

A world map with a color gradient representing climate zones. The colors range from dark red at the top (North Pole) and bottom (South Pole) to yellow in the middle. The map shows the outlines of continents and countries. The text "Test your climate-knowledge!" is overlaid in the center.

**Test your climate-knowledge!**



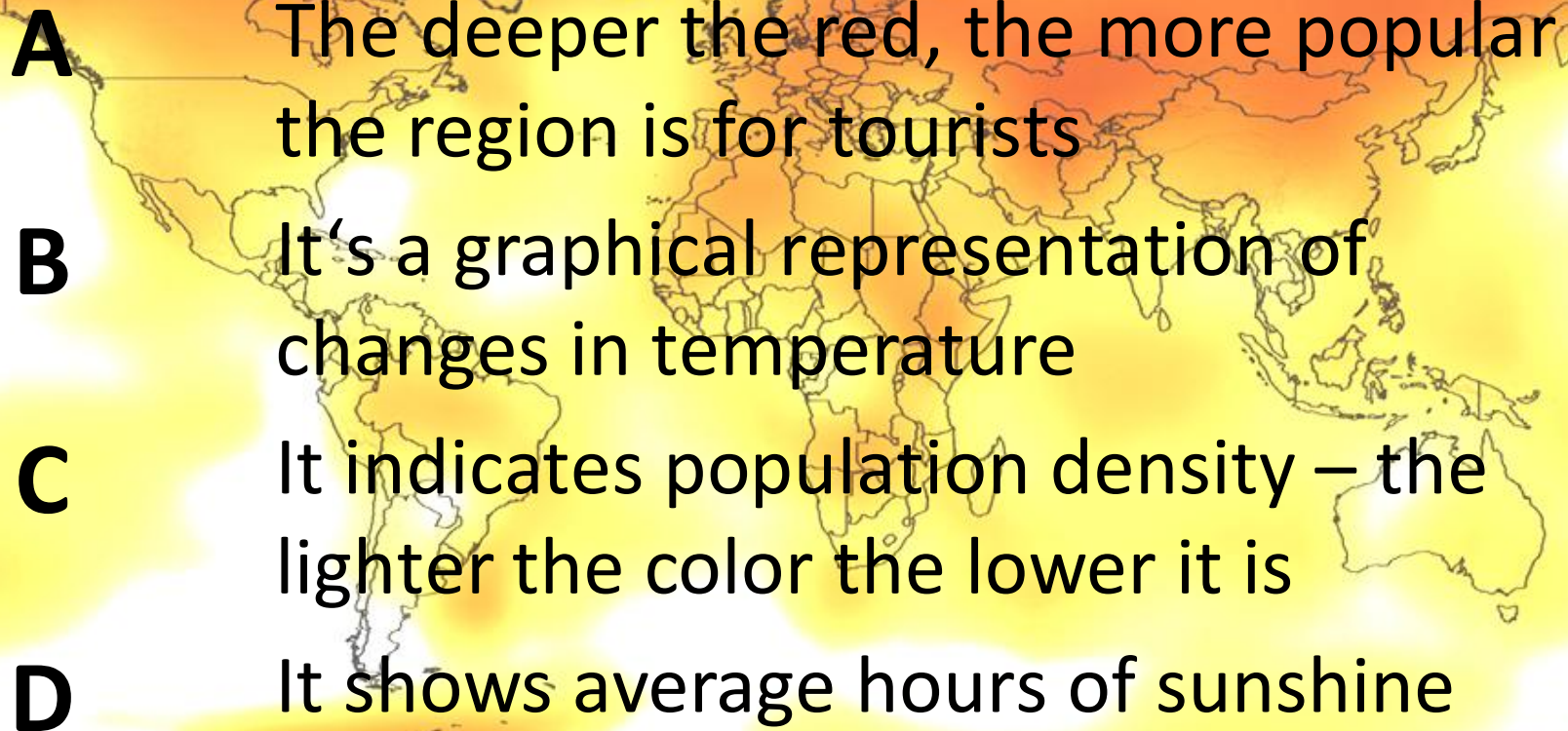






# What does the coloring in the background-map show?



- 
- A world map with a color gradient overlay. The colors range from light yellow to deep red, with the deepest red concentrated in North America, Europe, and parts of Asia. The map also shows some blue areas in the southern oceans.
- A** The deeper the red, the more popular the region is for tourists
  - B** It's a graphical representation of changes in temperature
  - C** It indicates population density – the lighter the color the lower it is
  - D** It shows average hours of sunshine

