

Meteorology – Lecture 3

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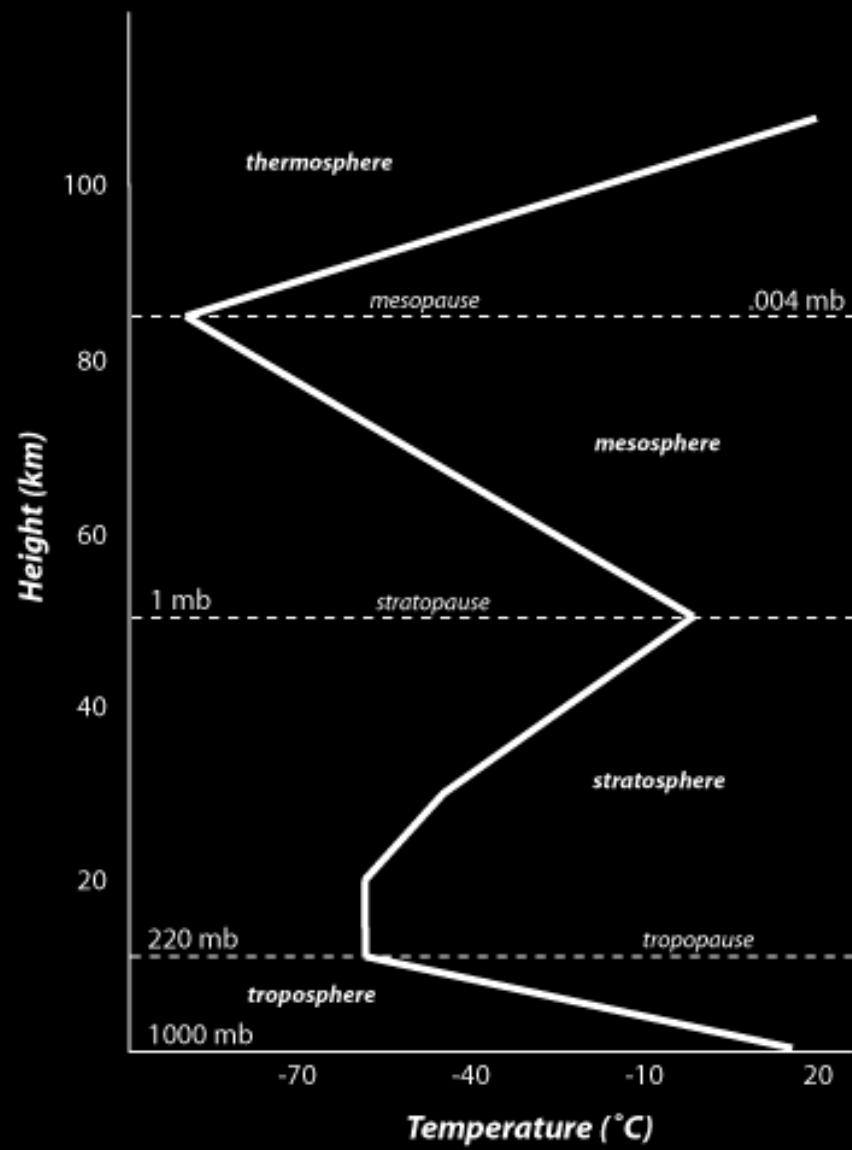
Important notes

