

Lecture 12: Wednesday, March 5, 2008

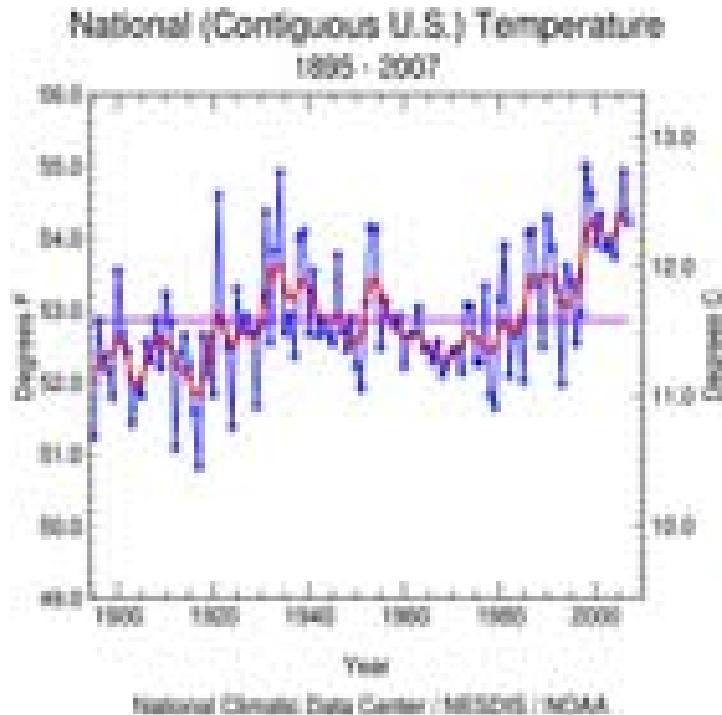
Exam scores are available on the web; read announcement  
And follow link from class home page

<http://www.physics.rutgers.edu/~karin/140/>

FAQ:

A curve WILL be used to compute final letter grades for the course

# NOAA: 2007 a Top Ten Warm Year for U.S. and Globe



## U.S. Temperatures

The average U.S. temperature for 2007 was 54.2°F; 1.4°F warmer than the 20th century mean of 52.8°F