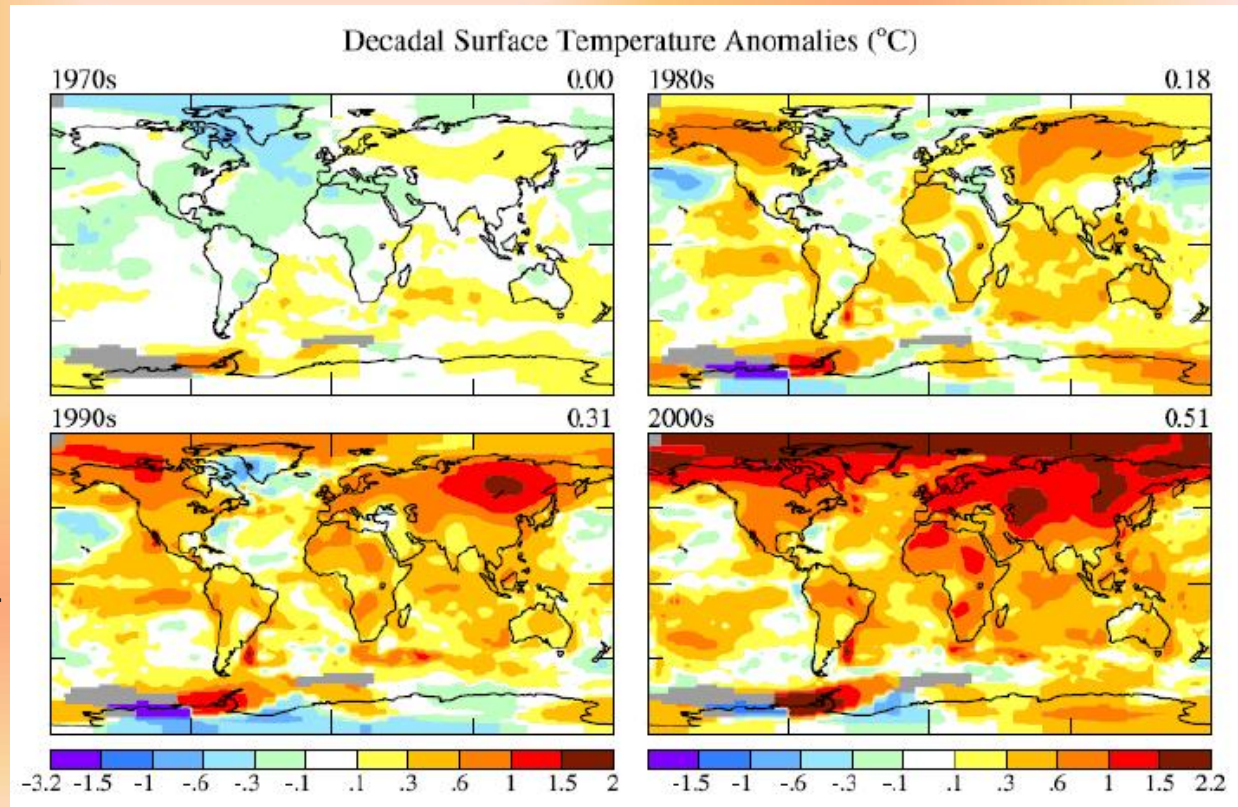


# What does the coloring in the background-map show?

**B** It's a graphical representation of changes in temperature

The colors show the changes in temperature of the past four decades in comparison to the mean temperature of 1951 to 1980. Warmer areas are shown in red, colder ones in blue. The Arctic and parts of Antarctica warmed the most. The first decade of the 21<sup>st</sup> century was warmer than the previous decade which was also warmer than the one before.

Grafik: NASA-GISTEMP





**? Which percentage of active climate scientists say that global warming is a fact? ?**

- A** 13 %
- B** 54 %
- C** 79 %
- D** 97 %





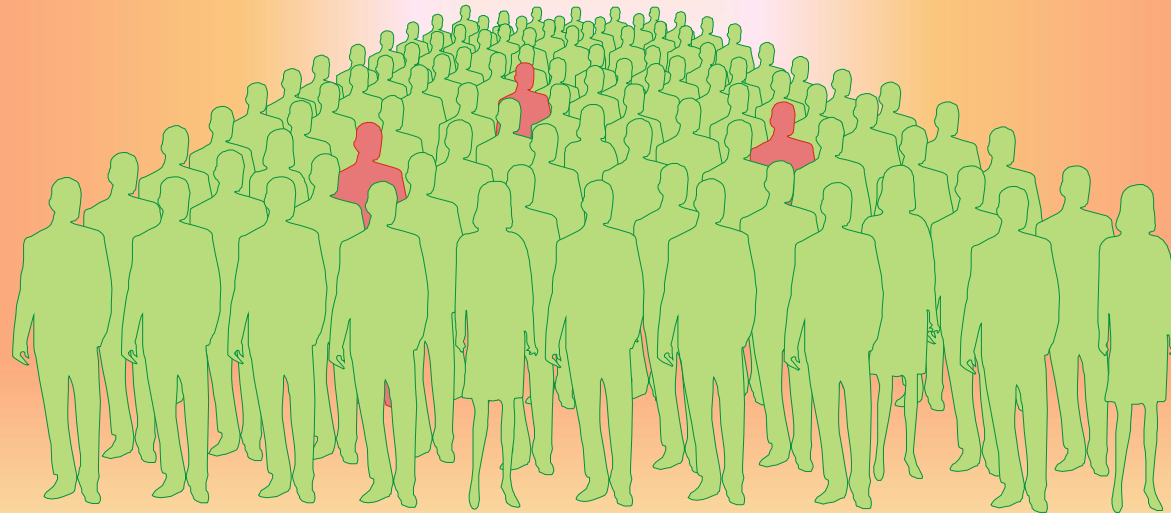


# Which percentage of active climate scientists say that global warming is a fact?



**D** 97 %

Over 97% of actively publishing climate scientists think humans are changing global temperature



