SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore – 35

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Approved by AICTE , New Delhi and Affiliated to Anna University , Chennai.

DEPARTMENT OF AGRICULTURAL ENGINEERING

19AGE401 – CLIMATE CHANGE AND ADAPTATION

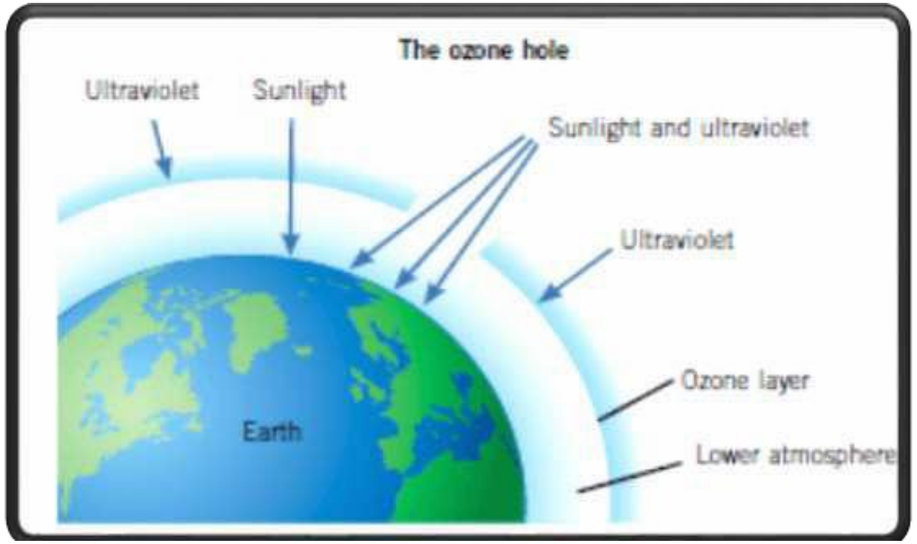
IV – YEAR VII SEMESTER

UNIT 1 – EARTH'S CLIMATE SYSTEM

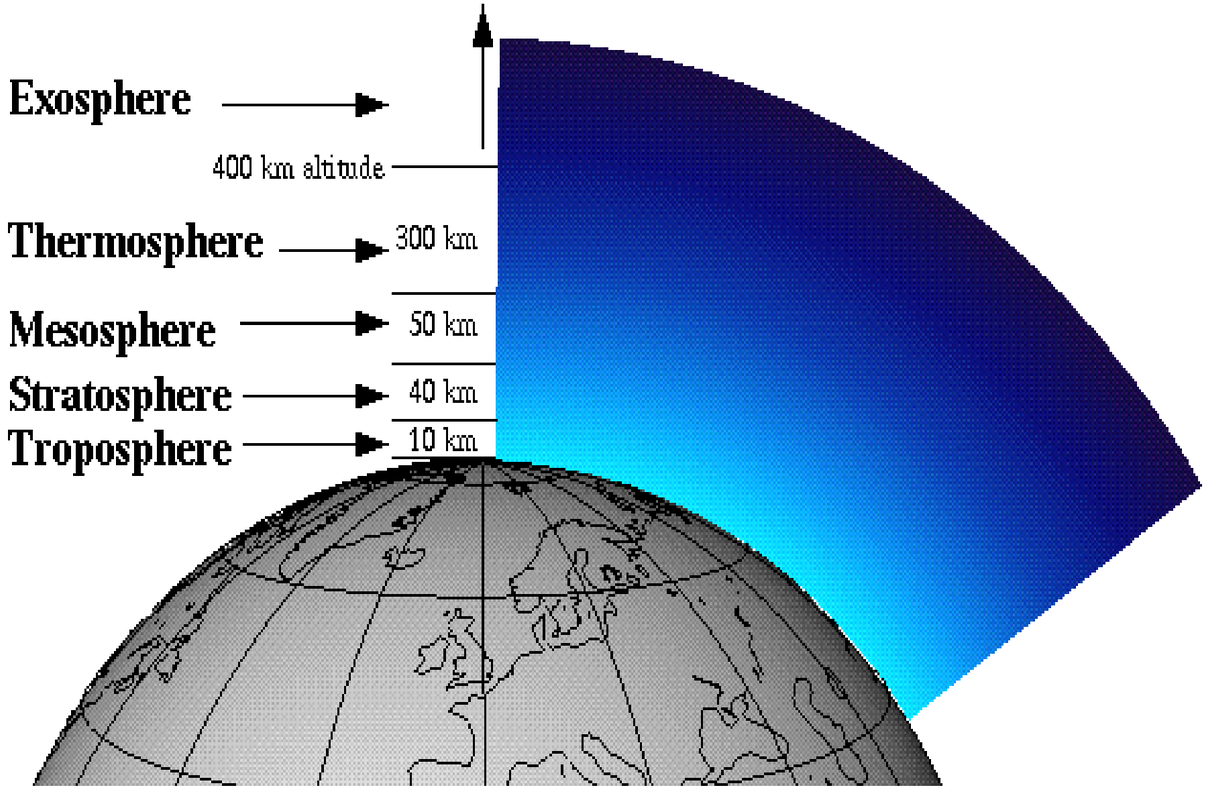
TOPIC 2 – OZONE LAYER

What is Ozone?

- O3