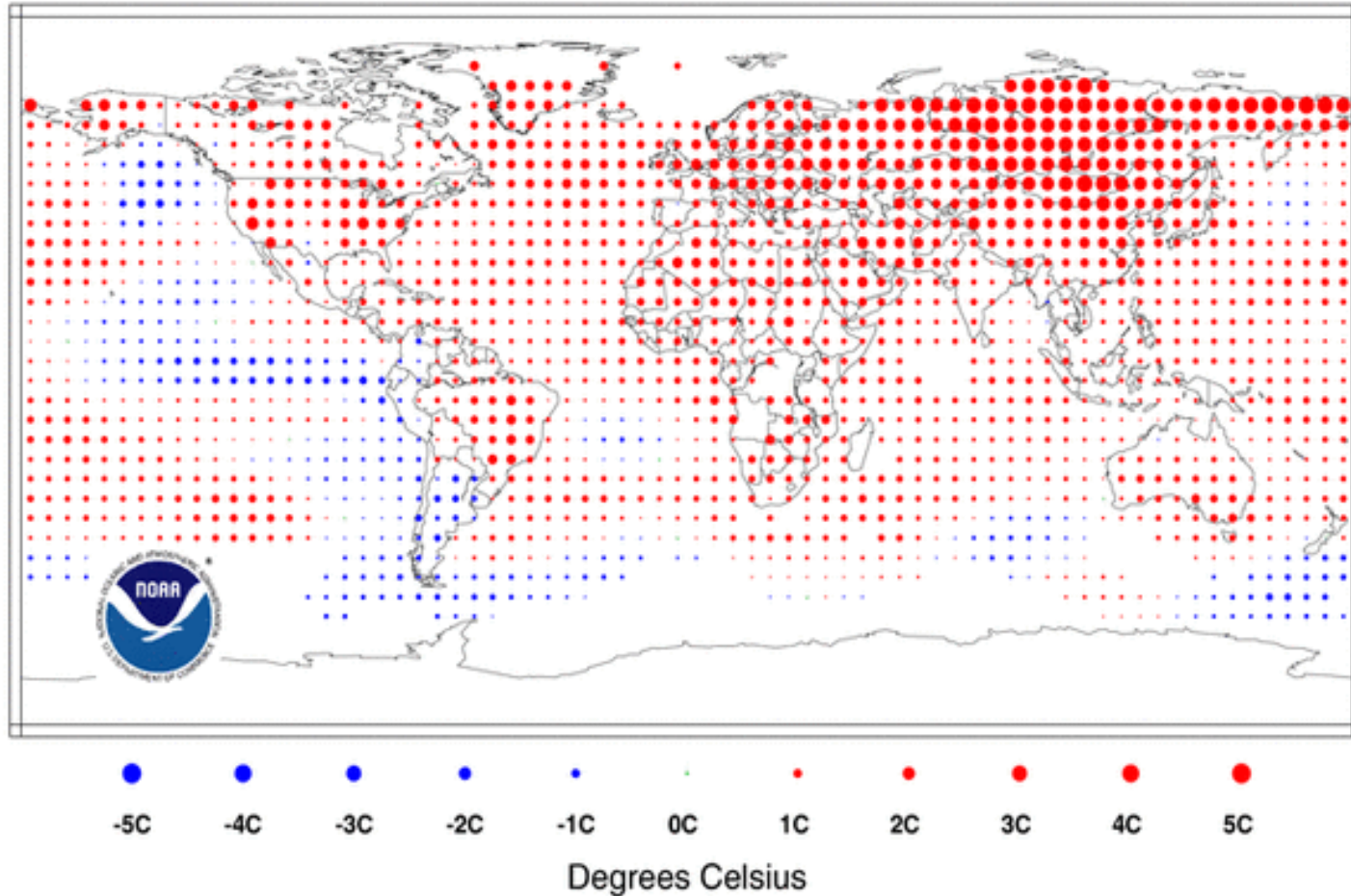
The year 2007 was the 10th warmest year for the contiguous U.S. since national records began in 1895, according to preliminary data from NOAA's National Climatic Data Center in Asheville, N.C. The year was marked by exceptional drought in the U.S. Southeast and the West, which helped fuel another extremely active wildfire season. The year also brought outbreaks of cold air, and killer heat waves and floods. Meanwhile, the global surface temperature for 2007 was the fifth warmest since records began in 1880.