Doran et al 2009, Anderegg et al 2010

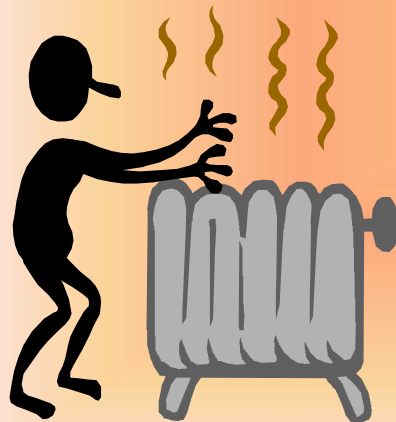




# What is the largest heat storage on Earth?



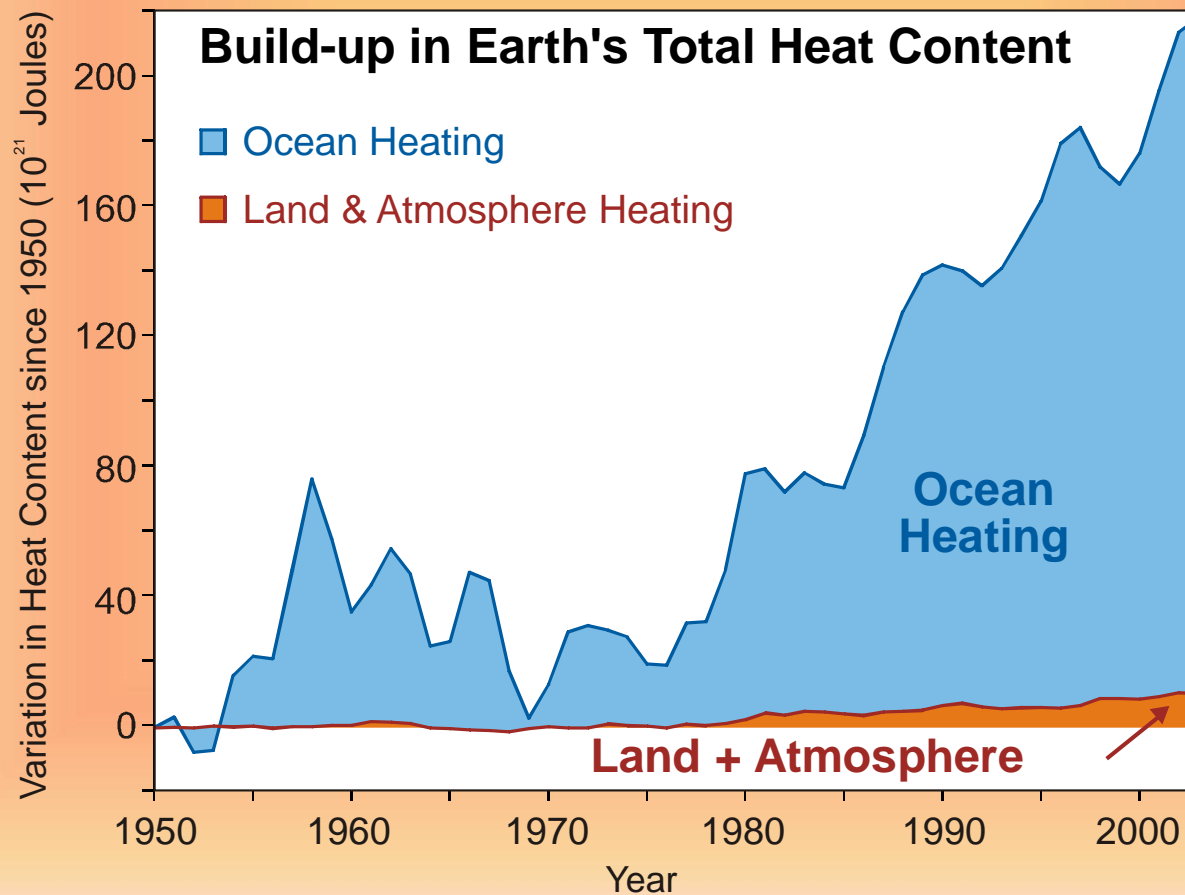
- A** The oceans
- B** Land and atmosphere
- C** Cities
- D** The world's population





# What is the largest heat storage on Earth?

## A The oceans







# What is the significance of the number 350?



- A** Number of climate scientists who think that climate change is happening
- B** Number of news-articles about climate change
- C** The CO<sub>2</sub> concentration in ppm (parts per Million) we should aim for
- D** Just a number without any meaning





