

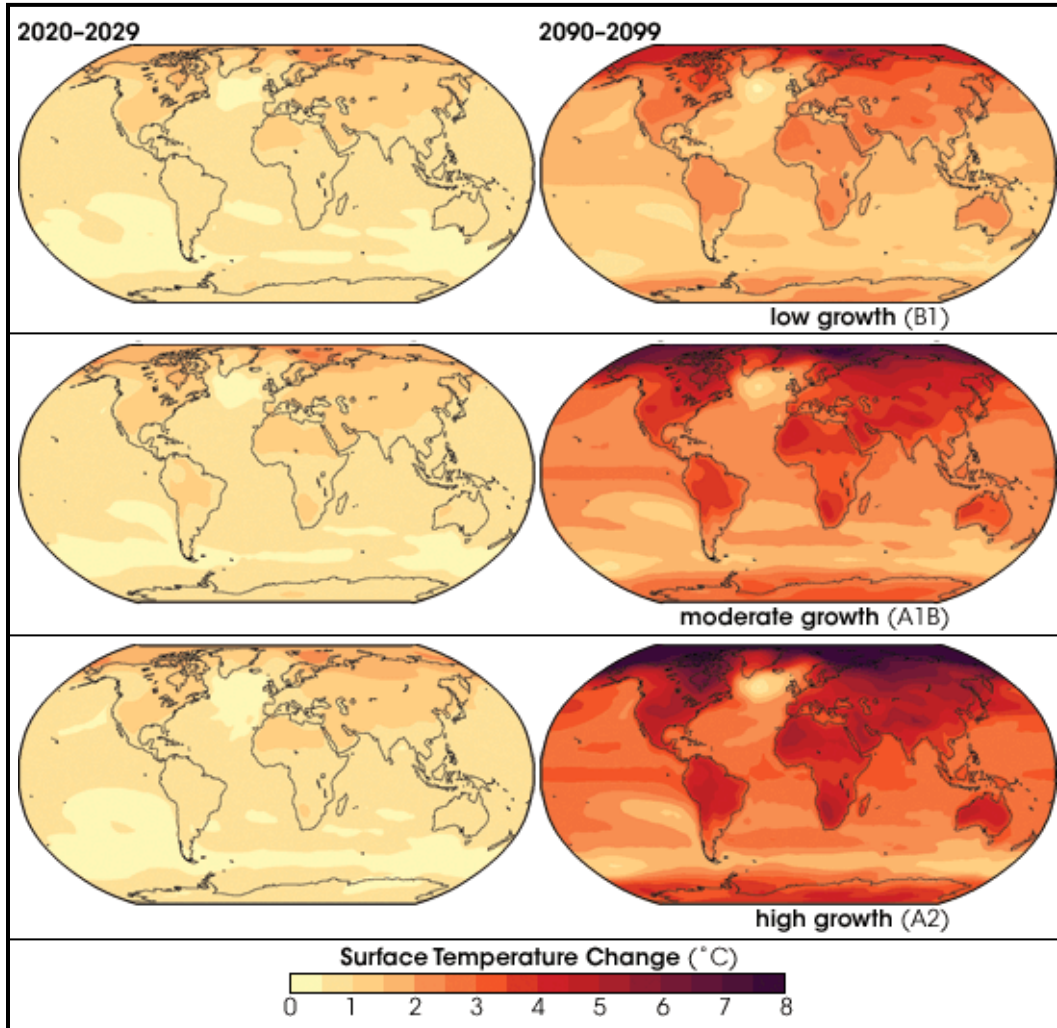
Thinking About Climate Change



Analyzing Projected Future Regional Patterns of Warming

These maps are results of global climate models that project future regional patterns of warming based on three scenarios (low, medium, and high) of growth of greenhouse gas emissions.

Source: [NASA Earth Observatory](http://www.nasa.gov), based on IPCC Fourth Assessment Report (2007)



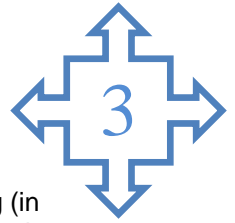
Questions to think about:

1. Change in surface temperature of the earth and the ocean is depicted on this graphic. What is the scale used? _____
What do the lighter colors represent? _____
What do the darker colors represent? _____
2. In the near term (2020-2029), where does the Earth warm the most? How much is the warming (in °C)? _____

In the near term, where does the Earth warm the least? How much is this warming (in °C)? _____

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Analyzing Projected Future Regional Patterns of Warming (page 2)

3. How does the warming change in the long term (2090-2099)? How much is the warming (in °C)? Have the areas of where greatest warming occurred in the same location and about the same size as in the short term graphics? What seems to be the trend?

4. Where is the least warming occurring? _____

What is the range in temperatures? _____

Looking back at the near term scenario, are these areas already developing the near term scenario? _____

5. Describe the differences in warming on the long term between the low and the high emissions growth. _____

If we curb our CO₂ emissions by promoting low growth in greenhouse gasses, how much of a difference in temperature can be expected for the areas that will warm the most?