- A gas composed of three atoms of oxygen
- Bluish gas that is harmful to breathe
- Nearly 90% of earth's ozone is in the stratosphere and referred to as the ozone layer.
- Ozone absorbs a band of ultraviolet radiation called UVB.



Ozone Layers!!!!



Formation Of Ozone Layer

O_2 + sunlight → O + O O + O_2 → O_3

Formation Of Ozone Layer

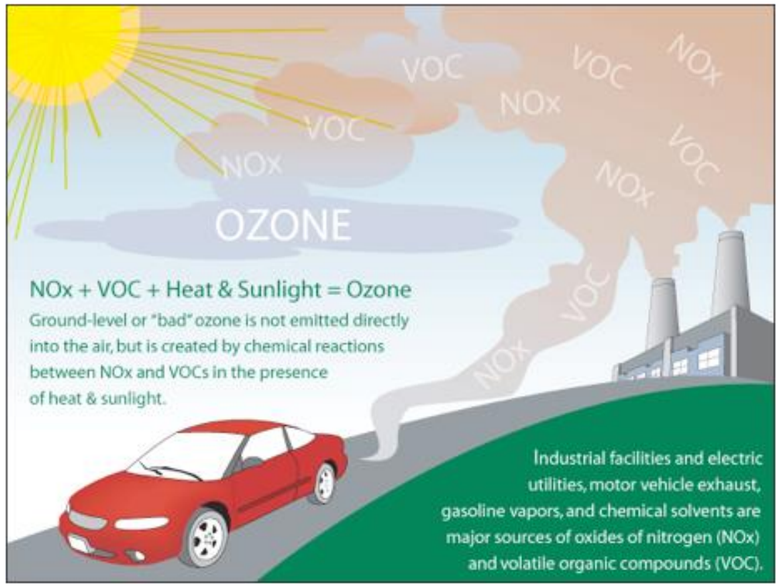
Ozone (O_3)

Chemically forms when UV hits on stratosphere
Oxygen molecules dissociate into atomic oxygen

