

1st EAST AFRICAN REGIONAL CONFERENCE AND EXHIBITION

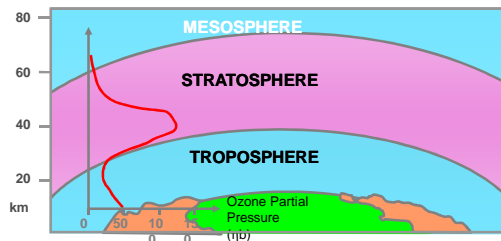
TOM MBOYA LABOUR
COLLEGE – KISUMU
17th-19th Nov 2008

PRESENTER

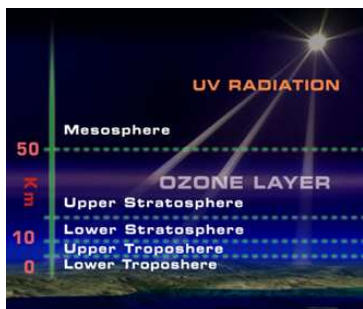
S M MWANGI
CELL 0722756749
E-MAIL
mwangisteve2000@yahoo.co.uk

OZONE

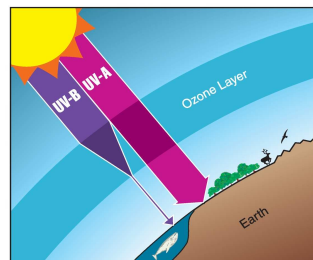
EARTH SURROUNDINGS



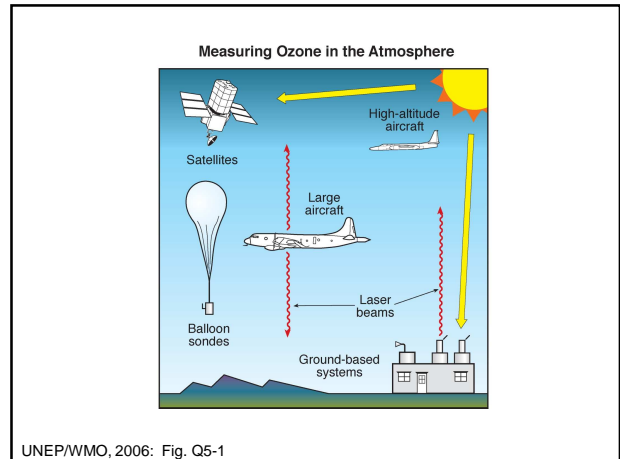
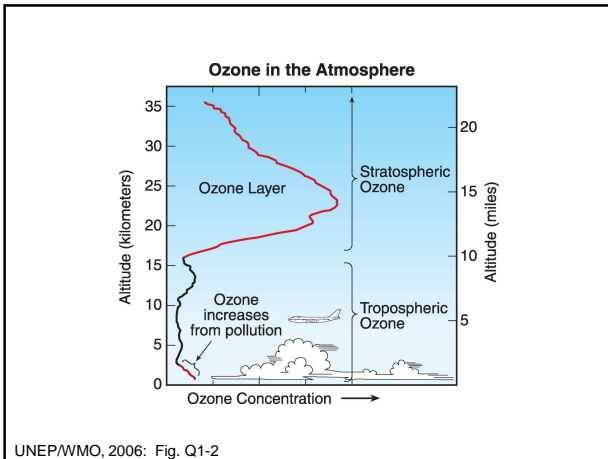
OZONE LAYER



