
Photo by NASA
DRONESVIP
CIVIL AERONAUTICAL
TRAINING CENTER

ATMOSPHERE

WHAT IS THE ATMOSPHERE?

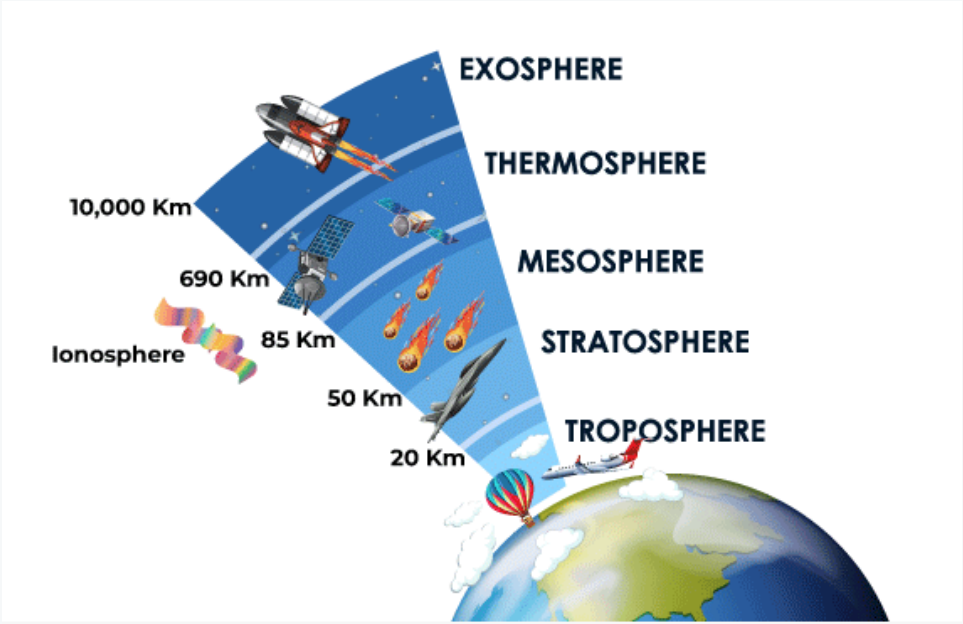
"Gaseous envelope that surrounds the Earth"

COMPOSITION

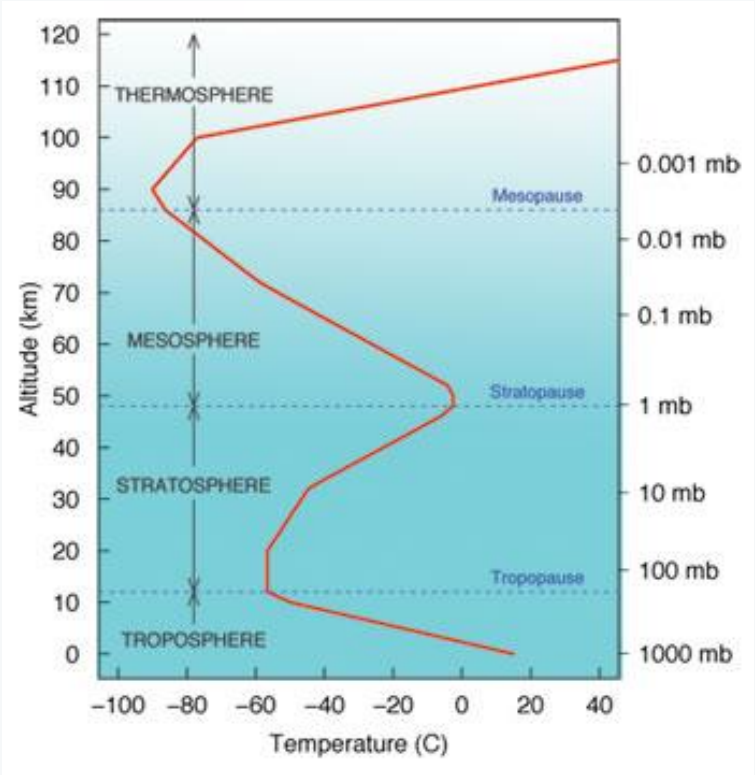
Nickel	78%
Oxygen	21 %
Argon	0.94 %
Carbon Dioxide	0.046 %
Rare gases (Ozone, Hydrogen, Helium, Methane, Xenon, etc.)	0.014 %

condiciones atmosféricas [illegible]
determinado clima.

