

# What's the difference between weather and climate?

By National Geographic Society, adapted by Newsela staff on 01.29.20

Word Count **685**

Level **810L**



A hailstorm is a weather event. It is different than climate. Here, large amounts of hail cover a landscape in Marion, Kansas. Image by Roger Hill/Science Source Image by Roger Hill/Science Source

Recently, we have had some very cold weather during the winter. But even so, average temperatures are rising around the world. Known as global warming, almost all scientists agree that global warming is real, it is happening now, and humans are causing it.



But how can we still have cold winter weather and global warming? It's because weather and climate are two different things.

## **Weather Describes Current Conditions**

Weather describes the conditions of the lower atmosphere, or the air close to the Earth's surface. These conditions include rain or snow, temperature, humidity (or how much water is in the air), wind speed and direction, and atmospheric pressure. They can change quickly. It could be sunny, cloudy, rainy, foggy, cold, hot, windy, stormy or snow.

The sun influences weather by heating the lower atmosphere. Warm air rises and cold air rushes in to fill its place. This causes wind. The air holds water in its gas form, known as water vapor. The wind and the water in the air cause clouds, rain or snow, and storms to form and move.

Conditions in the atmosphere are always changing. So weather is always changing. Meteorologists are scientists who study the weather. They get information from satellites, weather stations, and instruments that float in the ocean. They try to predict the weather that is coming in the next few

days or weeks. This is called a forecast. Weather forecasts are very important. They warn people of dangerous weather conditions. Big storms can cause flash flooding. Dry winds can whip up forest fires.

### **Climate Describes Long-term Conditions**

Weather changes often and can last for days or weeks or months. Climate, however, describes the conditions in the atmosphere over a long time, usually 30 years or more. Climate can be thought of as an average of weather conditions over time. That's why a very cold winter can happen even when average temperatures are warming.

Climate conditions are different in regions of the world. Climate affects the types of plants and animals that live there.

Weather and climate are linked. In fact, a change in climate can lead to changes in weather patterns.

### **Human Activities Are Affecting The Climate**

Climate change is not new. The climate has changed many times in Earth's history. However, it is changing much faster now than it has in the past. This time, human activities are to blame.

The biggest cause of climate change is burning coal, gas and oil. These are called fossil fuels because they formed from plants and animals that died and were buried a long time ago. We use fossil fuels to power our cars, trucks, buses and trains. We use them to make electricity, heat our homes, and run factories.

Burning fossil fuels releases carbon dioxide into the atmosphere. Carbon dioxide is a type of greenhouse gas. These gases are like the glass roof in a greenhouse. The gases allow heat from the sun to enter the atmosphere, but stop it from escaping. As a result, the Earth gets warmer.

Global warming is already happening. In the last 100 years, Earth's temperature has risen by 0.8 degrees Celsius (1.4 degrees Fahrenheit). Arctic sea ice is melting. Glaciers are shrinking. Sea levels are rising. Extreme weather events, like floods, wildfires and hurricanes, are becoming more common and severe. Animals and plants are moving to cooler areas.

### **Humans Try To Address Global Warming**

Scientists first learned how greenhouse gases affect the atmosphere in the 1800s. In the late 1930s, scientists found that Earth's temperature was already rising. In the 1980s, the science was accepted and people started to take action.

In 1988, the United Nations formed the Intergovernmental Panel on Climate Change. Since then, countries have agreed to lower the amount of carbon dioxide they release to fight climate change.

In 2015, 197 countries signed the Paris Agreement. It is a pledge to stop global temperatures from rising by more than 2 degrees Celsius (3.6 degrees Fahrenheit). In 2017, the United States announced it would withdraw from the agreement. Only China releases more greenhouse gases than the United States.

# Climate change poses major threat to Kiribati

By iGeneration Youth, adapted by Newsela staff on 10.30.18

Word Count **710**

Level **820L**



Image 1. Maritina Nakekea, 19, is a resident of Kiribati, a country made up of 33 coral atolls located halfway between Australia and Hawaii. Today Kiribati's existence is threatened by climate change. Photo: Itinnaibo Aukitino/iGeneration Youth

Kiribati is a country made out of coral islands. It is located in the Pacific Ocean, halfway between Australia and Hawaii. On March 3, 2014, giant waves called "king tides" crashed on its shores.

Mariston Ioabo was 7 years old at the time. At first, he thought the waves were fun. Later that day, he asked his mother for water. She told him they could no longer drink from the family well. That was when he learned that the situation was serious and dangerous.

