OZONE DEPLETION

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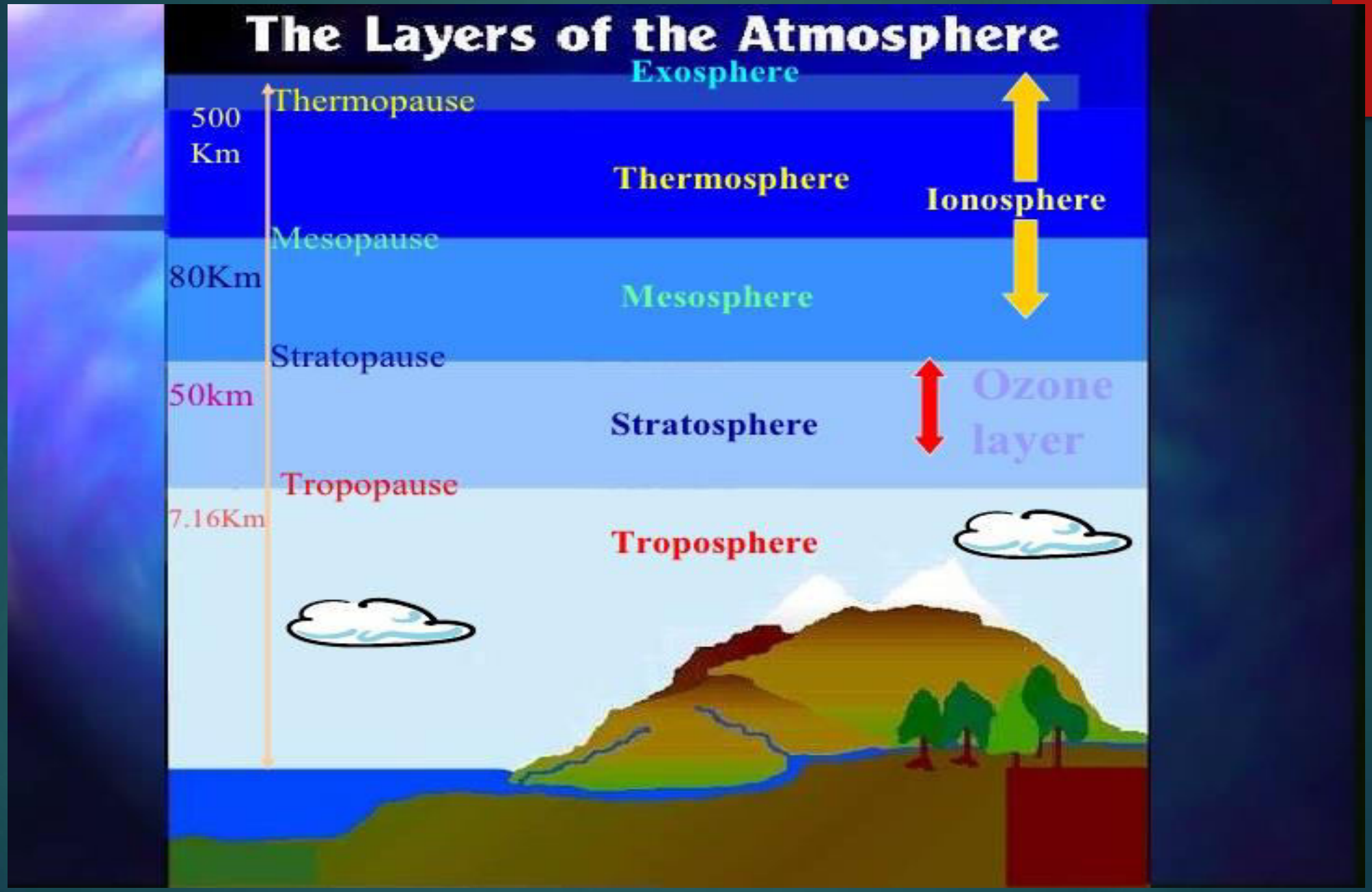