<http://www.ncdc.noaa.gov/oa/climate/research/2007/ann/ann07.html>

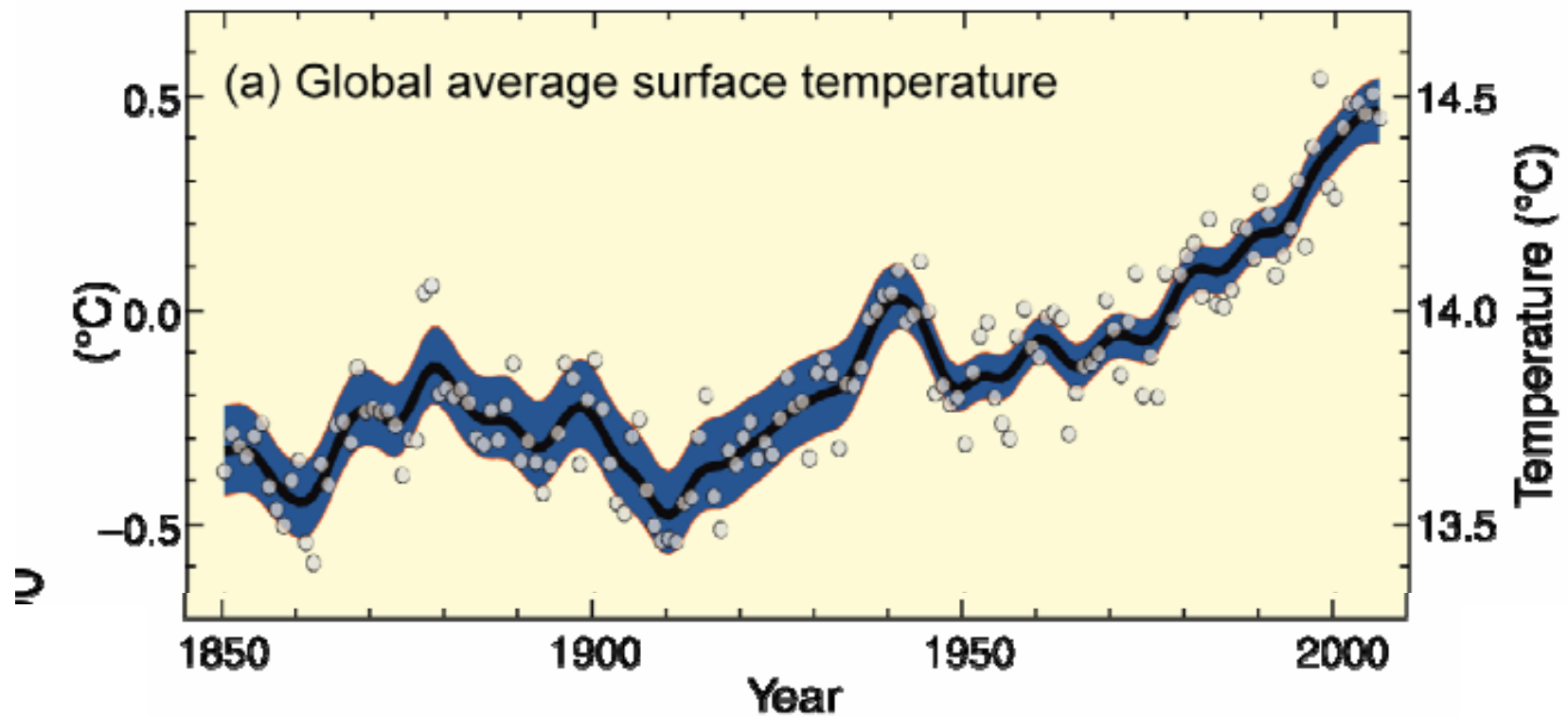
# Temperature Anomalies Jan-Dec 2007

(with respect to a 1961-1990 base period)

National Climatic Data Center/NESDIS/NOAA



From <http://www.ncdc.noaa.gov/oa/climate/research/2007/ann/global.html>



From 2007 report by the Intergovernmental Panel on Climate Change\*  
\*shared Nobel Peace Prize, 2007

March 2, 2008

## Skeptics on Human Climate Impact Seize on Cold Spell

By [ANDREW C. REVKIN](#)

The world has seen some extraordinary winter conditions in both hemispheres over the past year: snow in Johannesburg last June and in Baghdad in January, Arctic sea ice returning with a vengeance after a record retreat last summer, paralyzing blizzards in China, and a sharp drop in the globe's average temperature.