"I was restless, especially when I heard the loud sound of the roaring waves breaking on the shore," said Mariston, who is now 12 years old. "The incident I described still worries me."



## Low-Lying Pacific Island Nations In Most Trouble

Mariston is right to be afraid. The Australian government has a program called Pacific-Australia Climate Change Science and Adaptation Planning, or PACCAP for short. It studied how climate change will affect Pacific island nations. Kiribati is one low-lying Pacific nation that may be underwater within a few decades.

Greenhouse gases in the Earth's atmosphere keep the planet warm enough for life to survive. Over the past 250 years, humans have been adding more greenhouse gases. We do this by burning fossil fuels like coal and oil. Because of the extra greenhouse gases, the Earth is warming up, leading to climate change. Climate change describes the changes in the Earth's weather patterns caused by human activities.

Teruabine Anna Nuariki works for climate justice in Pacific countries. Nuariki explained that wealthier countries produce the most greenhouse gases. Climate change, then, has to be handled globally.

In Kiribati, rising ocean levels spoil the well water. Wells are the only source of fresh water for many people. Food crops are also being destroyed by seawater. Kiribati already has poor soil, said Nuariki. People have to depend on expensive food that has been shipped in.

### **Island Residents Worry About Future**

Teraiman Rubo, 18, lives on the island of Maiana. She is worried that wealthier countries will forget about smaller nations like Kiribati. They will have to deal with problems caused by climate change alone.

Another problem, said Nuariki, is that people close to shore are being forced from their homes.

Maritina Nakekea, 19, lives on the island of Marakei. She feels uncomfortable whenever a high tide comes. She said that people are being forced to move inland against their will, causing fighting because of overcrowding.

Many programs are trying to help Kiribati's people. In school, students are learning how to plant vegetables that can handle dry or rainy weather. Older students study the effects of climate change on Kiribati. They are focusing on how to reduce risk at the local level.

### **Finding A Way Out**

The goal is to teach children about climate change and how to deal with it, said Nuariki. Many people in Kiribati believe that they will stay. However, students like Mariston are being encouraged to study and get jobs elsewhere.

Nuariki believes people are leaving Kiribati because they are afraid it will one day be covered by the sea.

The challenge to save Kiribati is a large one. The people who live on the islands believe Kiribati is on the front line of a deadly attack from developed countries. The weapon is greenhouse gas emissions. They want developed countries to cut down greenhouse gases so people can stay and enjoy their culture and country.



Rubo talked about what she would miss most about Kiribati. She would miss the traditional dances and handicrafts, the smiling faces of its people, and welcoming visitors to her special country. Rubo does not want to leave. She simply wants a better place to live in the future.

"It will break my heart if there is no more Kiribati. I will be very sad, as I will lose my culture and identity," said Nakekea.

## What's the difference between weather and climate?

**Do Part 1 before you read the article!**

### Part 1: Are they talking about climate or weather?



People like to talk about conditions that affect their lives. Climate and weather are two of those conditions. Put a check in the climate box next to all the things that people say have to do with climate. Put a W in the climate box next to all the things people say that have to do with weather.

1. What shall I wear today?
2. What equipment do I need for a camping trip next summer?
3. It has rained on my birthday for the past three years.
4. We just got three feet of snow in March. So much for global warming.
5. I wonder when I should plant the tomato seeds in my garden.
6. Our state experienced the worst drought since records began more than 120 years ago.
7. News Flash! The drought in California has ended with the first significant storm this year dumping more than 10 inches of rain in many locations.

Climate	Weather

Explain your thinking. What rule or reasoning did you use to decide if a statement is related to climate or weather?

*I think that a statement will be about weather if it contains words like*

*I think that a statement will be about climate if it contains words like*

**Do Parts 2-3 after you read the article “What’s the difference between weather and climate”!**

**Part 2: Read the article “What’s the difference between weather and climate” and answer the following questions after you read the article.**

**During your first reading you should annotate the text using the instructions in your planner.**

Box words you don’t know.

Circle key terms, relevant names, dates places.

Put a ? mark by anything that is you have a question about or that is confusing.

Put an ! mark next to interesting or surprising information.

Highlight the author’s claims/arguments/points and supporting evidence

Online TIP: If you are working in adobe acrobat reader on your phone, tap the pencil icon and will open a menu that will allow you to highlight and draw on the document.