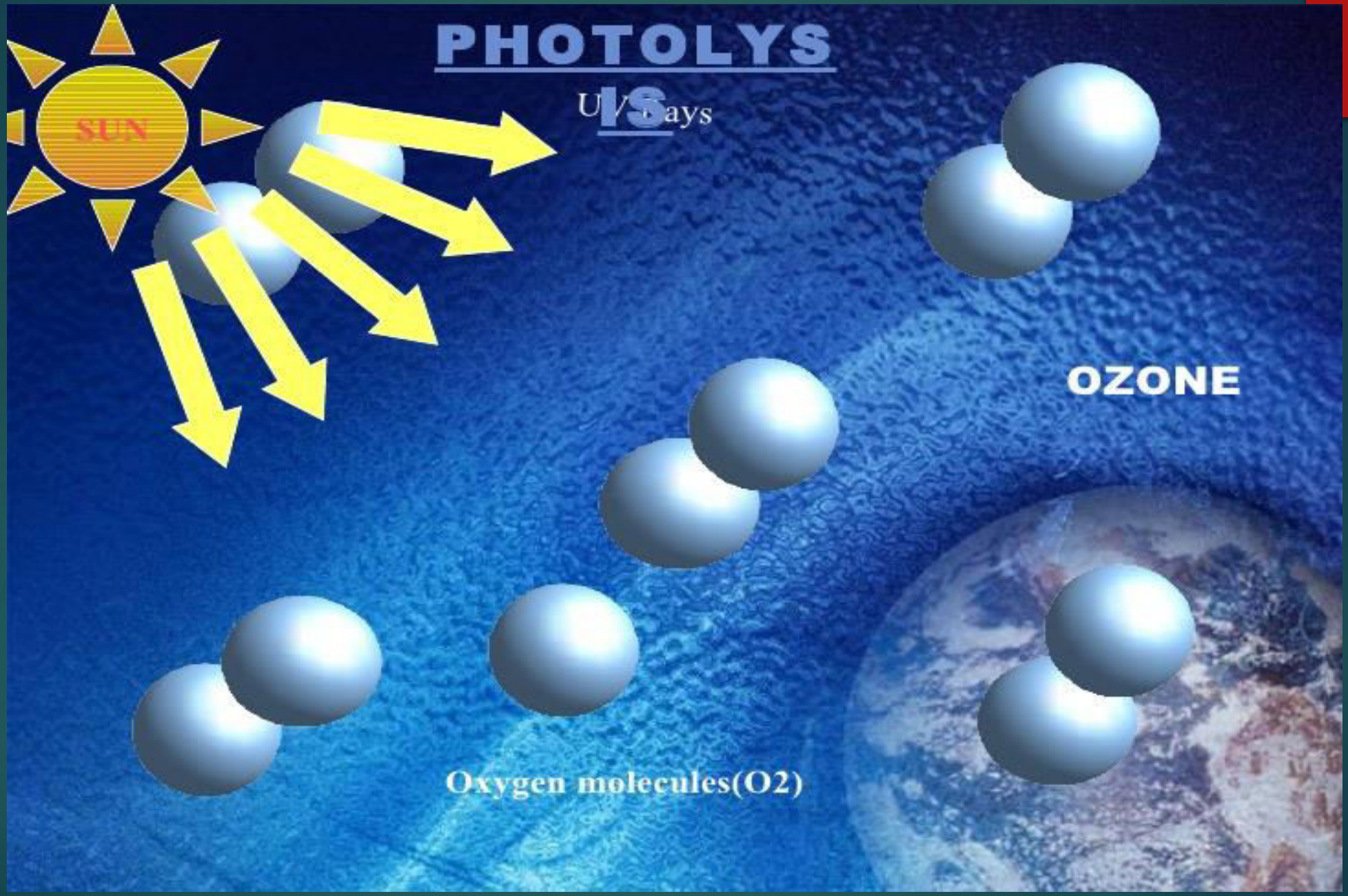
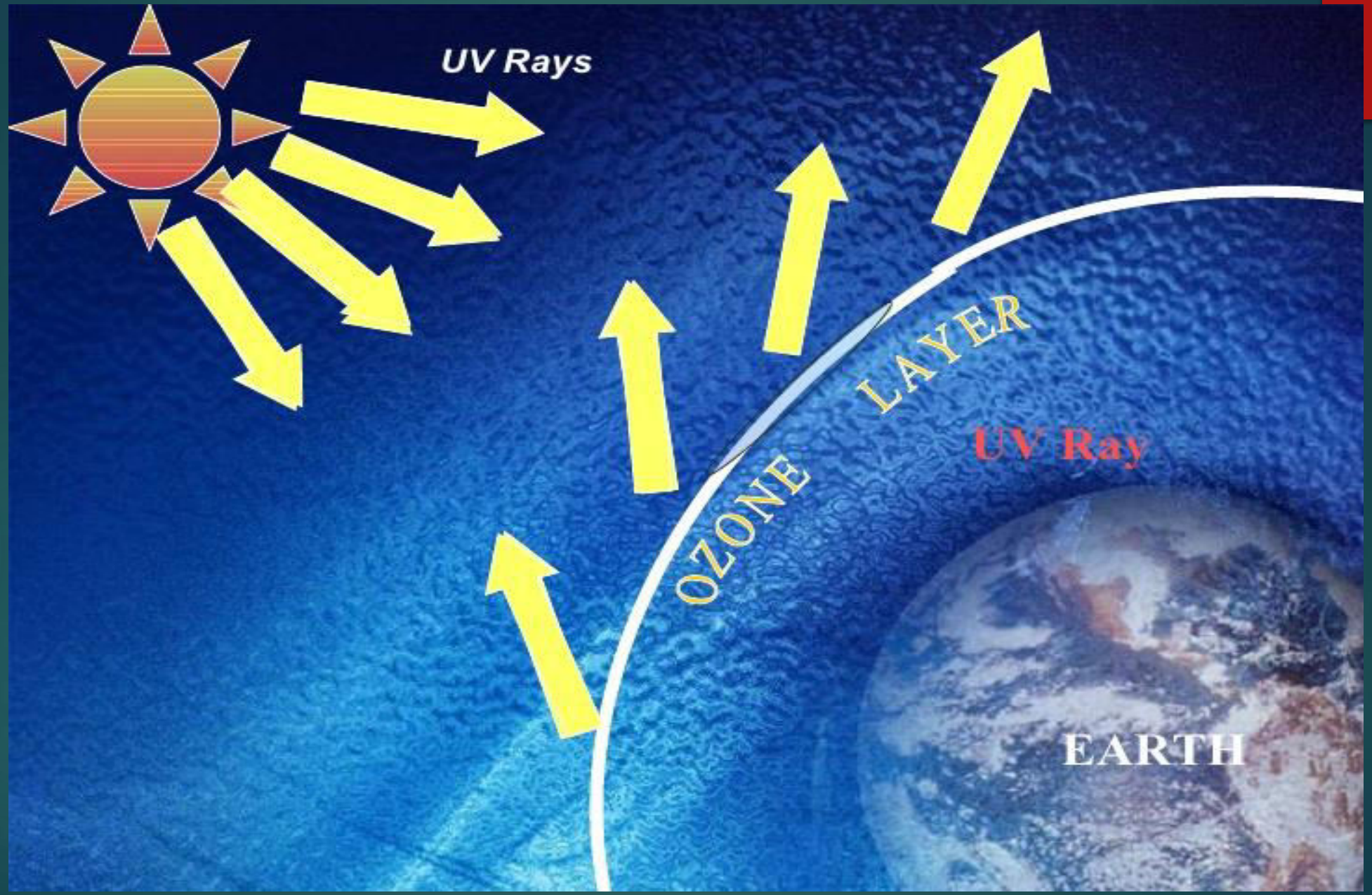