VERTICAL STRUCTURE



VERTICAL STRUCTURE



TROPOSPHERE: CHARACTERISTICS

Maximum air/ground energy interaction.

Maximum concentration of oxygen and water vapor.

Area of occurrence of most meteorological phenomena.

The density of the air and the atmospheric pressure undergo a rapid decrease depending on the altitude, which determines that the air temperature experiences a decrease of approx. 6.5ºC every 1000mts.

Its thickness is a direct function of the average temperature of the layer.

The upper top of this layer is called "Tropopausa", where the temperature undergoes a reversal in its behavior with altitude, due to the absorption of ultraviolet radiation by Ozone, which is concentrated in the upper layer called "Stratosphere".

The characteristics of the successive layers do not directly or significantly influence meteorological processes that are attempted to be described in this course.

STANDARD ATMOSPHERE (ISA)

The International Standard Atmosphere (ISA) is an atmospheric model defined by the ICAO (International Civil Aviation Organization) in 1949, and adopted by all countries, which presents a standard variation of pressure, temperature, density and viscosity, with height in the Earth's atmosphere and serves as a reference for aeronautical operations (Aircraft Performance, Altimetry, among other uses)

STANDARD ATMOSPHERE (ISA)

Height (m)	Pressure (mb)	Density	Temperature (°C)
0	1013	1.226	15
1000	898.6	1.112	8.5
2000	794.8	1.007	2
3000	700.9	0.910	-4.5
4000	616.2	0.820	-11
5000	540	0.736	-17.5
10000	264.1	0.413	-50
15000	120.3	0.194	-56.5

condiciones

STANDARD ATMOSPHERE (ISA)

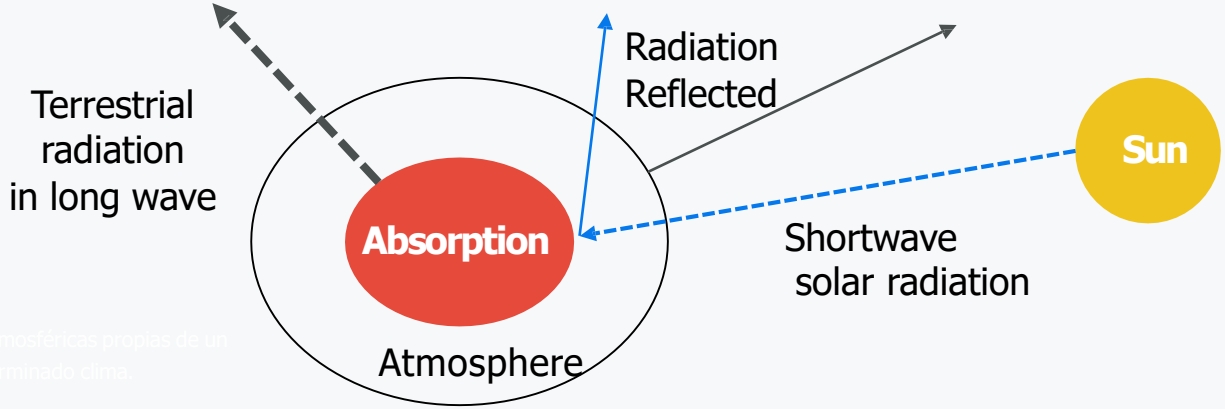
Pressure/Altitude Ratio (according to ISA)
$$h = \frac{\left(1 - \left(\frac{P0}{P_{ref}}\right)^{0.19026}\right) \times 288.15}{0.00198122}$$
h = Altitude, Height or FL (Depending on reference pressure) P_0 = Static Pressure (Atmospheric Pressure) P_{ref} = Reference pressure (altimeter setting)

condiciones atmosféricas propias de un determinado clima.

