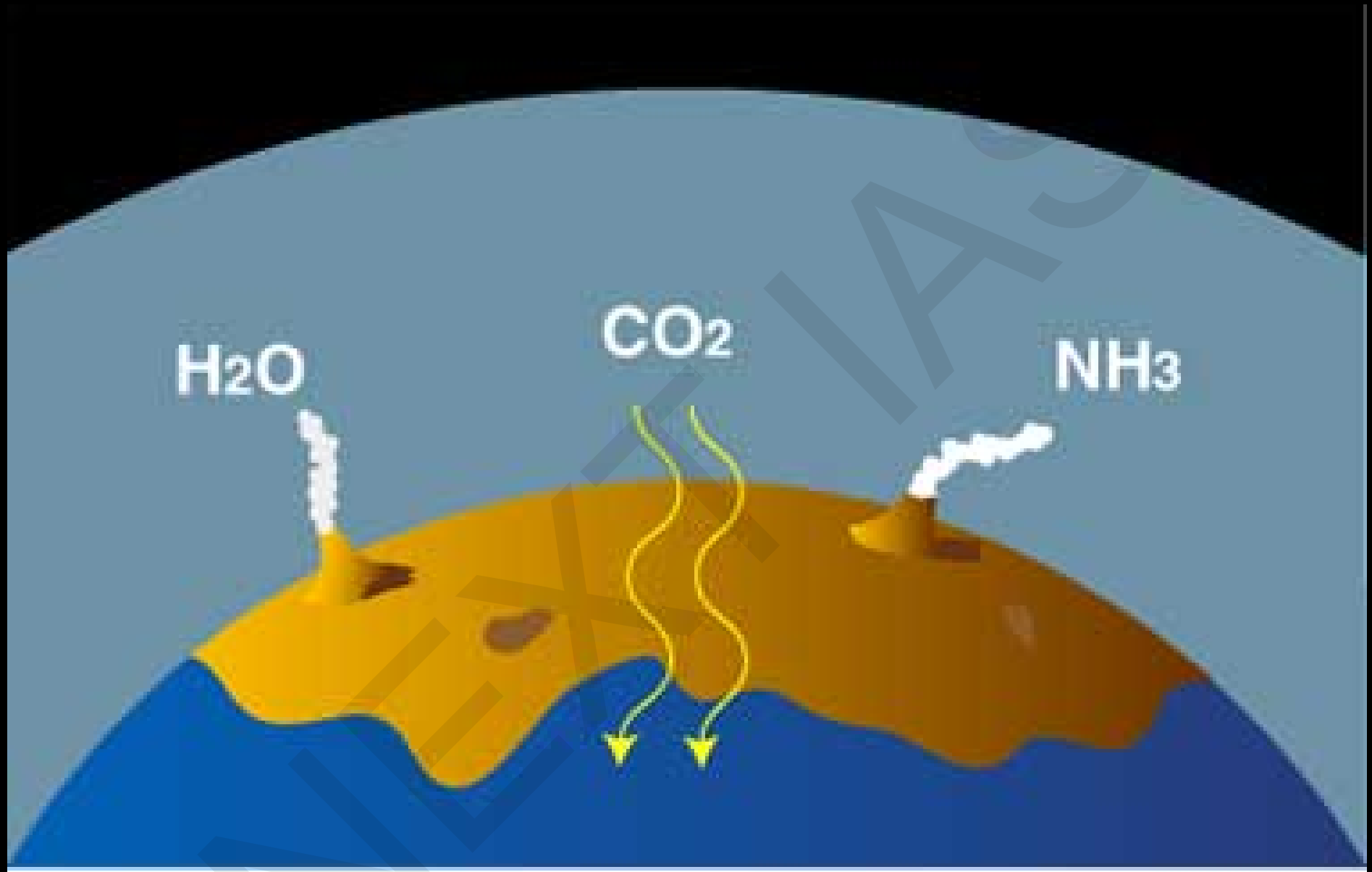
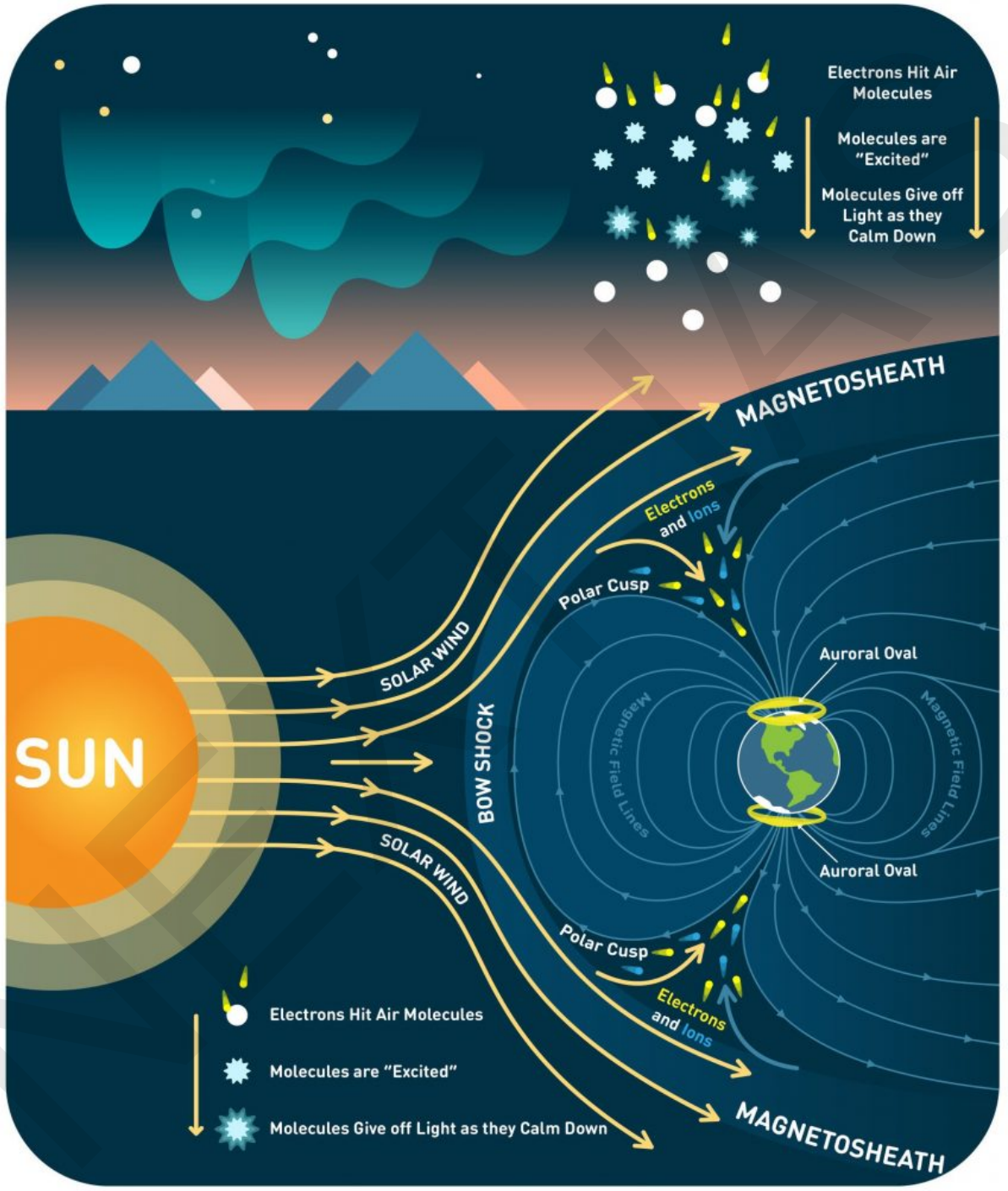