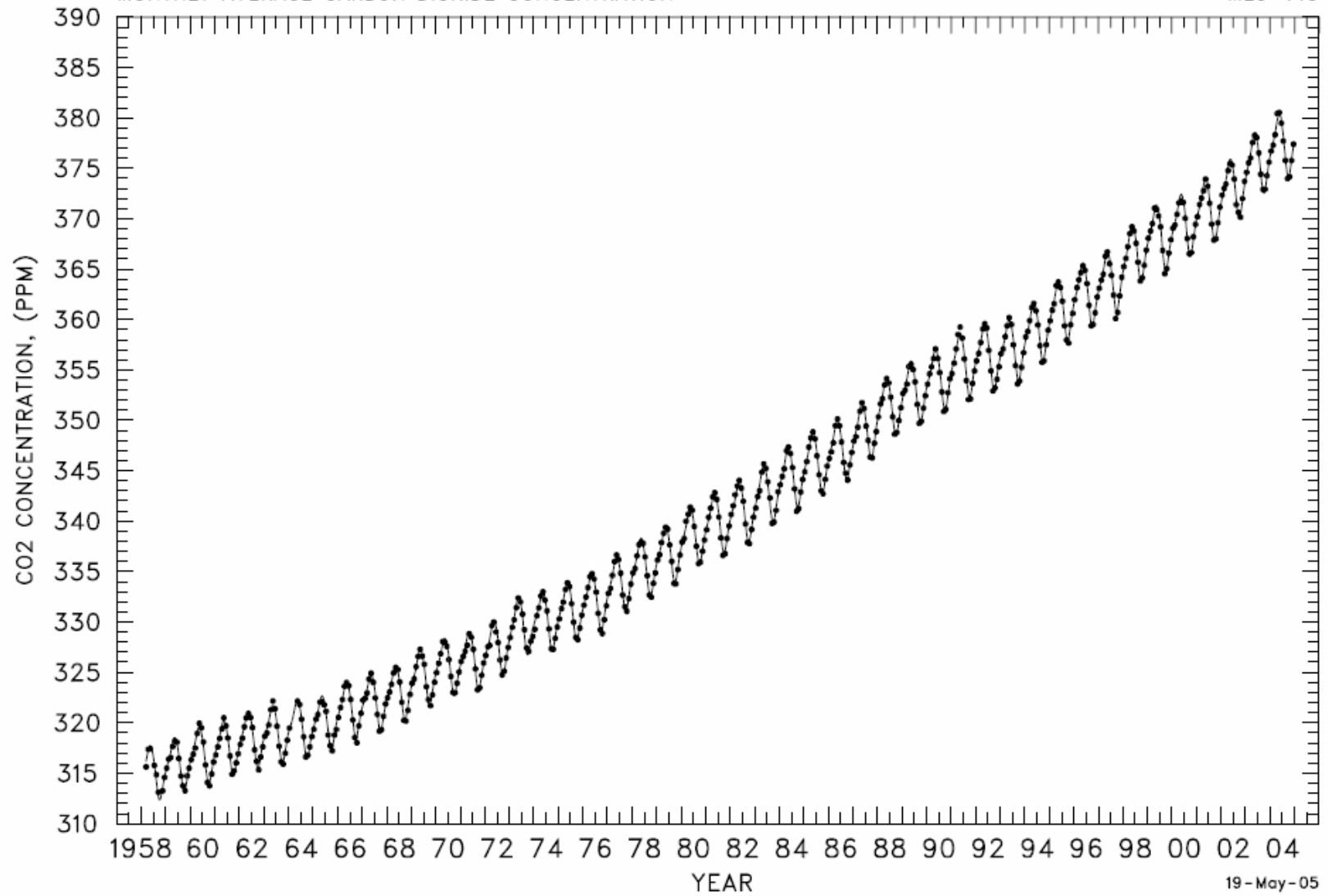
It is no wonder that some scientists, opinion writers, political operatives and other people who challenge warnings about dangerous human-caused [global warming](#) have jumped on this as a teachable moment.

“Earth's ‘Fever’ Breaks: Global COOLING Currently Under Way,” read a [blog post](#) and news release on Wednesday from Marc Morano, the communications director for the Republican minority on the Senate Environment and Public Works Committee.

So what is happening?

