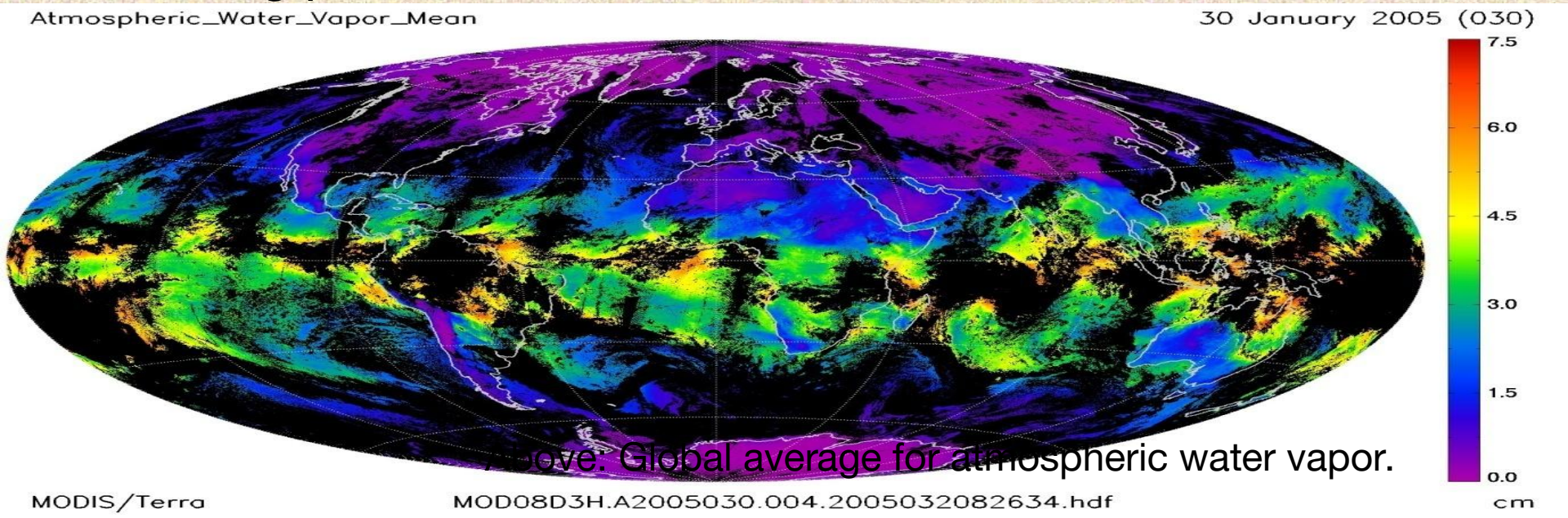
The Earth Climate

Contents

What is Climate?

Climate = the average and variations of weather over a long period of time (~30 years) but other periods may be used depending on the purpose. Climate also includes statistics other than the average, such as the magnitudes of day-to-day or year-to-year variations.

Therefore, c**limate** is “the average and variations of weather over long periods of time”.



Above: Global average for atmospheric water vapor.

The Intergovernmental Panel on Climate Change (IPCC) glossary definition is as follows:

Climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years. The classical period is 30 years, as defined by the World Meteorological Organization (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.[5]

The difference between climate and weather is usefully summarized by the popular phrase "Climate is what you expect, weather is what you get."[6]

