

Session 5

How Bad Is It? Analyzing a Perfect Storm Part 2

Session goal: This is a continuation of Session 5, now focusing on the problem of climate change – the goal is the same: To understand the realities about what is happening to God’s creation today, and why today’s environmental crisis is different from any we have experienced in the past.

Key Scripture: Psalm 90

Background Reading: *A Climate For Change*, p. 3-54; *Global Warming and the Risen Lord*, chapter 1

Warm Up

Read Psalm 90 to the group. In this Psalm Moses is reminding us of the challenge of understanding God’s ways when he works in thousands of years (vs. 4) and we are limited to the knowledge of a single life span (v. 10). His prayer in vs. 12 is appropriate to the topic we are studying in this session:

Teach us to number our days aright,
that we may gain a heart of wisdom.

Discuss: Where do you fall on the Climate Change Spectrum? Few topics have generated more controversy than climate change or global warming. There are some good reasons for this: It is a complex topic; it deals with predictions of events from the near to the distant future – and any predictions imply uncertainty; it is a scientific question – and science almost by definition deals in uncertainties; and responding to the problem – if there is a problem – requires political discussion and political agreement among people and groups who are predisposed to disagree by nature! So before we plunge into this topic, take a few minutes to share with each other where each of you stands on this question. Are you a confirmed believer – this problem is real and we have to do something? Or are you an outright skeptic – this is all a political plot? Or are you somewhere in between? And then commit to each other – and to the Lord – that you will approach the topic with open minds and loving hearts.

Pray together for wisdom as you study this material.

Content

6. Climate

Note for Leaders: This material is based on Katharine Hayhoe & Andrew Farley's excellent book, *A Climate For Change*. The graphics used here come from that work, which explains the principles behind climate change in easily understood language. We would encourage you as group leader to read that book, and perhaps have it available to answer your group's questions as they arise. One method of presenting this material to your group might be to go through the graphics in using the PowerPoint slide show we are providing.

Formatting Note: I am just placing pictures and charts in-line with the text. Formatting decisions will have to be made at the publication stage depending on the medium (Web vs. PDF for example).

What is happening?

1. The world is changing around us.



The village of Newtok, Alaska. [Cr. Hayhoe?]

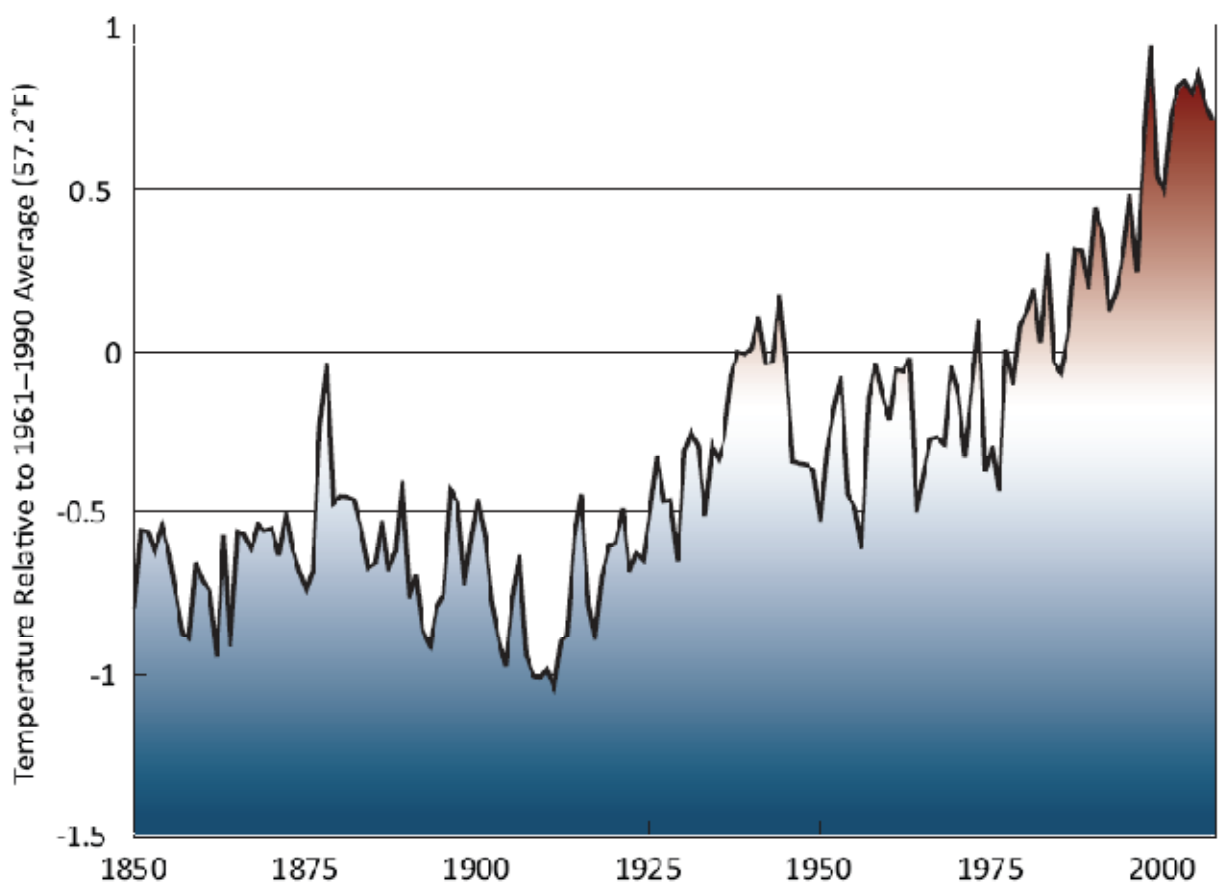
Climate Refugees: The Story of Newtok and Kivalina, Alaska.

Newtok, population 315, and Kivalina 400 are villages in Alaska that are being driven out of existence by global warming. Newtok has already become an island and is in the process of moving the entire community to a new site. Kivalina is still deciding what to do: Sea ice forms later and later in the season – three months of ice-free conditions have been replaced by five. Formerly protected by ice, the village is now pounded by waves from the open ocean during

storms, eroding the shoreline. Permafrost is melting, undermining the foundations of many of the buildings. The village must move – at a cost of up to \$250 million – but no one has the money. [Climate For Change, pp 4-6, [New York Times 5/27/2007](#)]

Our Earth is Warming Up

A. The Thermometers show it...



[Image – Katharine Hayhoe]

Over the last 150 years (see chart) the earth has become warmer and warmer, so much so that the this decade is the warmest since modern record keeping began, and 13 of the last 14 years are the warmest ever recorded.