# What is the significance of the number 350?



**C** The CO<sub>2</sub> concentration in ppm (parts per Million) we should aim for

350 ppm (parts per million) is – according to many scientists, climatologists and forward-thinking governments – the safe upper limit of CO<sub>2</sub> in our atmosphere

➔ more information: <http://www.350.org/>





**What is the current CO<sub>2</sub>-  
concentration?**



- A**      275 ppm
- B**      350 ppm
- C**      390 ppm
- D**      450 - 500 ppm





# What is the current CO<sub>2</sub>-concentration?



**C 390 ppm**

**A 275 ppm**

→ During most of human history up until about 200 years ago the average CO<sub>2</sub>-concentration in our atmosphere was around 275 ppm.

**B 350 ppm**

→ according to many climatologists this is the safe upper limit of CO<sub>2</sub>-concentration in our atmosphere.

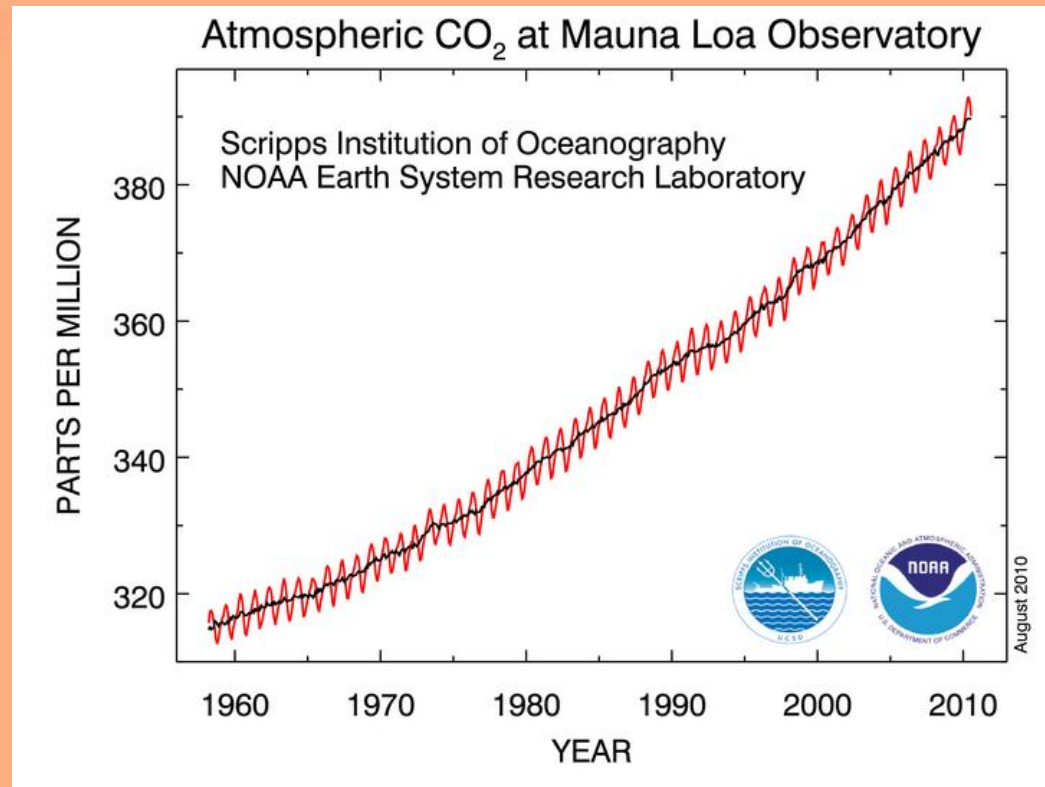
**D 450 bis 500 ppm**

→ according to the IPCC-report from 2007 this range is considered to be on the safe side in order to keep the warming below 2°C.





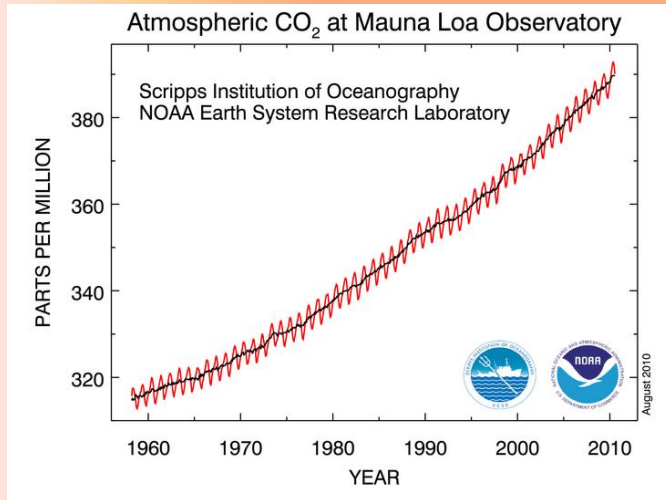
# Why is the CO<sub>2</sub>-curve zig-zagging like this?



