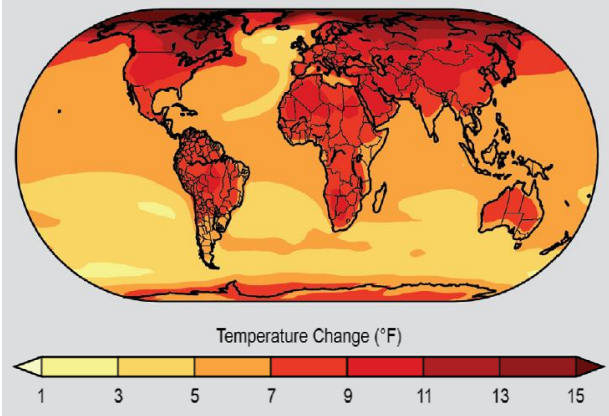
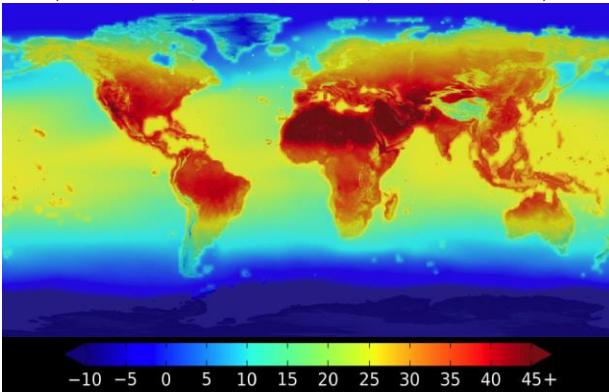


Fact 4: If we continue to emit CO₂ as we now do, we will greatly exceed the 2°C (3.6°F) carbon budget, making life on Earth extremely difficult for many.

1. This figure shows the projected increases in annual average temperature over the period 2071-2099 compared to 1970-1999.



- a. The Arctic will warm most, a projection we are already seeing.
 - b. Large areas of Earth will warm by 10°F or more, making it difficult to grow crops and work outdoors.
2. Maximum daily temperatures (°C) in July 2099 will be very high, as seen in the figure below. (0°C = 32°F, 40°C = 104°F; 45°C = 113°F)



- a. The southwestern U.S., Northern Africa, the Middle East, and northwestern India, will be exceedingly hot, making outdoor activities essentially impossible.
- b. Landmasses above the Arctic Circle will be well above freezing, melting permafrost.

Things You Can Do

- Educate yourself about climate change and energy systems.
- Talk about climate change to neighbors, friends, and family.
- Get involved!
 - Join an organization advocating for changes in our energy policies.
 - Write letters to the editor.
 - Call or write your elected officials about the need for action at the state, national, and international levels to limit the emission of CO₂ from fossil fuels.
 - Advocate for a revenue-neutral carbon tax as proposed by Citizens' Climate Lobby.
- Drive less, but when you do drive, use a vehicle that has the best mileage possible.
- Use alternative transportation when possible.
- Reduce your use of energy at home.
 - Weatherize your home. This minimizes your heating and cooling energy needs and their costs.
 - Use Energy Star appliances.
 - Change to LED lights.
 - Adjust your thermostat.
 - Use less hot water.
- Install solar panels on your home.
- Plant trees.
- Eat less meat, especially beef, and cheese.

For more information, visit the following websites:

<https://skepticalscience.com/>

<http://www.nationalgeographic.com/environment/climate-change/>

<http://nas-sites.org/americasclimatechoices/>

<http://www.globalchange.gov/>

<http://history.aip.org/history/climate/index.htm>

<https://www.yaleclimateconnections.org/>

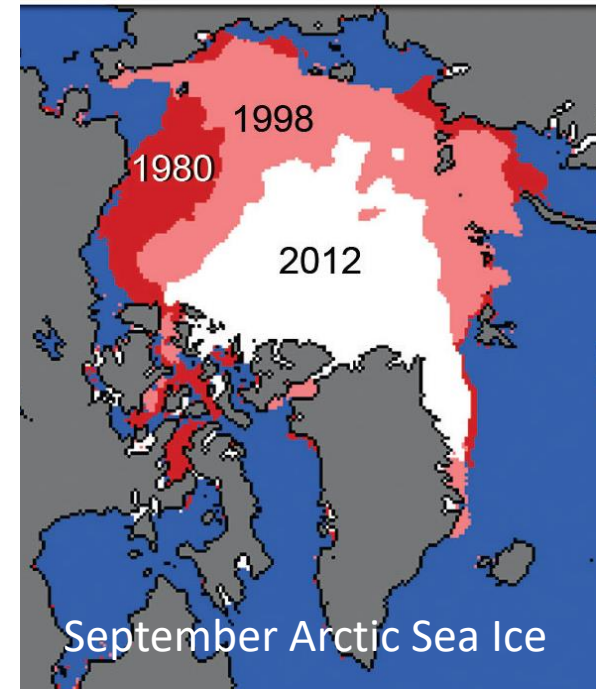
Climate Action Alliance of the Valley

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facebook.com/caavva

climateactionallianceofthevalley.org/

Version 2.0, September 2017



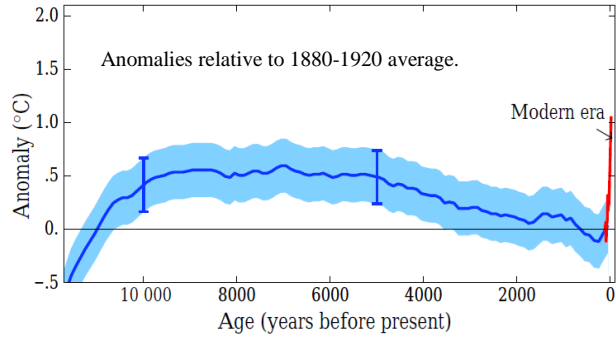
Climate Change Facts



Climate Action Alliance of the Valley
Harrisonburg, VA

Fact 1: Climate change is occurring. The evidence for climate change is clear and compelling.