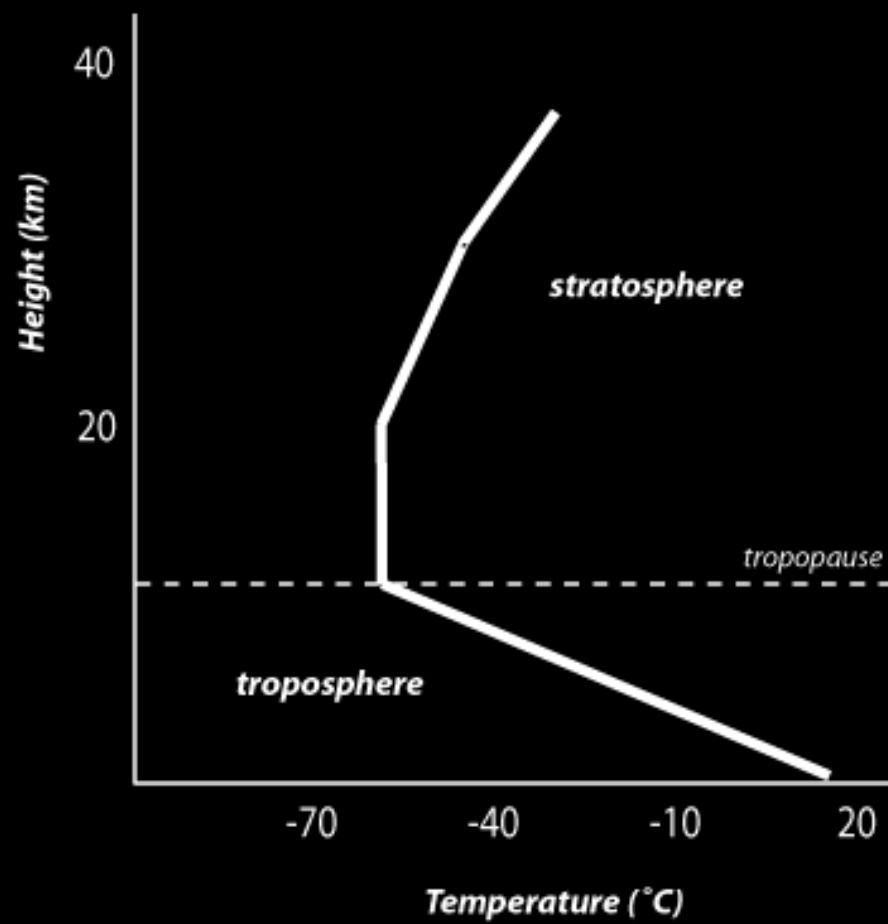
- These slides show some figures and videos prepared by Robert G. Fovell (RGF) for his “Meteorology” course, published by The Great Courses (TGC). Unless otherwise identified, they were created by RGF.
- In some cases, the figures employed in the course video are different from what I present here, but these were the figures I provided to TGC at the time the course was taped.
- These figures are intended to supplement the videos, in order to facilitate understanding of the concepts discussed in the course. *These slide shows cannot, and are not intended to, replace the course itself and are not expected to be understandable in isolation.*
- Accordingly, these presentations do not represent a summary of each lecture, and neither do they contain each lecture’s full content.

Animations linked in the PowerPoint version of these slides may also be found here:

<http://people.atmos.ucla.edu/fovell/meteo/>

The “standard atmosphere”



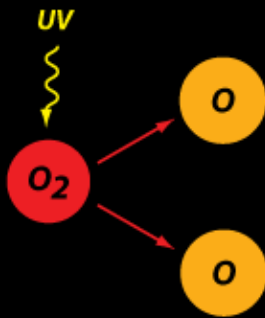


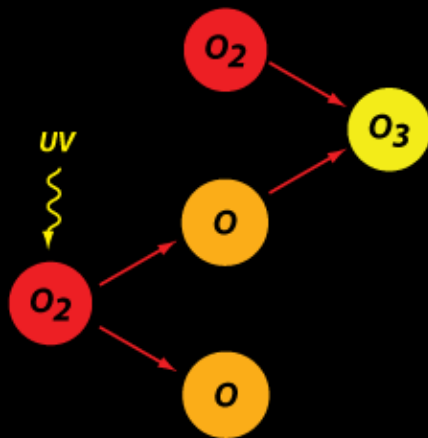
Stratospheric ozone chemistry



- Consider an O_2 molecule
- It absorbs UV radiation...

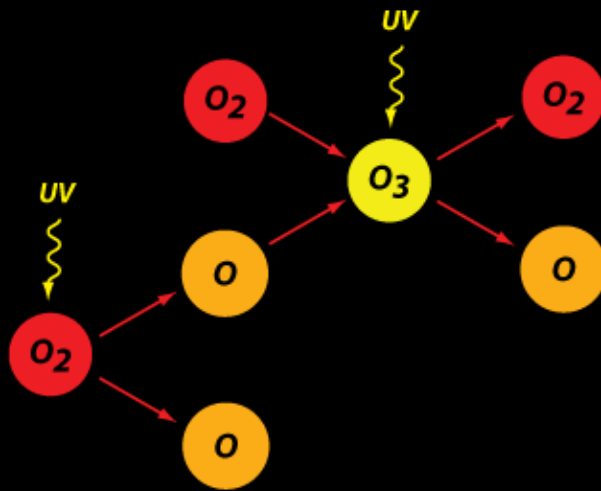
- It splits into individual oxygen (O) atoms

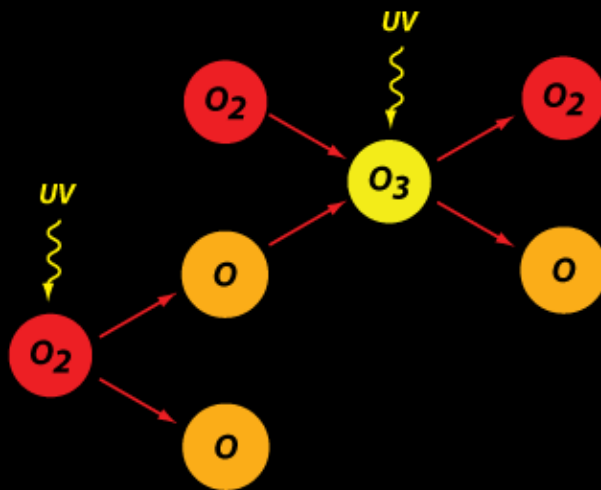




- Oxygen atoms don't last long
- Reaction with another O_2 molecule makes O_3 ... **ozone**