1. List key terms from the article that you didn’t know before and explain their meaning in your own words.

Key term 1:

Key term 2:

Key term 3:

2. List two things that surprised you when you read the article

Surprise 1:

Surprise 2:

3. List one interesting fact that you learned when you read the article.

**Part 3: Read the article a second time and then use what you learned from the article to complete the sentences below.**

**Word Bank: (Words may be used more than once)**

activity, air, atmosphere, atmospheric, carbon, changing, China, climate, conditions, dioxide, electricity  
faster, flood, foggy, forecasts, glaciers, global, greenhouse, heat, human, humidity  
hurricanes, ice, levels, limit, long, Meteorologists, rain, rainy, sea, snow, sunny, temperature  
vapor, warming, water, weather, wildfires, wind, withdrew, 0.8, 1930s, 2017

**1. From the first two paragraphs.**

Scientists agree that \_\_\_\_\_ is real and is caused by \_\_\_\_\_.

**2. From the section labeled. “Weather Describes Current Conditions”**

Weather is how we describe physical properties of the \_\_\_\_\_ outside our homes. These properties could include \_\_\_\_\_ and \_\_\_\_\_. We also use the word weather to also describe \_\_\_\_\_ conditions with words like \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

The sun causes changes in weather by heating the \_\_\_\_\_ near the earth. Differences in temperature of the air due to solar heating cause \_\_\_\_\_. The temperature of the air also influences how much \_\_\_\_\_ can be in the air.

**3. From the section labeled. "Climate Describes Long-term Conditions"**

Climate describes the pattern of conditions over a \_\_\_\_\_ period of time. Scientists who study climate think of it as an \_\_\_\_\_. For example, they might talk about the average \_\_\_\_\_ of a summer or the average amount of \_\_\_\_\_ during the winter in a certain place. We use our knowledge of an area's \_\_\_\_\_ to predict what \_\_\_\_\_ conditions might be like in the future.

**4. From the section labeled. "Human Activities Are Affecting the Climate"**

The climate of the earth is constantly \_\_\_\_\_. But scientists are worried because the change in the climate is much \_\_\_\_\_ now than in the past. The overall temperature of the earth has risen by \_\_\_\_\_ degrees Celsius. This change in temperature has caused \_\_\_\_\_ in the Arctic seas and \_\_\_\_\_ to melt which has caused \_\_\_\_\_ to rise. The increase in temperature in the atmosphere also increases the probability that dangerous \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ will happen.

Most scientists agree that the increase in temperature of the \_\_\_\_\_ is caused by an increase in the amount of \_\_\_\_\_ in the atmosphere. This gas is released when humans burn \_\_\_\_\_ to make \_\_\_\_\_, power vehicles and run factories. Carbon dioxide is called a \_\_\_\_\_ gas, because its presence traps \_\_\_\_\_ in the atmosphere.

**5. From the section labeled. "Humans Try to Address Global Warming"**

Scientists first started to understand that the earth's temperature was increasing in the \_\_\_\_\_.

When the countries of the world are compared, the US releases more \_\_\_\_\_ than any other country except for \_\_\_\_\_. 197 countries agreed to \_\_\_\_\_ the amount of greenhouse gases that they release. However, the US \_\_\_\_\_ from the agreement in \_\_\_\_\_.

**Read the article “Kiribati fights climate change” before you do part 4**

**Part 4: Read the article: Kiribati fights climate change**

**During your first reading you should annotate the text using the instructions in your planner.**

Box words you don't know.

Circle key terms, relevant names, dates places.

Put a ? mark by anything that is you have a question about or that is confusing.

Put an ! mark next to interesting or surprising information.

Highlight the author's claims/arguments/points and supporting evidence

Online TIP: If you are working in adobe acrobat reader on your phone, tap the pencil icon and will open a menu that will allow you to highlight and draw on the document.