HEAT ENERGY TRANSMISSION

RADIATION

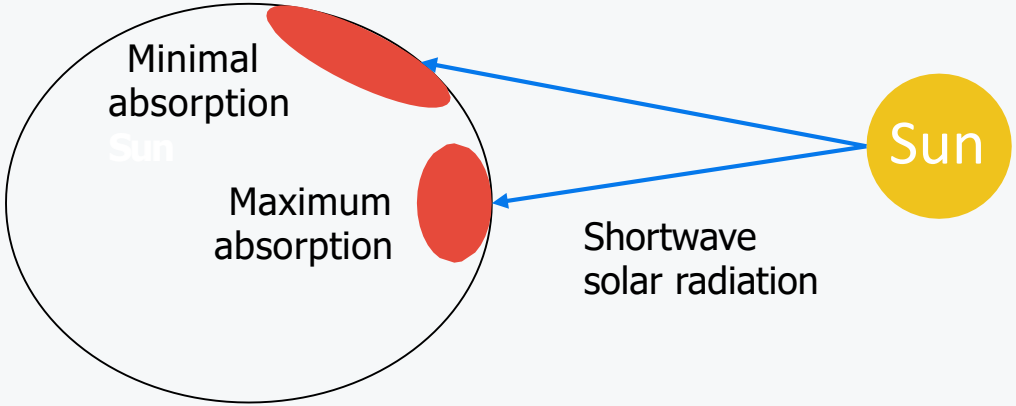
Transport of electromagnetic energy through the Earth's atmosphere. This radiation propagates in different wavelengths, with the solar being shorter than the terrestrial wavelength. The latter does so depending on the surface temperature of the plant.



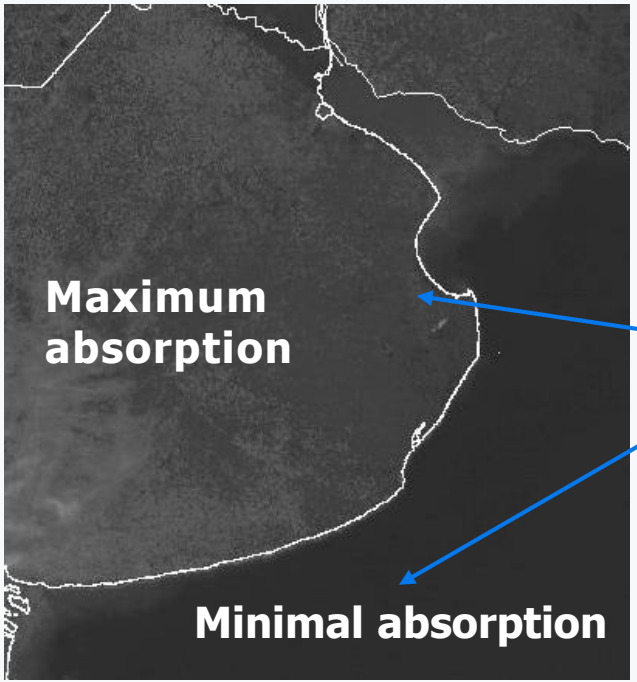
condiciones atmosféricas propias de un determinado clima.

RADIATION

The radiation absorbed by the surface of the planet translates into an increase in its temperature, depending on the type of surface (Earth-water) (types of soil, humidity, etc.) and the angle of incidence of the radiation, this is determined by the latitude, the time of year, the hours of the day

