

FRESHWATER WETLANDS AND CLIMATE CHANGE

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Standards:

- Science Georgia Standards of Excellence – S5E1
Obtain, evaluate and communicate information to identify surface features on the Earth caused by constructive and/or destructive processes.
- Ocean Literacy Principle 6
The ocean and humans are inextricably interconnected.
- Climate Literacy Principle 1
The Sun is the primary source of energy for Earth's climate system.
- Climate Literacy Principle 7
Climate change will have consequences for the Earth system and human lives.

WHAT IS A FRESHWATER WETLAND?



A freshwater wetland is a special area that is almost always covered by water. A wetland can be as small as your backyard or as big as millions of football fields combined! Their wet soils support water-loving plants, like lilies, mosses and ferns. Freshwater wetlands also provide habitat for frogs, birds, insects and many other animals.

SWAMPS, FENS AND BOGS, OH MY!

There are many different types of wetlands. In Georgia and Florida, there are swamps dominated by tall trees with roots sticking out of the water. Fens are a type of wetland in the Midwest that are fed by ground water and covered with grasses. Up north in Wisconsin or New Jersey, you can find wetlands called bogs with squishy moss and completely different plants, like the cranberries you eat for Thanksgiving.



CONGRATULATIONS, SWAMP INVESTIGATORS!

You have won a trip to St. Simons Island, Georgia! The area you are exploring is covered by water. It might be a wetland, but you aren't 100% sure. Let's investigate to find out if the area is a wetland or not. After looking around, you notice the water isn't moving, so you ask the resident scientist, Dr. Swampi, if it has rained recently? She says no, the water is always here.

*Do you think this makes the area **more likely** or **less likely** to be a wetland? (Circle one.)*

After looking around some more, you decide to get closer and stick your hands in the soil. It's very wet and almost black!

*Do you think this makes the area **more likely** or **less likely** to be a wetland? (Circle one.)*

Before you leave, you notice trees with strange black rings around the bottom, near where the water hits them.

*Do you think this makes the area **more likely** or **less likely** to be a wetland? (Circle one.)*

Dr. Swampi asks if you think the area is a wetland. Select a box (yes or no) below and explain your answer.

IS IT A WETLAND? ☐ **YES** or ☐ **NO**

EXPLAIN: _____

WHY ARE WETLANDS IMPORTANT?

Wetlands are fun places to explore, but it is also important to understand how they help protect the Earth! Wetlands provide habitat for all kinds of animals, like frogs, insects, small mammals and birds. To many animals, a wetland is like a five-star hotel that has all the food, water and shelter they need.

Wetlands are also important to humans. They act like a sponge, soaking up harmful chemicals and heavy metals; but their absorbing abilities don't stop there! They also soak up water from storms and hurricanes to help prevent drought and flooding. They even store carbon dioxide which reduces air pollution and helps prevent climate change.



NIFTY NITROGEN!

Did you know nitrogen is one of the most important elements on our planet? While there is a lot in the air we breathe, only a few organisms can actually use it this way. Tiny creatures in the swamp, called archaea (arr-key-yah) are Olympic Gold Medalists at a process called nitrogen fixation that turns nitrogen into a form that other creatures (like you and me) can use to grow.

WHAT IS CLIMATE CHANGE AND WHAT CAUSES IT?

Climate change describes Earth's changing climate as a result of increasing amounts of certain gases in the atmosphere. Greenhouse gases, like carbon dioxide (CO₂) and methane, act like a blanket over the Earth, trapping heat inside. This natural process is called the Greenhouse Effect and it keeps Earth's temperatures just right for organisms, including humans, to live here. However, too many greenhouse gases, partly from burning coal to



power cars and factories, creates a thicker "blanket," causing too much heat from the sun to stay in the atmosphere and leading to unwanted changes in Earth's climate. Places that stay cold year-round, like Antarctica or the North Pole, could warm enough for ice sheets to melt and sea levels to rise. In fact, these things are already happening. Ocean temperatures are also increasing and the ocean is becoming more acidic as it absorbs CO₂. Climate change can cause some areas to experience drought, while other areas experience extreme weather, like hurricanes and floods. Eventually, Earth could become too hot for humans to live here comfortably. Protecting the environment and using renewable energy can help slow the effects of climate change.