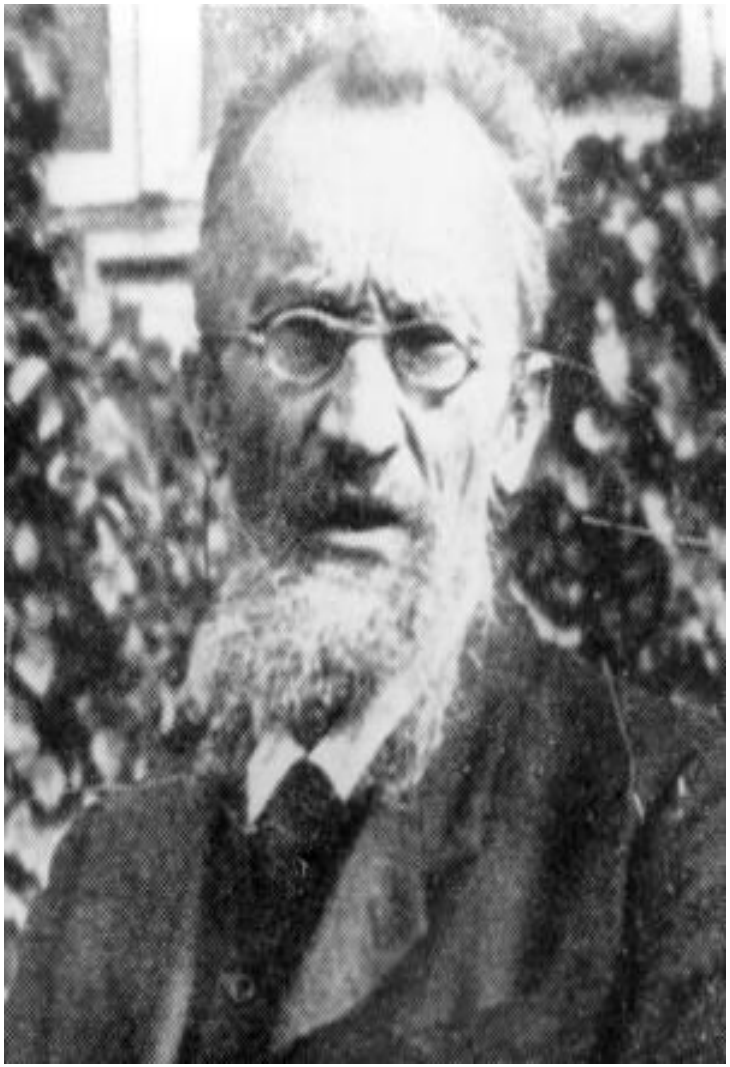
Climate classification

There are several ways to classify climates into similar regimes. Originally, climes were defined in Ancient Greece to describe the weather depending upon a location's latitude. Modern climate classification methods can be broadly divided into *genetic* methods, which focus on the causes of climate, and *empiric* methods, which focus on the effects of climate. Examples of genetic classification include methods based on the relative frequency of different air mass types or locations within synoptic weather disturbances. Examples of empiric classifications include climate zones defined by plant hardiness,[10] evapotranspiration,[11] or more generally theKöppen climate classification which was originally designed to identify the climates associated with certain biomes

Bergeron and Spatial Synoptic

The simplest classification is that involving air masses. The Bergeron classification is the most widely accepted form of air mass classification. Based upon the Bergeron classification scheme is the Spatial Synoptic Classification system (SSC). There are six categories within the SSC scheme: Dry Polar (similar to continental polar), Dry Moderate (similar to maritime superior), Dry Tropical (similar to continental tropical), Moist Polar (similar to maritime polar), Moist Moderate (a hybrid between maritime polar and maritime tropical), and Moist Tropical (similar to maritime tropical, maritime monsoon, or maritime equatorial).[14]

The Köppen Climate Classification System is the most widely used for classifying the world's climates. Most classification systems used today are based on the one introduced in 1900 by the Russian-German climatologist Wladimir Köppen. Köppen divided the Earth's surface into climatic regions that generally coincided with world patterns of vegetation and soils.



Köppen climate classification

The Köppen system recognizes five major climate types based on the annual and monthly averages of temperature and precipitation. Each type is designated by a capital letter. A - Moist Tropical Climates are known for their high temperatures year round and for their large amount of year round rain. B - Dry Climates are characterized by little rain and a huge daily temperature range. Two subgroups, S - semiarid or steppe, and W - arid or desert, are used with the B climates. C - In Humid Middle Latitude Climates land/water differences play a large part. These climates have warm, dry summers and cool, wet winters. D - Continental Climates can be found in the interior regions of large land masses. Total precipitation is not very high and seasonal temperatures vary widely. E - Cold Climates describe this climate type perfectly.