1. Temperature reconstructions show that current warming is unprecedented within the span of human civilization.



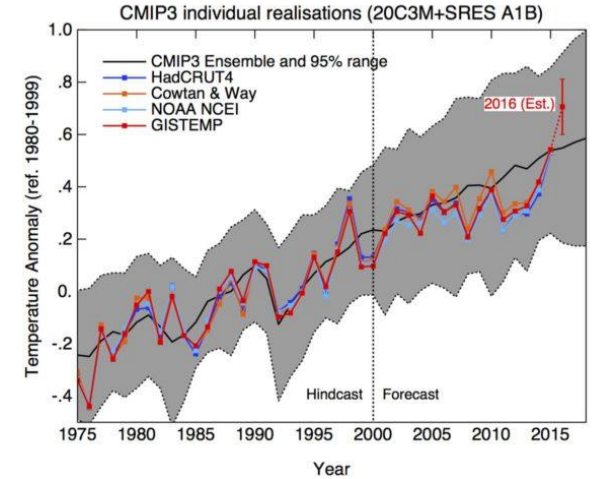
2. Mountain glaciers are melting all over the world.
3. The large glaciers in both Greenland and Antarctica are melting.
4. Oceans are warming.
5. Coral is bleaching.
6. Sea level is rising.
7. The Arctic ice cap is shrinking (see cover) and the nature of the ice is changing.
8. Weather is getting more extreme.
9. Heat waves are impacting outdoor workers and the elderly in many parts of the world.
10. Extreme droughts are causing many to leave rural areas and migrate to cities.
11. Heavy rainfall is disrupting life in many areas.
12. Permafrost, a layer of permanently frozen soil in the Arctic and Antarctic, is melting.
13. Many species of plants and animals are moving toward the poles.
14. Many species of plants and animals are changing their time of flowering or migration.
15. Fish populations are changing in the southern reaches of the Arctic seas.
16. Insects are moving north and south from the tropics, taking with them disease-causing bacteria and viruses.
17. Although skepticism is an inherent part of science, 97% of climate scientists agree that climate change is occurring.

Fact 2: Climate change is being driven by increased levels of carbon dioxide (CO₂) and other greenhouse gases (GHGs) in the atmosphere.

1. The level of CO₂ in the atmosphere has increased 40% in the past 150 years because of the burning of fossil fuels (coal, oil, and natural gas).
2. CO₂ acts like a global thermostat.
 - a. Water vapor is responsible for about 50% of the greenhouse effect and clouds 25%.
 - b. CO₂ directly contributes 20% of the greenhouse effect. Its impact is larger, however, because it influences the amount of water vapor and clouds in the atmosphere - its acts like a thermostat.
3. For Earth to maintain a constant average temperature, the amount of heat being radiated to space must equal the amount coming in from the sun. If less heat is leaving, Earth will warm.
4. A comparison of satellite data from 1970 to that from 2003 showed that less heat was leaving as CO₂ levels increased. The decrease could be attributed to the CO₂ increase.
5. CO₂ also sends heat back to Earth. A comparison of data from Earth-based sensors in 1973 and 2008 found an increase in incoming heat at the wavelengths at which CO₂ radiates. The increase in incoming heat was consistent with the increase in CO₂ in the atmosphere.
6. From 2000 through 2010, scientists measured atmospheric CO₂ levels in Oklahoma and Alaska, as well as incoming heat from CO₂. The CO₂ level trended upwardly over time. The amount of incoming heat changed directly with the CO₂ level.
7. The upper atmosphere has been cooling while the lower atmosphere and Earth's surface have been warming. This is characteristic of increases in CO₂ level and not changes in solar activity or natural climate variability.
8. As the level of CO₂ has increased, the number of warm nights has increased faster than the number of warm days. This is characteristic of changes in CO₂ level and not changes in solar activity or natural climate variability.

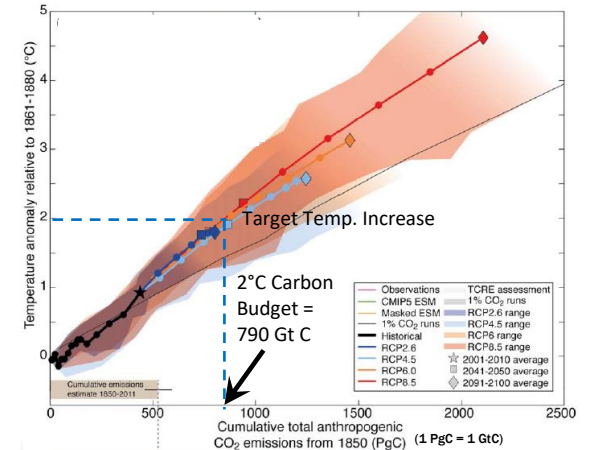
Fact 3: Temperatures will increase as long as the amounts of CO₂ and other GHGs in the atmosphere increase.

1. Climate scientists use simulation models to make projections of what will happen in the future as CO₂ levels increase.
2. The figure below illustrates that climate models accurately project future trends.



The colored lines are actual global average temperature variations from the 1980-1999 average. The black line is a model projection made in 2000.

3. Models show that future temperature increases will be directly proportional to the amount of CO₂ we put into the atmosphere.



This allows a carbon budget to be set based on an allowable (2°C) temperature increase.