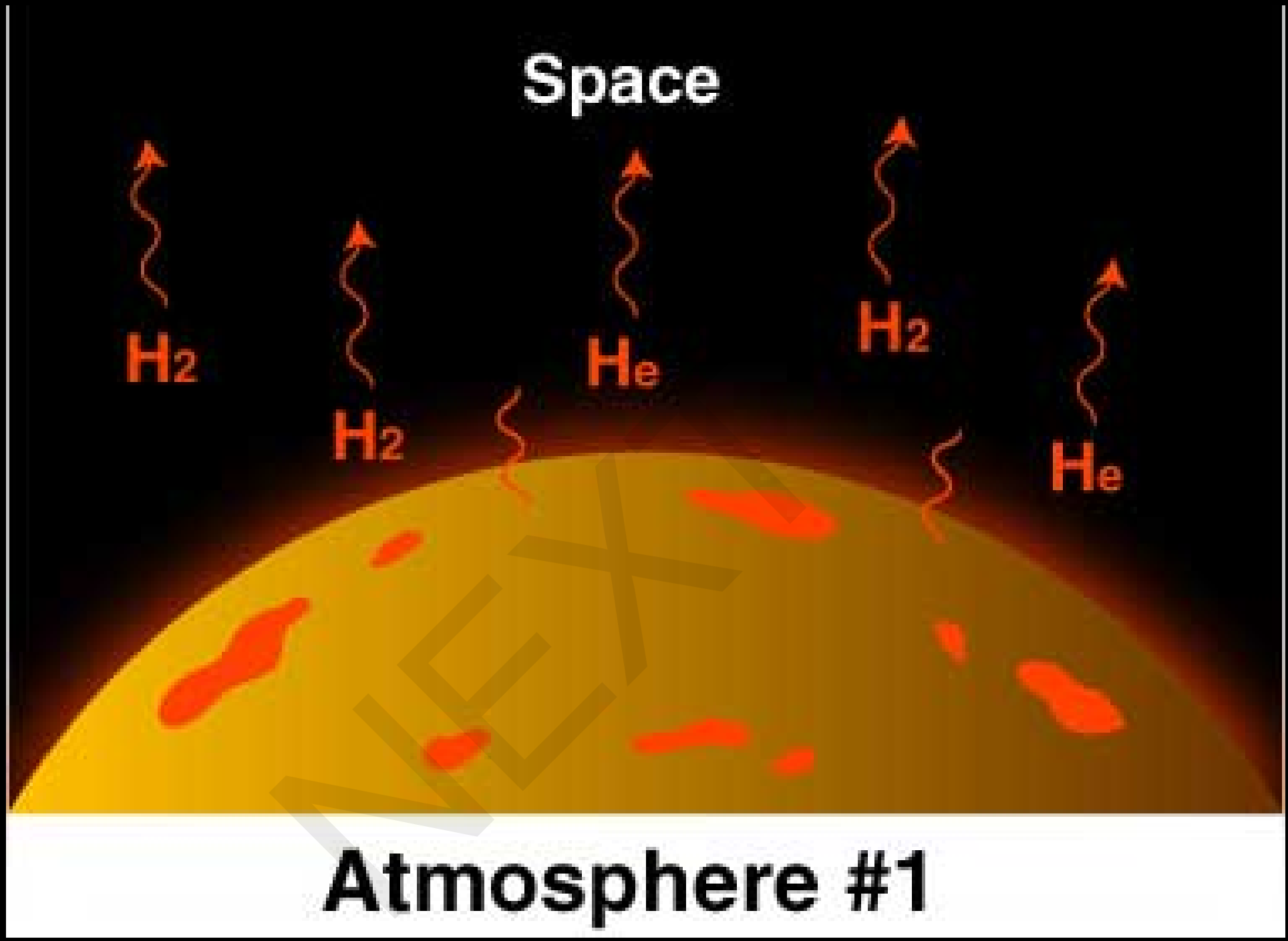
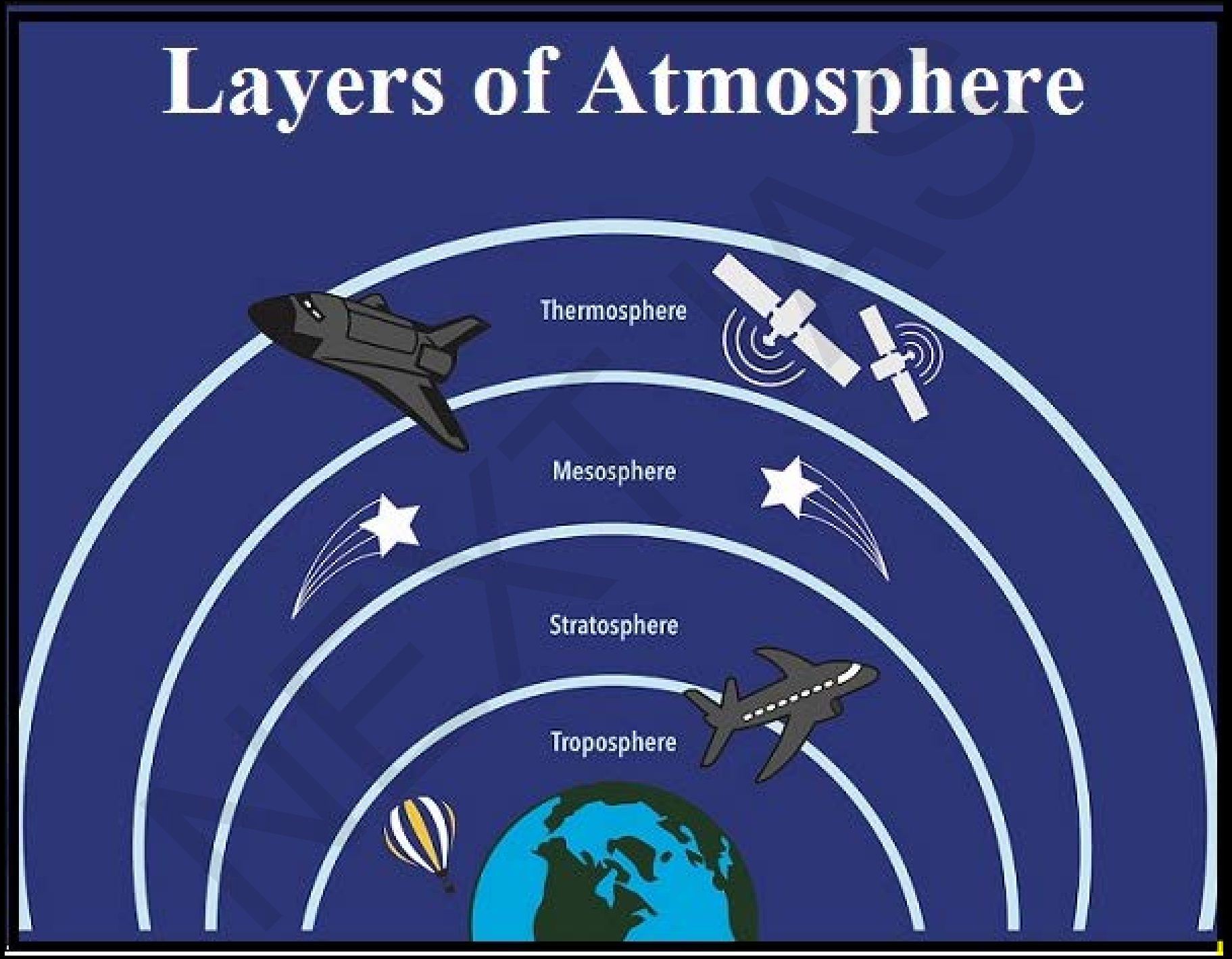