Tropical
- Tropical wet
- Tropical wet and dry

Dry
- Semiarid
- Arid

Moderate
- Mediterranean
- Humid subtropical
- Marine west coast

Continental
- Humid continental
- Subarctic

Polar
- Tundra
- Ice cap
- Highlands

- Non-permanent ice

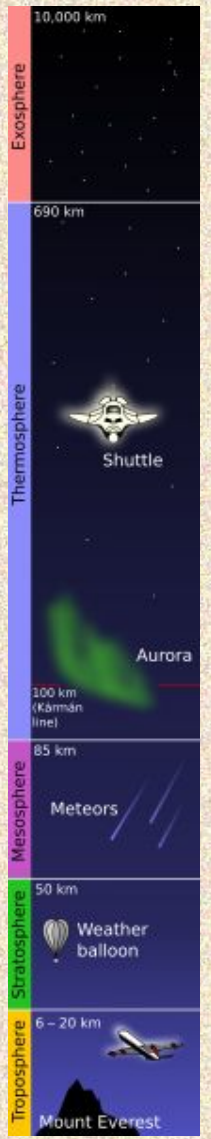
Global Climate Change

Climate Change, Global Warming…

…Shilina Anastasia

Logunov Andrew

9B



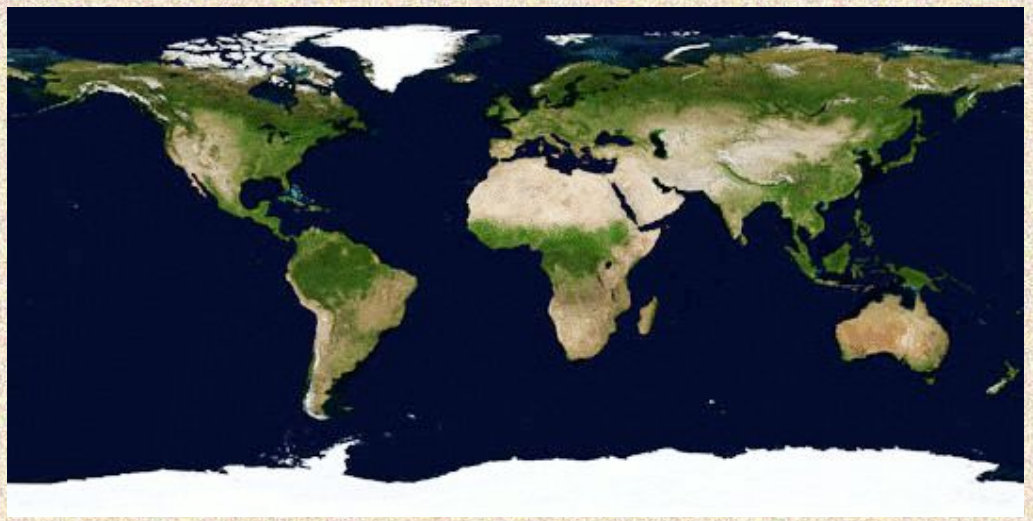
What is Weather?

- Weather = all natural phenonmena within the atmosphere at a given time (hours to days)

What is Science?