The Layers of the Atmosphere
Exosphere
Thermopause
500 Km
Thermosphere
Ionosphere
Mesopause
80Km
Mesosphere
Stratopause
50km
Stratosphere
Ozone layer
Tropopause
7.16Km
Troposphere

OZONE

- Bluish colored gas.
- Pleasant smelling in small concentration.
- Pungent smelling as concentration increases.
- Concentration under 10 parts per million.
- Found places near the oceans.


PHOTOLYS
UV Rays
SUN
OZONE
Oxygen molecules(O2)


UV Rays
OZONE LAYER
UV Ray
EARTH

DISCOVERY OF OZONE DEPLETION

- In 1985, using satellites, balloons, and surface stations, a team of researchers had discovered a balding patch of ozone in the upper stratosphere, the size of the United States, over Antarctica.

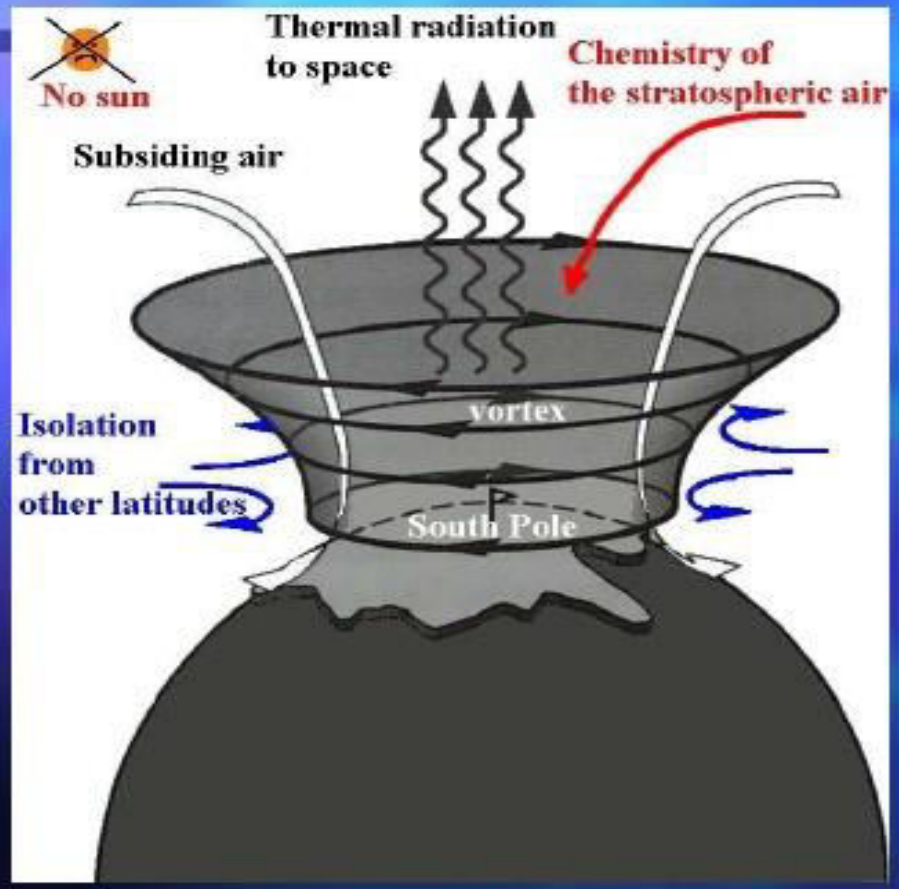
Team who discovered the hole 1985.
From left: Joe Farman, Brian Gardiner, and Jonathan Shanklin

FORMATION OF HOLE

Hole Formation Based on Two different mechanisms:

- Meteorological Mechanism
- Chemical Mechanism

Meteorological Mechanism

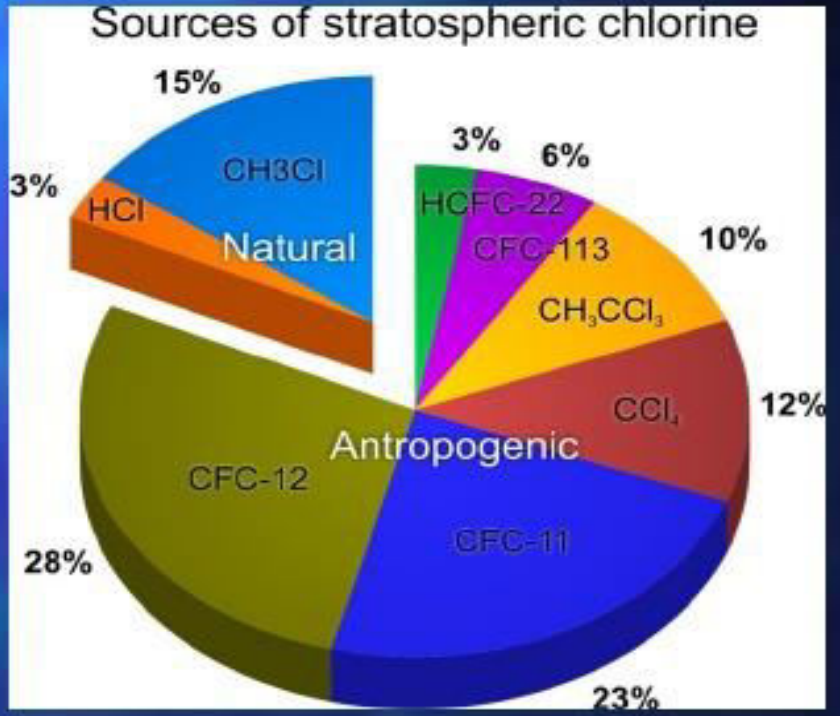


- Movement of air from one place to another in the upper stratosphere
- Cold temperature in the upper atmosphere causes nitric acid to freeze into crystals forming wispy pink clouds
- Forms a vortex of tightly twisted winds thus forming a hole in the upper atmosphere

Chemical Mechanism

- Different chemicals are responsible for the destruction of the ozone layer
- Topping the list :
  - chlorofluorocarbons (CFC's)
  - man-made, non-toxic and inert in the troposphere
  - In the stratosphere are photolysed, releasing reactive chlorine atoms that catalytically destroy ozone