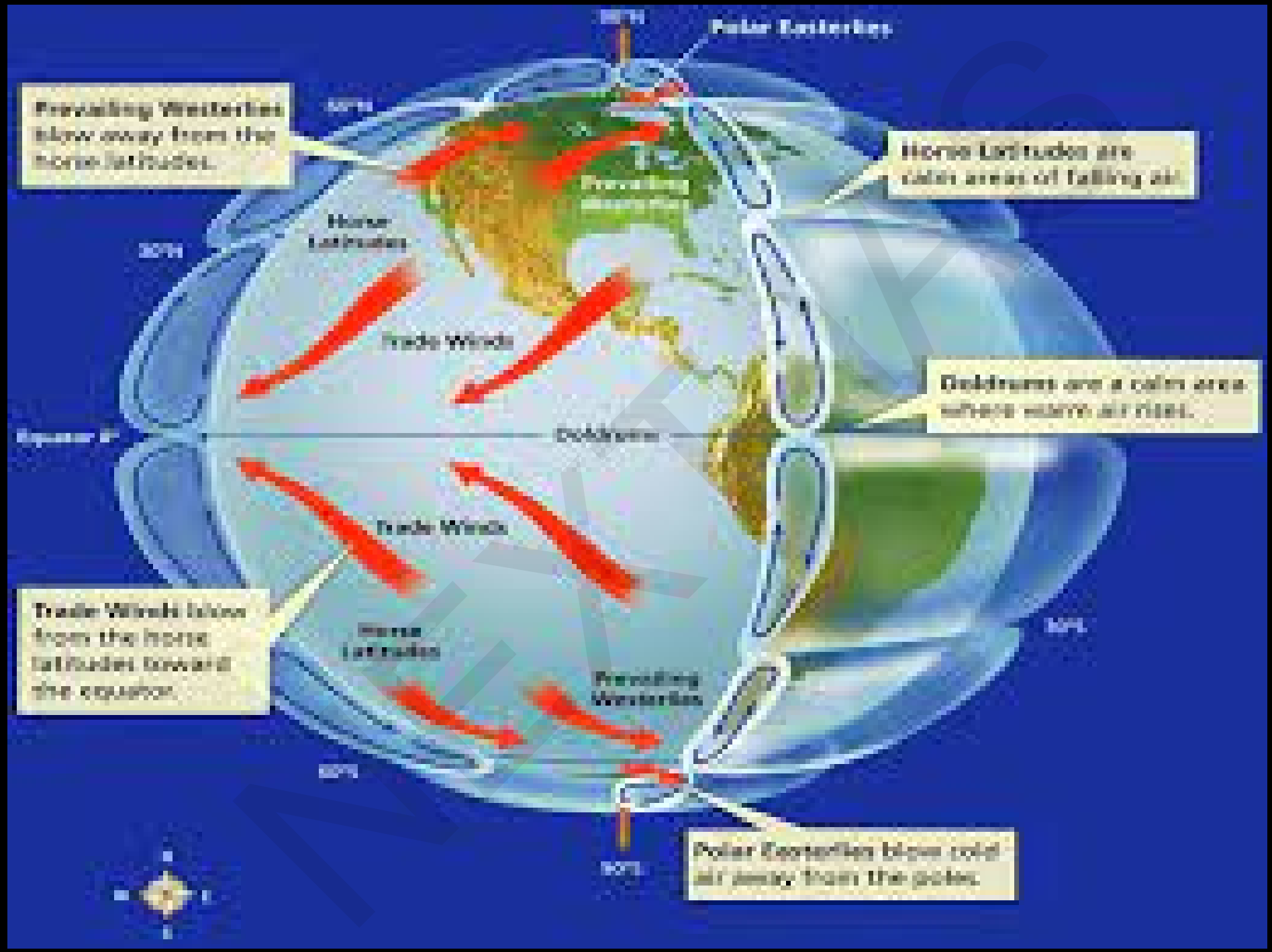
Atmosphere #2

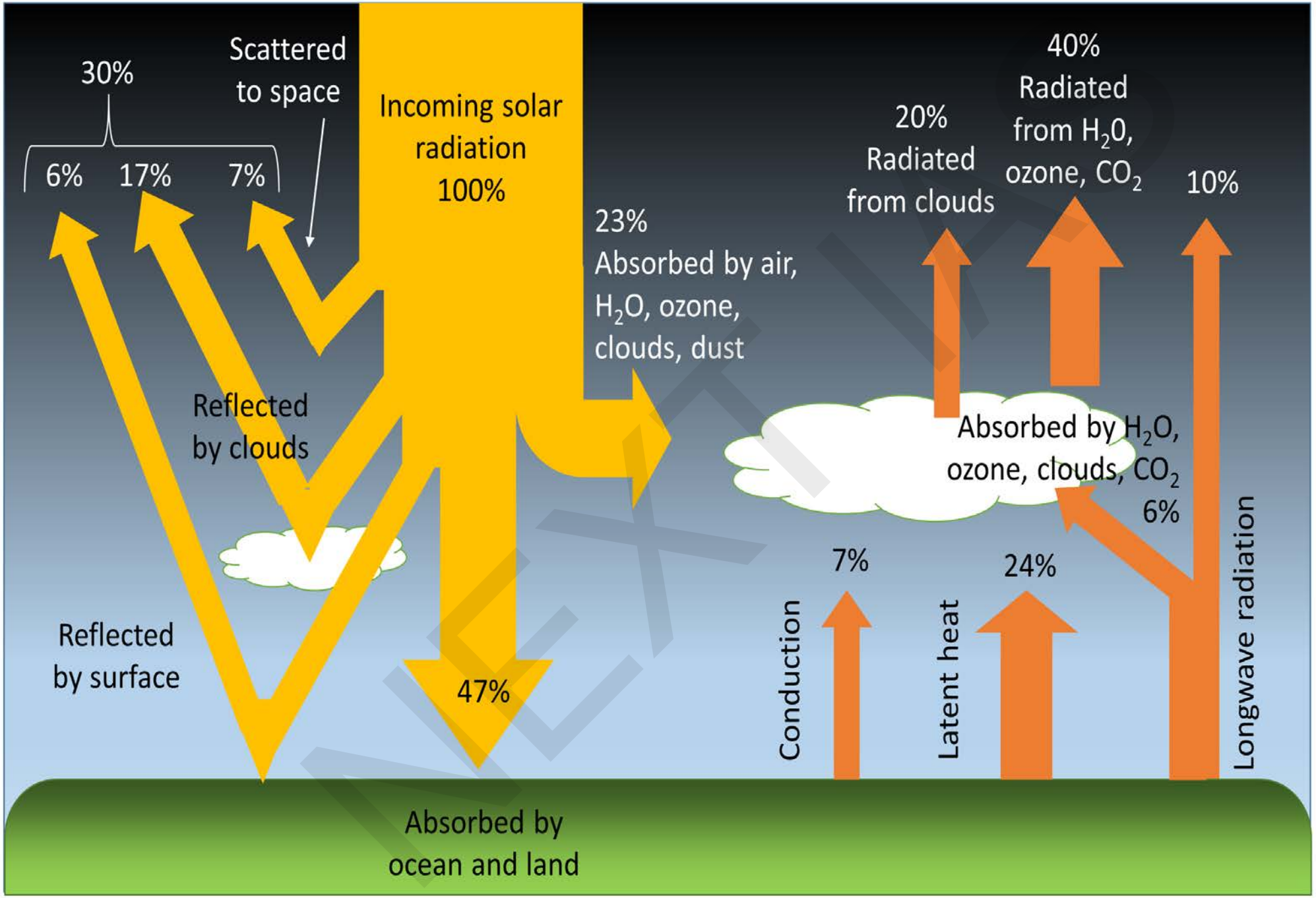

Electrons Hit Air Molecules
Molecules are "Excited"
Molecules Give off Light as they Calm Down
MAGNETOSHEATH
Electrons and Ions
Polar Cusp
SOLAR WIND
Auroral Oval
SUN
BOW SHOCK
Magnetic Field Lines
Magnetic Field Lines
Auroral Oval
SOLAR WIND
Polar Cusp
Electrons and Ions
Electrons Hit Air Molecules
Molecules are "Excited"
Molecules Give off Light as they Calm Down
MAGNETOSHEATH

