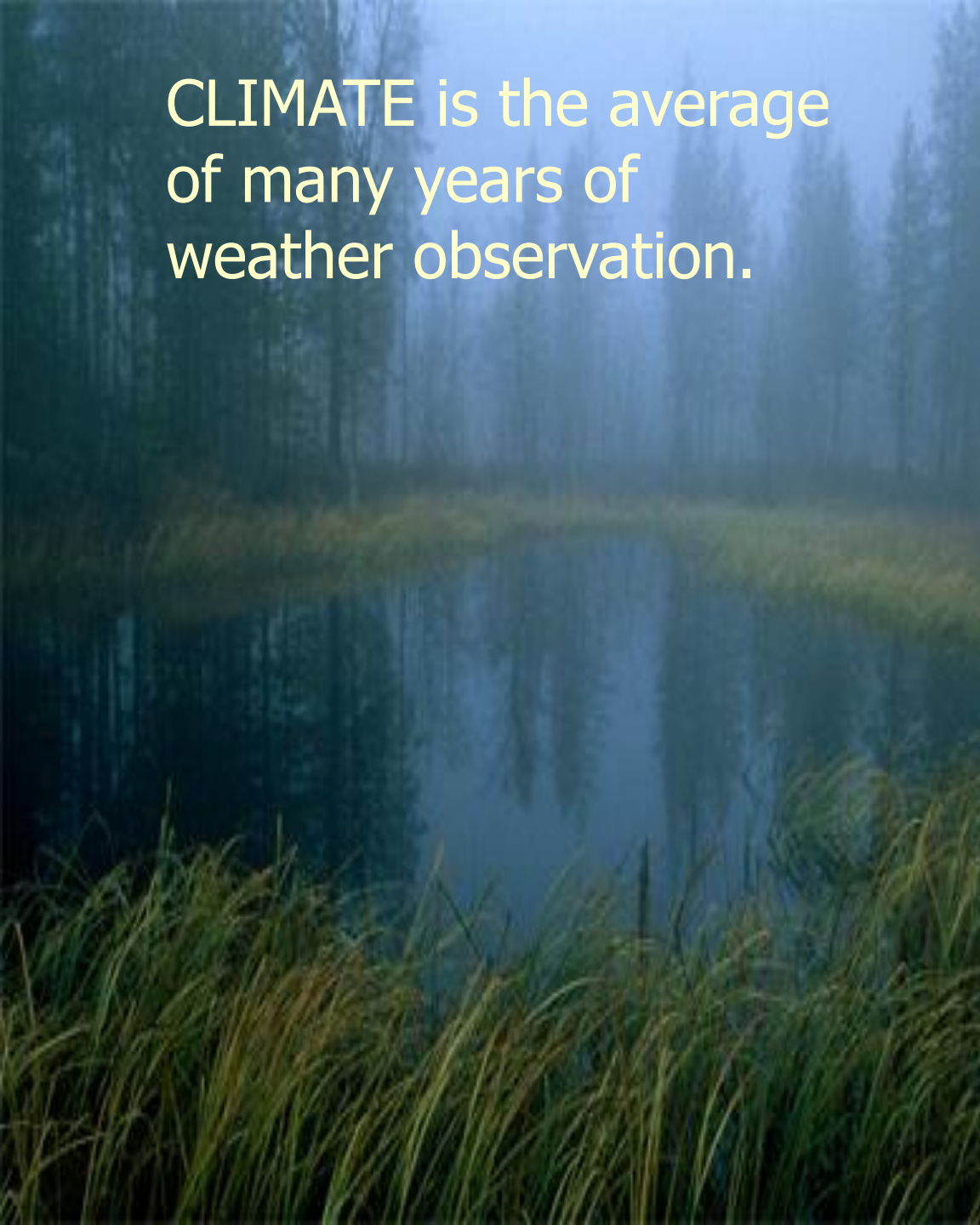


A vibrant garden scene featuring a variety of plants. In the center, several tall, slender purple flower spikes rise above the foliage. To the left, there are clusters of white daisies and other small white flowers. The background is filled with dense green leaves and branches, suggesting a wooded or overgrown area. The overall atmosphere is one of natural beauty and growth.