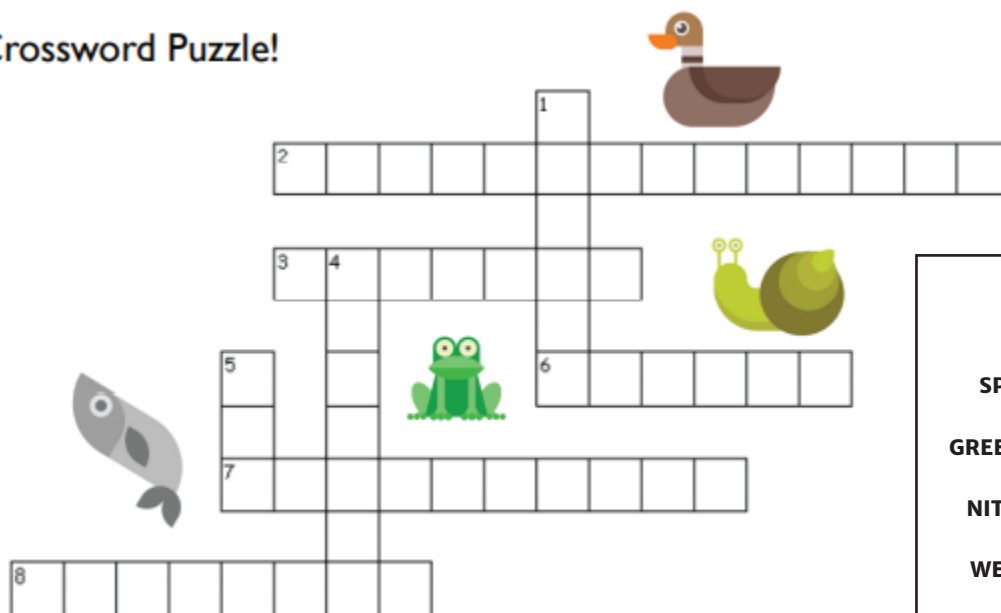
WHAT ROLE DO FRESHWATER WETLANDS PLAY IN CLIMATE CHANGE?

Just like other places on Earth, climate change could impact freshwater wetlands. As Earth gets hotter and sea levels around the world rise, salt water could start to creep into freshwater areas. If a swamp becomes salty, some animals may not be able to live there anymore and would have to move away.

Warmer temperatures could also contribute to **eutrophication**, where excess nutrients cause plants like algae to grow quickly and create a shield on top of the water, blocking sunlight and oxygen. Plants and animals that depend on sunlight and oxygen would slowly die away. Extreme weather, high winds and waves could also knock over trees and vegetation, destroying important habitat. Eventually, wetlands could become less diverse and not suitable for some organisms. We would then start to lose some of the benefits wetlands provide.



Crossword Puzzle!



WORD BANK:

SPONGE	BOG
GREENHOUSE	EUTROPHICATION
NITROGEN	EFFECT
WETLAND	EXTREME

Across

2. When excess nutrients cause plants to create a light-blocking shield on top of the water
3. An ecosystem that is almost always covered by water
6. The Greenhouse _____ is when gases trap heat in the atmosphere and warm the Earth
7. Carbon dioxide is a _____ gas
8. An element that all creatures need to survive created by tiny animals called archaea

Down

1. Wetlands absorb water like a _____
4. Examples of _____ weather are things like hurricanes, tornados and blizzards
5. A type of wetland where you can grow cranberries



REVIEW QUESTIONS:



1. What is one type of freshwater wetland?

2. Why are freshwater wetlands important?

3. How do greenhouse gases like CO₂ enter the atmosphere?

4. How can you help protect freshwater wetlands?

5. What is something cool you learned today about wetlands?

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