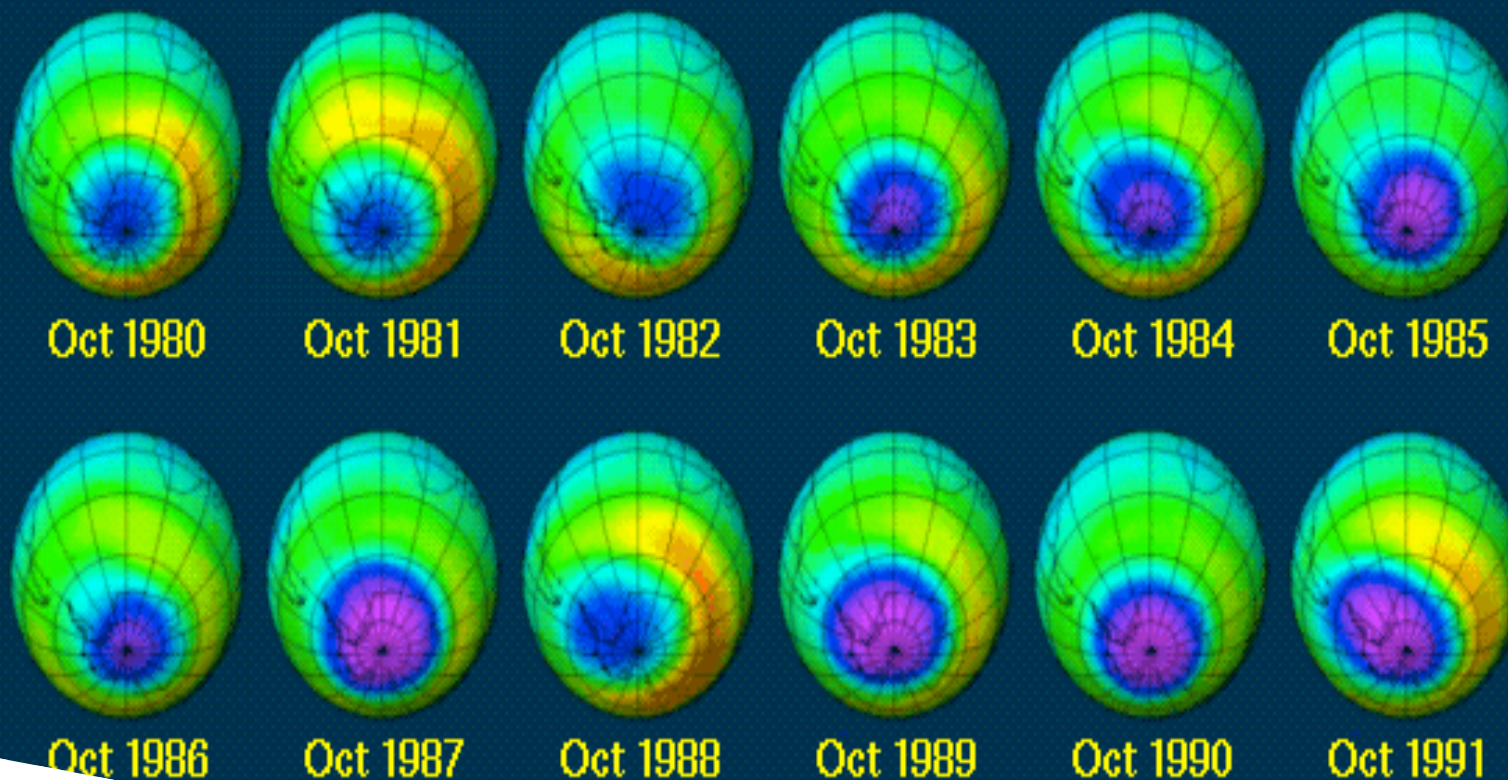




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**IAE5
Climate
Change**

Antarctica & the hole In the ozone layer

