

A Change in the Wind: Climate Change in Quebec

Group Members: _____

Trivia Challenge: Search the entire poster to find answers for the following:

1. Approximately how far apart (km) are Montreal and Quebec City?
2. When did an ice storm hit Quebec, leaving half the population without power?
3. Can you see anything in the landfill that could have been recycled? If so, what?

Did You Know? Use the pieces of information under this heading (“Did You Know?”) on the poster to answer the following true/false (T or F) questions. If the statement is false, cross out the incorrect word or number value, and write in the correct version.

- ___ The two warmest years on record are 1988 and 1989.
- ___ ¼ of greenhouse gas emissions in Quebec are the direct result of human activities.
- ___ Flooding costs \$10 - \$15 million annually in Quebec.
- ___ Montreal is frequently hit by severe weather events.
- ___ Methane, CH₄ can retain 10 times more heat than CO₂.
- ___ Zebra mussels have significantly altered Quebec’s ecosystem.
- ___ The average car emits over 2 times its weight in CO₂ every year.
- ___ Northern regions are likely to be most affected by a projected warmer climate.
- ___ Caribou herds will increase with a warmer climate.
- ___ The Earth’s heating more rapidly than it has at any other time during the past 1000 years.

What is Climate Change?

1. What is the average temperature at the Earth's surface? _____
2. What would it be without greenhouse gases? _____
3. Which of the GHGs has increased in concentration the most since the Industrial Revolution? _____
4. Record the percentages of incoming solar radiation:
 - a) absorbed by the atmosphere: _____%
 - b) absorbed by the Earth's surface: _____%
 - c) reflected by the atmosphere: _____%
 - d) reflected by the Earth's surface: _____%

A Climate in Constant Flux:

1. When have 10 of Quebec's warmest years of the century occurred?
2. When did the Little Ice Age occur?
3. What computer models are used to predict future climatic conditions?
4. Viewing the global map, what areas are projected to have the greatest temperature change in the next half century?
5. How do the 3 graphs depict the projected temperature change by the year 2100?

Our Health:

1. What is the most direct health risk from warming climates?
2. Will warming increase or decrease the amount of smog?
3. Of the 4 indirect impacts on human health, decide which one will likely affect you the most. Explain.

Extreme Weather – What are the Risks?

1. List examples of severe, or extreme weather events that may increase with global warming.
2. How could climate change affect the condition of our roads in Montreal?
3. Brainstorm in your group to generate a list of how more extreme weather events will impact humans.

Could a Warmer Climate Mean a Shortage of Water?

1. How will the projected climate change alter precipitation patterns?
2. What might be the effects of droughts and reduced groundwater, as a result of climate change, on humans?
3. When groundwater changes due to changes in precipitation, how does it affect fish?

The St. Lawrence has its Ups and Downs:

1. Fill in details of the St. Lawrence River:
 - a) Distance of flow: _____
 - b) Length of shoreline: _____
 - c) The 3 sections are: _____

2. Why is there a concern for biodiversity/life along shorelines as the freshwater reach changes?
3. Describe what the coastal erosion at Rivière à Claude looks like?
4. What is the one and only potentially positive effect of rising sea level in the gulf?
5. What is meant by the term “riparian”?

A Dynamic Forest:

1. What will happen to the tree line in Quebec?
2. Describe the southern Quebec forest from the picture.
3. How are the following expected to be altered with global warming?
 - a) Precipitation?
 - b) Forest fires?

4. Compare the 2 maps:
- What 2 new ecoclimates may be found in Quebec with a climate of double CO₂ levels?

 - What ecoclimate might disappear in this region?

What about the Far North?

- How has the permafrost been affected by climate warming?
- What specific impacts to northern communities will occur if the permafrost melts?
- What tree dominates in the northern forest?
- How will tree growth be affected by climate warming?

Wildlife Acclimates:

- Use the poster to describe how 3 particular species might be affected by a change in climate:
 - _____:
 - _____:
 - _____:

Our Farms:

- How will grain crops be affected by climate warming?
- What will happen to the range of fruit and vegetable production in Quebec?

3. What is the maple syrup industry sensitive to?
4. Discuss the possible "+" and "-" effects to Quebec's agriculture from the poster, and decide whether the net result will be more of a positive or negative one. Explain your decision.

Emissions – How Do We Measure Up?

1. Rank the following activities by their GHG (greenhouse gas) emissions:

- _____ Residential
- _____ Electricity
- _____ Waste
- _____ Transportation
- _____ Agriculture
- _____ Industry

2. What gas is released from buried garbage?
3. What does "hydraulically generated" mean?

We Can All Help:

1. What is the "must do" to counter the effects of climate change?
2. Read the 6 ideas provided for energy reduction, and create a list of at least 3 more energy-saving tips that YOU can work on:
 - a)
 - b)
 - c)