- Science is the search for knowledge

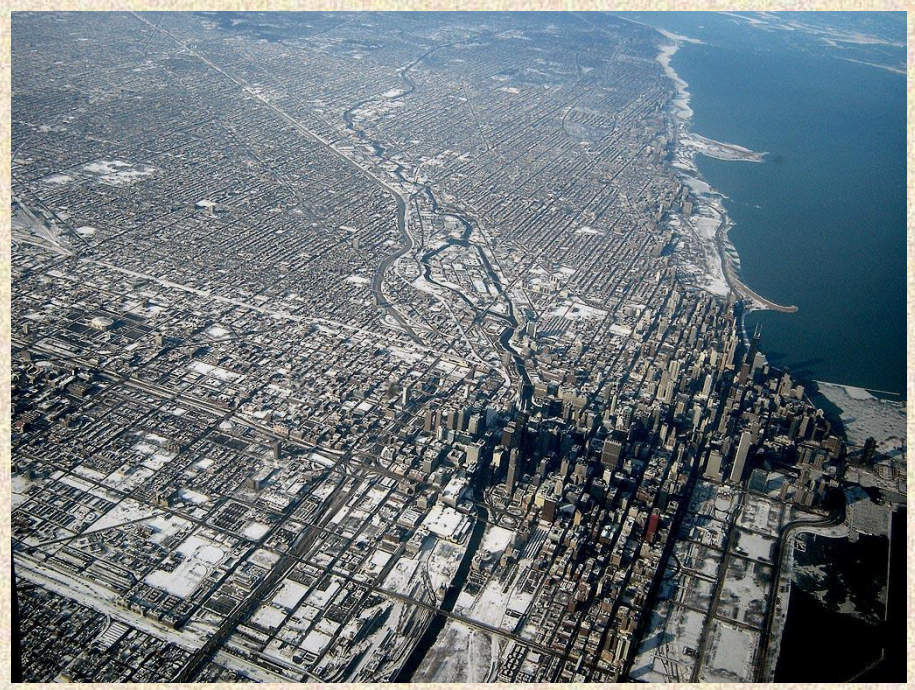
The lunar cycle



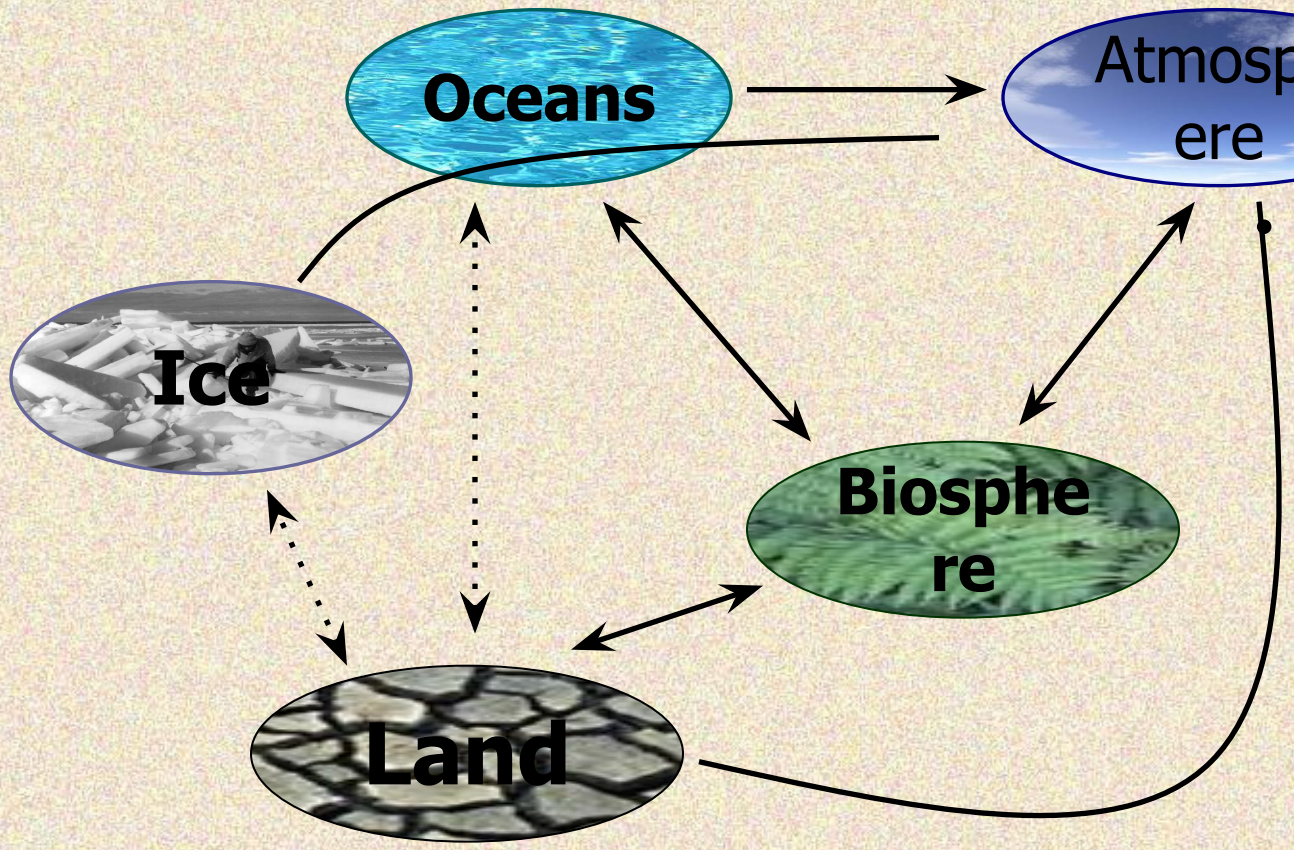
The extent of snowfall as the seasons progress from Summer into Winter and then back to Summer again.

What is Climate Change?