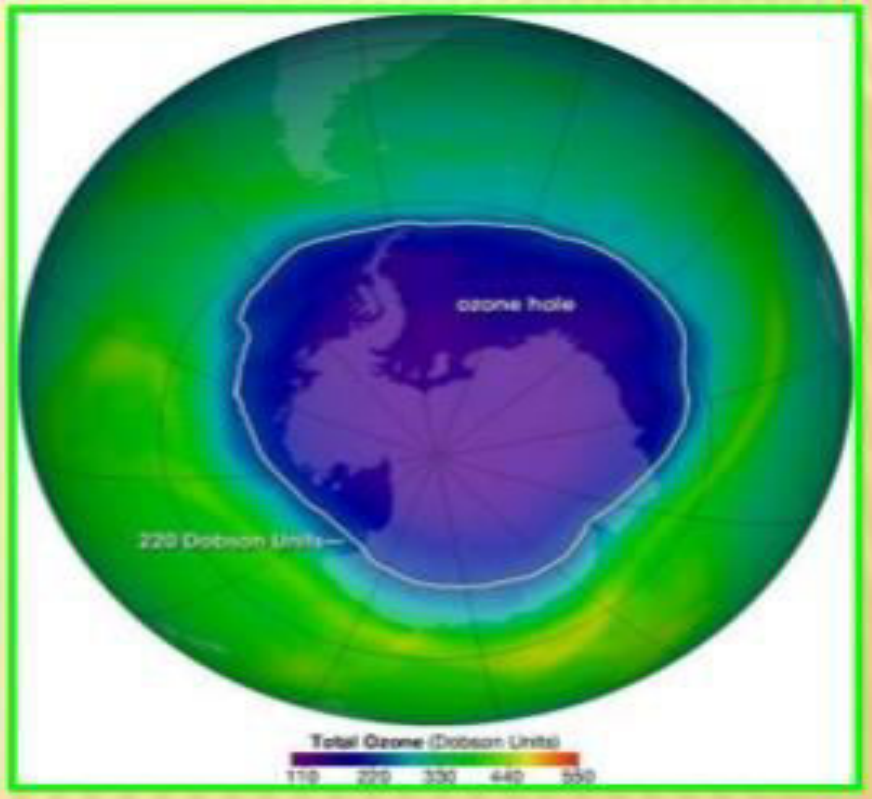
Ozone Depleting Substance



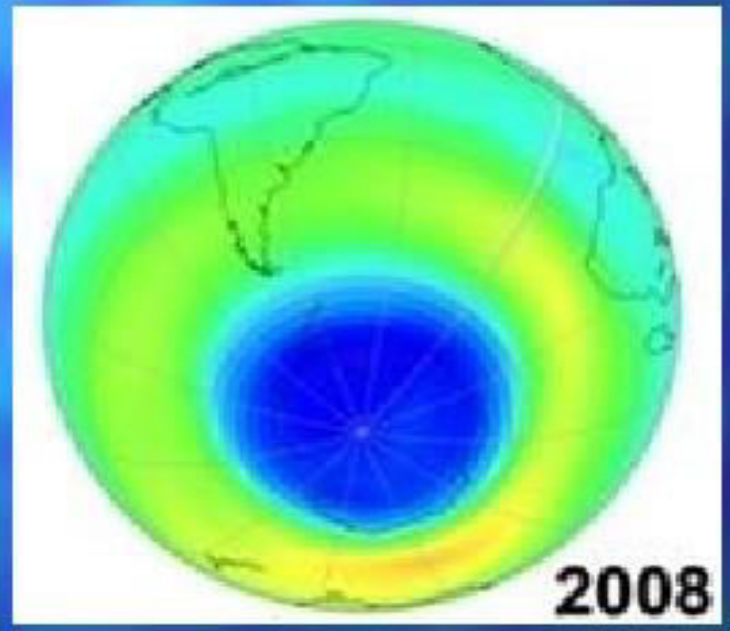
WHAT IS THE OZONE HOLE?

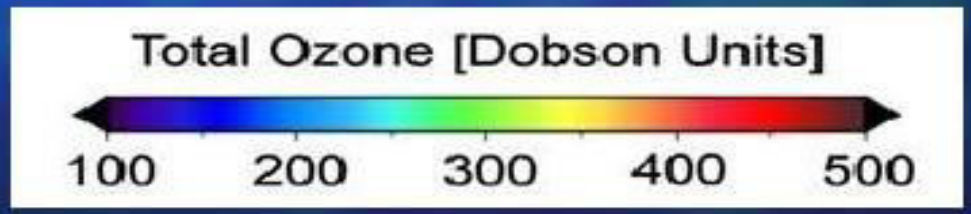
- The ozone hole is not technically a "hole" where no ozone is present, but is actually a region of depleted ozone in the stratosphere over the Antarctic that happens at the beginning of Southern Hemisphere spring (August-October).

- The average concentration of ozone in the atmosphere is about 300 Dobson Units; any area where the concentration drops below 220 Dobson Units is considered part of the ozone hole.