IMSAM Amsterdam

Inspire Antarctic Expedition 5

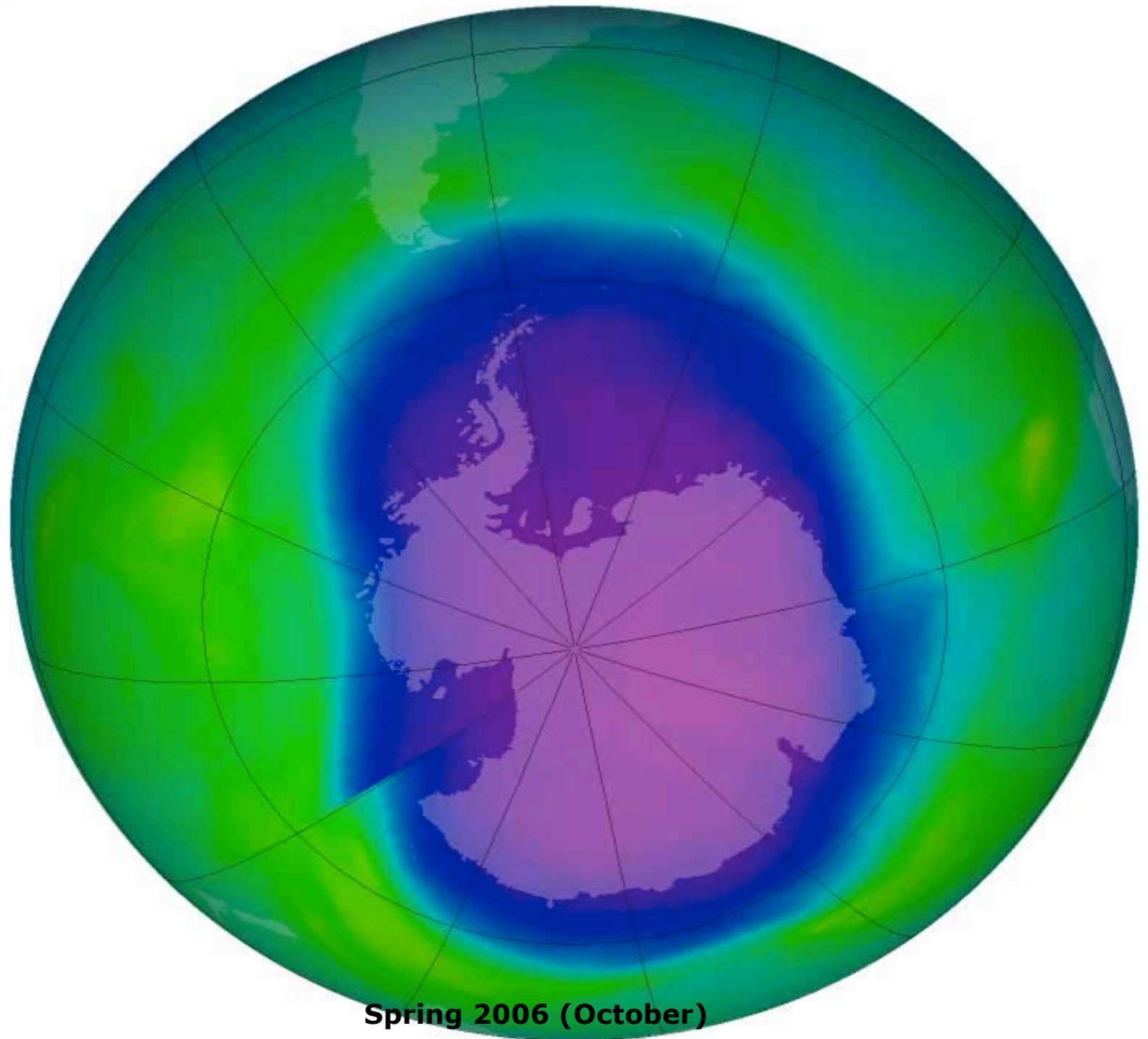
February 17 - March 3, 2007