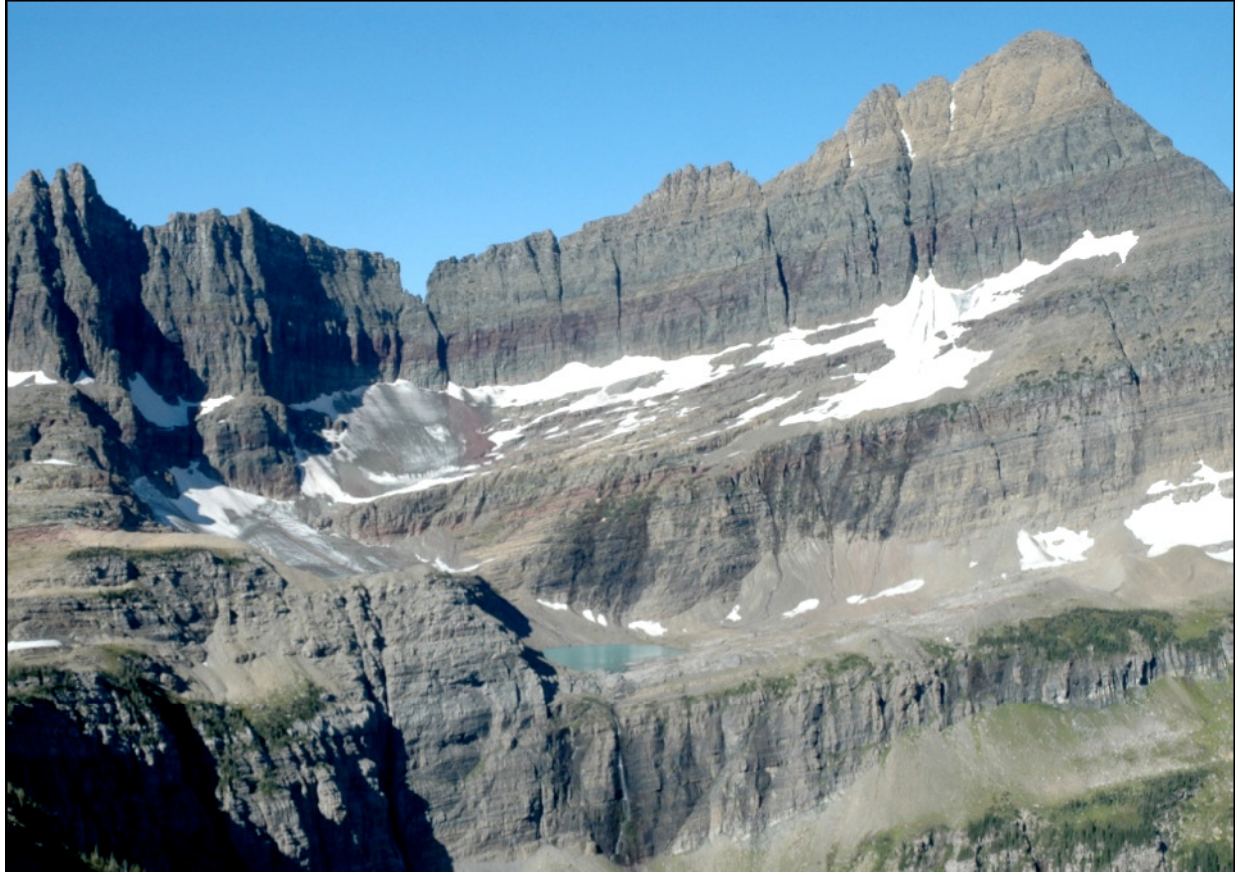
B. But so do “natural thermometers” throughout God’s Creation.

Ice is melting in Mountain Glaciers and the Greenland Ice Sheet

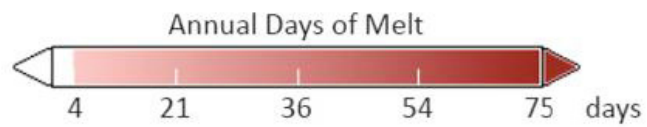


Shepard Glacier, Glacier National Park in 1913 –

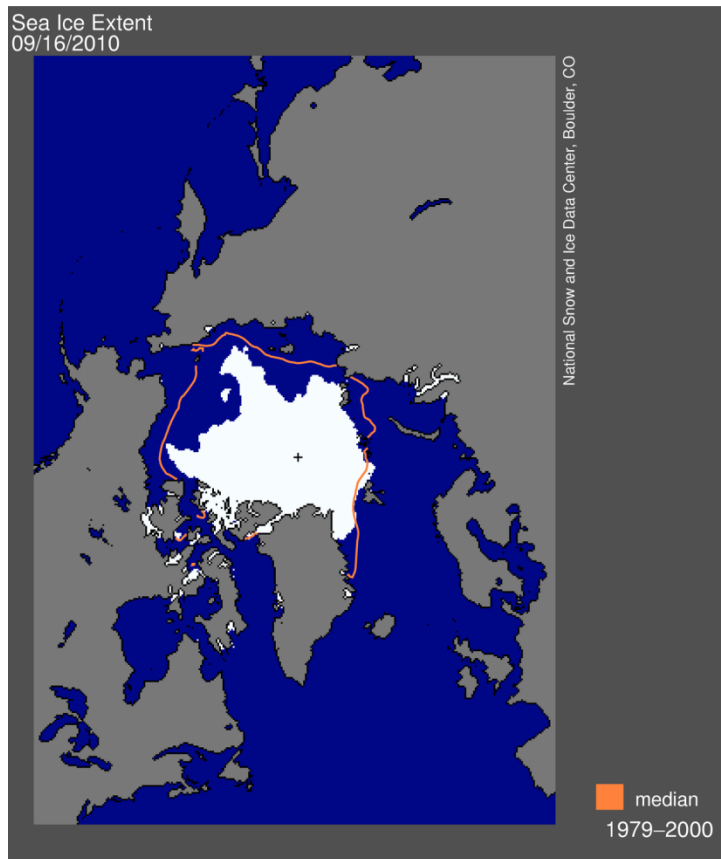
And in 2005:



When the park was created there were 150 glaciers; in 2005, only 27 remained.