$$O_2 \longrightarrow O + O$$

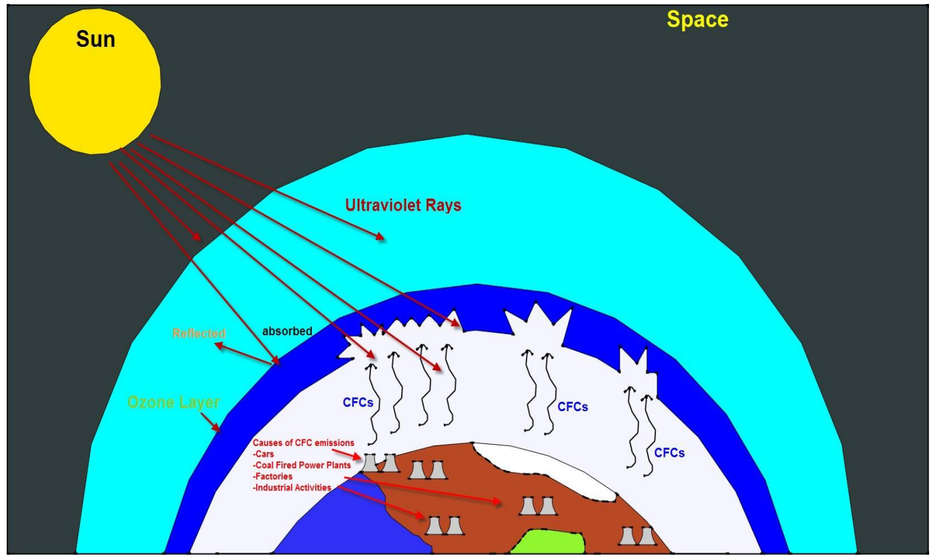
Atomic oxygen quickly combines with other oxygen molecules to form ozone

$$O + O_2 \longrightarrow O_3$$



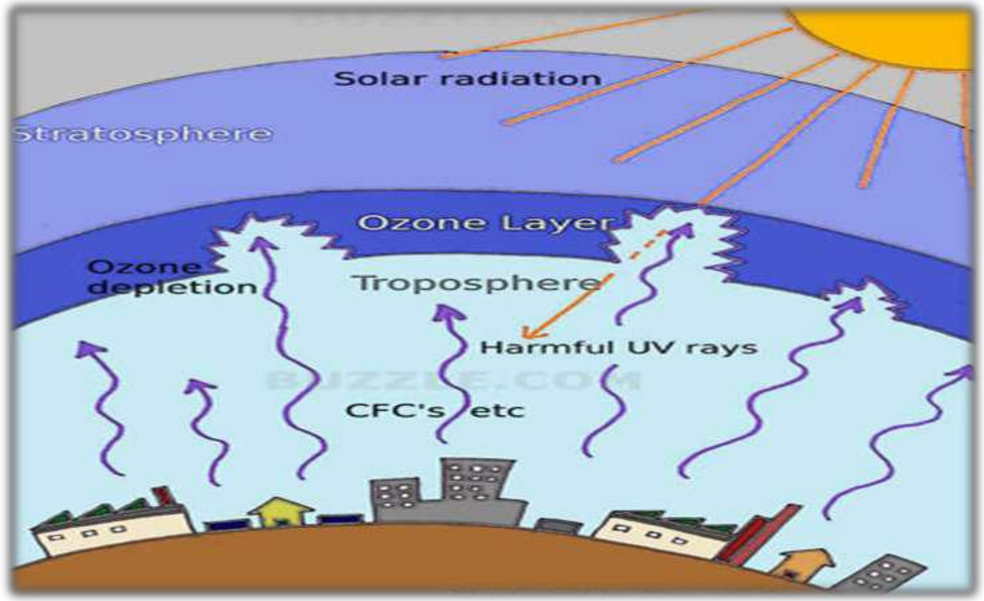
Ozone Depletion

- Ozone layer depletion, is simply the wearing out (reduction) of the amount of ozone in the stratosphere.
  Unlike pollution, which has many types and causes, Ozone depletion has been pinned down to one major human activity.
- Industries that manufacture things like insulating foams, solvents, soaps, cooling things like Air Conditioners, Refrigerators and 'Take-Away' containers use something called chlorofluorocarbons (CFCs).