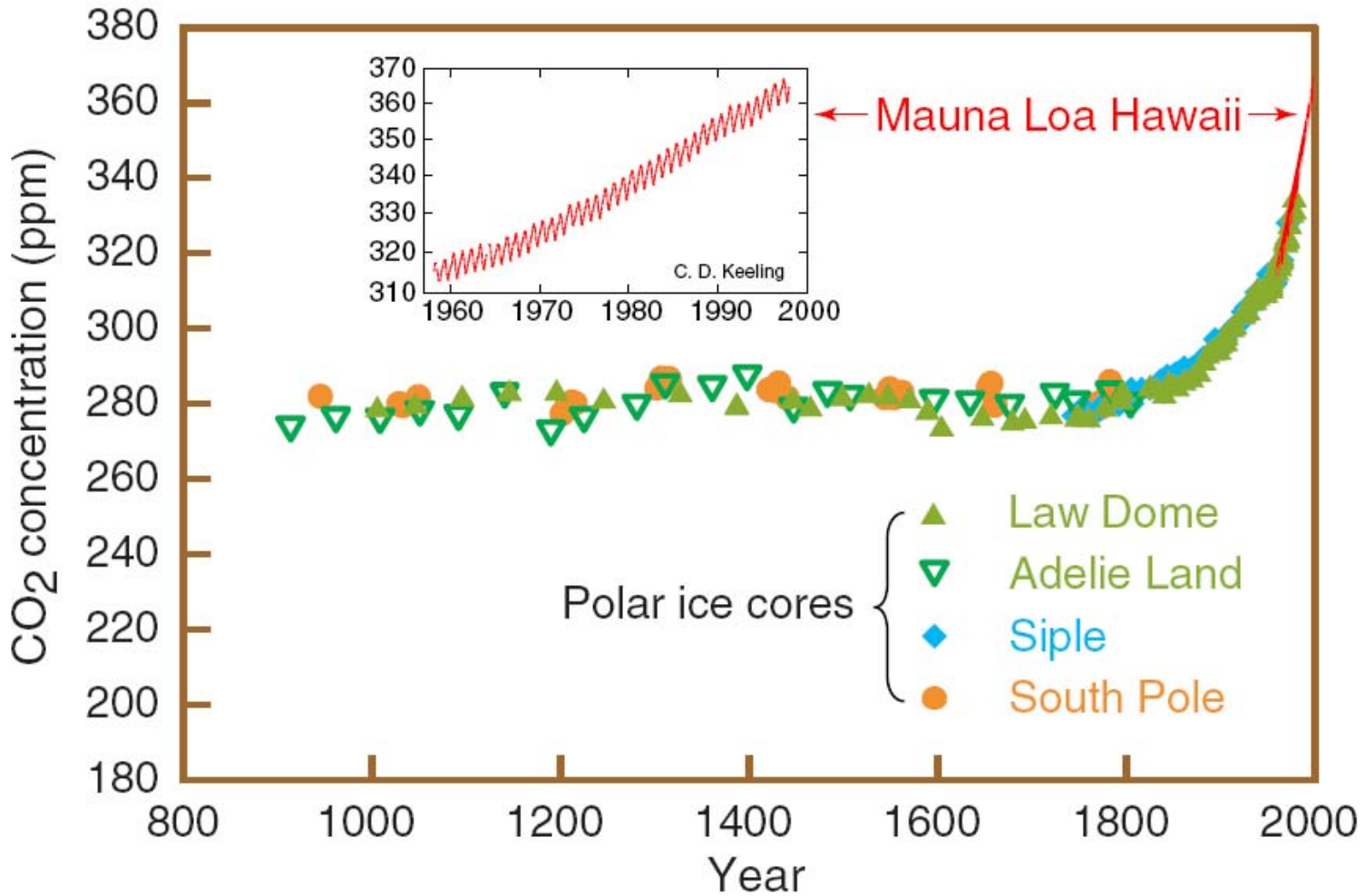
MAUNA LOA OBSERVATORY, HAWAII  
MONTHLY AVERAGE CARBON DIOXIDE CONCENTRATION

MLO-145

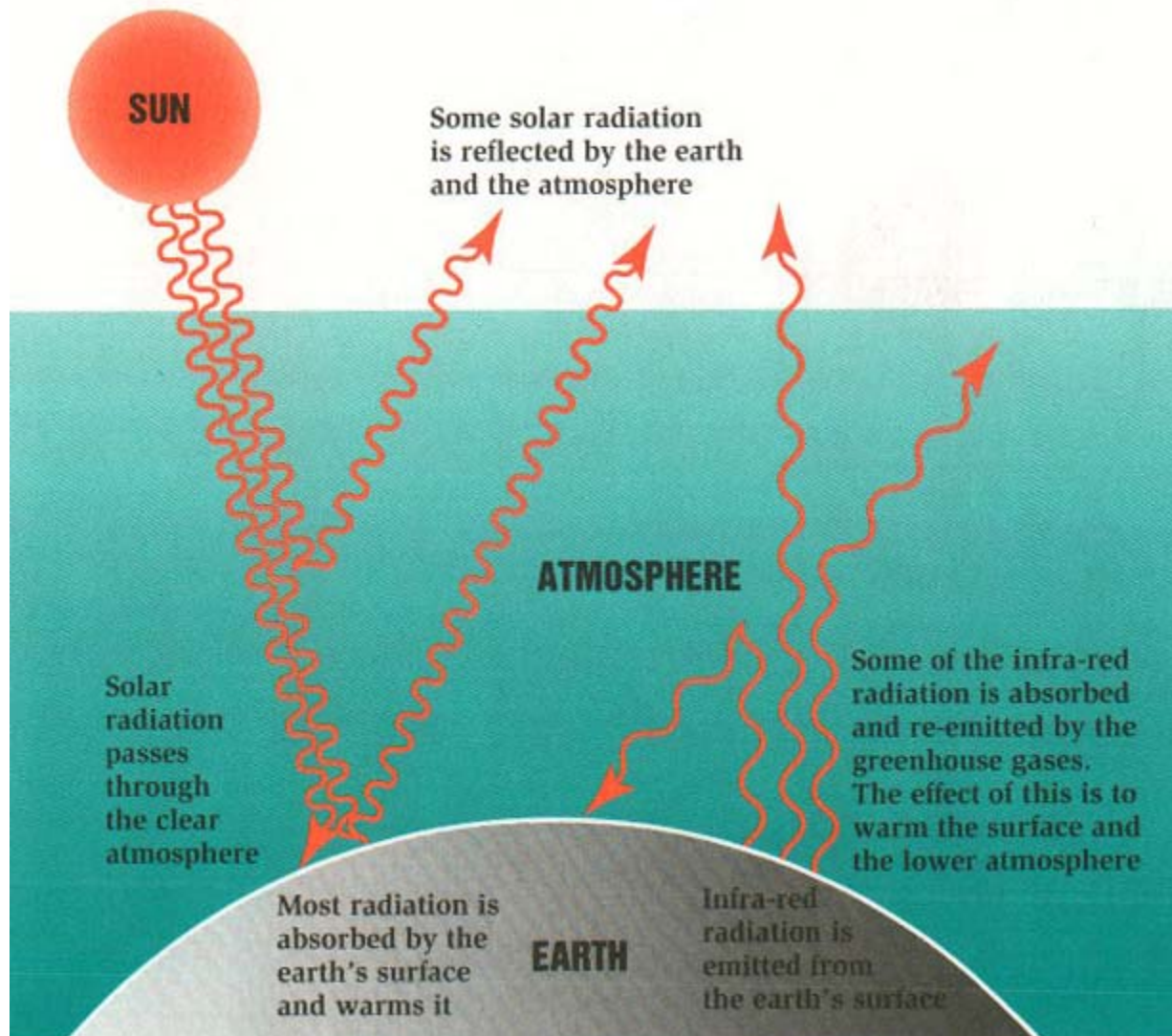


19-May-05

# ATMOSPHERIC CARBON DIOXIDE IS INCREASING



Global carbon dioxide concentration over the last thousand years