- A** This is related to eruptions of the Mauna Loa volcano
- B** It's due to recalibrations of the instruments
- C** It just looks more interesting
- D** It's a reaction to the vegetation-cycle of the northern hemisphere



# Why is the CO<sub>2</sub>-curve zig-zagging like this?

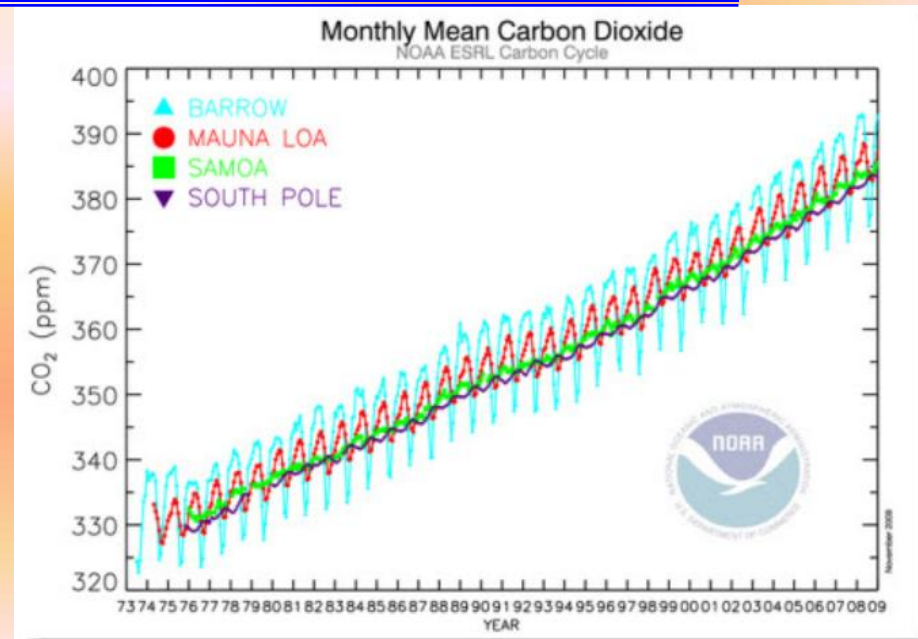


There are several other stations measuring CO<sub>2</sub> and all show the same upward-trend. The amplitude is different, dependent on the geographical location.

**D** It's a reaction to the vegetation-cycle of the northern hemisphere

→ During spring/summer CO<sub>2</sub>-concentration in the atmosphere goes down measurably as CO<sub>2</sub> is absorbed by plants when their leaves grow. During fall/winter, the concentration goes up due to decaying leaves and plants. Overall, the trend is clearly upwards (black line, where the seasonal changes have been smoothed out)

→ <http://www.esrl.noaa.gov/gmd/ccgg/trends/>







**What types of effects are expected from a sea-level-rise of 50 cm?**



- A** none
- B** Coastal infrastructure worth between \$25,000 to \$28,000 billions will be at risk
- C** Salt water intrusion into low lying agricultural land
- D** Problems for island nations in the South Pacific

(more than one answer is correct!)





## What types of effects are expected from a sea-level-rise of 50 cm?



- B** Coastal infrastructure worth between \$25,000 to \$28,000 billions will be at risk
- C** Salt water intrusion into lowlying agricultural land
- D** Problems for island-nations in the South Pacific

Many densely populated areas on Earth are found close to the coast. Infrastructure like harbors and airports will be jeopardized with just a small rise of sea-levels and adaptation measures are costly.

Coastal areas will be hit harder from these climate change effects as storms and flooding can simultaneously have disastrous impacts as shown by hurricane Katrina in New Orleans in 2005.

Source: Joint report from WWF and Allianz „Tipping points“ Nov. 2009  
[http://www.wwf.de/fileadmin/fm-wwf/pdf\\_neu/Tipping\\_Points\\_WWF\\_Allianz\\_01.pdf](http://www.wwf.de/fileadmin/fm-wwf/pdf_neu/Tipping_Points_WWF_Allianz_01.pdf)





# How much ice is lost on Greenland each year?



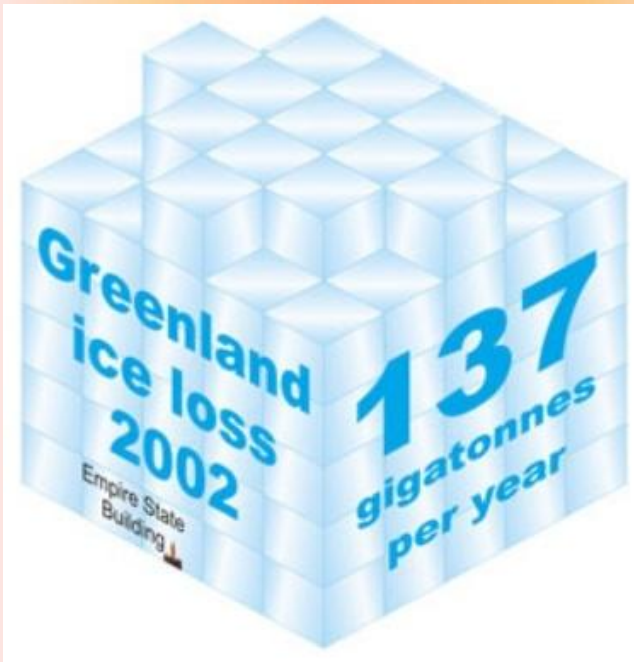
- A** none – it is even gaining mass
- B** 1 gigatonne (an ice-cube with an edge-length of about 1 km)
- C** 137 gigatonnes
- D** 286 gigatonnes