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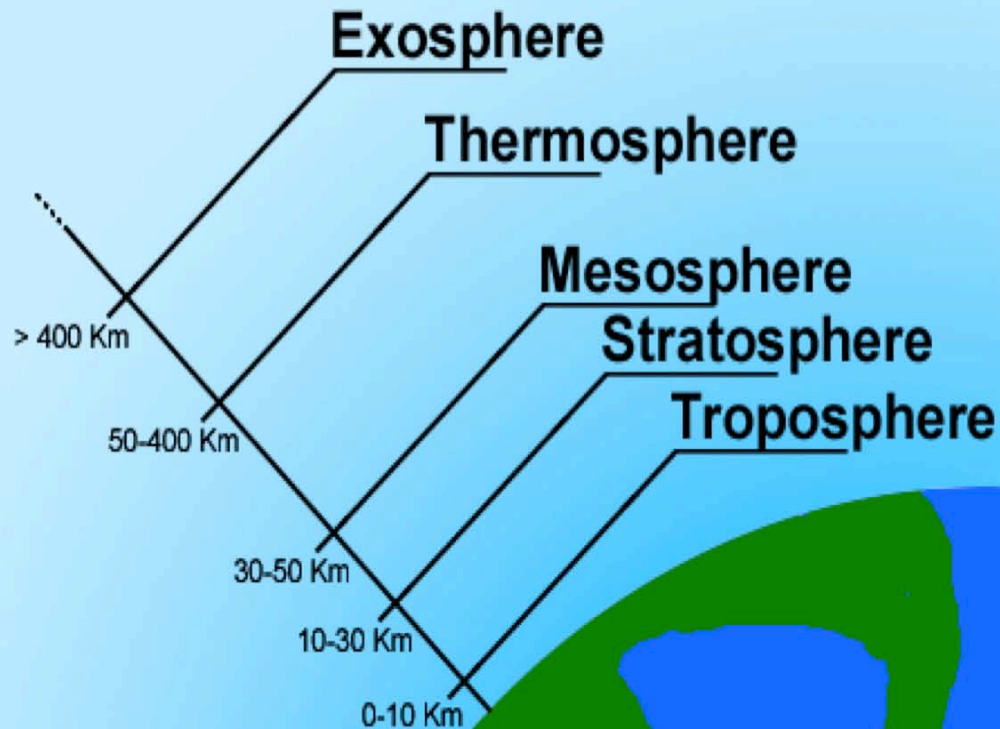
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Ozone layer: what is it?