- Records change over decades to millions of years



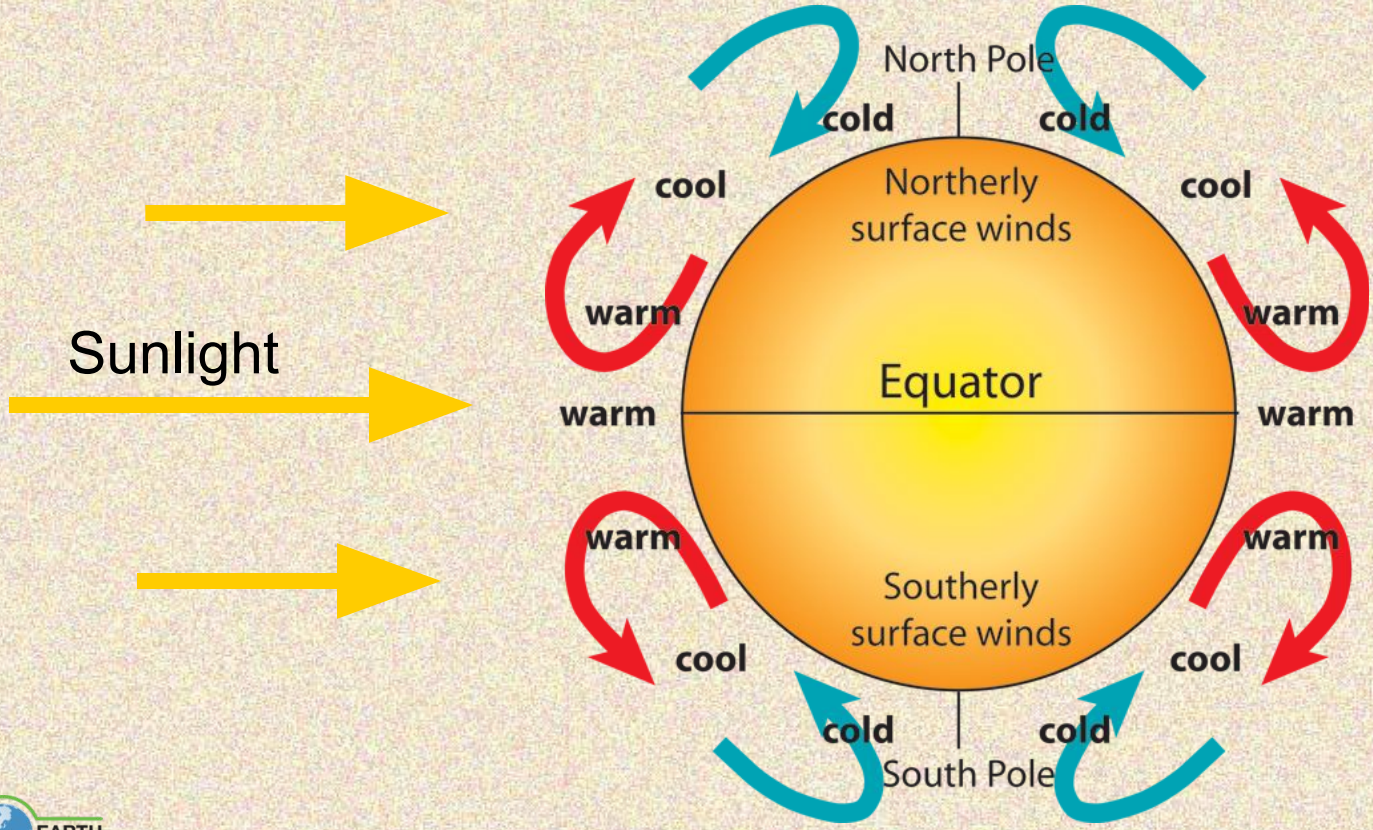
The Climate System



- The Earth has many different systems that interact with each other in different ways.