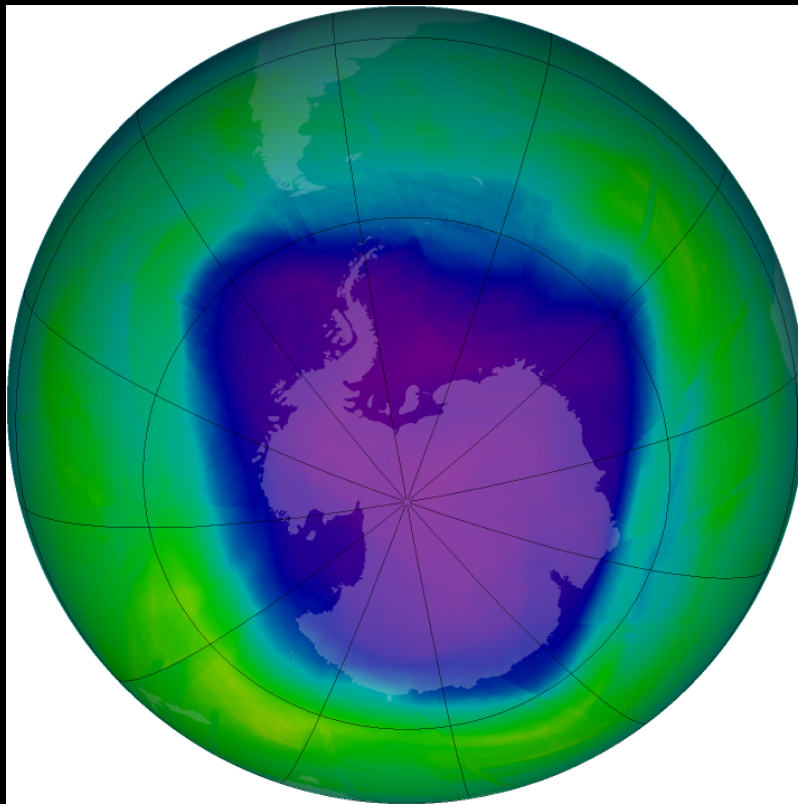
- Ozone also absorbs UV which splits it apart...



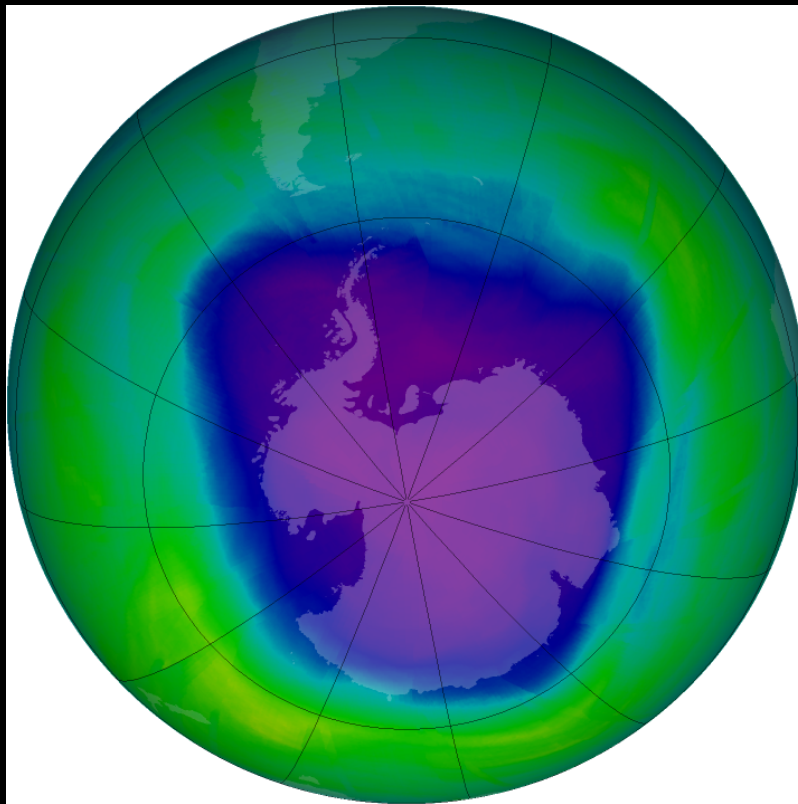


- In this process...
- Ozone is both *created* and *destroyed*
- NO NET LOSS
- 2 UV absorption events are involved
- That's harmful radiation that DOESN'T REACH the GROUND

The ozone hole



- Here's how the ozone hole looked on a single day
- Sept 30, 2008
- As seen by NASA satellites
- We are looking down on South Pole



- Colored field is total ozone in a vertical column
- Virtually all ozone is in *stratosphere*
- Blue colors are very low concentrations
- The ozone hole has engulfed Antarctica, and has reached out towards South America

For animation, see <http://people.atmos.ucla.edu/fovell/meteo/>

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