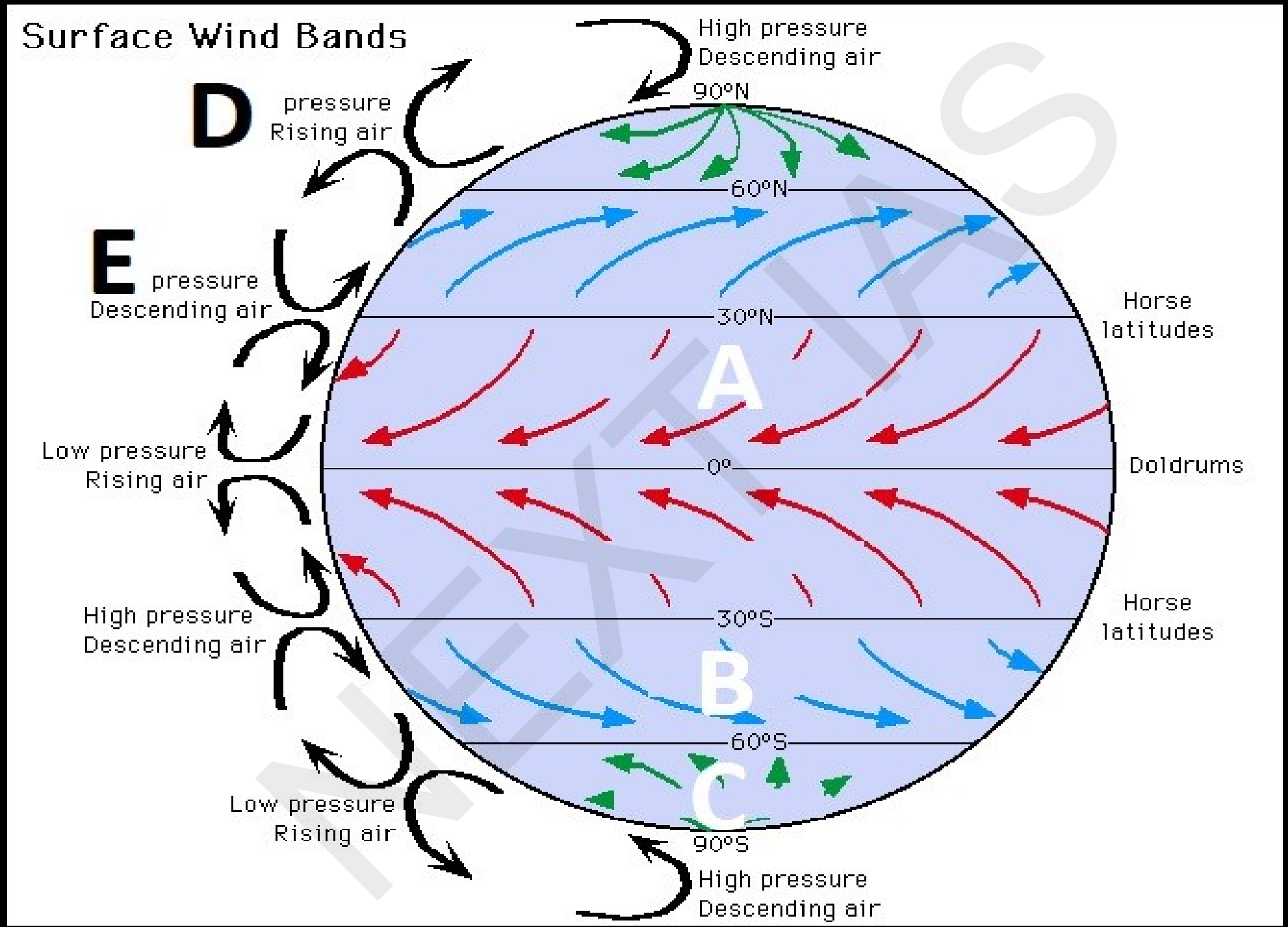

Space
H2
H2
He
H2
He
Atmosphere #1

Layers of Atmosphere

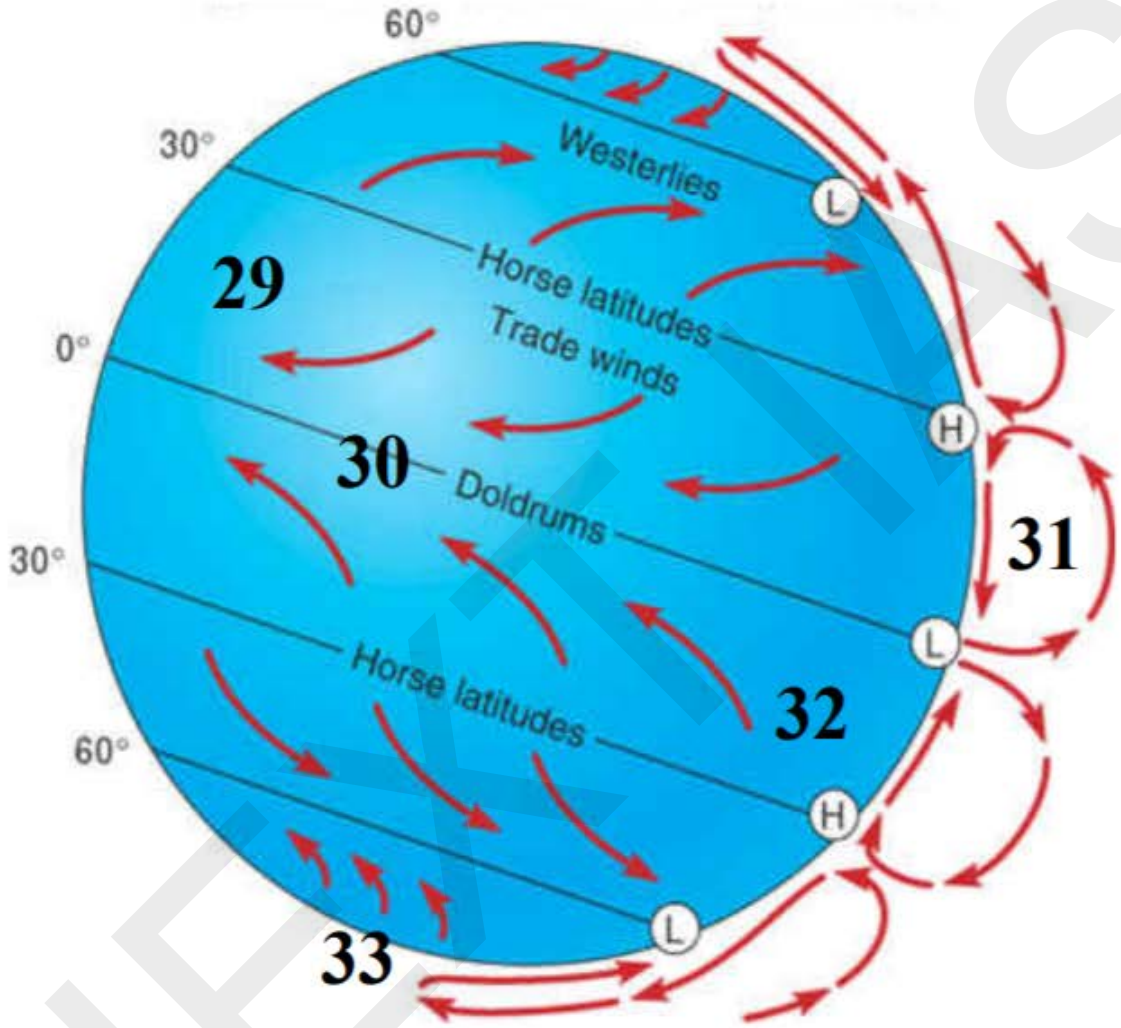



Polar Easterlies
Prevailing Westerlies blow away from the horse latitudes.
Horse latitudes are calm areas of falling air.
Horse Latitudes
Trade Winds
Doldrums are a calm area where warm air rises.
Doldrums
Trade Winds
Trade Winds blow from the horse latitudes toward the equator.
Horse Latitudes
Prevailing Westerlies
Polar Easterlies blow cold air away from the poles.

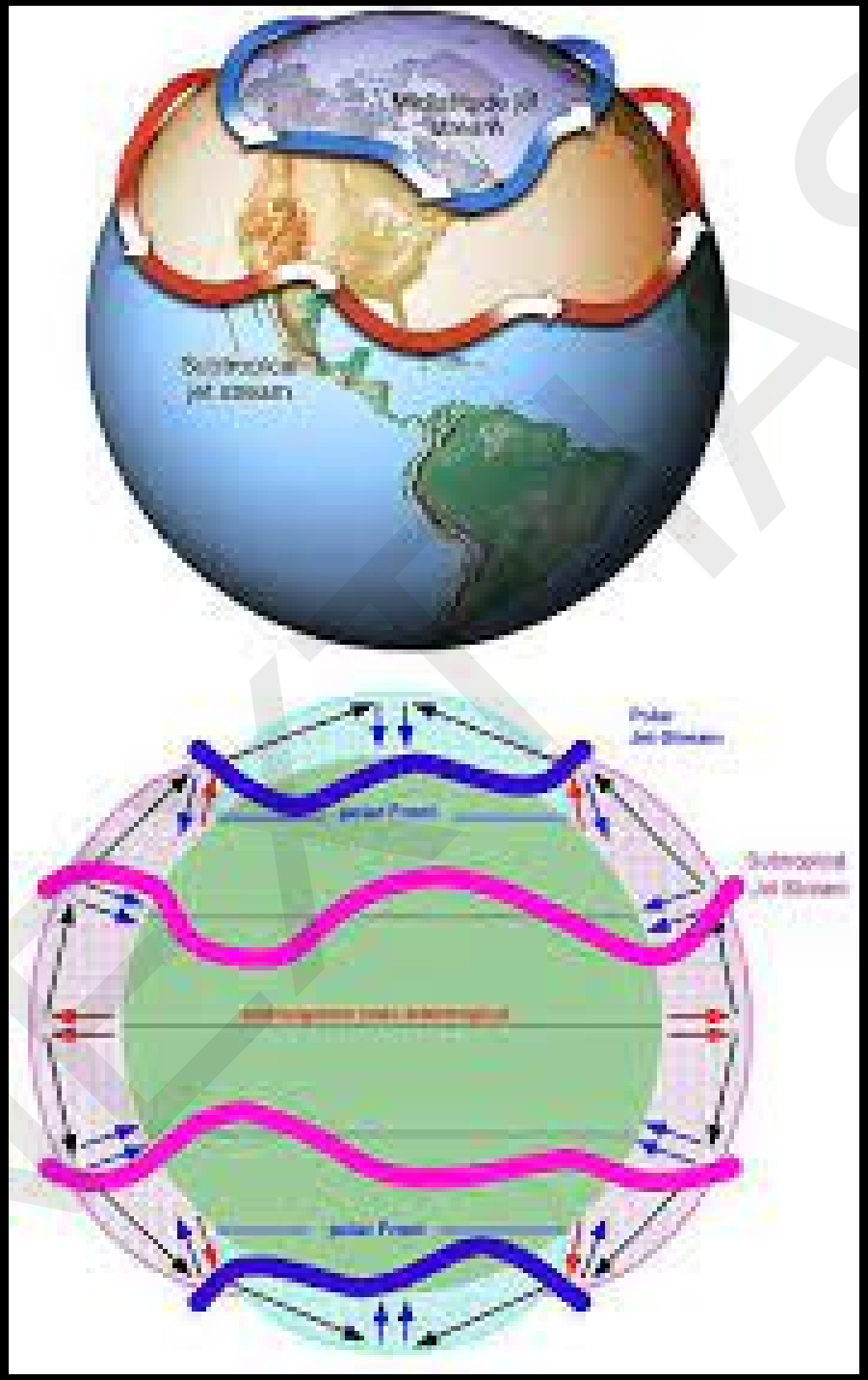

30%
Scattered to space
Incoming solar radiation 100%
6%
17%
7%
23% Absorbed by air, H_2O, ozone, clouds, dust
20% Radiated from clouds
40% Radiated from H_2O, ozone, CO_2
10%
Reflected by clouds
Absorbed by H_2O, ozone, clouds, CO_2 6%
7%
24%
Conduction
Latent heat
Longwave radiation
Reflected by surface
47%
Absorbed by ocean and land