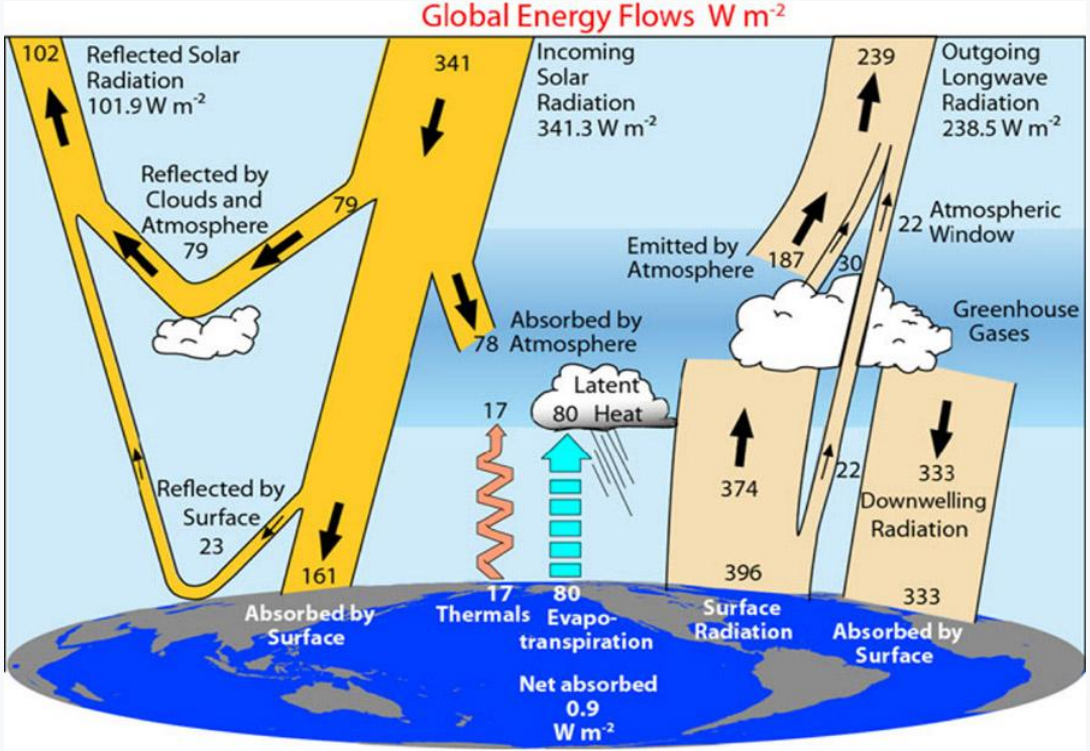


RADIACIÓN



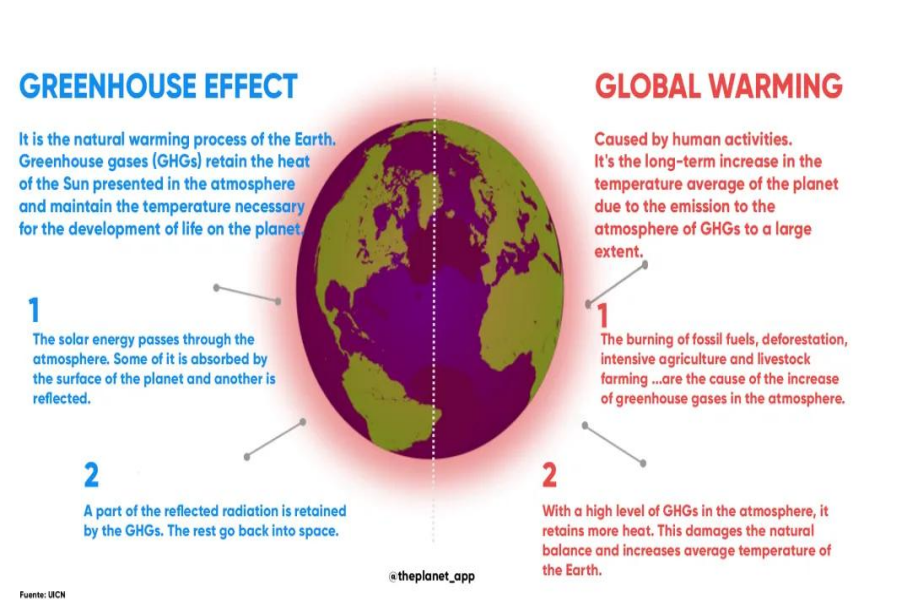
Because most of the solar radiation received by the planet's liquid surfaces is used to evaporate surface water, the maximum use of solar radiation occurs in areas of the mainland.