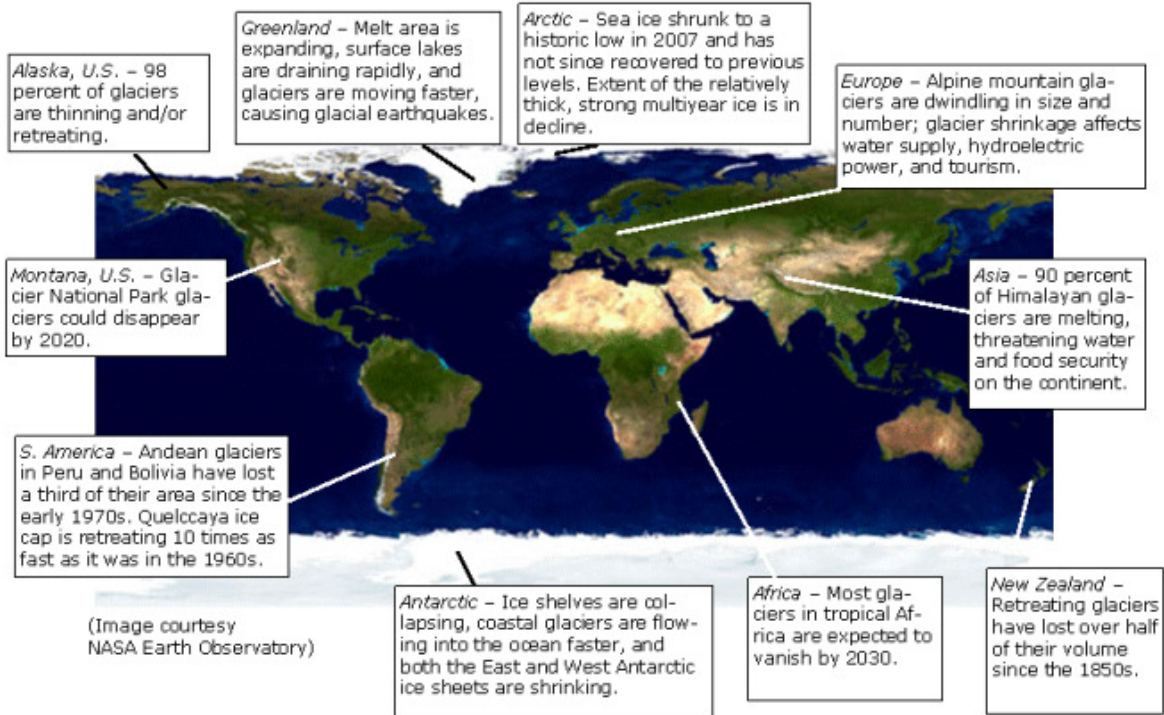


Melting of the Greenland ice sheet is increasing dramatically, as measured in number of days of melting per year – notice the increase over the last 30 years in these images. [Hayhoe]



The Arctic ice cap has shrunk dramatically. This image shows the cap on September 16, 2010, at its annual summer minimum – the orange line represents the average ice extent at summer minimum for the last 30 years. Notice that for the first time in history, it is now theoretically possible for a few weeks in the summer to sail a surface ship through the famous Northwest Passage from the Atlantic to the Pacific oceans using either the Canadian or the Russian routes. [Cr: [National Snow and Ice Data Center](#)]

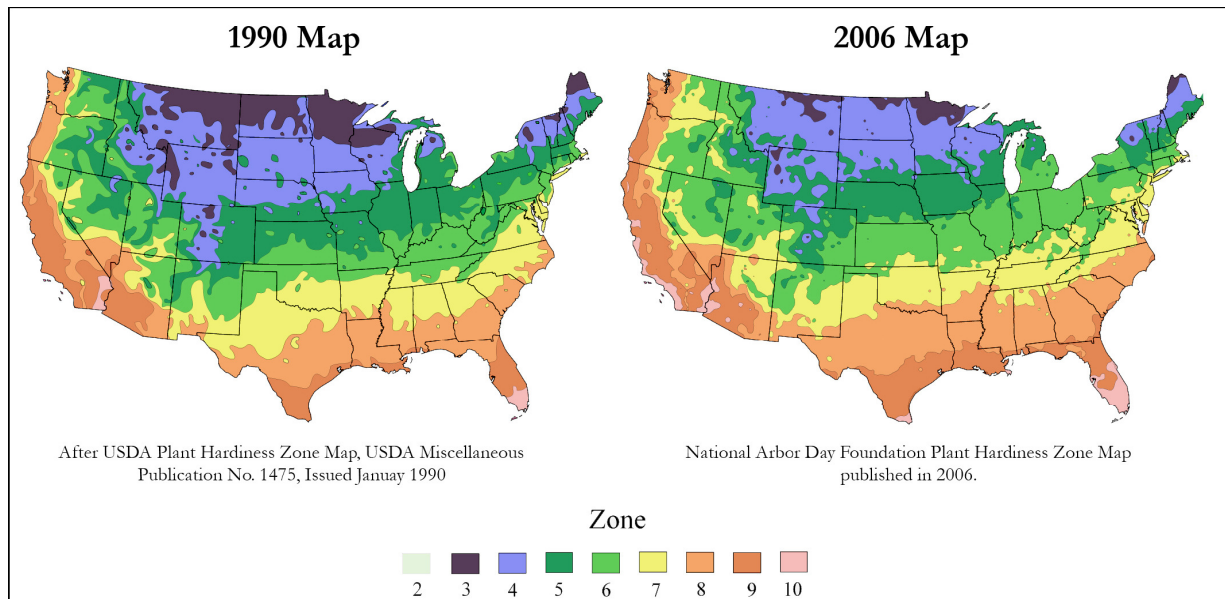
ICE MELTING FASTER EVERYWHERE



For more information, see Earth Policy Institute's 2009 Eco-Economy Indicator, "Ice Melting Faster Everywhere," available at www.earthpolicy.org

Source: Compiled by Earth Policy Institute, December 2009, www.earthpolicy.org.

Spring is coming earlier and earlier – up to 2 weeks earlier depending on where you live.

