



# CLIMATE CHANGE IS HAPPENING

WHAT IT IS  
AND WHAT  
YOU CAN  
DO.

# Reduce Reuse Recycle

Here is a list of some simple (and not so simple) things each of us can do.

- ✓ Unplug televisions, computers, and chargers when not in use. Plugged in electronics and appliances still use electricity, called "standby power."
- ✓ Buy less stuff. For example, instead of buying a case of plastic water bottles, consider buying one refillable one.
- ✓ Know where your food comes from. If you buy local, your food travels fewer miles, reducing fossil fuel use.
- ✓ Eat vegetarian meals several times a week. Growing vegetables uses less energy than raising cattle, for example.
- ✓ Walk or bicycle more often or try taking the bus or carpooling.
- ✓ Turn off lights when you leave a room
- ✓ Program your thermostat
- ✓ Close curtains at night – to keep in warmth. Install shades for your windows – to keep the inside cool.
- ✓ Install a water-saving showerhead and low-flow toilets
- ✓ Use energy efficient lighting, such as compact fluorescent or LED lights.
- ✓ Use cold (or warm) water to wash your laundry – and consider drying clothes on a line instead of dryer.
- ✓ Be green in your yard
  - ✓ Plant native species. They are generally more drought tolerant.
  - ✓ Avoid pesticides
  - ✓ Grow a vegetable garden
  - ✓ Compost your food scraps for fertilizer
  - ✓ Plant a tree to shade west-facing windows

THE **Arboretum**  
AT FLAGSTAFF



Sources:  
Environmental Protection Agency  
[www.epa.gov/climatechange](http://www.epa.gov/climatechange)

Our Climate  
[www.ourclimate.net](http://www.ourclimate.net)

Garfin, G. et al. 2013. Assessment of Climate Change in the Southwest United States. A Report Prepared for the National Climate Assessment. A report by the Southwest Climate Alliance. Washington D.C.: Island Press

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US Global Change Research Program  
[www.globalschange.gov](http://www.globalschange.gov)

# We can

see all around us that temperatures are rising, snow and rainfall patterns are shifting, and more extreme weather events—like heavy rainstorms and record high temperatures—are occurring. From Superstorm Sandy to terrible drought in California, climate change is already affecting our neighborhoods and landscapes, and the plants and animals that share them.



## How does weather differ from climate?

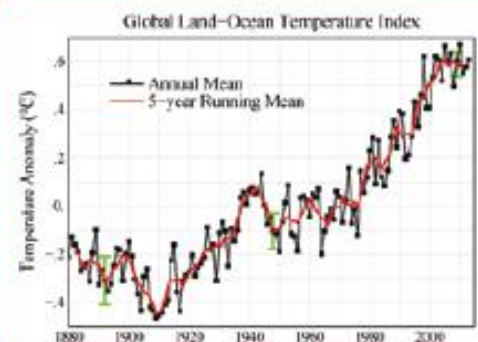
The difference between weather and climate is a measure of time. Weather covers atmospheric conditions (e.g., rainfall, daily temperature highs and lows, wind speed) over a short period of time, while climate is how the atmosphere behaves over long periods of time.



## What is climate change?

When we talk about climate change, we talk about changes in long-term averages of daily weather. Even small changes in the average temperature of the planet can translate to large and potentially dramatic shifts in climate, with resulting changes in the natural world. For example, in Arizona, flowers that hummingbirds use as food sources are blooming earlier and thus are no longer in sync with the timing of the birds' migration—affecting hummingbirds' ability to gather food and nest successfully.

This graph shows rising average land and ocean temperatures since 1880.

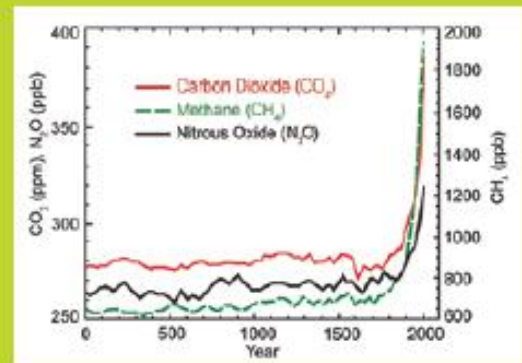


## Why is current climate change unlike climate change in the past?



While climate does change over time, human influences have caused much more dramatic changes than would have normally taken place.