**CLIMATE
CHANGE**

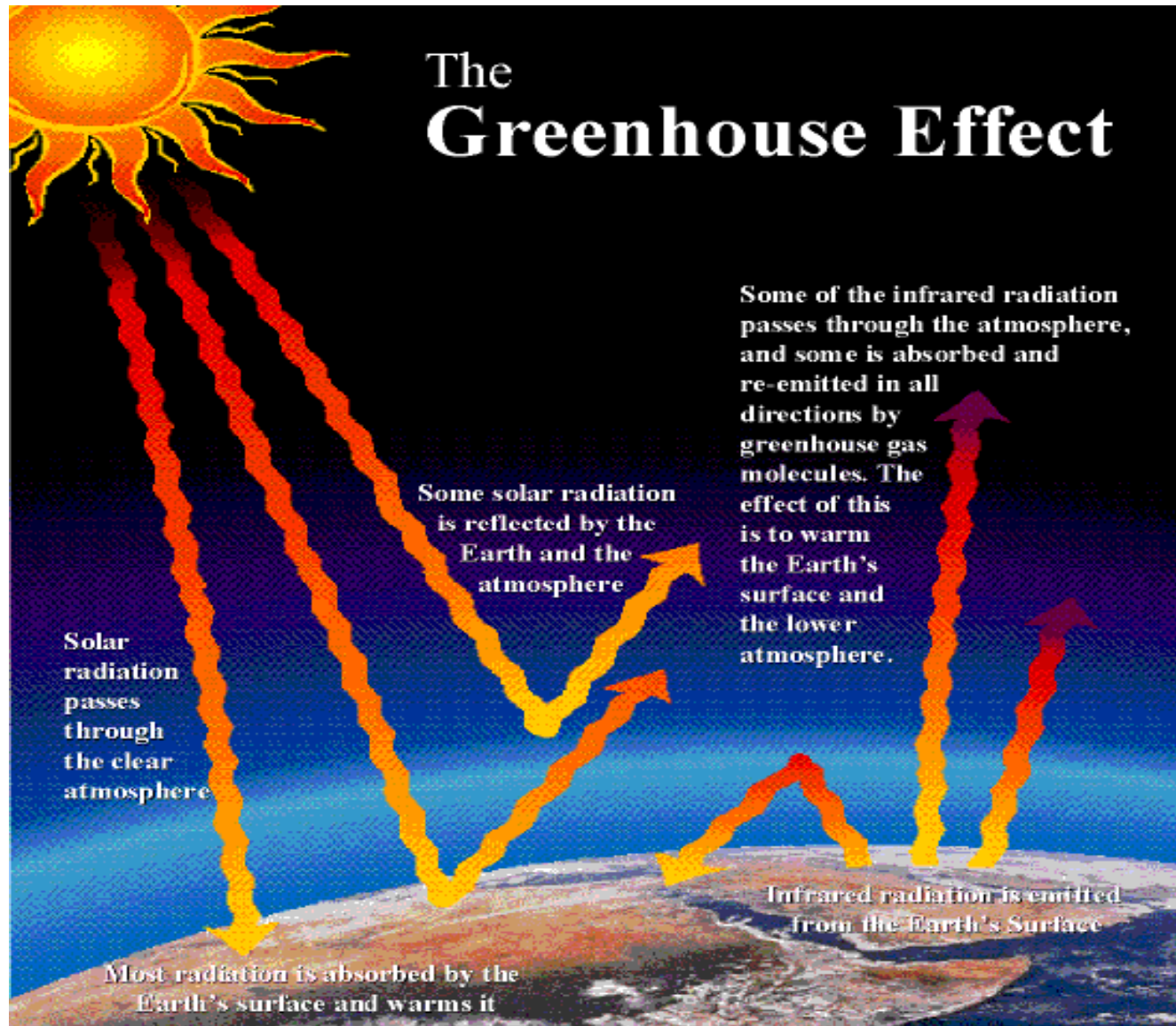
A serene landscape photograph showing a calm body of water, possibly a lake or a wide river, reflecting the surrounding environment. In the foreground, there are tall, green grasses or reeds. The middle ground shows a dense forest of tall, thin trees, their forms reflected in the still water. The background is shrouded in a light mist or fog, creating a soft, atmospheric effect. The overall color palette is muted, with greens, blues, and greys.