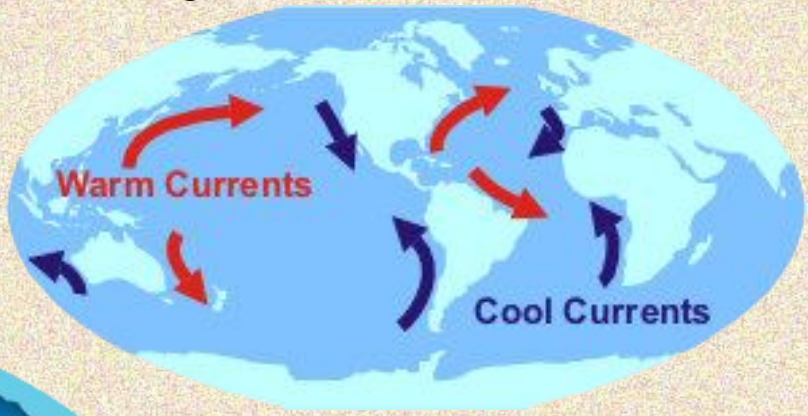
Modern Climate Systems

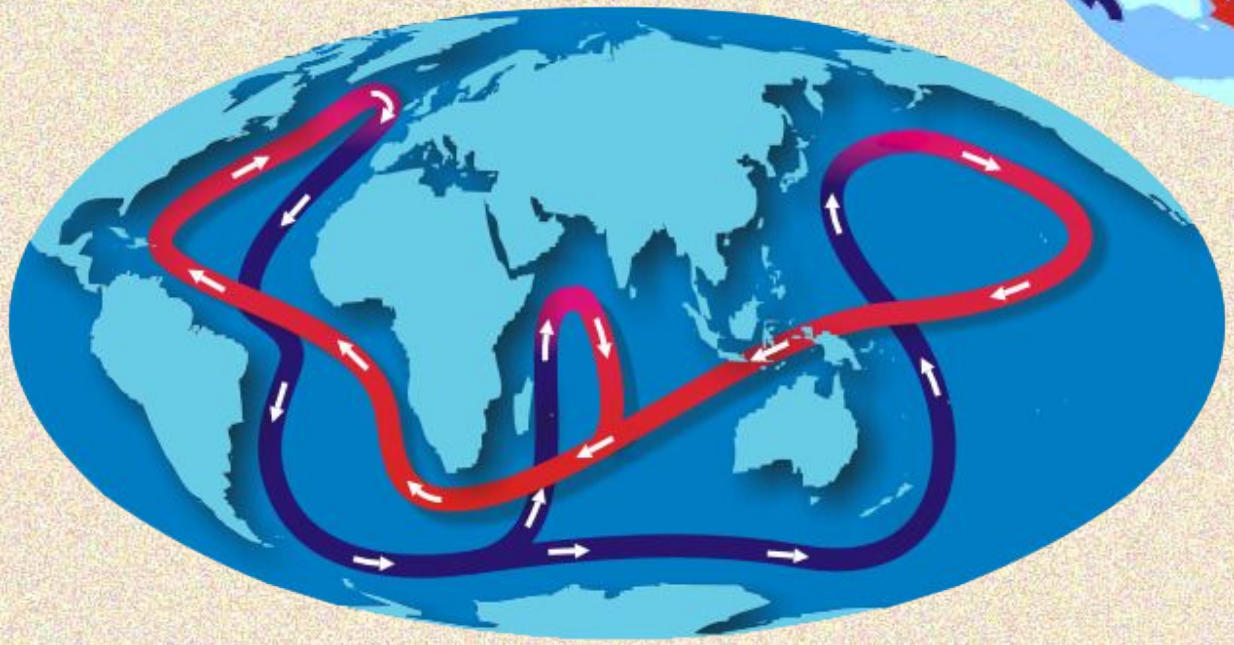
- Atmospheric circulation



Modern Climate Systems

- Ocean circulation

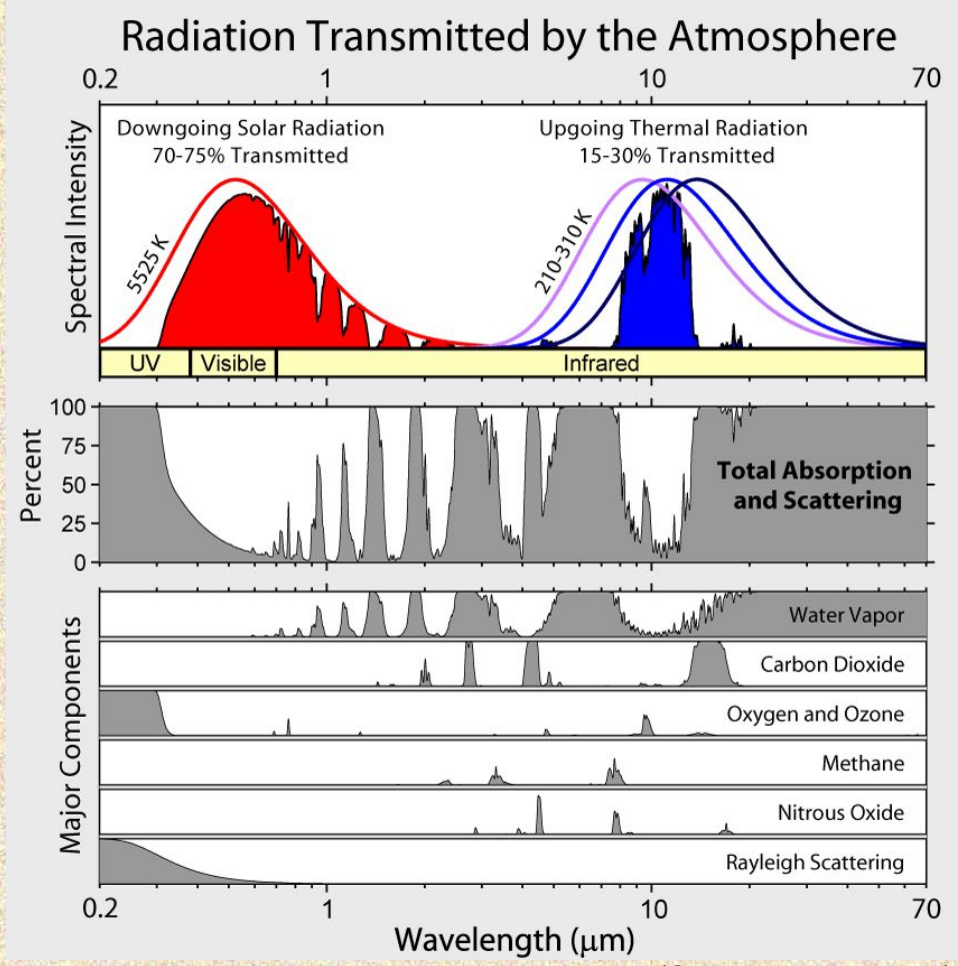




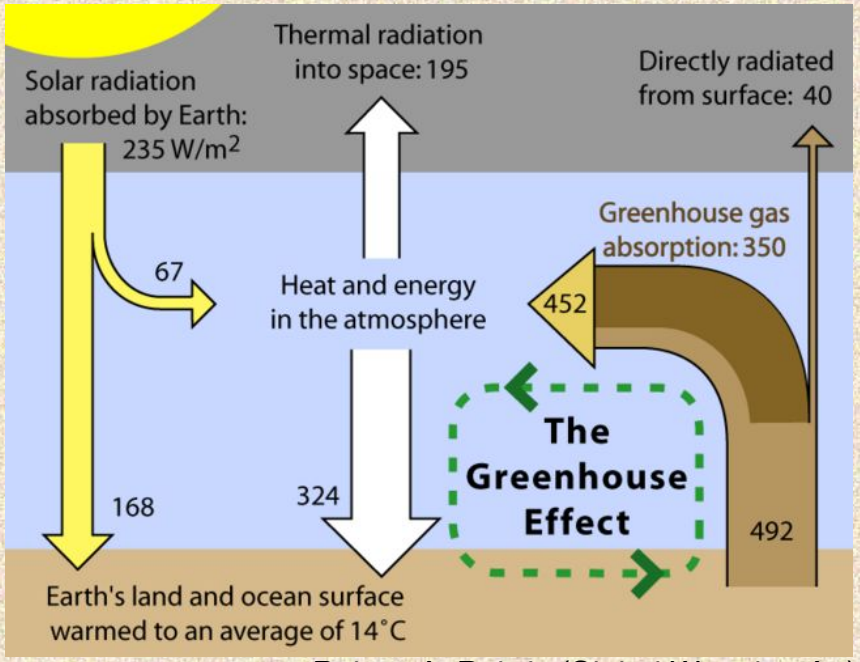
The Great Ocean Conveyor

Sinking cool water, rising warm water and wind help to form global ocean current systems.