# How much ice is lost on Greenland each year?

**D 286 gigatonnes**



From 2002 to 2003 the ice-loss on Greenland happened with a rate of 137 gigatonnes per year.

source: <http://www.skepticalscience.com/Visual-depiction-how-much-ice-Greenland-is-losing.html>



Within a decade the rate of ice-loss has been more than doubled. From 2008 to 2009 286 gigatonnes were lost.





# Why is ocean acidification dangerous?



- A** It becomes more difficult for marine life like corals and shellfish to form the hard shells necessary for their survival
- B** You'll get acid-burns when bathing in the sea
- C** Saltwater will taste worse than it already does
- D** It's jeopardizing the whole marine foodchain with devastating implications for millions of people in the human populations at the end of that chain.

(more than one correct answer!)





# Why is ocean acidification dangerous?



- A** It becomes more difficult for marine life like corals and shellfish to form the hard shells necessary for their survival
- D** It's jeopardizing the whole marine foodchain with devastating implications for millions of people in the human populations at the end of that chain.

As surface waters become more acidic, it becomes more difficult for marine life like corals and shellfish to form the hard shells necessary for their survival, and coral reefs provide a home for more than 25% of all oceanic species. Tiny creatures called pteropods located at the base of many oceanic food chains can also be seriously impacted. The degradation of these species at the foundation of marine ecosystems could lead to the collapse of these environments with devastating implications to millions of people in the human populations that rely on them.

The IAP also stated that, if atmospheric CO<sub>2</sub> were to reach 550 parts per million (ppm) along its current rapid ascent from its pre-industrial level of 280 ppm, coral reefs around the globe could be dissolving.

(Quelle: Skeptical Science – Ocean Acidification: Global warmings evil twin  
<http://www.skepticalscience.com/ocean-acidification-global-warming.htm>



# How can “climate” be defined best?

- A** It's happening within hours to a couple of weeks
- B** It's happening within a few days, one week, one month or a season.
- C** It is a statistical average of the Earth's weather determined over several decades – usually 30 years.
- D** You can't define climate.





# How can “climate” be defined best?



- C** It is a statistical average of the Earth’s weather determined over several decades – usually 30 years.



**“Climate trains the boxer but weather throws the punches.”**

(Source: <http://www.climatewatch.noaa.gov/2010/videos/soc2009>)

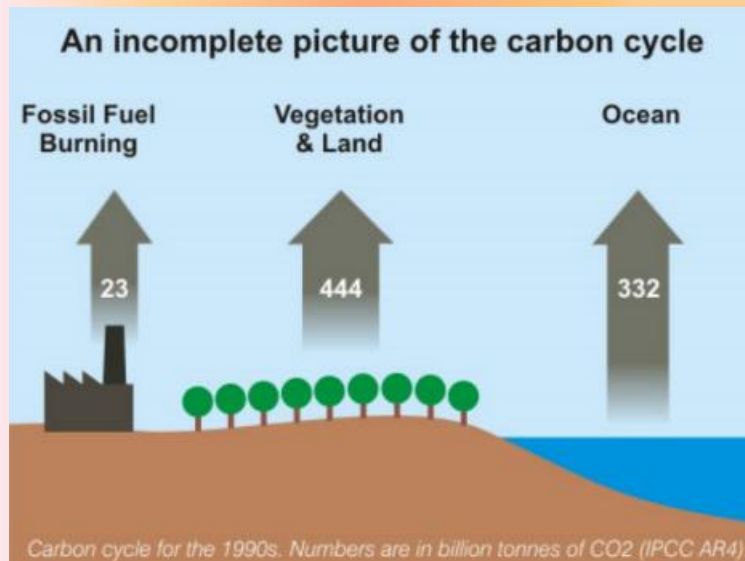


**“Climate is what you expect, weather is what you get.”**





# Why is this chart titled “incomplete picture of the carbon cycle”?



- A** It's a typo – it should read “complete picture....”
- B** It's missing the CO<sub>2</sub>-uptake of vegetation & land
- C** It's missing the CO<sub>2</sub>-uptake of the oceans
- D** It's missing the CO<sub>2</sub>-uptake of vegetation & land and oceans