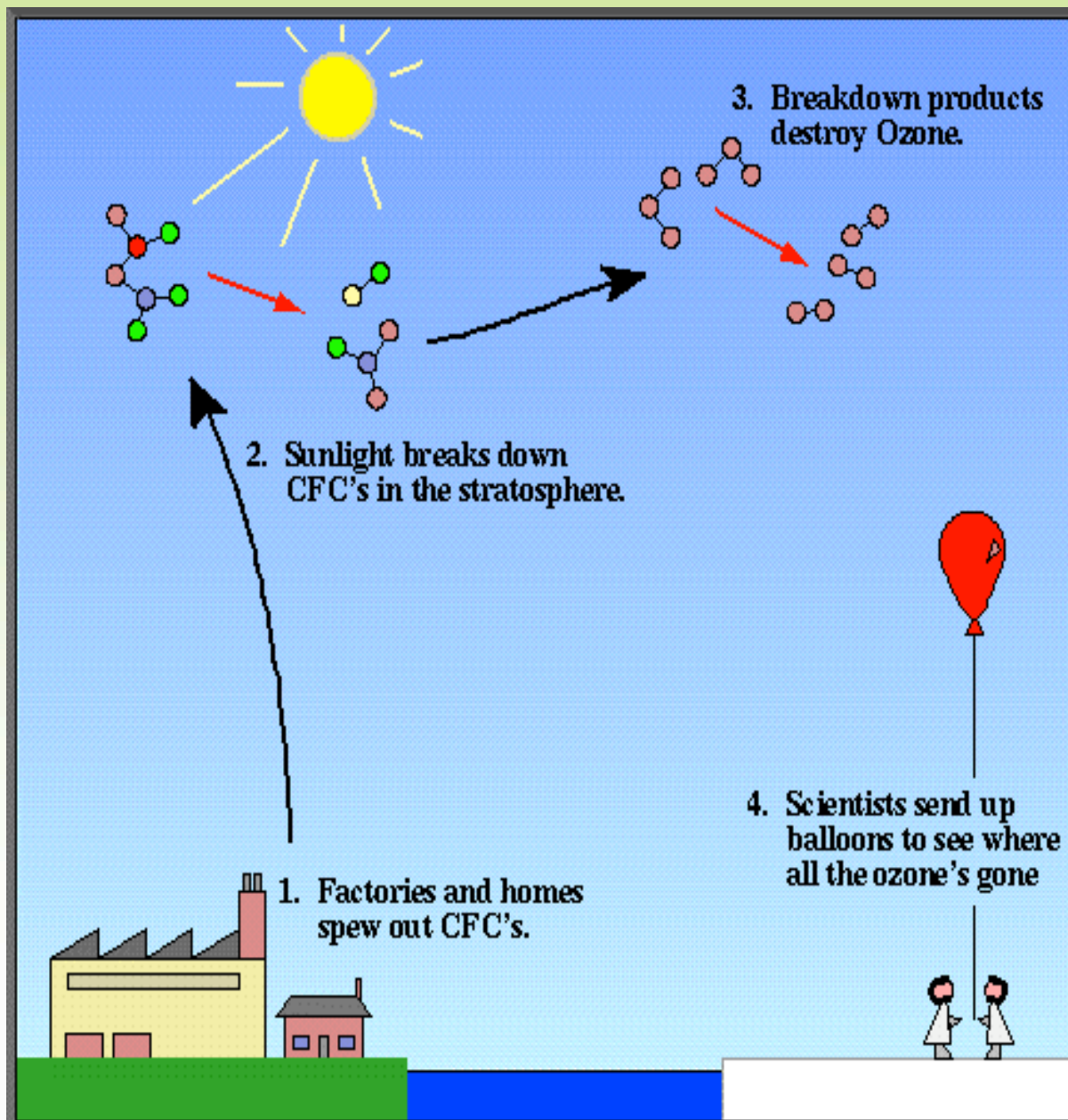


- Between 16&50 km
- 1 ozone molecule per 100.000 molecules of air
- Absorbs UV-B



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Ozone hole: what is it?



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Stratospheric clouds

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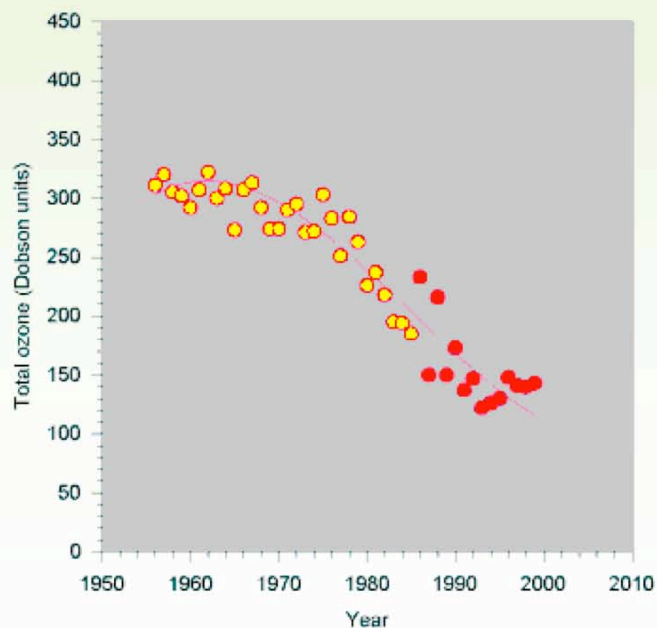
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Ozone Hole: some data

- 1957- ozone measurements start
- 1985 - ozone hole discovered (art. *Nature*)
- Ozone layer becomes thinner (5-10%)
- Ozone Hole above Antarctica due to extreme cold stratosphere (-80C)