What is the Greenhouse Effect?



cc. Robert A. Rohde (Global Warming Art)

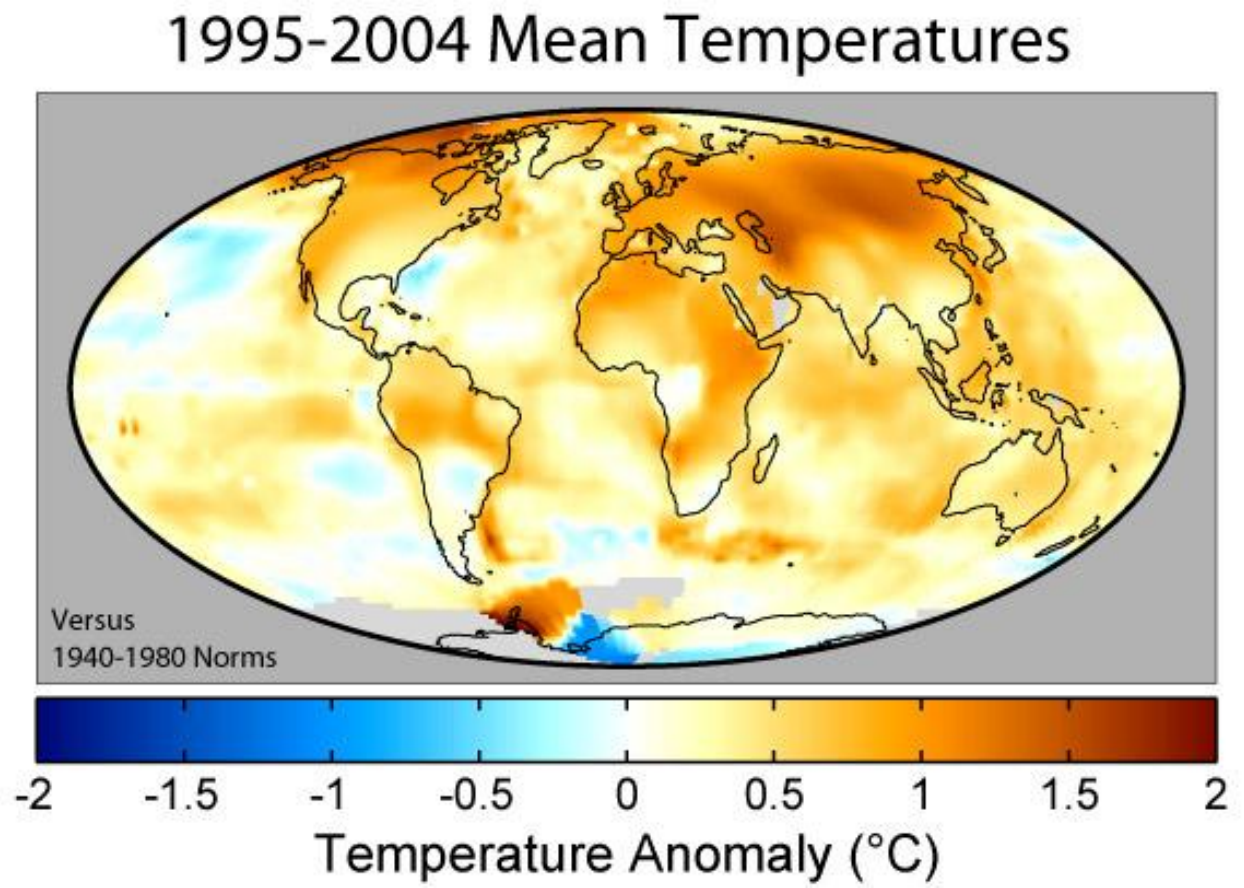


cc. Robert A. Rohde (Global Warming Art)

The temperature of the Earth depends on the amount of energy we receive from the sun versus the amount of energy lost back out to space.