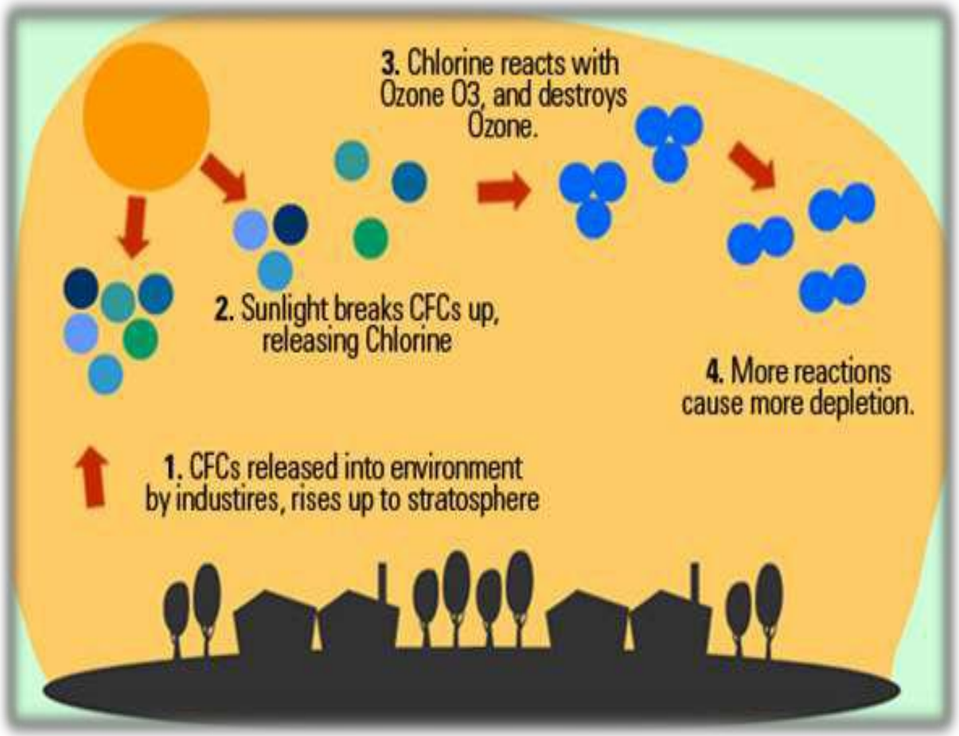


Ozone Depletion

- ✓ Depletion begins when CFC's get into the stratosphere.
- ✓ Ultraviolet radiation from the sun breaks up these CFCs.



Ozone Depletion

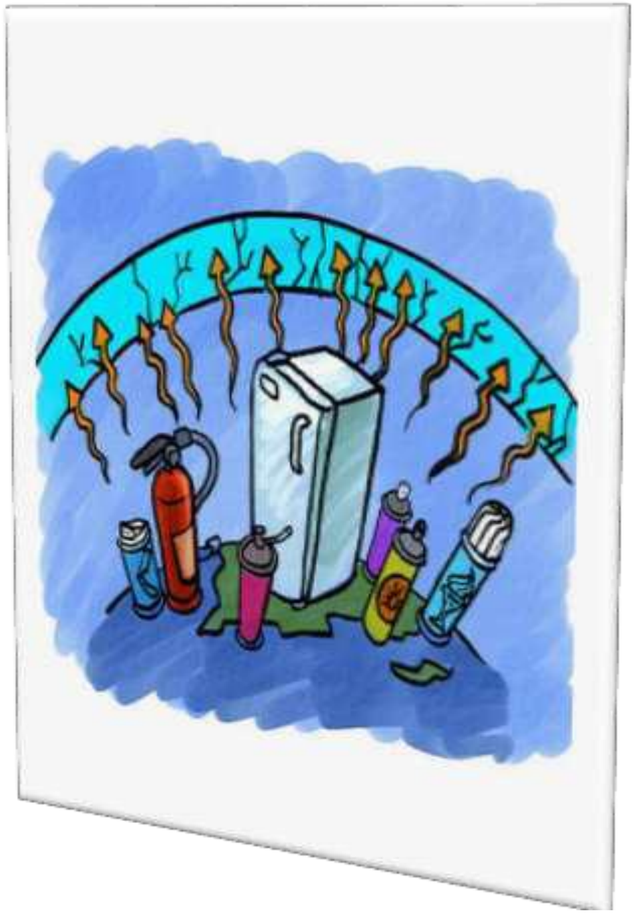


- The breaking up action releases Chlorine atoms.
- Chlorine atoms react with Ozone, starting a chemical cycle that destroys the good ozone in that area.
- One chlorine atom can break apart more than 100,000 ozone molecules.