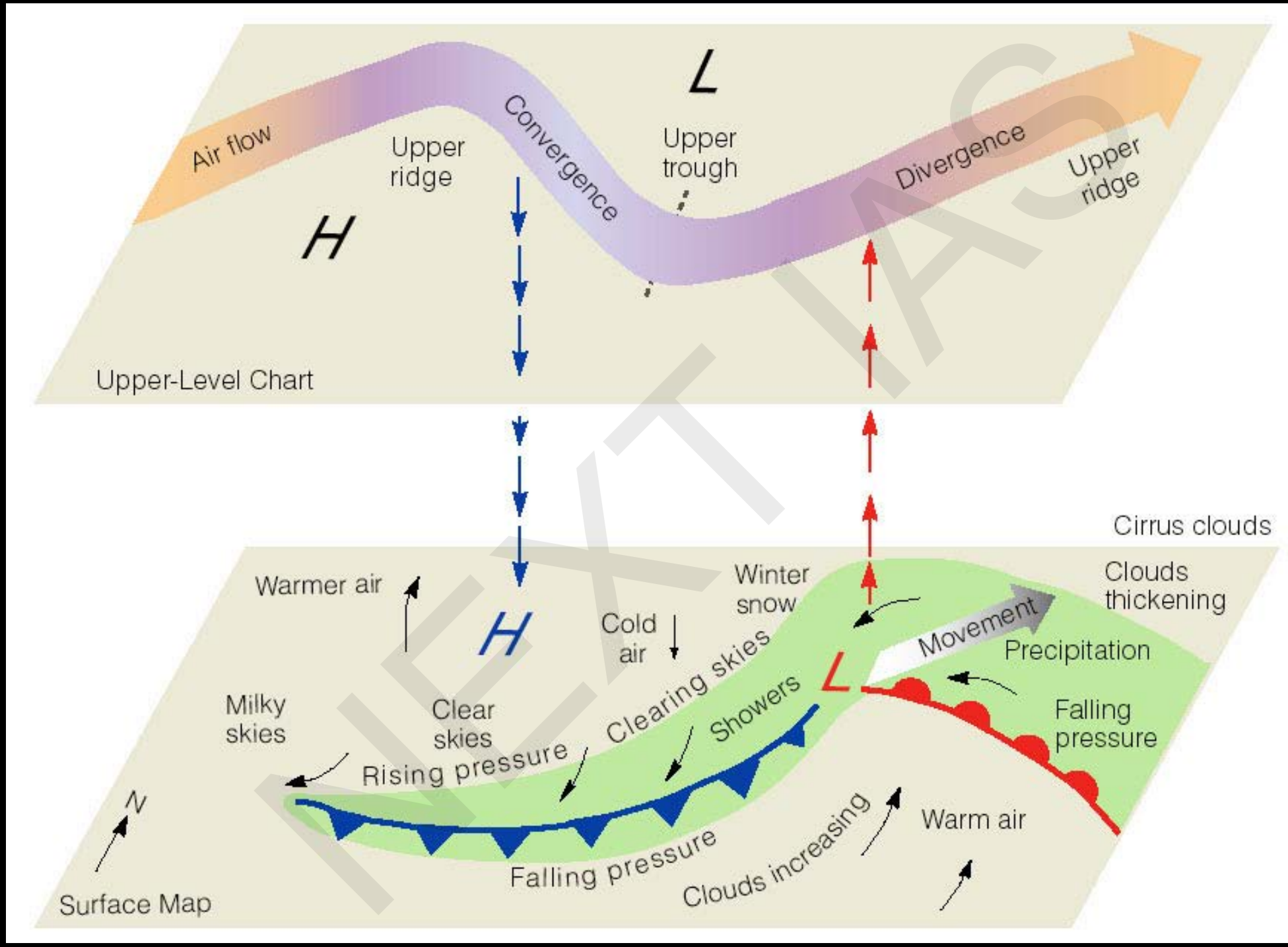

Surface Wind Bands
High pressure
Descending air
90°N
D
pressure
Rising air
60°N
E
pressure
Descending air
30°N
Horse
latitudes
A
Low pressure
Rising air
0°
Doldrums
High pressure
Descending air
30°S
Horse
latitudes
B
60°S
C
Low pressure
Rising air
90°S
High pressure
Descending air