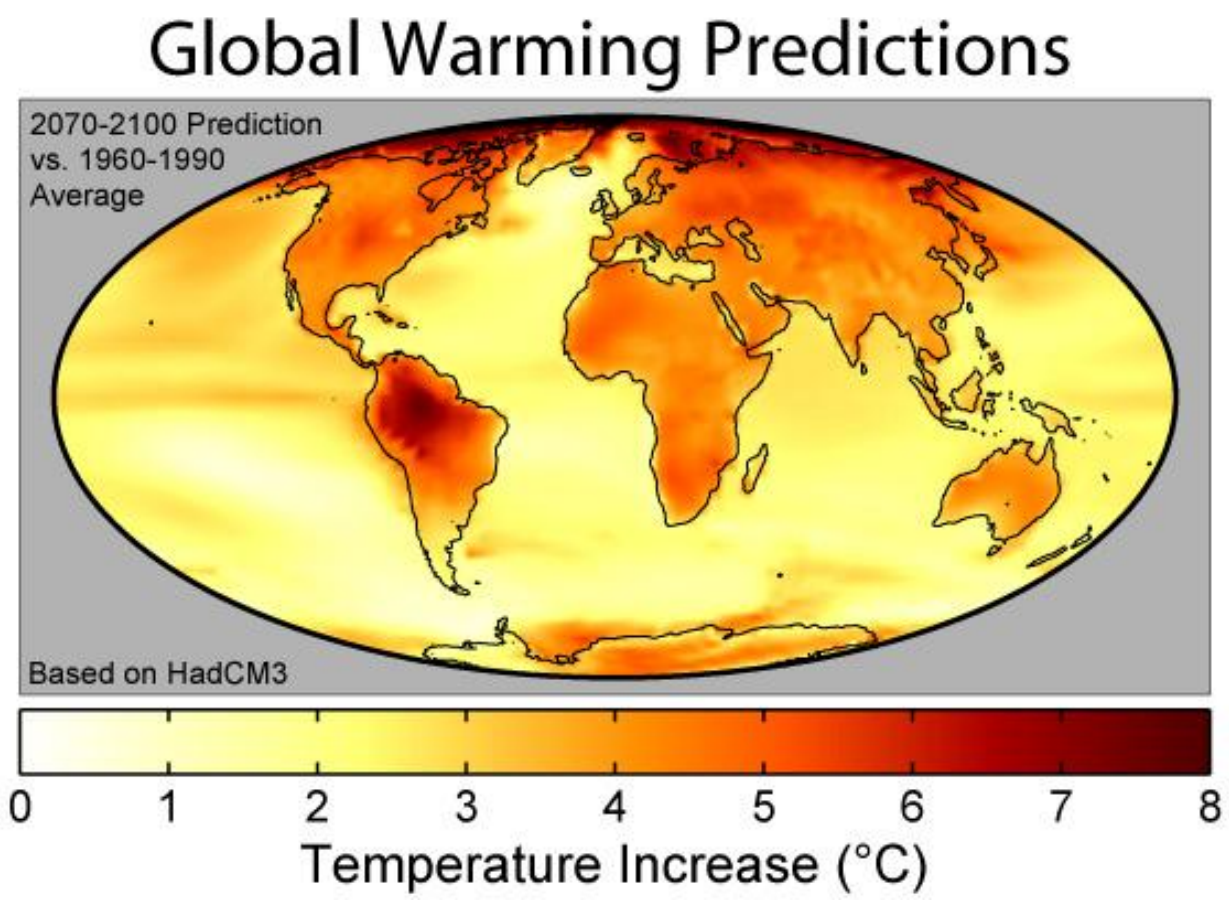
Is the Climate Changing?

What are the current climate trends?



cc. Robert A. Rohde http://www.globalwarmingart.com/wiki/Image:Global_Warming_Map_jpg

Future predictions…



- Based on no changes in emissions ("business as usual")
- The UK would be 2-3.5°C hotter on average.

cc. Robert A. Rohde http://www.globalwarmingart.com/wiki/Image:Global_Warming_Predictions_Map_jpg

The way to solve the problem.

- Recycle
- Turn off lights
- Low energy light bulbs
- Shorter showers
- Recycle «grey»water
- Install solar panels
- Walk or ride instead of taking a vehicle

References

1. **Jump up^** AR4 SYR Synthesis Report Annexes. Ipcc.ch. Retrieved on 2011-06-28.
2. **Jump up^** C. W. Thornthwaite (1948). "An Approach Toward a Rational Classification of Climate". *Geographical Review* **38** (1): 55–94.doi:10.2307/210739. JSTOR 210739.
3. **Jump up^** "Climate". *Glossary of Meteorology*. American Meteorological Society. Retrieved 2008-05-14.
4. **Jump up^** "Climate averages". Met Office. Retrieved 2008-05-17.
5. **Jump up^** Intergovernmental Panel on Climate Change. Appendix I: Glossary. Retrieved on 2007-06-01.
6. **Jump up^** National Weather Service Office Tucson, Arizona. Main page.Retrieved on 2007-06-01.
7. **Jump up^** Stefan Rahmstorf The Thermohaline Ocean Circulation: A Brief Fact Sheet. Retrieved on 2008-05-02.