6. What do these projected future warming patterns mean for human habitation?

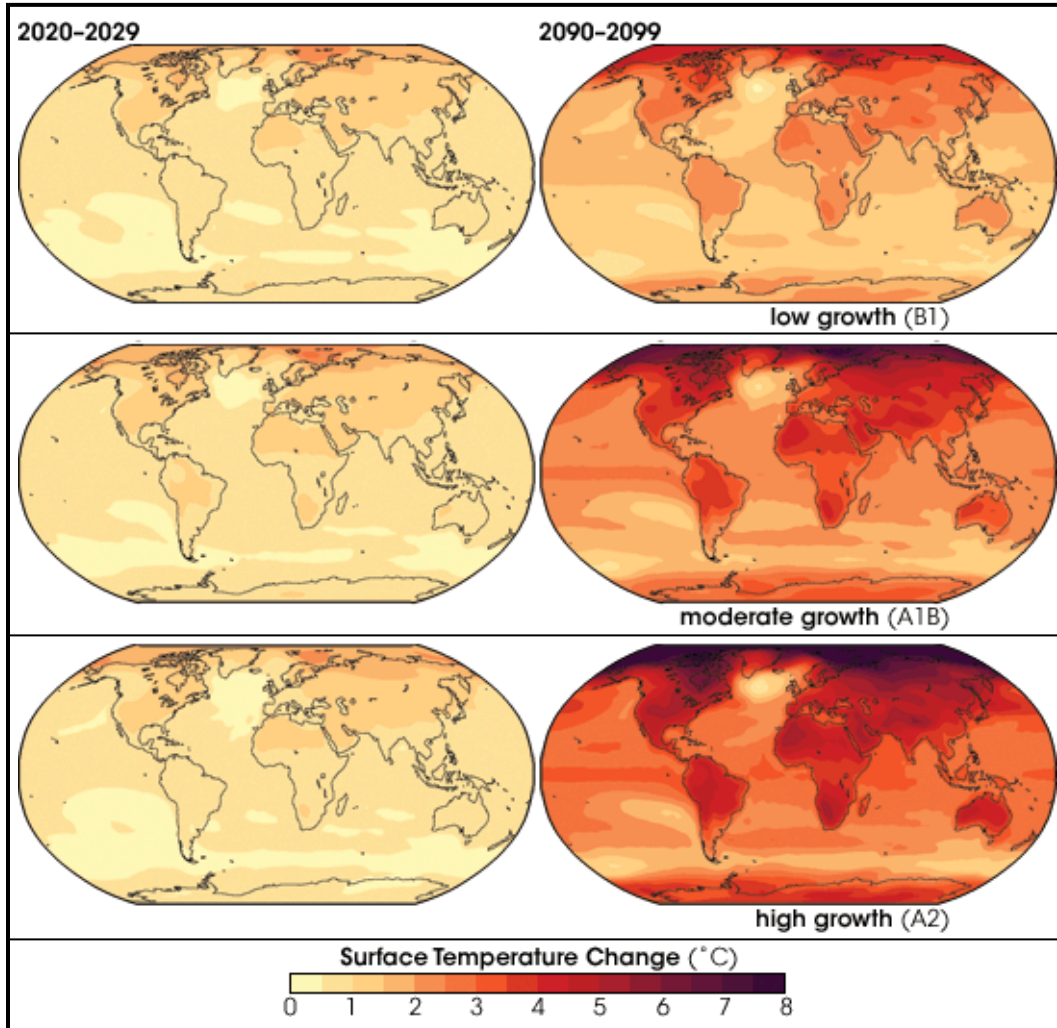
Image Source: US Environmental Protection Agency (September 8th, 2009) **Future Temperature Changes**. Accessed October 29, 2009 at <http://www.epa.gov/climatechange/science/futuretc.html>

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Analyzing Projected Future Regional Patterns of Warming

Projected future regional patterns of warming based on three emissions scenarios (low, medium, and high growth of greenhouse gas emissions) and global climate models. [Figure 2. Source: [NASA Earth Observatory](#), based on IPCC Fourth Assessment Report (2007)]



Questions to think about:

1. Change in surface temperature of the earth and the ocean is depicted on this graphic. What is the scale used? **Temperature in degrees °C**
What do the lighter colors represent? **Lighter colors = smaller change by 0-2°C**
What do the darker colors represent? **Darker colors = larger change by 5-8°C**
2. In the near term (2020-2029), where does the Earth warm the most? How much is the warming (in °C)? **In all three scenarios, the Earth is warming most at the North Pole. This warming is in the range of 1-2°C.**
In the near term, where does the Earth warm the least? How much is this warming (in °C)? **In all three scenarios, the Earth is warming the least in the southern oceans and in the center of the North Atlantic. This warming is in the range of 0-0.5°C.**

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3. How does the warming change in the long term (2090-2099)? How much is the warming (in °C)? Have the areas of where greatest warming occurred in the same location and about the same size as in the short term graphics? What seems to be the trend?

In all three scenarios, the Earth is still warming most at the high latitudes in the Northern Hemisphere. This warming is in the range of 5-8°C in the long term forecast.

4. Where is the least warming occurring? **Less warming is occurring generally in the southern hemisphere.**

What is the range in temperatures? **0-0.5°C**

Looking back at the near term scenario, are these areas already developing the near term scenario? **These areas generally have the least temperature change in the near term.**

5. Describe the differences in warming on the long term between the low and the high emissions growth. **Warming extends over nearly the entire Earth's land mass, warming at least 4°C and the ocean 2-4.5°C, with the north polar region increasing the most with the exception of the "cool spot" off Greenland.**

If we curb our CO₂ emissions by promoting low growth in greenhouse gasses, how much of a difference in temperature can be expected for the areas that will warm the most? **1-3°C**

6. What do these projected future warming patterns mean for human habitation?

Image Source: US Environmental Protection Agency (September 8th, 2009) **Future Temperature Changes**. Accessed October 29, 2009 at <http://www.epa.gov/climatechange/science/futuretc.html>