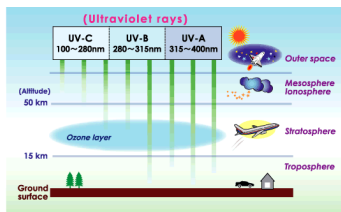
UV Protection by the Ozone Layer



UNEP/WMO, 2006: Fig. Q3-1



UV LIGHT



CFC WONDER CHEMICALS

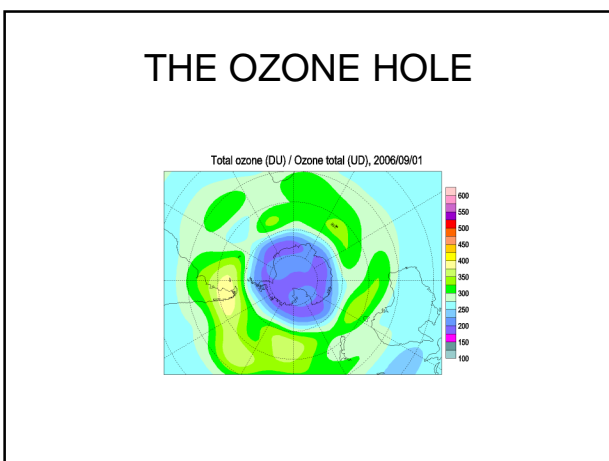
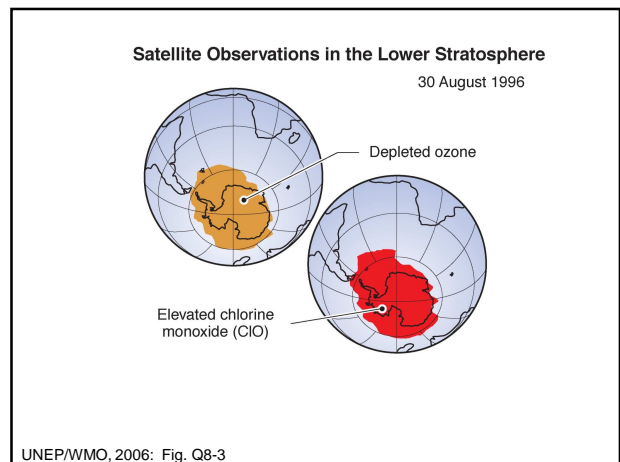
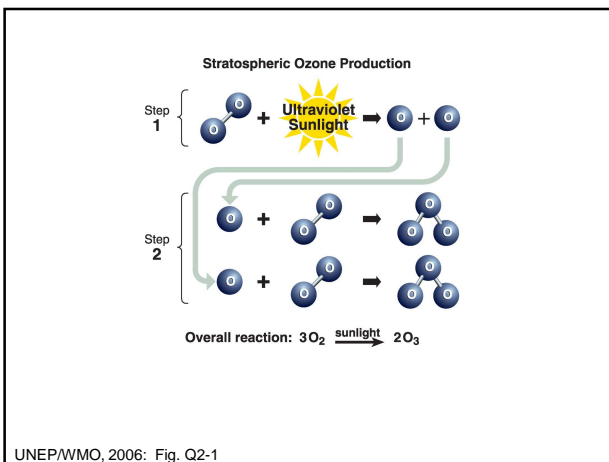
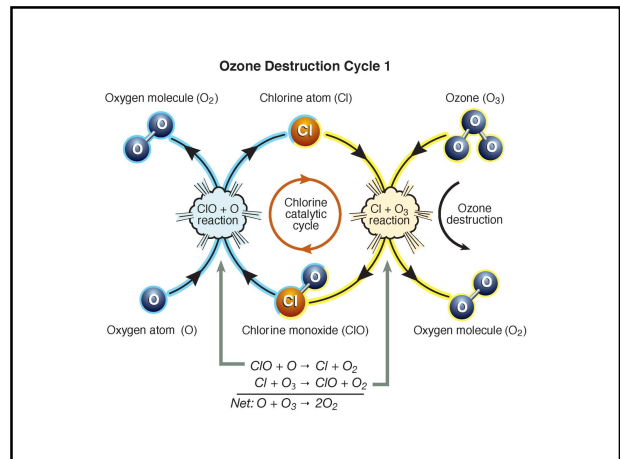
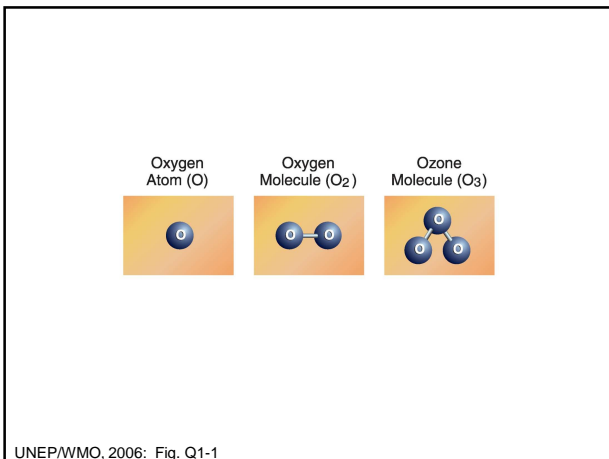
- In 1928, a class of synthetic wonder chemicals, known as CFC, was invented.
- CFC were highly stable and non-toxic.
- CFC soon replaced ammonia as a household refrigerant.
- During the 1950s and 1960s, many other uses of CFC were found.