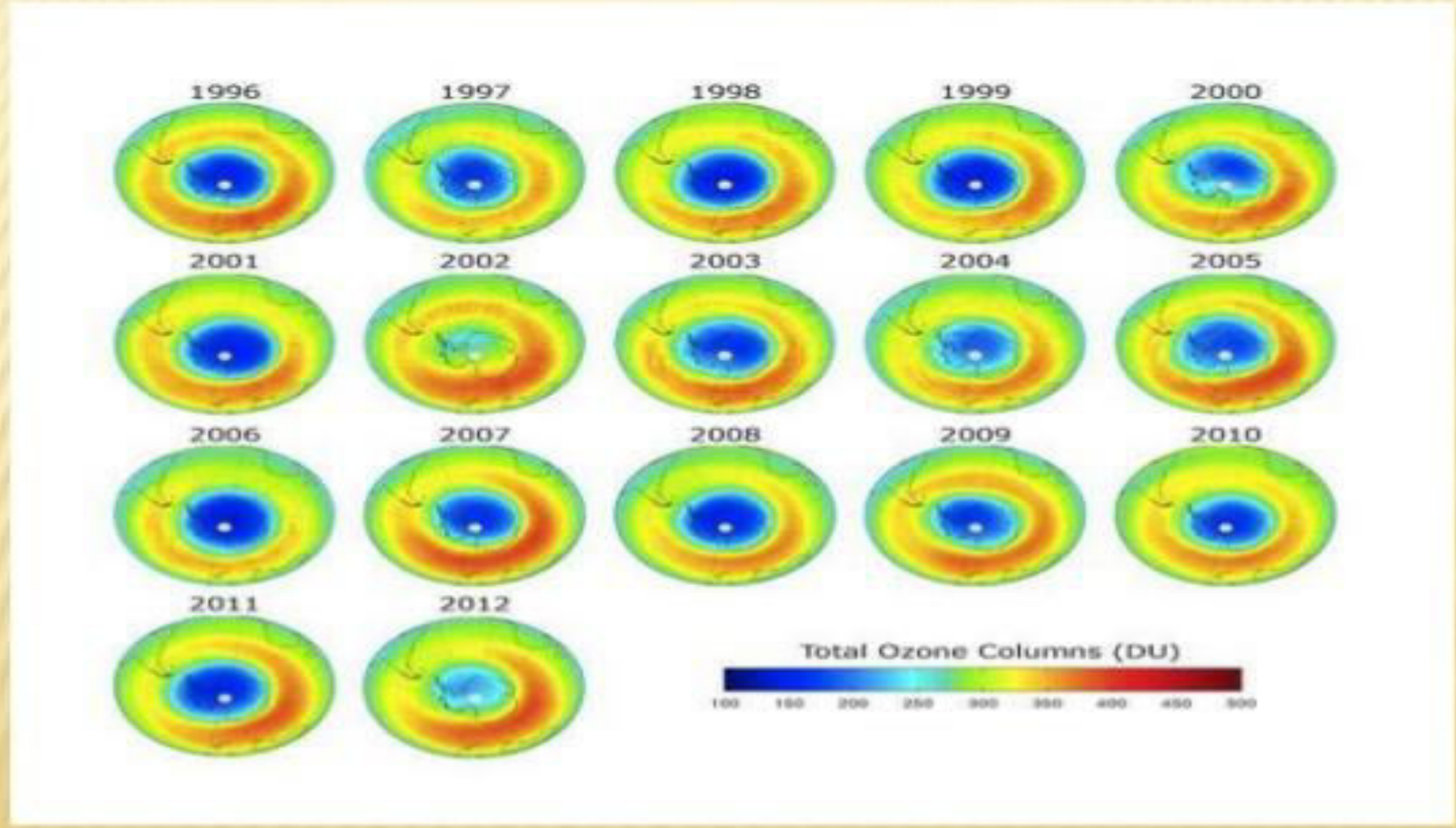


OZONE HOLE 1995-2008





OZONE HOLE OVER THE YEARS



EFFECTS ON HUMAN HEALTH

- Skin Cancer (melanoma and nonmelanoma)
- Premature aging of the skin and other skin problems
- Cataracts and other eye damage
- Immune system suppression