RADIOACTIVE EARTH-ATMOSPHERE BALANCE

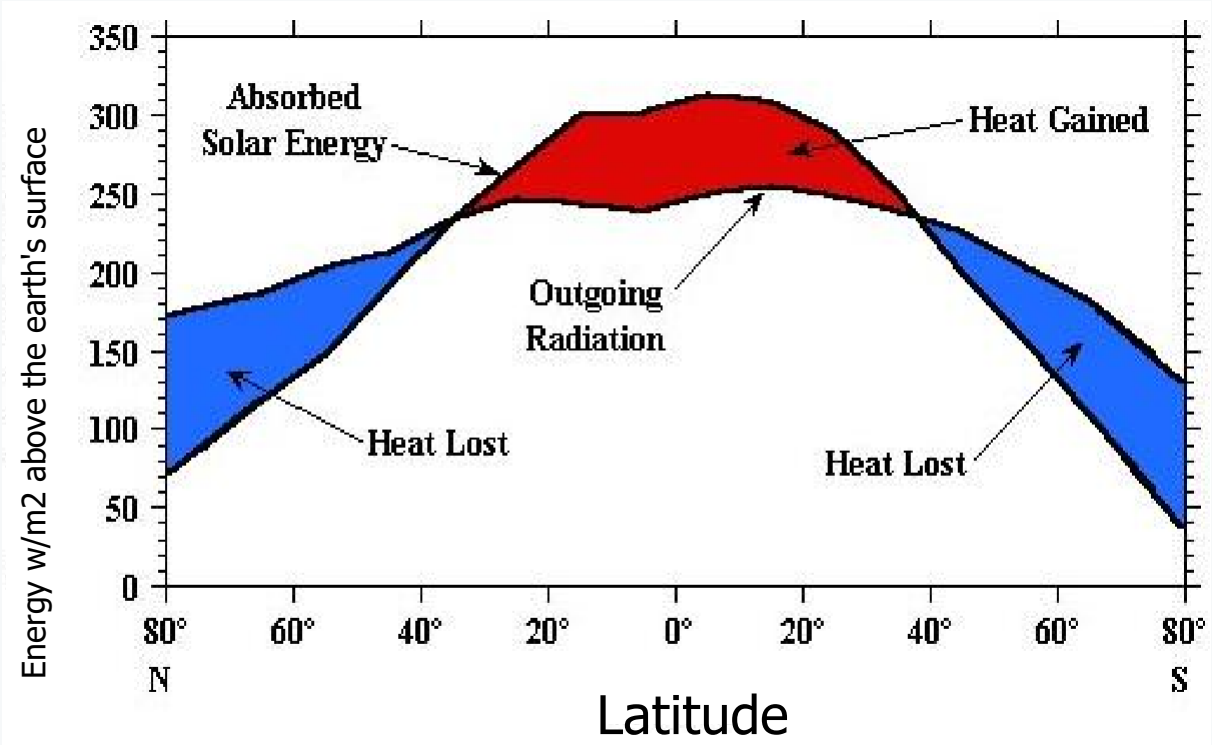


GLOBAL WARMING

In the lower troposphere, there are gases such as CO2, among others, that have the ability to reflect back to the earth's surface, the longwave radiation that the earth's surface emits, helping to mitigate cooling, particularly at night, thus maintaining a balance between warming and cooling of the earth's surface. But an increase in the amount of these gases, a product of the hand of Man, generates an imbalance in the natural balance, leading to a progressive warming of the planet.



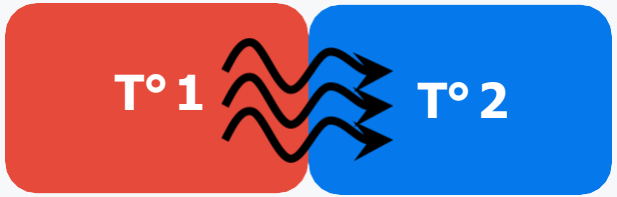
LATITUDINAL SOLAR RADIATION BALANCE



CONDUCTION

Heat transport by contact between two bodies, from the one with the highest temperature, to the one with the lowest temperature, until thermal equilibrium is reached between them