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Hole

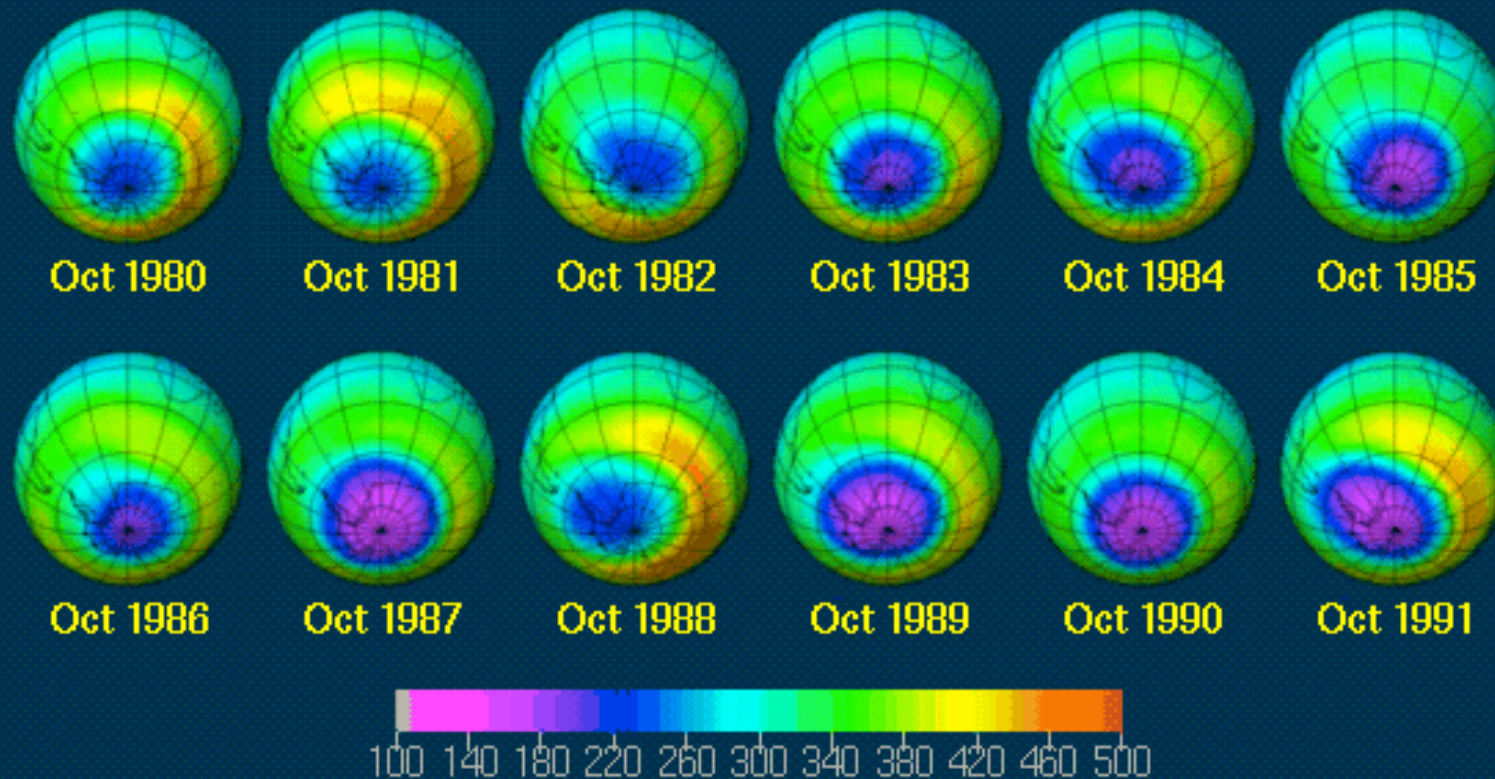
Mean October ozone at Halley





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Ozone Hole 1980 - 1991



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Ozone hole: what does it do?

- Ozone absorbs UV-B radiation
- UV-B can
 - modify DNA, enzymes and other proteins
 - cause cancer, malfunction, bleaching and death of organisms
 - harms microbes, plants, animals, algae, lichens and mosses



Ozone and climate change

- Climate change and ozone depletion are *separate problems*.
- Link 1: CFC's deplete ozone but are also greenhouse gasses
- Link 2: greenhouse effect is warming the earths surface, BUT also cools the stratosphere and effects ozone hole



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The Solution

Montreal Protocol

- International treaty on the phase-out of ozone depleting substances
- Into force at January 1, 1989
- Modified 5 times
- Ratified by 183 countries (2004)
- Treaty is built around groups of substances
- Each group has a timeframe for phasing out



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And now...

“If the provisions of the *Montreal Protocol on Substances that Deplete the Ozone Layer* of 1987 are revised, strengthened and followed, there is a reasonable chance that the Antarctic ozone hole will permanently repair itself, but not before the next appearance of Haleys comet in 2061. (...) There is a prospect that the Antarctic ozone hole will be repaired in 2100.”

British Antarctica Survey (BAS)