Over the past century, human activities have released large amounts of carbon dioxide and other greenhouse gases into the atmosphere. Greenhouse gases act like a blanket around Earth, trapping energy in the atmosphere and causing it to warm. This phenomenon is called the "greenhouse effect" and is natural and necessary to support life on Earth. However, the buildup of greenhouse gases can change Earth's climate, resulting in negative effects on human health and welfare and ecosystem function.



This graph shows the increase in greenhouse gas (GHG) concentrations in the atmosphere over the last 2,000 years. Increases in concentrations of these gases since 1750 are due to human activities in the industrial era. *Source: USGCRP (2008)*



The majority of greenhouse gases come from driving vehicles and burning fossil fuels to produce energy, although cutting down trees, industrial manufacturing, and some agricultural practices also emit gases into the atmosphere. The contribution of greenhouse gases from human activities has sped up the warming of the planet to an unprecedented rate.



## How does climate change impact humans and wildlands?

Through shifts in average high and low temperatures and precipitation events, climate change influences agricultural crop yields, affects human health, causes changes to forests and other ecosystems, and even impacts our energy supply, as more electricity is used for air conditioning. Climate-related impacts are occurring across all regions of the country and across many sectors of our economy.



## Climate Change in the Southwest

The Southwest is getting hotter. Since 1950, folks in the Southwest have experienced the warmest period of comparable length than has been observed in the last 600 years, based on tree-ring data.

Recent droughts have been severe—and are ongoing. The areal extent of drought in the Southwest for the last decade (2001-2010) was the second highest for any decade from 1901 to 2010.

Drought, ensuing wildfire, and invasive plant and pest outbreaks all threaten native Southwest forests and wildlife.

The flow of precious water is decreasing. In the four major Southwest drainage basins, streamflow totals were 5% to 37% lower during 2001-2010 than the 20th century average. Less water in the region will strongly affect the overall economy.

Rising temperatures and drought pose threats not only to those who live in cities, but to those who depend on the land—our region's native peoples, farmers, ranchers and the tourism and recreation industries.

When the forests close due to drought induced wildfire risk – tourists stay away!

## What is The Arboretum doing?

The Arboretum at Flagstaff has instituted many practices to address energy and water use, in addition to participating in climate change research projects such as the Southwest Experimental Garden Array ([www.sega.nau.edu](http://www.sega.nau.edu)). We utilize solar panels, encourage staff to telecommute, manage water use, recycle, and do not use chemical fertilizers or pesticides—and much more! For more information, visit us at: [www.thearb.org](http://www.thearb.org)



Replacing just one incandescent light bulb in every American home would save enough energy to provide electricity to three million American homes for one year

- ✓ Buy a fuel-efficient vehicle
- ✓ Seal and insulate your home. Get an energy audit.
- ✓ Buy Energy Star appliances, heating/cooling systems, and electronics
- ✓ Buy green power from your utility company
- ✓ Use sustainably harvested wood
- ✓ If you are building a home, build energy efficient
- ✓ Install solar panels
- ✓ Vote your beliefs – you have the power to evoke change in policy



Please consider your impact on the Earth in all your decision-making.



## What Can be done to Minimize the Impact of Climate Change?

We need to reduce greenhouse gas emissions and also keep our landscapes healthy so that they are less vulnerable to climate change.

Individuals, communities, organizations and societies can prepare for, or respond to, climate change impacts. For example, on a larger scale, we can:

- Develop crop varieties that are more tolerant of heat, drought, and water logging from heavy rainfall or flooding
- Plant trees and expand green spaces in urban settings to moderate heat increases
- Protect and increase migration corridors to allow species to migrate as the climate changes.
- Increase energy efficiency to help offset increases in energy consumption.
- Improve water use efficiency and build additional water storage capacity.
- Protect and restore stream and riverbanks to ensure good water quality and safe guard water quantity.

Many of these measures are things we are already doing but could be stepped up or modified to prepare for climate change.