Causes Of Ozone Depletion

- Man-made Causes
1. Chlorofluorocarbons (CFCs)
2. Halons
3. Methyl Chloroform
4. Hydrofluorocarbons (HCFCs)

- Natural Causes



Assessment

- **What is the symbolic representation of Ozone**
- **Ozone layer depletion, is simply the wearing out (reduction) of the amount of ----------in the stratosphere**

Impacts of Ozone Depletion

Harm to human health

Adverse Impacts of Agriculture

Effects on Plants

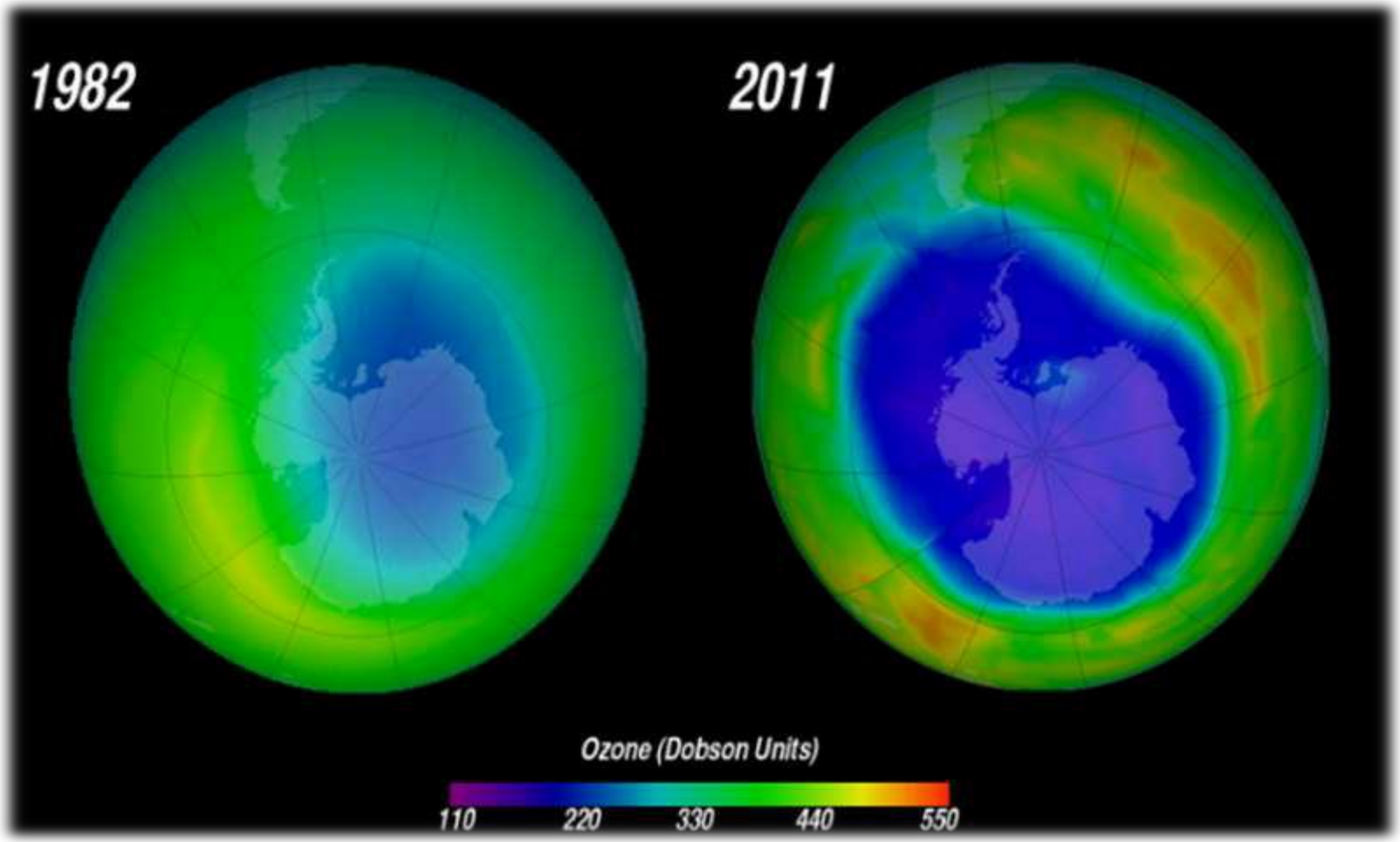
Effects on Animals

Effects on Materials

Importance of Ozone Layer

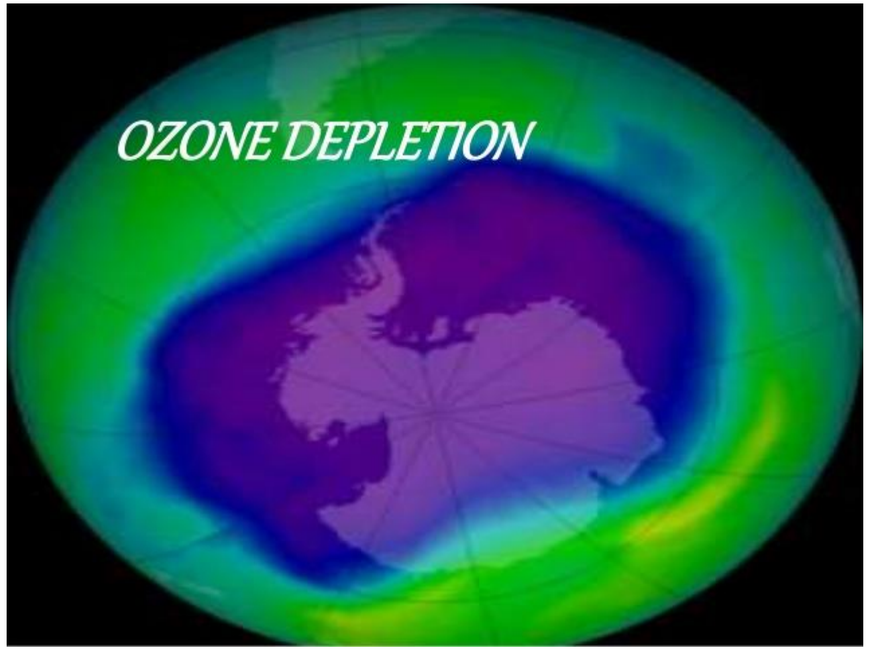
- Ozone is concentrated in the lower stratosphere between 15 and 30 km above the earth's surface – the so-called '**ozone layer'.**
- Ozone can be produced by numerous chemical reactions, but the main mechanism in the atmosphere for its production and removal is absorption of ultra-violet (UV) radiant energy from the sun.
- The maintenance of enough **stratospheric ozone to absorb harmful UV sunlight** is therefore vitally important to all life forms on earth.

Ozone Hole!!!



Measures to Prevent the Ozone Depletion

- Limit private vehicle driving
- Use eco-friendly household cleaning products
- Avoid using pesticides
- Developing stringent regulations for rocket launches
- Banning the use of dangerous nitrous oxide



Protective Measures!!!