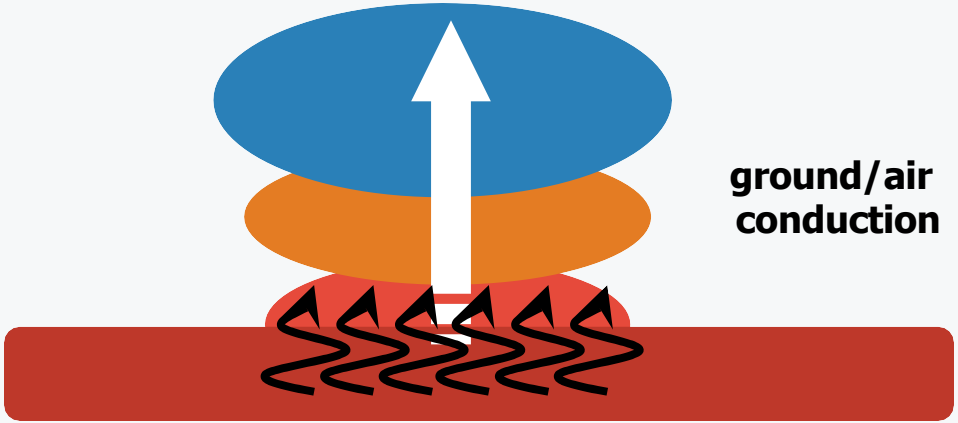
T° 1 >T° 2



T° 1 =T° 2

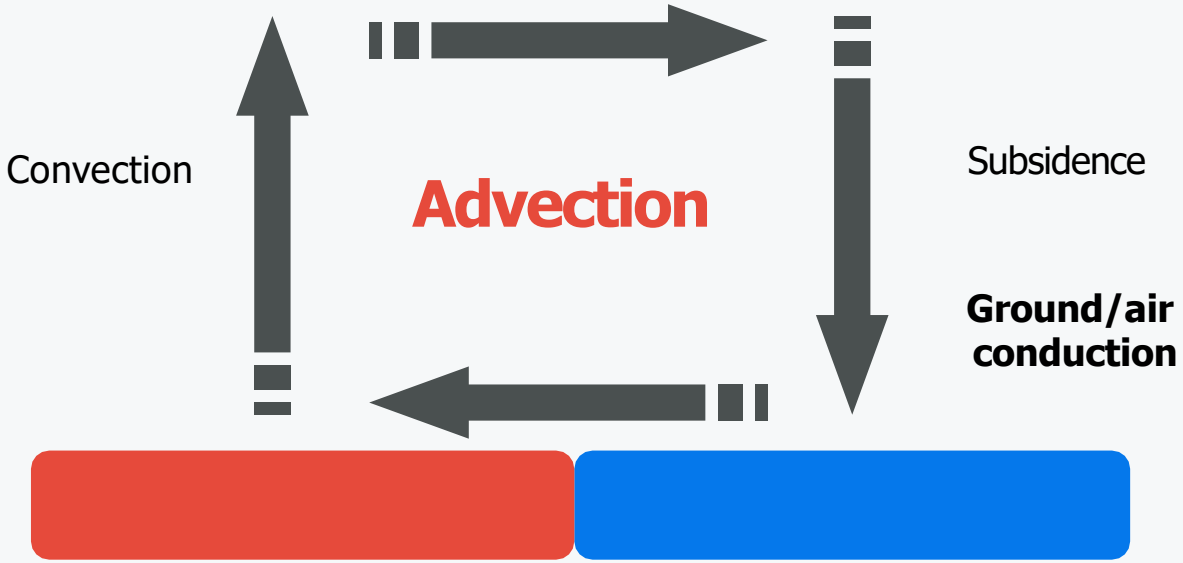
CONVECTION

Vertical heat transport (ascent), from heating from below. The air parcel rises, because when heated its density and weight decreases, thus forming an updraft that transports the heat upwards