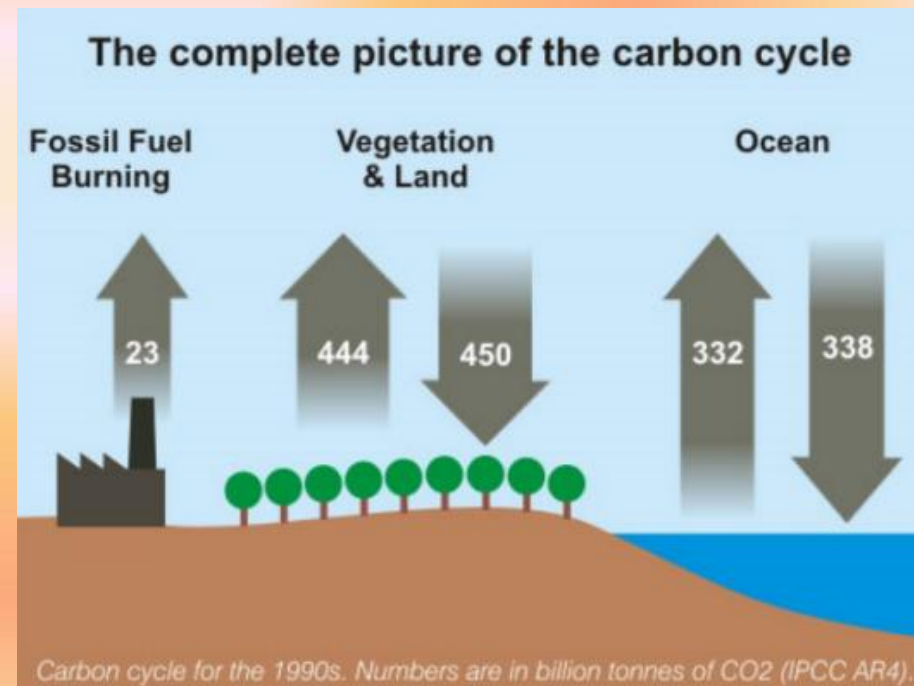
# Why is this chart titled “incomplete picture of the carbon cycle”?

**D** It's missing the CO<sub>2</sub>-uptake of vegetation & land and oceans

## **This is the complete picture:**

Natural land and ocean carbon remains roughly in balance and have done so for a long time. Although our output of 29 gigatons of CO<sub>2</sub> is tiny compared to the 750 gigatons moving through the carbon cycle each year, it adds up because the land and ocean cannot absorb all of the extra CO<sub>2</sub>. About 40% of this additional CO<sub>2</sub> is absorbed. The rest remains in the atmosphere.

(source: <http://www.skepticalscience.com/human-co2-smaller-than-natural-emissions.htm>)







# How much more CO<sub>2</sub> is due to human activity than volcanoes?



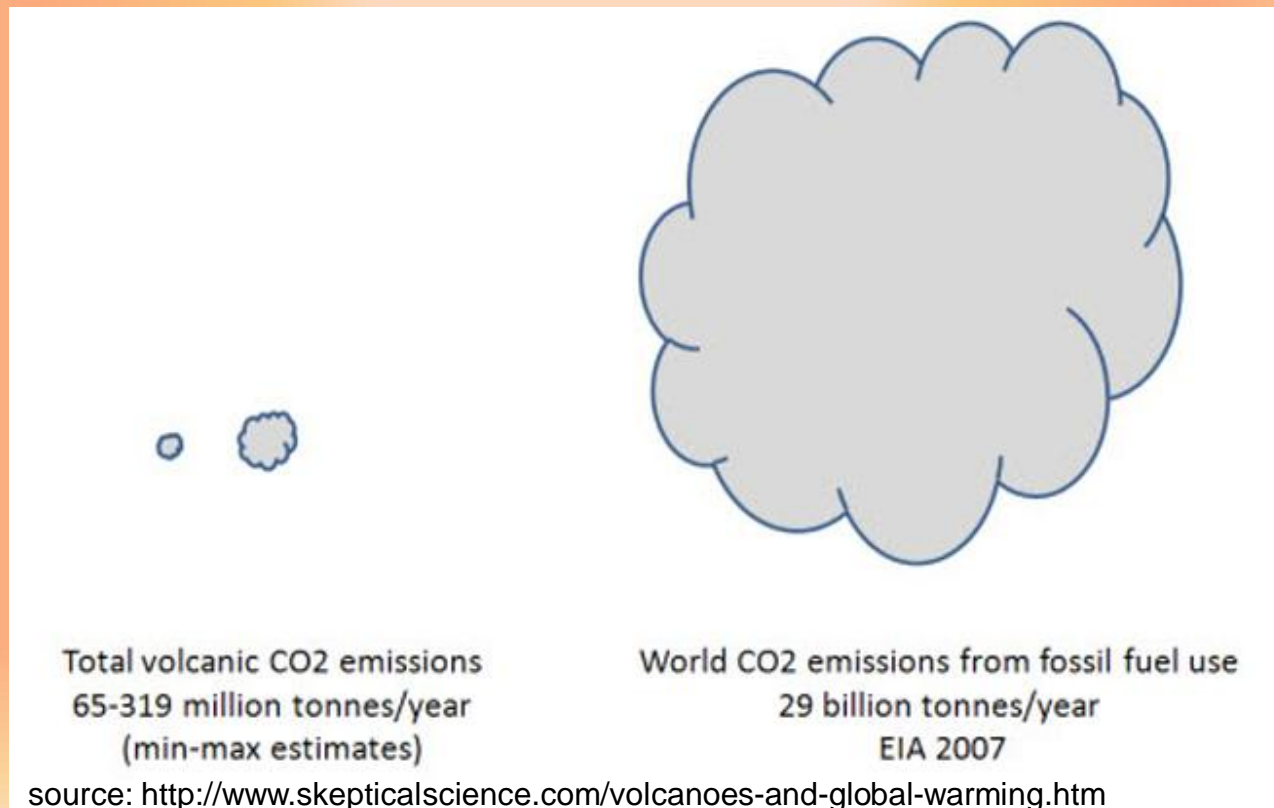
- A** Not more at all! Just about half as much
- B** Volcanoes and human activities contribute about the same amount of CO<sub>2</sub>
- C** Ten times as much
- D** Hundred times as much