VARIOUS USES OF CFC

- Solvents - Cleaning or degreasing of metallic surfaces
- Aerosols - Delivery, as sprays, cosmetics, drugs e.g Metered.Dose Inhalers
- Foam making
- Refrigeration - Blowing agent
- Both in domestic and commercial sectors

DEPLETION OF OZONE LAYER BY CFC

- In 1970, CFCs were found in the upper stratosphere but were not suspected to destroy the ozone layer.
- In 1974, Sherwood and Rowlands reported that CFCs were depleting the ozone layer.



EFFECTS OF THE OZONE LAYER DEPLETION

The depletion of ozone layer causes damage to:

- human health and
- environment

cont

- **human eye: more cases of cataract, snow blindness (actinic keratitis) and other chronic eye diseases.**
- **human skin: more sunburn and skin cancers**
- **immune systems: reduced human and animal resistance to infections and diseases including cancers and allergies, and diseases such as malaria,**
- **crops: smaller plants, lower yields, potential reductions in nutritional value,**

cont

- **need to search for UV-B resistant crops**
- **natural ecosystems: altered plant forms and changes in competitive balance between plants, the animals that eat them, and plant pathogens and pests**
- **marine and aquatic life: reduced production of phytoplankton, zooplankton, juvenile fish, crabs and shrimps which will in turn threaten all marine life and reduce fisheries productivity**
- **man-made materials: faster degradation of certain materials including many paints and plastics**
- **increased global warming and climate change.**



DNA-related effects

- DNA damage
- Mutagenicity
- Tumours
- HIV-! Activation

Livestock animal

- Skin cancers
- Damage to cornea
- Damage to lens (cataract)

Aquatic animal species

- Biomass reduction of juvenile fish species e.g. shrimps and crabs
- Damage to fish eggs (e.g. sea urchins, sponges, and corals) which are deposited at or near the sea surfaces

Plastics and paints

- Degradation of plastics and paints used in buildings

Plant effects

- Inhibition of growth in terrestrial plants (beans, maize, sorghum, etc)
- Biomass reduction and growth reduction of pine seedlings
- Inhibition of growth in aquatic plants (phytoplankton)

Climate change

- Increase in abundance of green house gases (carbon dioxide, methane (CH₄), nitrous oxide (N₂O), and halogen gas sources) in the atmosphere result in **radioactive forcing**
- Effect of radioactive forcing on climate change
- Human activities increase Ozone in the troposphere leading to radioactive forcing
- Largest radioactive forcing comes from CO₂
- Linkages between climate change and ozone layer depletion

International Commitments

- **1985: Vienna Convention for the Protection of the Ozone Layer calls for voluntary measures to reduce emissions of ozone-depleting substances (ODS).**
- **1987: Montreal Protocol on Substances that Deplete the Ozone Layer establishes a schedule to reduce the production and consumption of CFCs and Halons.**
- **" Perhaps the single most successful international environmental agreement to date has been the Montreal Protocol , in which states accepted the need to phase out use of ozone depleting substances"**

UN Secretary General Kofi Annan

The 1985 Vienna Convention on Protection of the Ozone Layer

- Several countries (USA, Canada, Norway, and Sweden) imposed the first ban on non-essential use of CFC in aerosol sprays

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer

- The Protocol required that CFCs and other listed Ozone Depleting Substances should eventually be phased out based on agreed timeframe schedules

The phase out schedules for CFC

Control Measure	Phase out dates applicable to	
	Developed countries	Developing countries
Base Level	1986	1995-97
Freeze	January 1, 1992	January 1, 1999
50% reduction		January 1, 2005
100%	January 1, 1994 (with possible essential use exemptions)	January 1, 2010 (with possible essential use exemptions)

The phase out schedules for HCFC

Base level average	2009 - 2010
Freeze both production and consumption	January 1, 2013
10% reduction	January 1, 2015
35% reduction	January 1, 2020
67.5% reduction	January 1, 2025
100% phase out (allow annual average of 2.5% for servicing of equipment existing on Jan. 1. 2030 during the period 2030-2040 – subject to review in 2025)	January 1, 2030