



## Is Climate Change Good for Frogs?

### Audience/Group Setting

Classroom setting – this is a thought-provoking activity that individuals or small groups can do together, led by an instructor. Activity can be tweaked for event setting. Appropriate for visitors aged 7 and up.

### Goal

To recognize that climate changes that may occur due to global warming will have an impact on day-to-day life for every animal on Earth (humans and frogs included).

### Objectives

By the end of this activity, participants will be able to:

- List one type of weather-related change that global warming might cause.
- List one way their own lives might be affected by climate change.
- List one way an amphibian's life might be affected by climate change.

### Big Idea/ Main Message

Amphibians, like humans, will be affected by climate change.

### Conservation Action/ Behavior Addressed

**Reduce the use of fossil fuels, such as oil, coal, and natural gas.**

Climate change is impacting amphibian populations worldwide. By using less energy or choosing renewable sources of energy, you can help slow the rate of climate change. Drive less, buy fuel-efficient cars, and use compact fluorescent light bulbs!

### Background Information

We live in a world in which we expect a certain amount of climatic predictability. In temperate interior regions, we expect very warm summers and cold winters. In more southerly regions and along coastlines, we expect more rainfall in certain seasons than others. For some, snow in May is typical; for others, annual droughts are the norm. Regardless of where we live, we have adapted our activities, economies and communities to the region's annual seasonal cycles and climatic conditions.

One of the most important examples of our dependence on predictable weather patterns is in agriculture. Plants have specific tolerances to rainfall, droughts, and temperatures. Because of this, farmers rely on having predictable seasonal weather patterns when they determine what types of crops they will grow. Many other businesses rely on the weather as well, including ski operations, camping facilities, and tourist attractions such as zoos. Think of how empty the ski hills would be if it rained most of the winter!

We tend to take for granted that the climate will stay the same within certain limits, but if our climate does change, many other aspects of our lives would have to change in response.

The effects of global climate change on amphibians are difficult to predict, in part because its impacts will vary throughout the world. For example, some data suggest that species are showing a trend towards breeding earlier in the year; however, data on other species buck that trend. Even if breeding seasons are shifting, the implications of that are unknown.

The amphibian habitats thought to be most vulnerable to future climate changes are cool montane forests. As temperatures rise, amphibians will migrate to higher elevations, until at some point they cannot escape the warmer temperatures and or lack the ability to disperse between mountains. These effects will be even more marked in the tropics, which are traditional amphibian diversity hotspots, because gradients between high- and low-elevation habitats are steeper than in the temperate zone. Changes in cloud formation, water and mist, and continued deforestation further shrink these areas as potential habitats. And again, climate change has the potential to interact with other factors, such as the *Batrachochytrium dendrobatidis* (*Bd*) fungus that is prevalent in tropical mountains.

In the northern hemisphere, there is potential for cool-adapted forest species to expand their ranges north toward the pole. However, species found in grasslands, semi-arid habitats, and deserts may find that the temporary ponds they rely on for reproductions disappear more quickly, stressing breeding efforts. Changes that result in more rainfall and less snowfall tend to lead to quicker run-off, also impacting the longevity and depth of small breeding ponds.

## Materials Needed

- Copy of the worksheet for each participant
- Pencils
- Pictures of different types of weather (not necessary, but good for discussion)

## Staff

This is a worksheet-based activity that should be facilitated by a volunteer or staff person.

## Length of Activity

20 minutes

## Set up

- Ahead of time: Make copies of the worksheet and gather pencils and weather pictures.
- Day of: Prepare an area for the activity (table-top with signs or classroom setting).

## Procedures

Note: This activity can be done individually, but students will benefit from discussing their ideas in groups.

1. Using the worksheet as a starting point, have students discuss and record what they think would be the consequences of various climate changes (have them complete only the first 2 columns). Note that the chart is very general and does not expect the students to quantify the changes – only to consider general trends. You may want to add other weather conditions or events that are common in your region.
  - a. The following are examples of ideas you might expect from students:
    - i. More rainstorms would make my baseball or soccer games be cancelled more often.
    - ii. More rainstorms would lead to water leaking into our basement;
    - iii. More rainstorms would cause more tree branches to break in my neighborhood.
    - iv. More rainstorms would affect the local farmers and ruin their crops.
    - v. More rainstorms would affect the local summer festivals because events would have to be cancelled and they may not make as much money.

2. Once the groups have completed the first 2 columns of the chart, have them work on the amphibian column to think about how these climate changes might affect these animals. Since all organisms depend on things in their habitat, encourage students to look at amphibians' requirements for food, shelter and water, as well as interdependence with other organisms. How might these changes in climate affect or influence these factors?
3. Once the groups have completed the chart, discuss the responses as a class. Ask if there are any categories where there are no negative effects. Remind students to consider the effects of storms and other events on infrastructure, such as roads, electricity, etc.
4. Discuss what adaptations humans and frogs might have to make if these weather events become more common. Adaptations might include changes to infrastructure and buildings and/or changes in diet, dress, activities, and transportation.
5. As a final discussion point, make a list of activities that we can do to help stop global warming and climate change.

## **National Science Education Standards**

This activity is aligned to the K-8 Life Science Content Standards.

- Population & Ecosystems
- Diversity & Adaptations
- Change, Constancy & Measurement
- Evolution & Equilibrium
- Populations, Resources & Environment
- Natural Hazards
- Science as Human Endeavor

*Note: Activity materials adapted from and used with permission Teaching About Climate Change: Cool Schools Tackle Global Warming, edited by Tim Grant and Gail Littlejohn.*

# IS CLIMATE CHANGE GOOD FOR US?

<b>SEASON:</b> _____			
<b><i>TYPE OF CLIMATE CHANGE</i></b>	<b><i>HOW WOULD IT AFFECT ME?</i></b>	<b><i>HOW WOULD IT AFFECT THINGS AROUND ME?</i></b>	<b><i>HOW WOULD IT AFFECT AMPHIBIANS?</i></b>
More rainstorms or snowstorms			
Less rainfall or snowfall			
More sunshine			
Less sunshine			
Higher daytime temperatures			
Lower daytime temperatures			
Higher wind speeds			
Other changes			