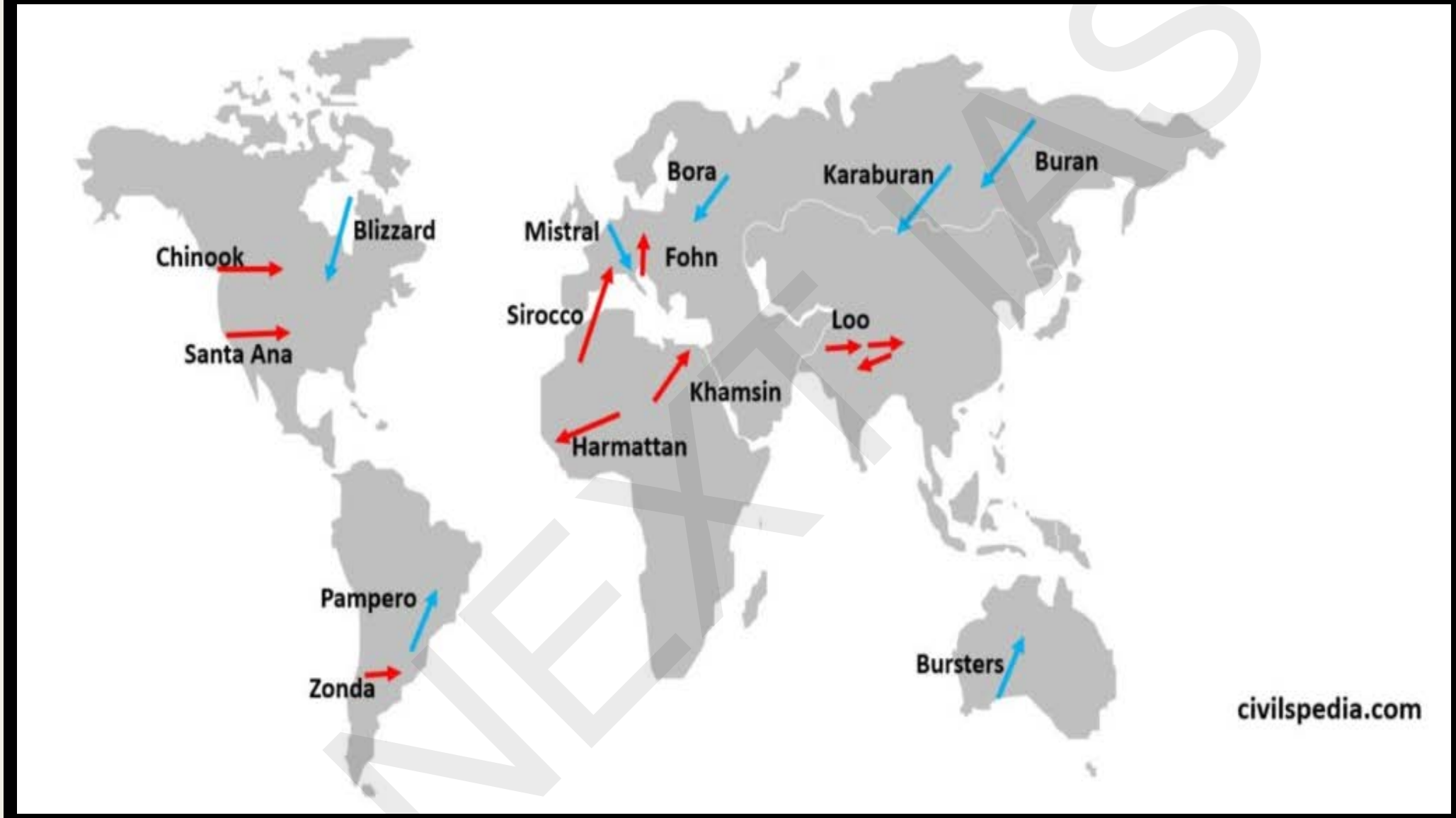
Atmospheric Circulation II

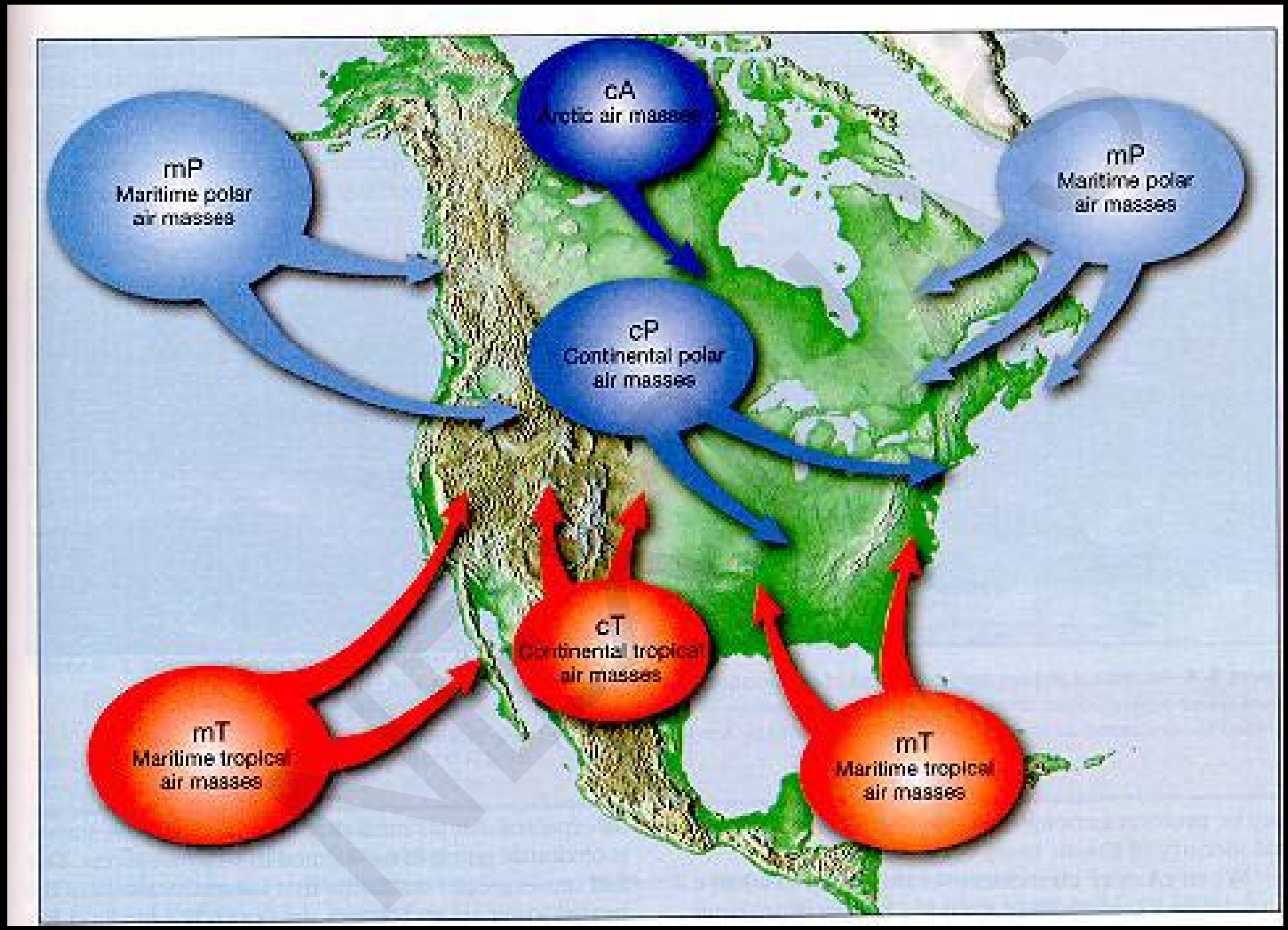


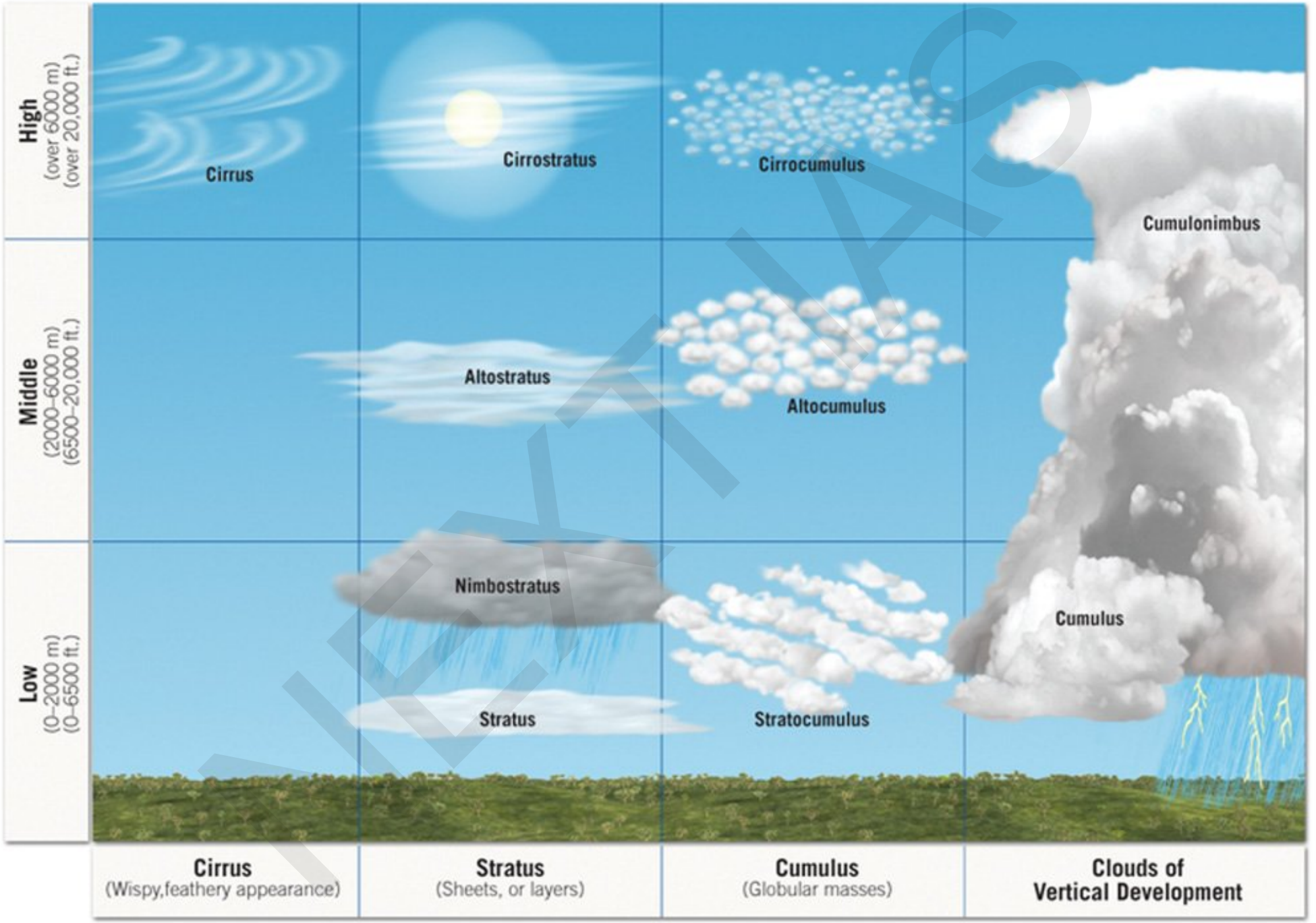
a) Surface winds deflect to the left in the southern hemisphere
b) A polar high pressure, where cold air blows toward the equator away from the pole.
c) Atmospheric circulation from warm, humid region to cool dry region
d) Surface winds converge at the ITCZ
e) Surface winds deflect to the right in the northern hemisphere