STEPS AGAINST OZONE DEPLETION

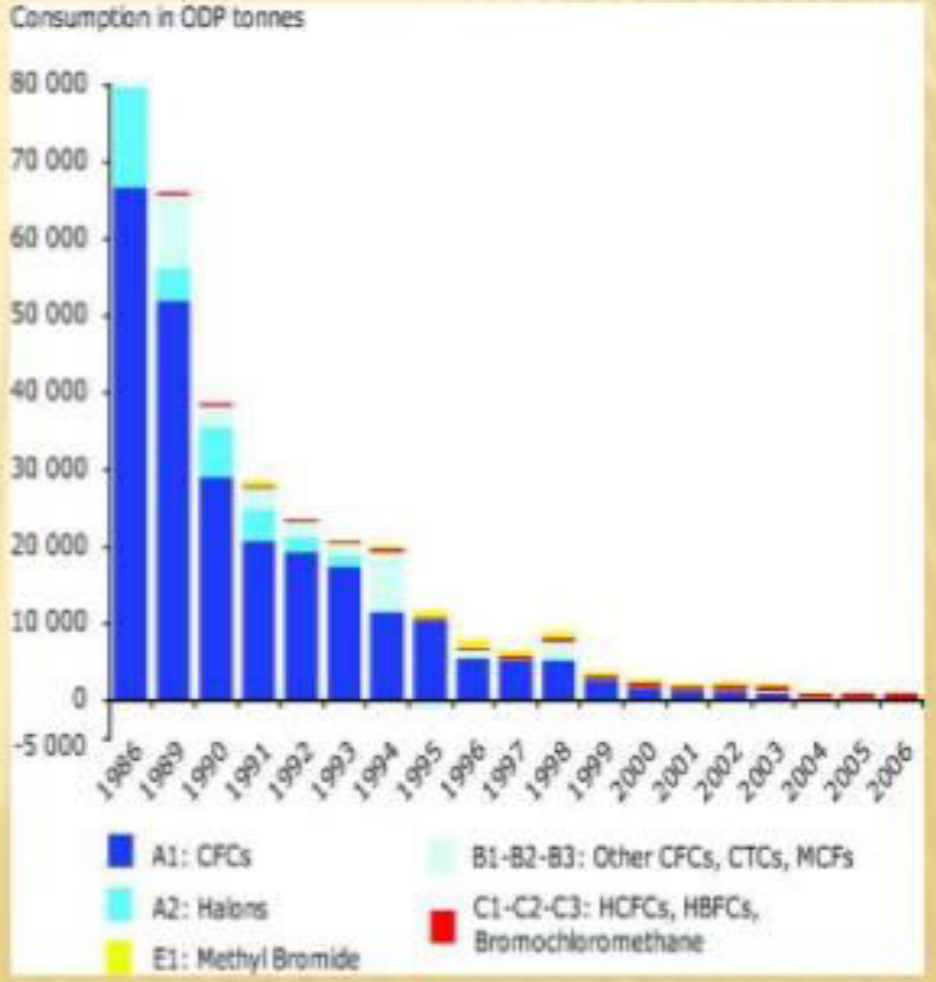
- MONTREAL PROTOCOL(1987)
- THE ENVIRONMENTAL AGENCY(EPA)

MONTREAL PROTOCOL

- The Montreal Protocol is an international agreement adopted in 1987 to control the production and consumption of specific man-made chemicals that destroy the ozone layer, the earth's protective shield.
- The Montreal Protocol says that the production and consumption of compounds that deplete ozone in the stratosphere--chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform--are to be phased out by 2030.
- Montreal Protocol adopted in 1987

191 countries have signed the Montreal Protocol including all the CARIFORUM countries

- India signed the Montreal protocol on 19th June, 1992



HOW CAN WE MAKE A DIFFERENCE

- Avoid using and buying products that might be made with CFCs
- For example: use a reusable cup instead of a plastic foam one.
- Have home and car air conditioners checked for leaks
- Use air conditioners only if needed for health or safety reasons.
- When serving your car, take it to a station that can recycle the air conditioning coolant
- Make sure that old refrigerators and air conditioners are disposed of safely by giving them to a recycling yard. Take care not to damage the cooling circuit which contains the ODS.

International Day for the Preservation of the Ozone Layer

September 16 was designated by the United Nations General Assembly as the International Day for the Preservation of the Ozone Layer.
This designation was made on December 19, 1994, in commemoration of the date, in 1987, on which nations signed the Montreal Protocol on Substances that Deplete the Ozone Layer.