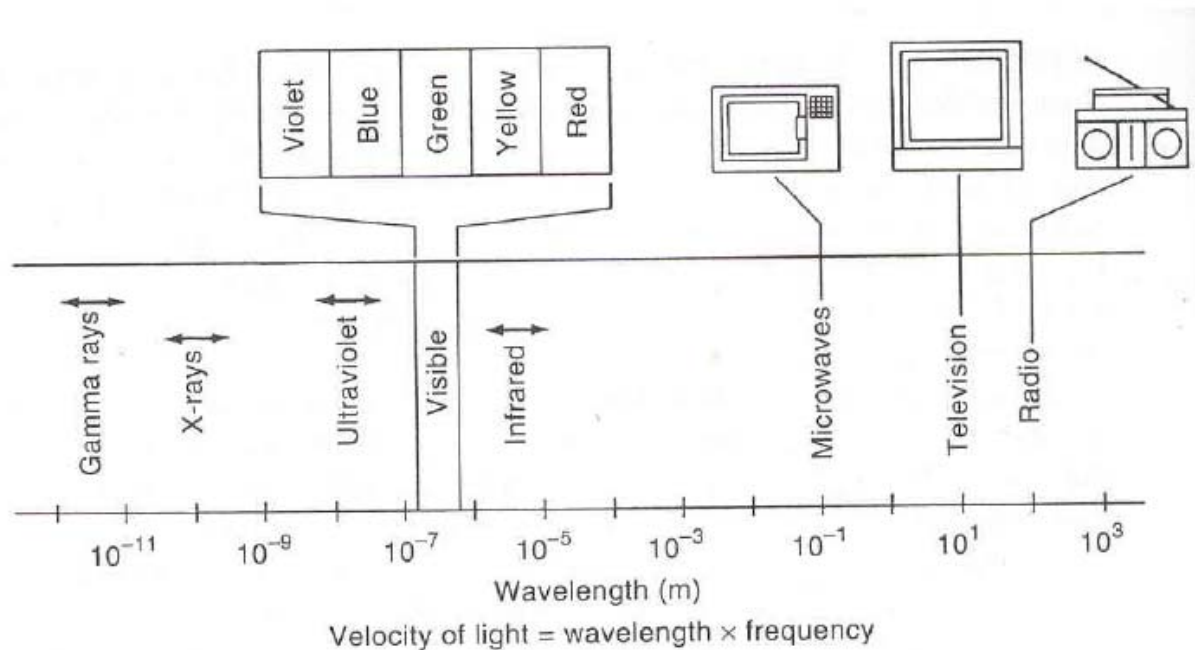


### 3. Radiation: A means of heat transfer

Radiation is emitted from an object in the form of electromagnetic waves...

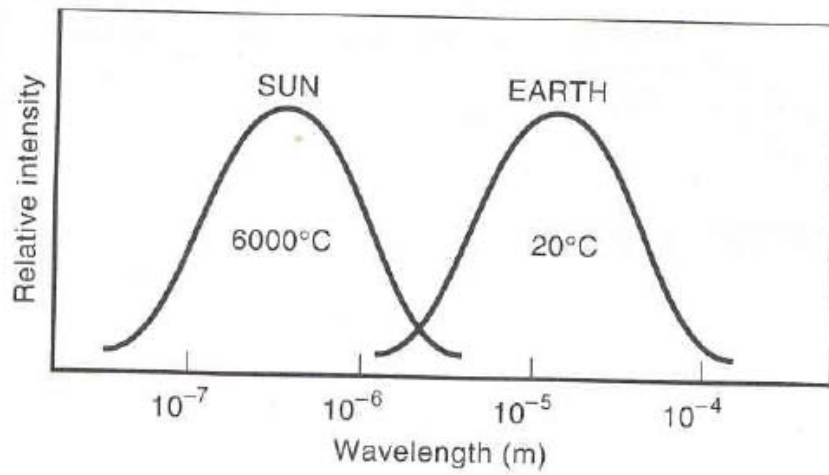
Types of electromagnetic radiation include many familiar waves:

Visible light, radio waves, microwaves, X-rays and infrared waves



**FIGURE 4.15**

The electromagnetic spectrum, shown as a function of wavelength.



**FIGURE 4.16**

The spectrum of radiation emitted from the sun and the earth. The vertical scales for each spectrum are different, as the intensity of radiation from the sun is many times greater than that from the earth.