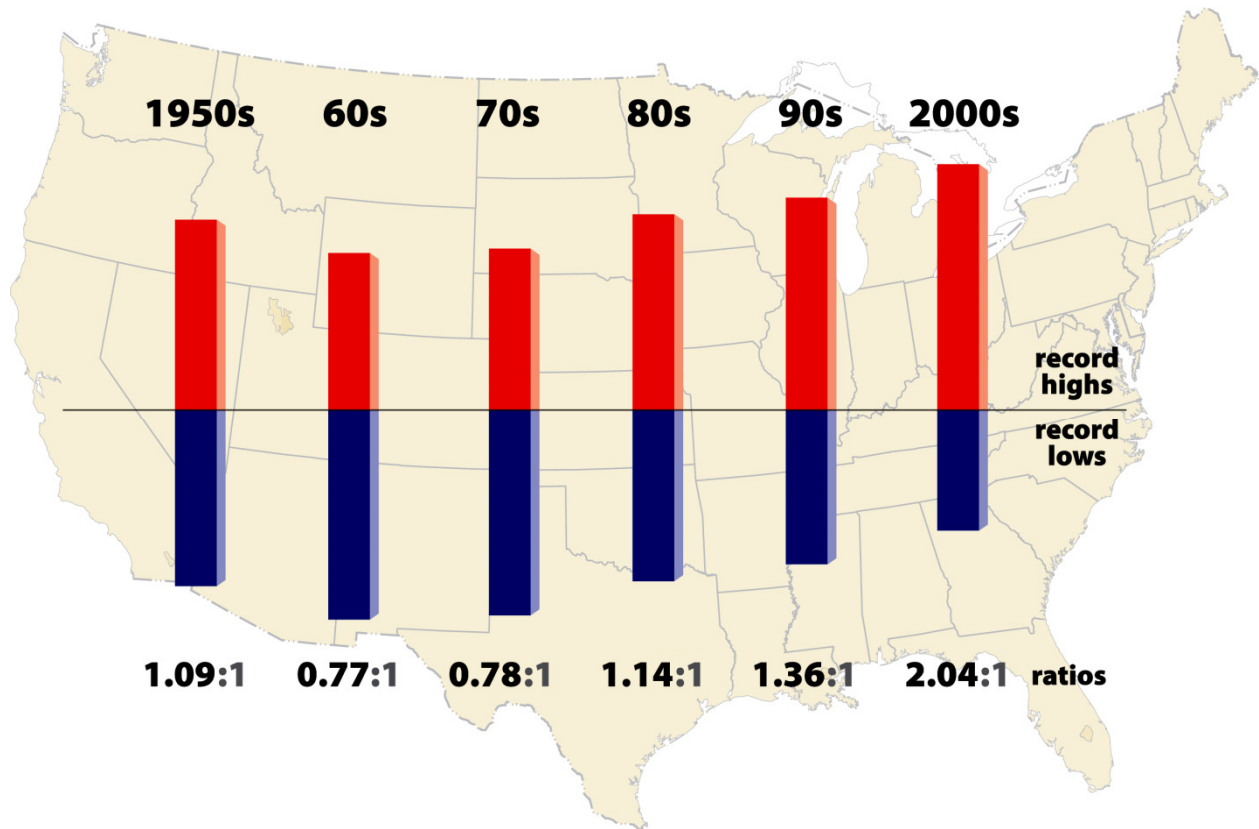


Plant Hardiness Zones have changed – you can plant warm-climate plants much farther north than you used to be able to.



Pests like kudzu and red ants are moving further north, and the pine beetle is out of control in many western forests because winters are not as cold as they used to be. Here, all of the orange colored trees have been killed by the pine beetle. As of 2010, more than 15 million acres are affected. [Cr: USDA]

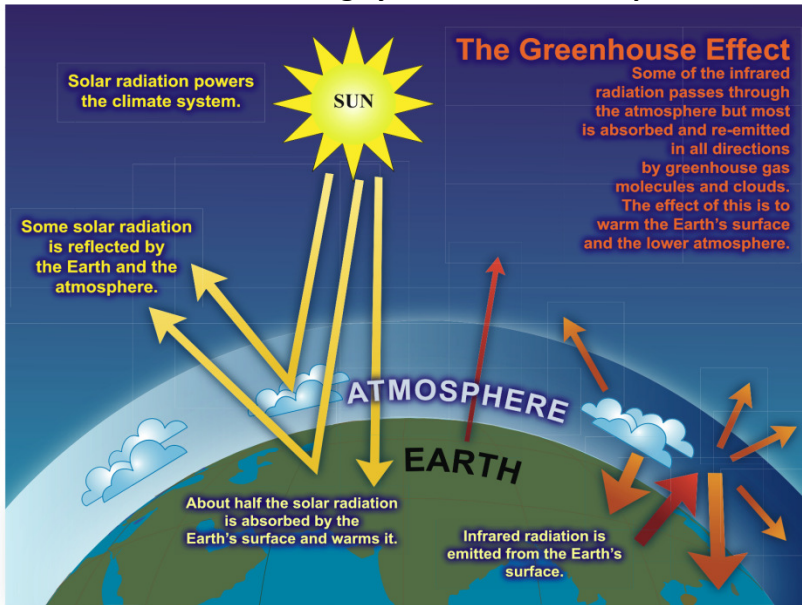
C. Human Temperature Records are falling like dominoes



Because temperature records are always being set somewhere, one way to measure a changing climate is by comparing the ratio of record highs to record lows. A stable climate would show a ration of 1:1; a cooling climate, less than 1 to 1, and a warming climate greater than 1 to 1. As you can see in this graphic, after being more or less stable in the 1950s, cooling slightly in the 60's and 70's, the 2000's show a dramatic acceleration. [\[©UCAR, graphic by Mike Shibus\]](#)