CLIMATE is the average
of many years of
weather observation.

CLIMATE IS:

- Long term
- Wide area
- Seasonal changes
- Measured over long spans of time

Greenhouse Gases are essential to our Climate





With no greenhouse gases at all in its atmosphere, scientists estimate that Earth's average atmospheric temperature would be about -18°C , or about 0°F

The Earth's Climate....



...is just right...

...for the moment, anyway!

A number of Greenhouse Gases occur naturally in the Earth's atmosphere

- Water vapor
- Carbon dioxide
- Methane
- Nitrous oxide



The greenhouse gas content
of the atmosphere is being
altered by human activity.

The result of this change is
global warming.

4 KEY FINDINGS

of the Intergovernmental Panel on Climate Change*

- 1** There is 95 percent certainty that human activities are responsible for global warming
- 2** Carbon dioxide is at an "unprecedented" level not seen for at least the last 800,000 years
- 3** Sea level is set to continue to rise at a faster rate than over the past 40 years
- 4** Over the last two decades, the Greenland and Antarctic ice sheets have been melting and glaciers have receded in most parts of the world

* IPCC Assessment Report Summary for Policy Makers, released Sept. 27, 2013
<http://www.ipcc.ch/>



GLOBAL CLIMATE CHANGE
climate.nasa.gov

National Science Foundation

Key Messages

- **Human influence on the climate system is clear**
- **The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts**
- **We have the means to limit climate change and build a more prosperous, sustainable future**

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

Changes in extreme weather and climate events observed since about 1950 have been linked to human influence



AR5 WGI SPM

Impacts are already underway

- **Tropics to the poles**
- **On all continents and in the ocean**
- **Affecting rich and poor countries**