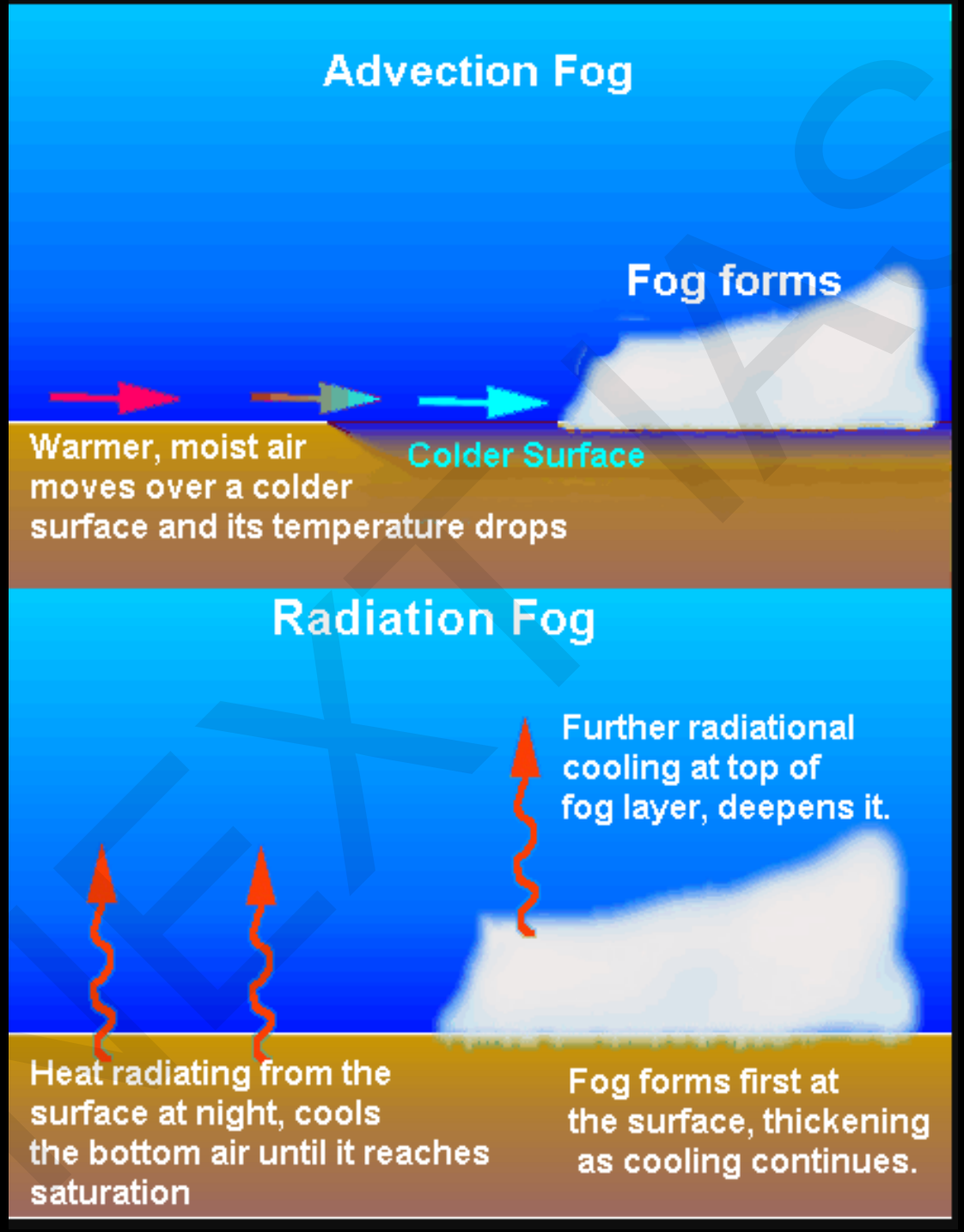

Polar
Subtropical

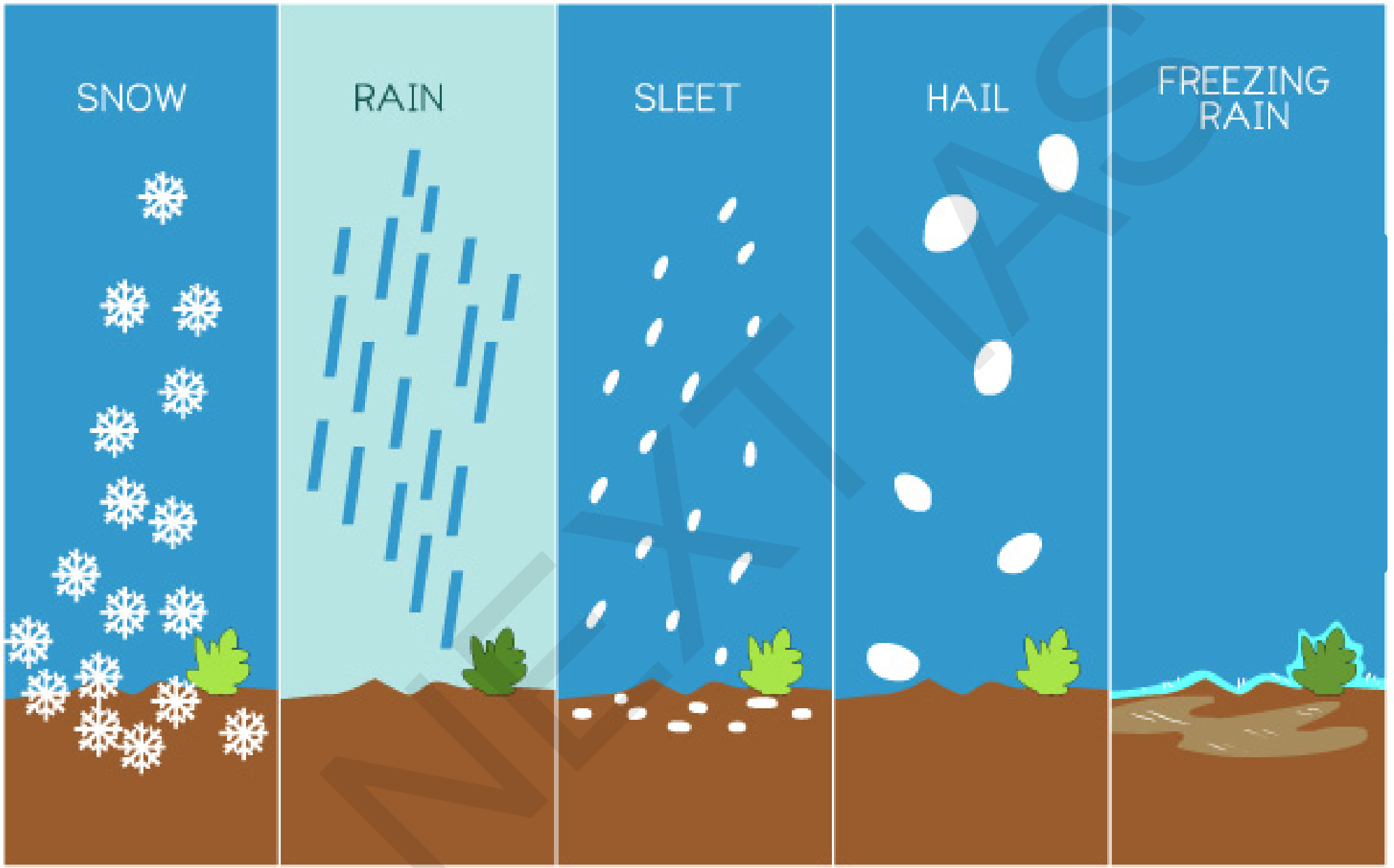

L
Air flow
Upper ridge
Convergence
Upper trough
Divergence
Upper ridge
H
Upper-Level Chart
Cirrus clouds
Warmer air
H
Cold air
Winter snow
Clouds thickening
Movement
Precipitation
L
Clearing skies
Showers
Milky skies
Clear skies
Rising pressure
Falling pressure
N
Surface Map
Falling pressure
Clouds increasing
Warm air


Bora
Karaburan
Buran
Blizzard
Mistral
Chinook
Fohn
Sirocco
Loo
Santa Ana
Khamsin
Harmattan
Pampero
Zonda
Bursters
civilspedia.com


cA
Arctic air masses
mP
Maritime polar
air masses
mP
Maritime polar
air masses
cP
Continental polar
air masses
cT
Continental tropical
air masses
mT
Maritime tropical
air masses
mT
Maritime tropical
air masses


High
(over 6000 m)
(over 20,000 ft.)
Middle
(2000–6000 m)
(6500–20,000 ft.)
Low
(0–2000 m)
(0–6500 ft.)
Cirrus
Cirrostratus
Cirrocumulus
Cumulonimbus
Altostratus
Altocumulus
Nimbostratus
Cumulus
Stratus
Stratocumulus
Cirrus
(Wispy,feathery appearance)
Stratus
(Sheets, or layers)
Cumulus
(Globular masses)
Clouds of
Vertical Development

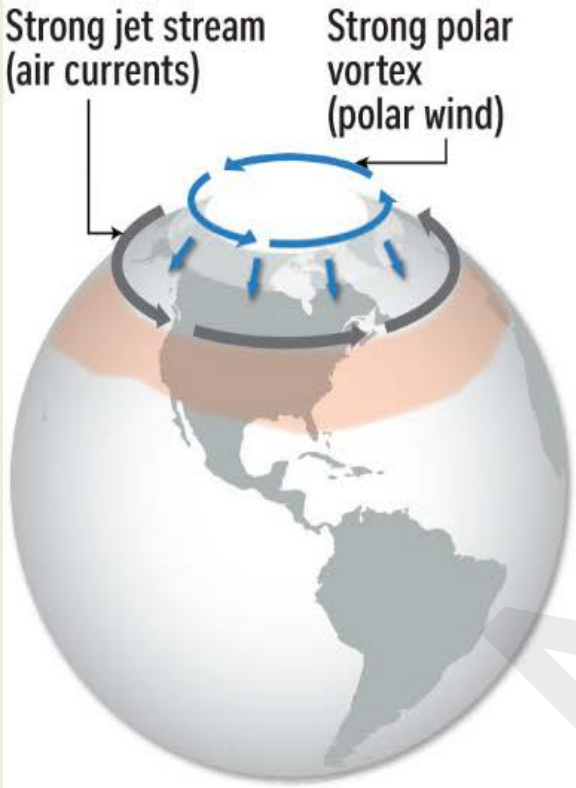

Advection Fog
Fog forms
Warmer, moist air moves over a colder surface and its temperature drops
Colder Surface
Radiation Fog
Further radiational cooling at top of fog layer, deepens it.
Heat radiating from the surface at night, cools the bottom air until it reaches saturation
Fog forms first at the surface, thickening as cooling continues.


SNOW
RAIN
SLEET
HAIL
FREEZING RAIN

Changes in the Arctic

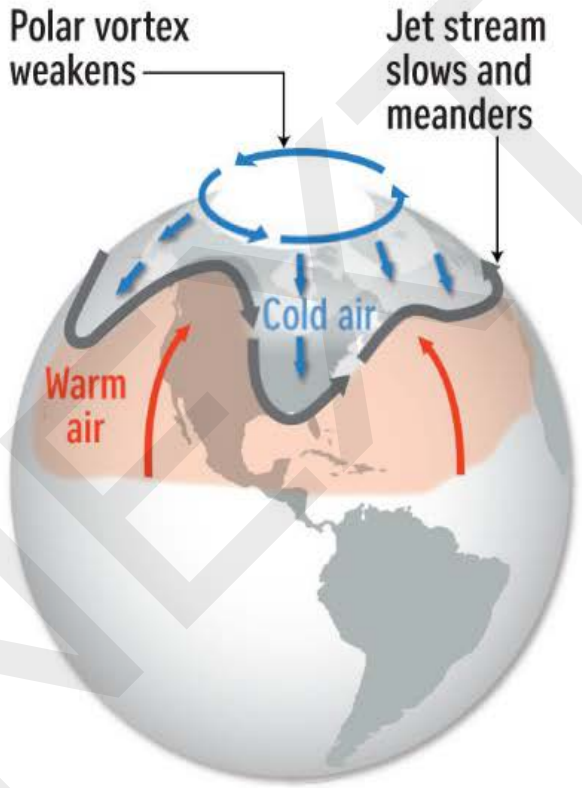
NORMAL CIRCUMSTANCES

Strong polar vortex and jet stream trap freezing air in the Arctic and warm air in lower latitudes