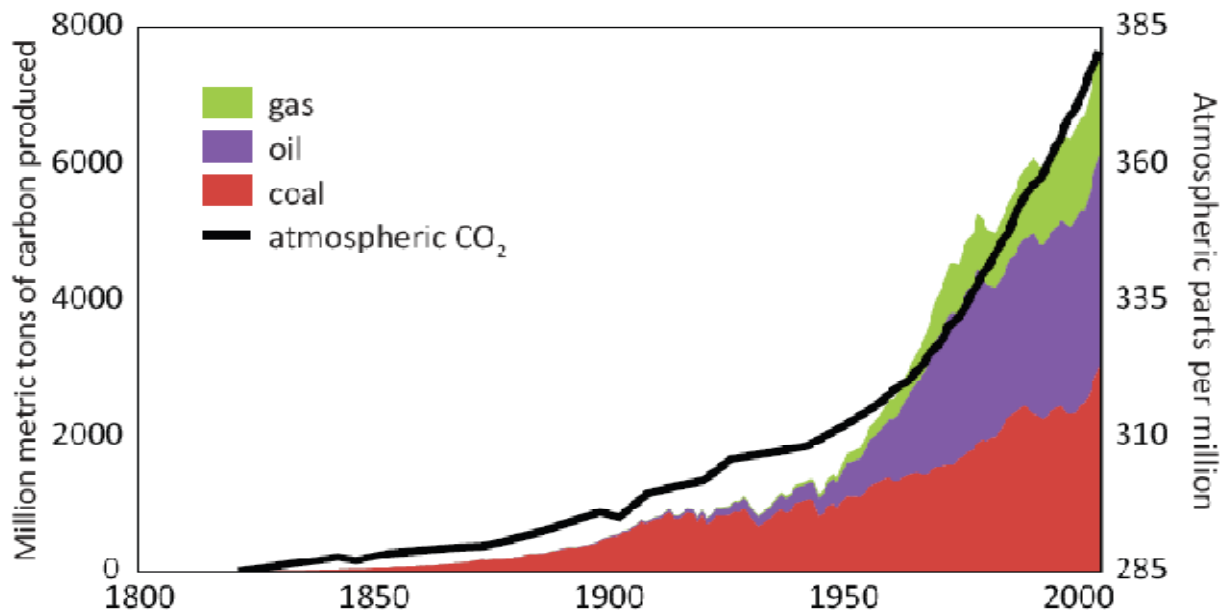
So Why is This Happening? [A brief introduction to Climate Science]

A. God has created an amazing system to make our planet habitable by creatures like us...

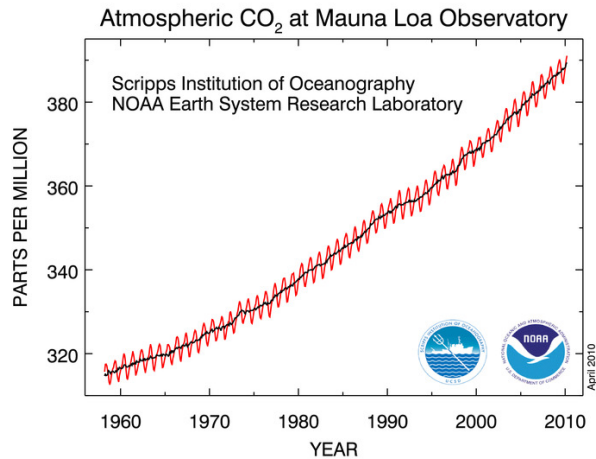


Scientists call this the 'greenhouse effect' because, like the glass in a greenhouse, the gases in our atmosphere keep earth about 70 degrees F warmer than it otherwise would be.

B. Our Human activities are producing more and more of these "Green House Gases" and changing the balance of this atmospheric system.

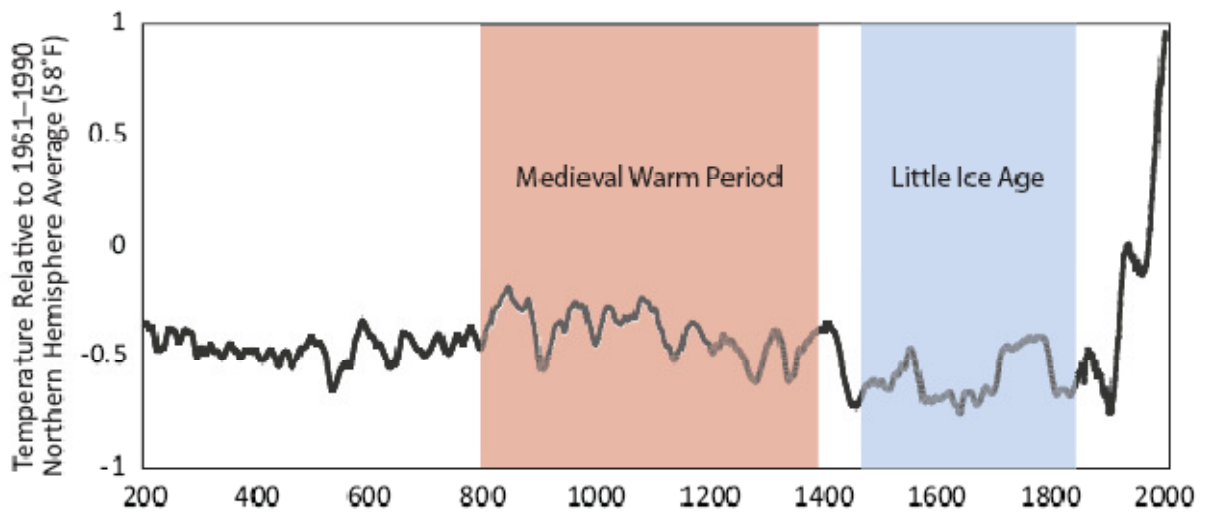


This chart shows the relative amounts of gas, oil and coal that have been burned annually since the industrial revolution took hold, and how the level of CO₂ in the atmosphere has increased correspondingly. [Cr Hayhoe]