AR5 WGII SPM



NPS Photo by Jeff Henry



©UCAR, Photo by Carlye Calvin / NCU



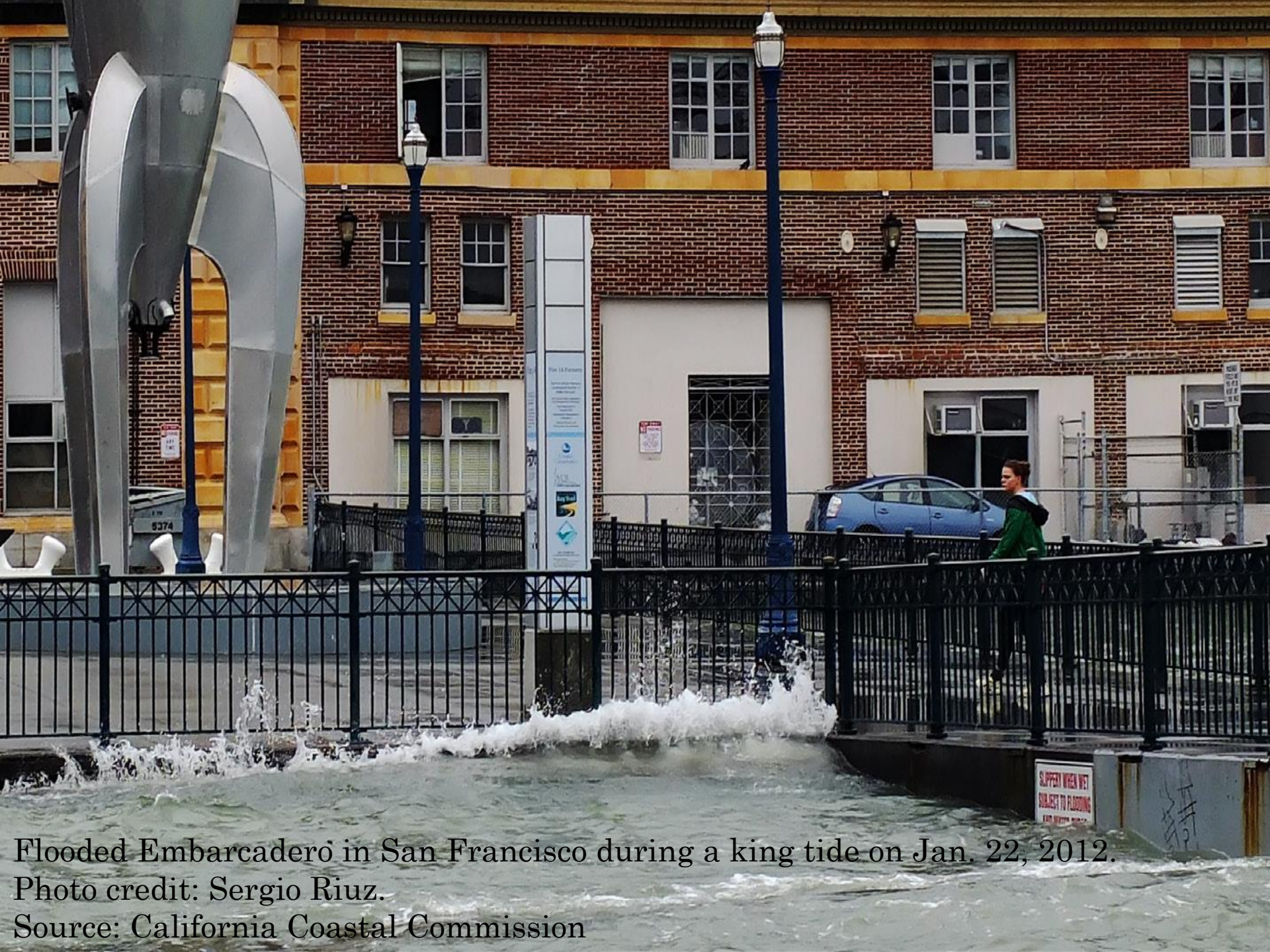
Matthes photo, NPS Archives, 1900



Lisa McKeon, USGS



NOAA Corps, John Bortniak



Flooded Embarcadero in San Francisco during a king tide on Jan. 22, 2012.

Photo credit: Sergio Riuz.

Source: California Coastal Commission

Impacts of Climate Change

Climate change is apparent now across our nation.

Trends observed in recent decades include:

- rising temperatures,
- increasing heavy downpours,
- rising sea level,
- longer growing seasons,
- reductions in snow and ice, and
- changes in the amounts and timing of river flows

These trends are projected to continue, with larger changes resulting from higher amounts of heat-trapping gas emissions, and smaller changes from lower amounts of these emissions.

Responding to Climate Change

“Mitigation”

Options for limiting climate change

“Adaptation”

Responding to present and future climatic conditions



Impacts & Adaptation by Sector

Source: USEPA



International Efforts



Coastal Areas



Human Health



Forests



Water



Ecosystems



Society



Energy/Electricity



Agriculture



Transportation

Projected climate changes

Continued emissions of greenhouse gases will cause further warming and changes in the climate system



Oceans will continue to warm during the 21st century



Global mean sea level will continue to rise during the 21st century



It is very likely that the Arctic sea ice cover will continue to shrink and thin as global mean surface temperature rises



Global glacier volume will further decrease

AR5 WGI SPM

Potential Impacts of Climate Change



Food and water shortages



Increased displacement of people



Increased poverty



Coastal flooding

AR5 WGII SPM

Some Mitigation Measures



More efficient use of energy



Greater use of low-carbon and no-carbon energy

- Many of these technologies exist today



Improved carbon sinks

- Reduced deforestation and improved forest management and planting of new forests
- Bio-energy with carbon capture and storage