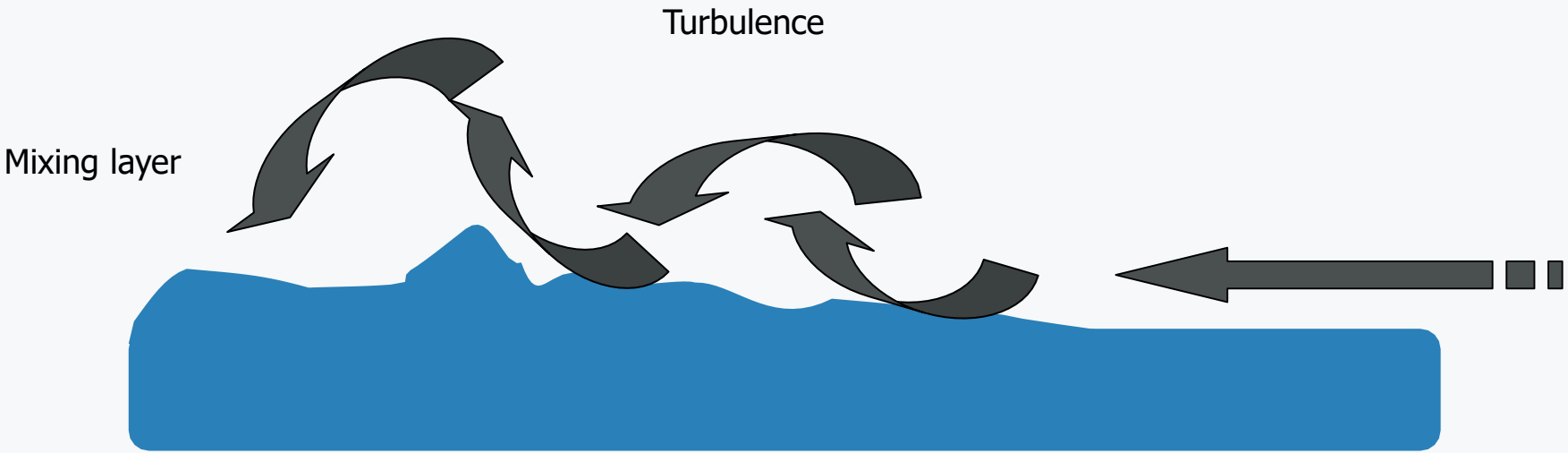
ADVECTION

Horizontal transport of heat, humidity, etc.



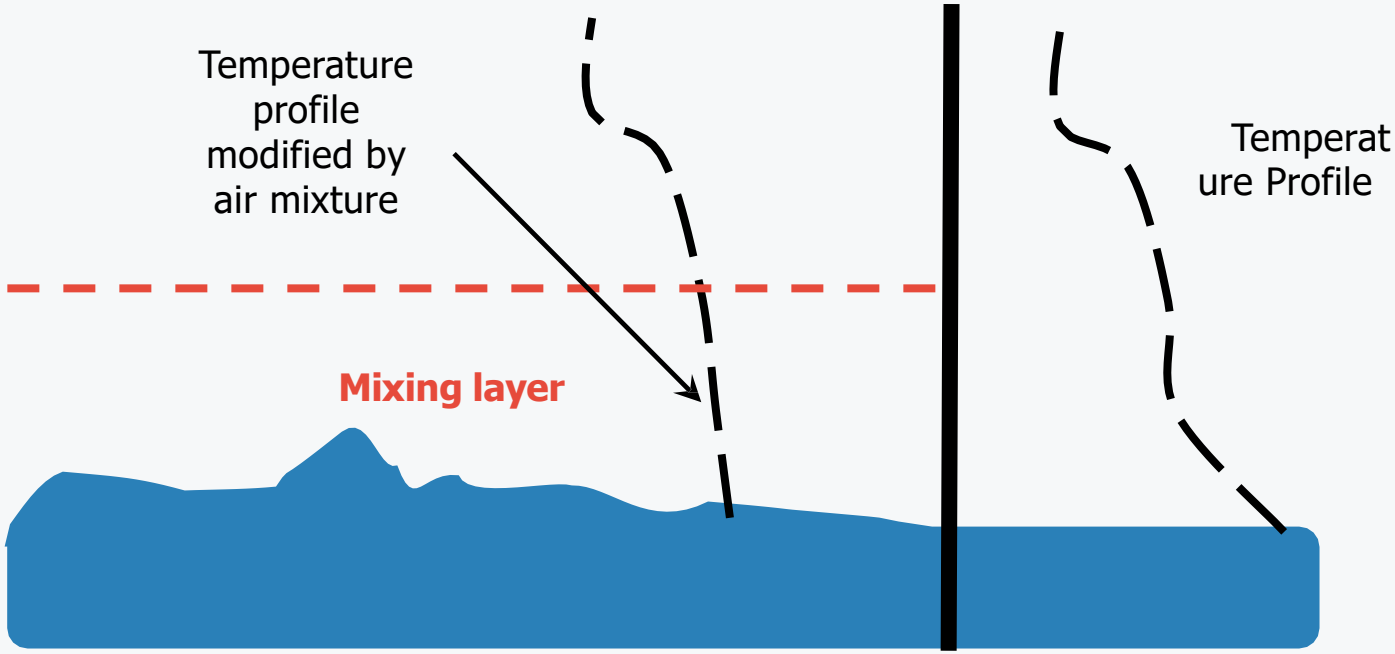
MIXTURE

Energy transport from turbulence originating in a layer



MIXTURE

Energy transport from turbulence originating in a layer



QUESTION TIME!

DRONESVIP
CAPACITATION