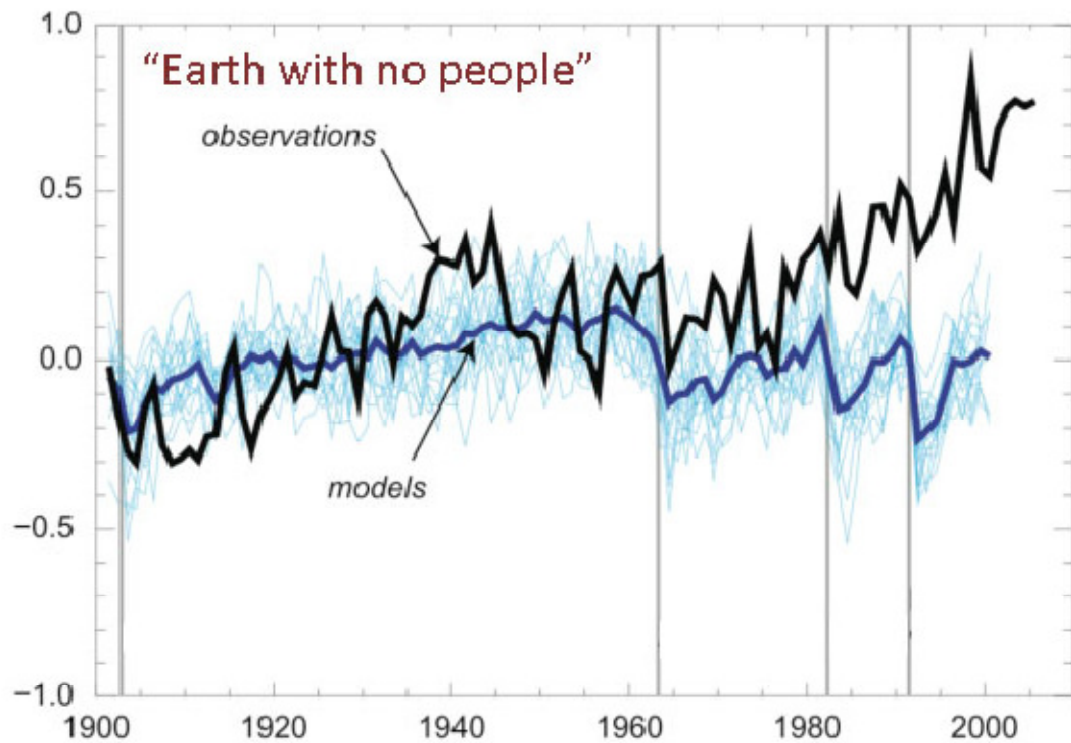


And this one shows how levels of CO₂ at the Mauna Loa observatory in Hawaii have been increasing every year since measurements there began. [Cr NOAA]

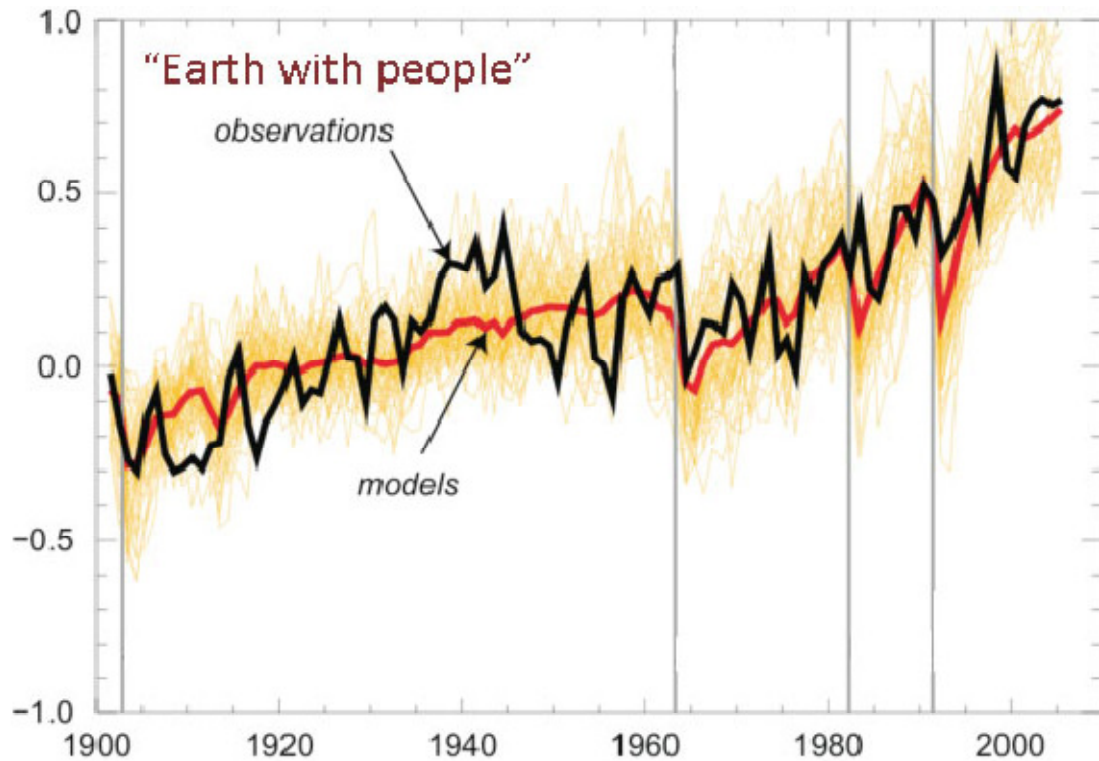
C. With the result that temperatures today are warmer than any time in the last 2000 years at least:



D. And Human Activity is the only explanation that works:

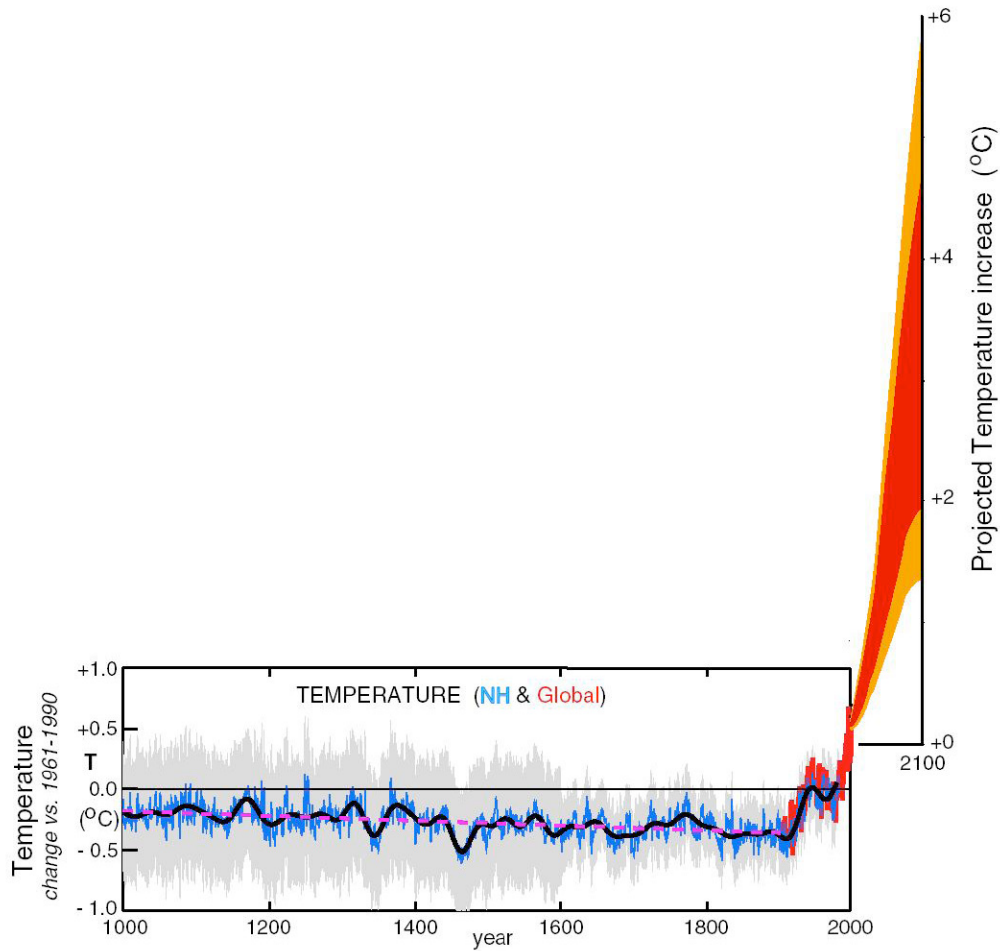


This chart shows how the computer models predict temperature from 1900 to 2000 (the blue lines) as compared with actual temperatures for those time periods (the black line). You can see that the models actually expect that apart from human influence, temperatures right now would be stable or declining.

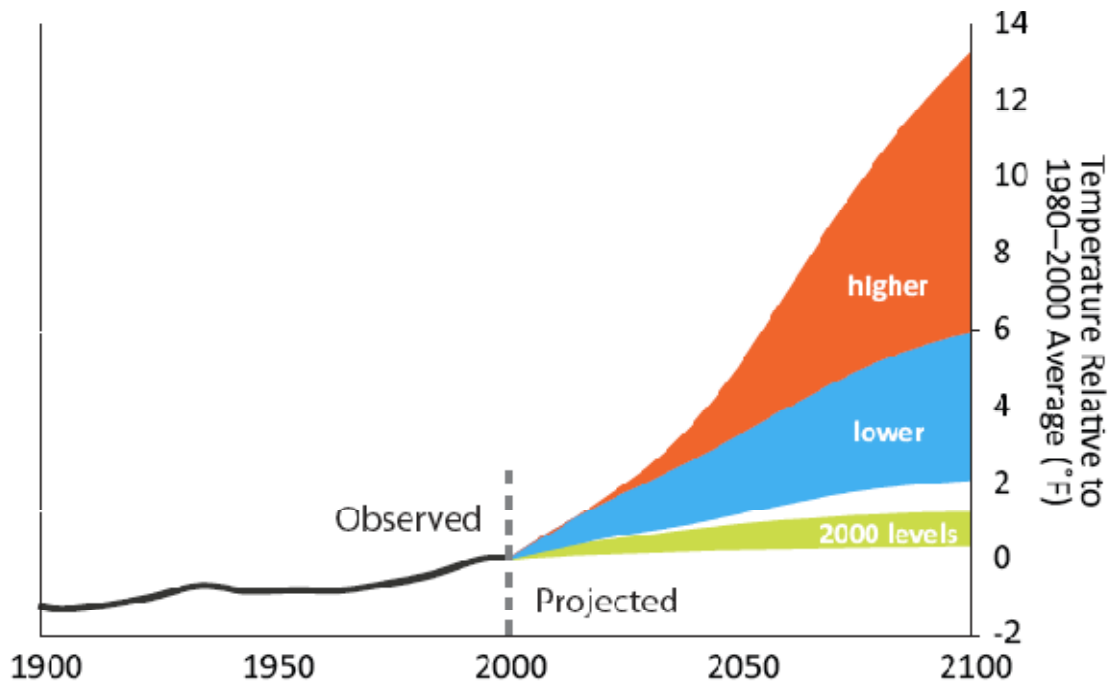


And this one shows what the models predict when human influences – producing green house gases – are added to the equation. What the models predict, and what has been actually observed (the black line again) run very closely together. This is one of the reasons most climate scientists are in agreement that human activity is the cause of the increased temperatures we are experiencing today. [Cr: Hayhoe]

E. And much worse lies ahead of us



The science that explains the .5 degree C increase we have already experienced predicts additional increases of 2 to 5 degrees in this century. The range of possibilities represents different possible outcomes based on whether we stick to "business as usual" or implement efforts to change how we do things, as indicated in this chart:

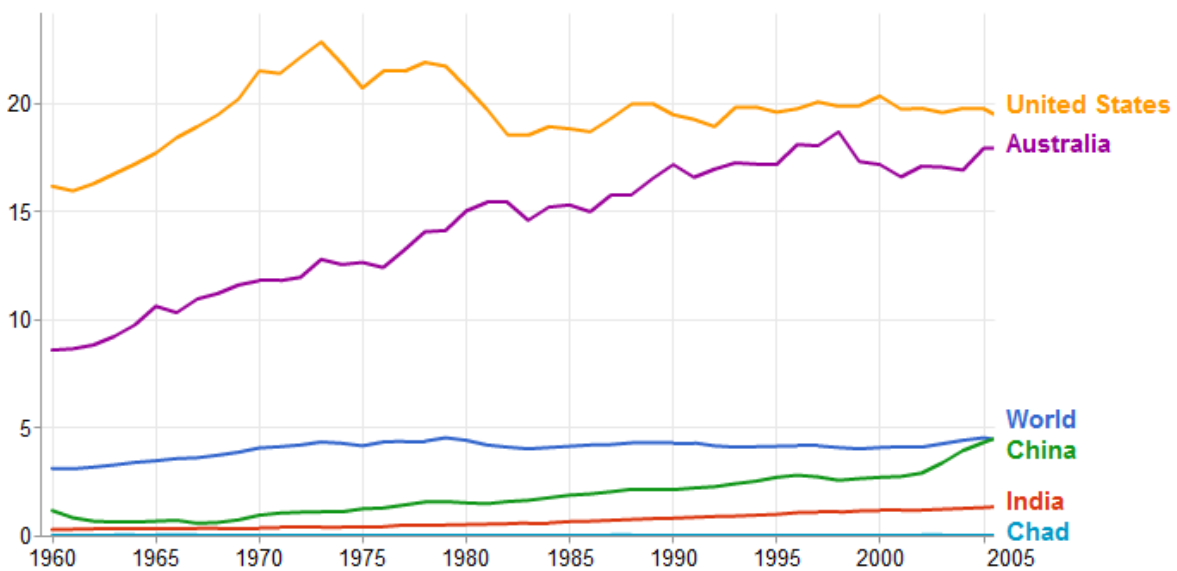


Why It Matters

- A. People in the wealthiest countries of the world are producing far more CO₂ per person than those in the poorest countries.