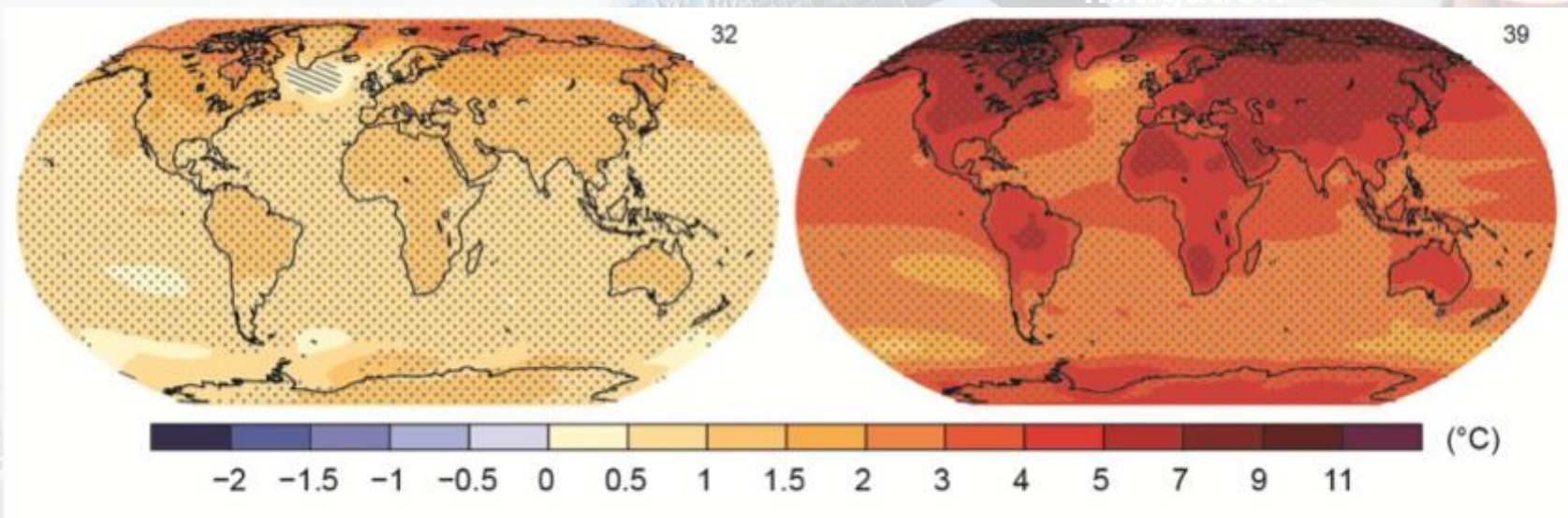
Lifestyle and behavioural changes

AR5 WGIII SPM

The Choices We Make Will Create Different Outcomes

With substantial
mitigation

Without
additional
mitigation



Change in average surface temperature (1986–2005 to 2081–2100)

AR5 WGI SPM

What can be done?

First we must admit that climate change is everyone's problem. No agency, government, or scientist can "fix it" for us. We are all in this together.

**We got here because of our lifestyle.
So our lifestyle has to change.**

Conserve Electricity



- **Turn off lights and appliances when not needed.**
- **Change to CFL or LED bulbs.**
- **Unplug chargers for cell phones, computers and other appliances when not in use.**
- **Buy more efficient refrigerators, furnaces, appliances.**
- **Install timers or motion sensors on outdoor lights.**

What other ways can you conserve electricity?

Heating and Cooling

- **Install Solar Panels for supplying electricity.**
- **Install programmable thermostats.**
- **Better insulation for doors and windows.**
- **Adjust your clothing instead of the thermostat.**
- **Keep furnace and AC filters clean.**
- **Use more efficient furnaces and air conditioner.**
- **Plant trees on the sunny side of your home.**

What other ways can you conserve heat and AC?

Conserve Car & Fuel

- **Plan ahead – do several errands in a single trip.**
- **Walk or bike. It's healthier anyway.**
- **Carpool.**
- **Support public transportation – ride the bus or train.**
- **Keep your engine properly tuned.**
- **Keep your tires properly inflated.**
- **Consider a electric or hybrid car for your next vehicle.**

What other ways can you use less gas?

Conserve Hot Water

In the average home, 17% of energy is used to heat water.

<http://www.eia.doe.gov/kids/energyfacts/uses/residence.html>



- **Take shorter showers.**
- **Install low flow shower heads.**
- **Reduce lawn and plant watering**
- **Install blanket on your hot water heater.**
- **Insulate hot water pipes.**
- **Only run the dishwasher if it's full.**
- **Fix leaky faucets**

What other ways can you cut down on hot water use?

Reduce waste

- **Recycle and buy recycled products.**
- **Choose products that have less packaging.**
- **Reuse, repair, or donate.**
- **Don't buy it unless you really need it.**
- **Carry cloth bags when shopping.**
- **Use a refillable travel mug or water bottle.**

What other ways can you cut down on waste?

There's no place like home...



...and there may never be one again. **Do Your Part.**