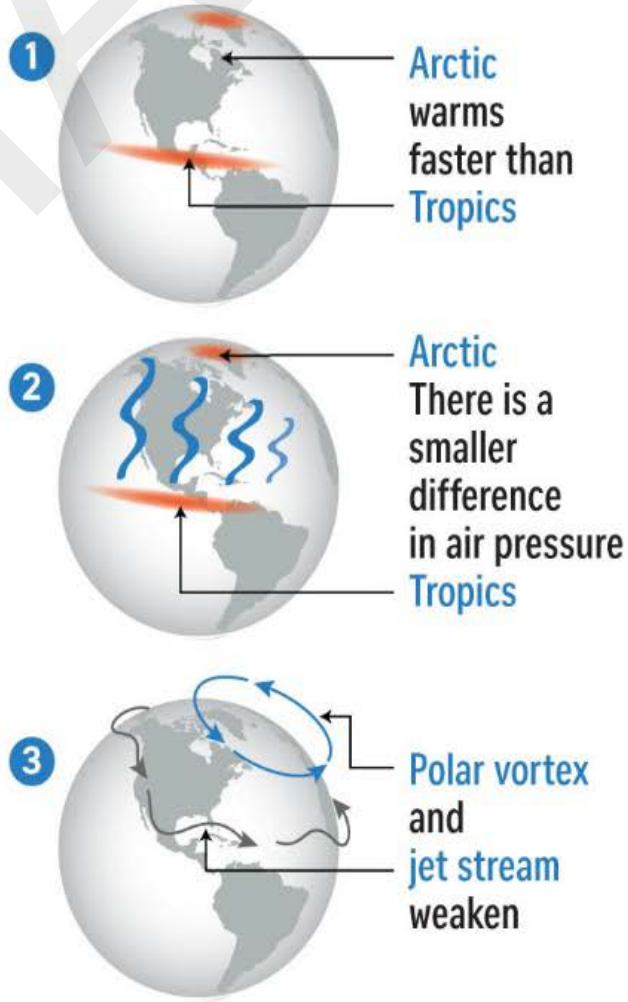


ARCTIC WARMS FASTER THAN LOWER LATITUDES

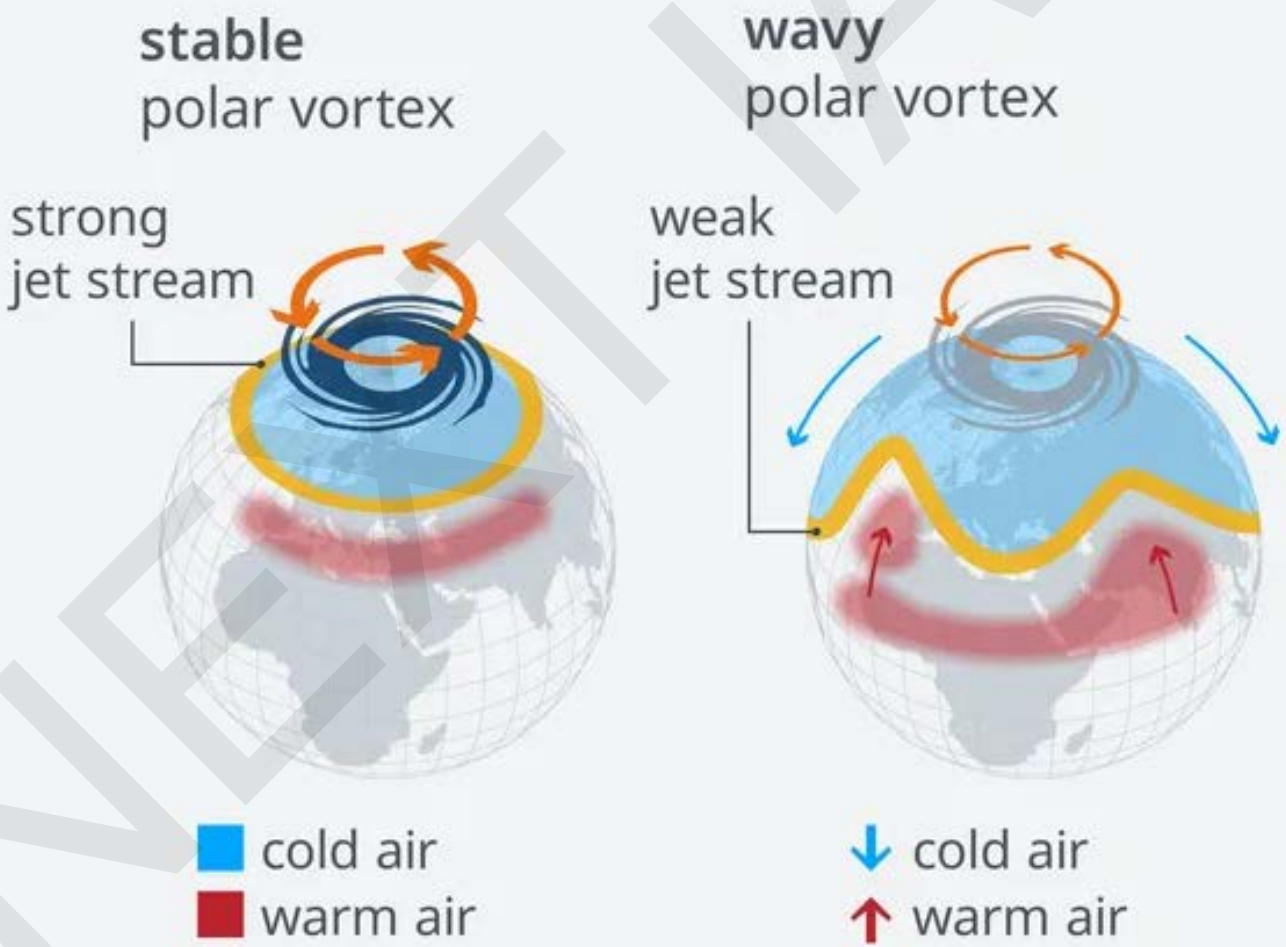
Polar vortex and jet stream weaken, so Arctic air moves south and warm air moves north

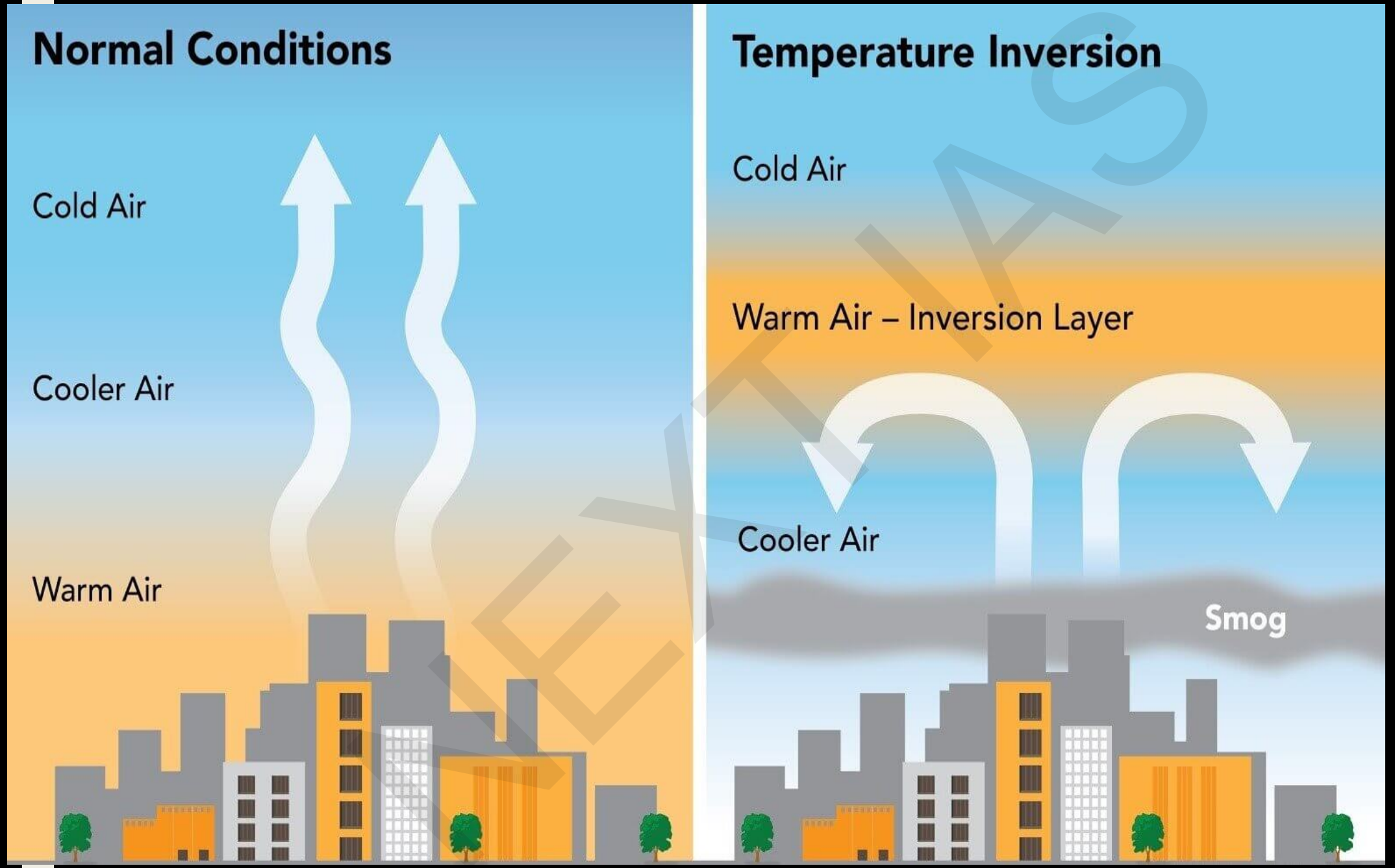


HOW CLIMATE CHANGE DISRUPTS THE POLAR VORTEX



How the polar vortex affects our weather




Normal Conditions
Cold Air
Cooler Air
Warm Air
Temperature Inversion
Cold Air
Warm Air – Inversion Layer
Cooler Air
Smog