CO₂ emissions per capita

Carbon dioxide emissions in metric tons per capita. [More info »](#)



Data source: [World Bank, World Development Indicators](#) - Last updated July 26, 2010

B. But most of the worst effects of climate change will fall on those living in the poorest countries.

[The following material comes from *Global Warming and the Risen Lord* by Jim Ball, chapters 5, 6 and 7. Refer to this book for references and source material.]

There are at least seven major concerns for people living in poor countries:

[NOTE: This does not mean there will be no effects on people living in the US or Europe. Significant effects can be expected in these countries as well; the difference is that wealthy countries have more ability and resources to adapt to changes than poor countries do.]



[CR: Oxfam](#) International

1. **Hunger and Malnutrition:** *From 40-170 million additional poor people annually could be at risk of hunger and malnutrition from impacts on agricultural production according to the IPCC. Another major report suggests that it could be as much as 550 million annually. MSS P 85*

This will be caused primarily by changes in rainfall patterns affecting rain-fed agriculture (80% of the world's agriculture is in this category), leading to both an increase in damaging floods in some areas and an increase in devastating droughts in others.



[CR: Care of Creation](#)

2. **Water Scarcity:** *Worldwide, roughly 1-2 billion people already in a water stressed situation could see a further reduction in water availability. MSS P 88*

Anticipated water shortages will come from the same anticipated changes in rainfall patterns, as well as the ultimate loss of water from glaciers that feed some of the major rivers in the world because of a warmer atmosphere. These glaciers are already retreating dramatically.



A flooded village in Pakistan in August, 2010 [CR Globovision CC License through Flickr]

3. **Flooding:** *Not counting inland flooding, the IPCC conservatively estimates that climate change could result in 100 million more people being impacted from coastal flooding alone due to sea level rise and storm surge. More recent scientific findings suggest this number could be substantially higher. MSS P 94*

The amount of sea level rise expected is highly uncertain, and depends on many factors such as the speed with which major continental ice sheets like Greenland and Antarctica melt. The summer of 2010 in Pakistan, which brought a monsoon flood that displaced 20 million people, is a reminder that inland flooding from altered weather patterns is a huge risk that remains unpredictable but that can potentially affect millions,



CR: [andylangager \(CC License through Flickr\)](#)

4. **Disease:** Diarrheal diseases are the #1 cause of death for children age 5 and under in poor countries. Global warming will significantly increase the number of children in the poorest countries who are vulnerable. In poor countries with little capacity to cope, an additional 90-200 million could be more vulnerable to malaria by 2080. Worldwide, an additional 900 million by 2055 and 1.4 billion by 2085 will be at increased risk from denque fever. MSS P 98

These health effects arise from a variety of causes, including the disruption to life and sanitation systems caused by floods, stress to survivors because of droughts, and new habitats for disease vectors – mosquitoes and other pests that carry diseases like malaria, dengue, and plague and thrive in warm, wet areas.



Loss of pollinators like bees represents much potential for human suffering. [[CR: Seraphina \(CC License through Flickr\)](#)]

5. **Extinctions:** *Approximately 20- 30% of God's creatures are likely to be at increased risk of extinction in this century, making global warming the single biggest threat to biodiversity today. MSS P 100*

This effect is not usually thought of as being an effect on human beings – but it is. Bio-diversity (a measure of the variety of plants, animals, and insects in an area) is an indication of the ability of that place to support life in general, including human life and prosperity. When God's creatures vanish, human beings, especially the poor who live close to the land, suffer and die as well.



Refugee camp in Haiti – [CR Oxfam Italia](#)

6. Refugee Migrations: *Climate impacts could create, roughly, 200 million refugees by 2050.*
MSS P 104

This effect will be, and already is in places like Darfur, a direct consequence of some of the other effects listed above. When agriculture fails, people are hungry and will move to find food. When a flood destroys villages, people will move to cities temporarily or permanently to survive. When an entire country's ability to feed itself is in jeopardy, the people who live there will try to move to other countries creating the largest amount of refugees the world has seen in the modern era.



Refugee camp in Darfur – one of many conflicts with environmental and climate-change roots. [CR Picture Alliance dpa]

- 7. Violent Conflict and Terrorism:** *Global warming will increasingly act as a threat multiplier for instability in some of the most volatile regions of the world, and has the potential to result in multiple chronic conditions occurring globally at the same time. ... One group's estimate, although quite speculative, suggests that as many as 2.7 billion in 46 countries could be at high risk for violent conflicts. MSS P 112*

The causes of violence and terrorism are exactly the same as those that cause people to become refugees. Some people flee, other people fight. In both cases people are pushed to the edge of survival because of the failure of agriculture or the destruction of their homes by a changing climate.

Why does it matter?

This has been a lot of material to cover. What stands out to you? Is it helpful to see climate change framed in terms of human impacts? Does that change how you think about climate change?

Solutions and hope

For ideas on how to address global warming and hope on what can be done see part III of *Global Warming & The Risen Lord*.

Prayer Time

Read Daniel's prayer in Daniel 9, especially v. 15-19. Note that Daniel both confesses and asks for God's mercy – and that he does this on behalf of his people, not just himself. We need to confess the sin that has caused this situation, even those parts of it that seem far too big for us to control. Then we can ask God to intervene for us – for his sake, as well as for the sake of the poor in the world, and for ourselves and our families as well.

Prepare ahead

Read next session's material.

Use your outdoor time to be reminded of how beautiful the world still is. Walk in the most beautiful place you can find in order to remember that all is not lost – we need to be aware of the negatives, but creation is still alive and so are we.

Measure your Materialism: Our next session deals with the impact of our consumer consumption on God's creation. To prepare for the discussion, take some time to measure your own personal investment in material things by counting one of these categories, whichever seems most applicable or interesting to you:

- The number of separate electronic devices you use in a typical day;
- the number of hours you spend in car in a week
- The number of things you buy at the store
- The number of separate disposable cups you use (coffee, soda, etc.)
- the number of containers of various substances (cosmetics to cleaning supplies) in your bathroom and kitchen