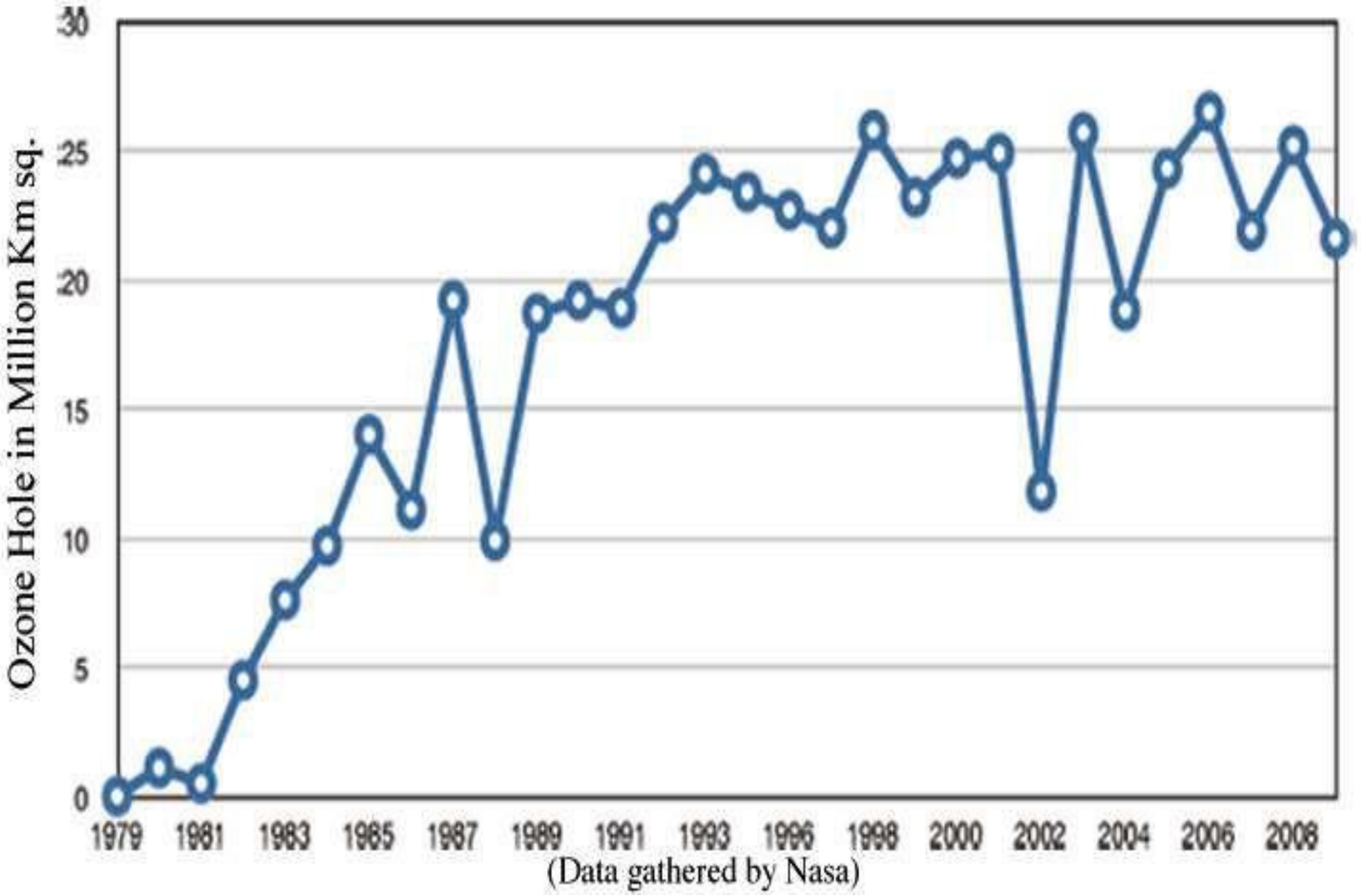
INTERNATIONAL LEVELMEASURES

1. Montreal protocoal signed in 1987.
2. Comprise of 189 countries now.
3. To reduce CFC substances.

NATIONAL LEVEL MEASURES

1. India banned use of CFC products in 1991D.
2. Countries can control the import and manufacture of CFC product.

Ozone Hole Data!!!



Reference Videos

See You at Next Class!!!!