4. List key terms from the article that you didn't know before and explain their meaning in your own words.

Key term 1: \_\_\_\_\_

Key term 2: \_\_\_\_\_

Key term 3: \_\_\_\_\_

5. List two things that surprised you when you read the article

Surprise 1: \_\_\_\_\_

Surprise 2: \_\_\_\_\_

6. List one interesting fact that you learned when you read the article.

**After your second reading of the article, answer these questions.**

7. What problems do rising sea levels create in Kiribati?

8. What is Teraiman Rubo worried about?

9. What is Maritina Nakekea worried about?

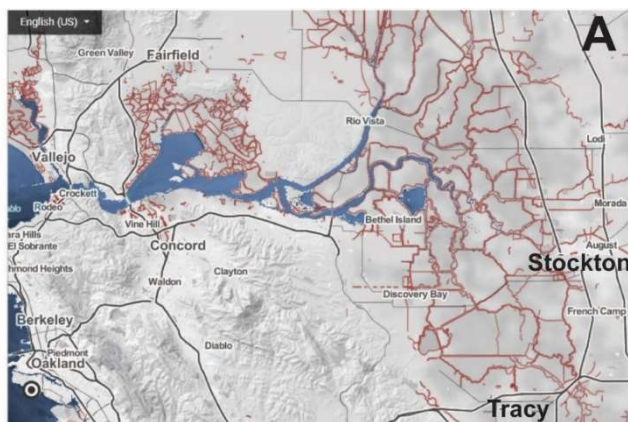
10. Who is contributing to Kiribati's problems and what is that they are doing which creates the problems?

## Part 5: What could happen in Tracy if sea levels rise?

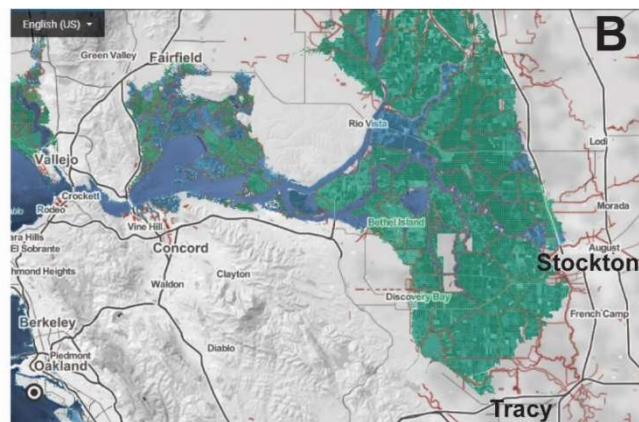
If the world's nations succeed in limiting the rise in global temperature to between 1-2°C, sea level, the altitude of the surface of the world's oceans, is predicted to increase by about 0.5-2 ft in the next fifty years. Think about how life in Kiribati will change according to the article. Will we face the same types of challenges since we live near the San Joaquin delta? Examine the data below carefully to help you construct your answer.

**Write a short paragraph of 5-7 sentences** explaining how you think that global warming will affect your life when you are 50 years old. When you have finished your paragraph. Let it sit for at least a day while you work on Assignment #2.

**Write a second draft of your paragraph.** When you have the best paragraph that you can write, please call (209) 565-0124 and leave a voicemail for Dr. Libeu. In the voicemail, you should read your paragraph. When you turn in your packet, you should turn in both your draft of the paragraph and the final version.



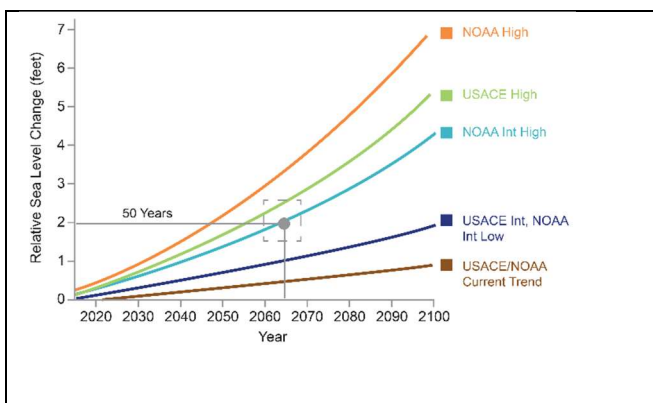
**Panel A: San Joaquin Delta today.** The red lines are levees that protect areas from flooding.



**Panel B: San Joaquin Delta if the sea level increases by 1 ft.** The green areas are areas that would be below sea level but are protected by the current levees.

FYI: I made panels A and B using <https://sealevel.climatecentral.org/maps/>

Click on Risk Zone Map and type Tracy, Ca into the search box. You can then find out what would happen if the sea level increase is even higher. If you want to look at other places in the world, just change the location in the search box.



For example: *When I am 50 years old in the year 2060, the average global temperature may have increased by ..... This could affect my life by changing the climate of where I live by ..... I think I might experience more of these types of weather ..... I think I might experience these types of events ..... Because of the change in sea level, there might be .....*

Write the draft of your paragraph in this box.

Write the final version of your paragraph in this box.