# How much more CO<sub>2</sub> is due to human activity than volcanoes?

**D** Hundred times as much







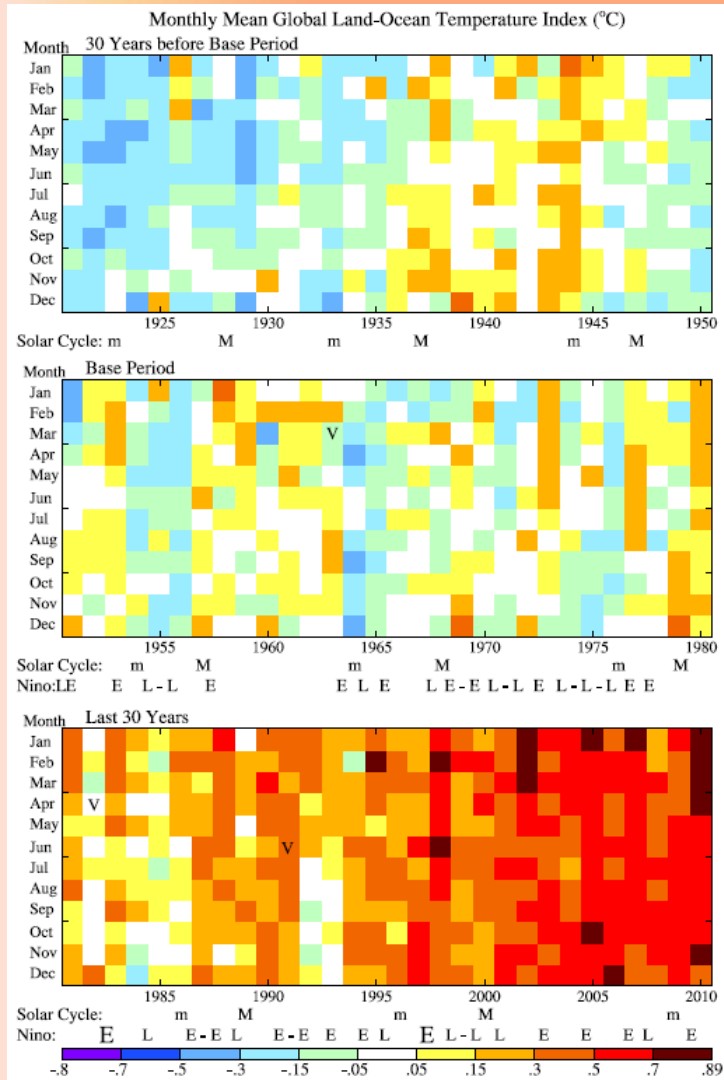
# What are you looking at?



- A** Modern art
- B** Temperature changes over time
- C** Signals from outer space
- D** Mural from an Indonesian temple



# What are you looking at?



## B Temperature changes over time

The graphic was first created by Tom Yulsman who publishes the blog [cejournal.net](http://www.cejournal.net). He stitched the three NASA/GISS produced panels together into one continuous horizontal graphic. Each column represents one year and each row one month. The base-period is 1951 to 1980, blue boxes represent colder temperatures, red boxes warmer temperatures than the base period's mean surface temperature.

(Sources: <http://www.cejournal.net/?p=4525> and <http://data.giss.nasa.gov/gistemp/graphs/Tvs.year+month.pdf>)



A world map is shown with a color gradient overlay. The colors range from blue in the southern oceans to red in the northern regions, with yellow and orange in between. The map includes outlines of continents and countries. The text "We hope you enjoyed this quiz!" is centered over the map in a bold, black, sans-serif font.

**We hope you enjoyed this quiz!**



# Thirsty for more information?

Then check out this website:

<http://skepticalscience.com>

