CLASS TWO
WHERE ARE WE AND HOW DID WE GET HERE?

(view light background)

Review and Reflections:

Highlights from previous week:

- The first class we looked at the connection between basic beliefs of faith groups and our responsibility to care for the Earth. We also explored the history of discoveries and actions that have led us to this moment of understanding.
- Reflect on what you heard in the news or other sources about the climate crisis since you studied the first class. Did you find yourself doing anything differently? Think about your emotional response to this

information. Would it help to find others to share with?

Preview of Class Two

Learning Objectives:

⇒ Continue to develop your climate vocabulary.

⇒ Begin to develop a basic understanding of the current science regarding the climate crisis.

⇒ See connections between the Industrial Revolution and the current climate crisis.

⇒ Review the essentials of life and the church's mandate for creation care.

⇒ Become familiar with the concept of climate science denial.

Class Two Sections:

Section One: Developing A Common Language

(The first six terms are from The Climate Reality Project at THIS WEBSITE.)

- A Greenhouse Gas is a chemical compound found in the Earth's atmosphere, such as carbon dioxide, methane, water vapor, and other human-made gases. These gases allow much of the solar radiation to enter the

atmosphere, where the energy strikes the Earth and warms the surface. Some of this energy is reflected back towards space as infrared radiation. A portion of this outgoing radiation bounces off the greenhouse gases, trapping the radiation in the atmosphere in the form of heat. The more greenhouse gas molecules there are in the atmosphere, the more heat is trapped, and the warmer it will become.

- Trapping of the sun's warmth in the planet's lower atmosphere by greenhouse gases is called the Greenhouse Effect.
- Carbon Dioxide (also known by its shorthand CO2) is the primary greenhouse gas and driver of climate change. It's an integral part of life cycles on earth, produced through animal respiration (including human respiration) and absorbed by plants to fuel their growth, to name just two ways. Human activities are drastically altering the carbon

cycle in many ways. Two of the most impactful are: one, by burning fossil fuels and adding more carbon dioxide into the atmosphere; and two, by affecting the ability of natural sinks (like forests) to remove carbon dioxide from the atmosphere.

- Methane is a chemical compound that's the main component of natural gas, a common fossil fuel source. Just like carbon dioxide, methane is a greenhouse gas that traps heat in the atmosphere. Methane accounts for about 10 percent of all US greenhouse gas emissions (using 2013 figures), second only to carbon dioxide. Many people don't understand the negative effects of methane as an alternative to other fossil fuels. While methane doesn't stay in the atmosphere as long as carbon dioxide, it absorbs 84 times more heat, making it very harmful to the climate.

- Fossil Fuels are sources of non-renewable energy, formed from the remains of living organisms that were buried millions of years ago. Burning fossil fuels like coal and oil to produce energy is where the majority of greenhouse gases originate. As the world has developed and demand for energy has grown, we've burned more fossil fuels, causing more greenhouse gases to be trapped in the atmosphere and air temperatures to rise.
- Emissions refer to greenhouse gases released into the air that are produced by numerous activities, including burning fossil fuels, industrial agriculture, and melting permafrost, to name a few. These gases cause heat to be trapped in the atmosphere, slowly increasing the Earth's temperature over time.
- Anthropocene Era is an unofficial unit of geologic time, used to describe the most recent period in Earth's history when human activity started to have a significant impact on

the planet's climate and ecosystems. (National Geographic)

- Holocene Era is the name given to the last 11,700 years of the Earth's history since the end of the last major glacial epoch or ice age; a relatively warm period in between ice ages. (UCMP Berkeley)
- Ocean Acidification refers to altering the pH balance of the ocean and is a result of absorption of CO2 from the atmosphere into the ocean.
- Ecosystem is the biological community formed from the interactions of interdependent organisms and the habitat in which they live.

Section Two: A Simplified Story of The Earth

The Story

It’s eons ago, and the Earth’s atmosphere is high in carbon dioxide and low in oxygen. Conditions evolve to allow for prolific plant growth which uses much of the carbon dioxide and creates oxygen through photosynthesis. Plants take up CO2 and give off oxygen (O2). Animals take in O2 and exhale CO2. A balance of CO2 and O2 allows animal life…including humans… to exist on Earth with plant life. Geological changes and events over many years sequester excess carbon dioxide as coal, gas, and oil in the Earth. As human beings increase in numbers, many forests are cut down to build cities and other necessities. This reduction in forests reduces the uptake of CO2 by trees. In addition, huge swaths of trees are harvested to increase agricultural growing space. Then the combustion engine comes along requiring fossil fuels (coal, gas, oil) as its energy source. These energy sources are mined from deep in the Earth where they had been sequestering carbon. When they are burned, the carbon is

released back into the atmosphere as CO2. With more CO2 in the atmosphere, more global warming occurs. The additional heat leads to melting of the glaciers and ice sheets and warms the permafrost which has stored and now releases more carbon as methane and CO2. The oceans absorb a good part of the increased CO2 which causes acidification in the ocean's waters with the death of coral reefs and other consequences. The world's population increases from 1 billion in 1800 to almost 8 billion in 2022. Commercial forms of agriculture deplete soil health and release carbon stored in the soil. Temperature changes lead to destabilization of weather patterns and lots of weather-related disasters. And so, the Earth and its inhabitants arrive at NOW.

"In the past ten years, humans have released 43 billion US tons of CO2 each year. About 28% of it is captured by terrestrial vegetation and soils, and about 22 percent is absorbed by the

oceans, but the remaining 44% remains in the atmosphere." (This is Climate Change by David Nelles and Christian Serrer.)

Now watch unit 2 of Drawdown's Climate Solutions 101: How To Stop Climate Change.

Section Three: The Industrial Revolution

The industrial revolution began in the 1760's and continued into the early 1900's (the ending date is debated, some sources suggesting as early as 1840 and others as late as through WWII.) It was a period of sustained economic prosperity (at least for some) in Great Britain, Continental Europe and the United States and Canada. The advent of the steam engine, electricity, cheap steel, the gas engine, oil, coal, and gas as new energy sources, introduced mass production which increased productivity

and efficiency and lowered cost to the consumer. Many of our ancestors left farming and joined the ranks of factory workers in cities. The building of roads, canals, railways and the invention of the airplane allowed for movement of products throughout the world and a major increase in global trade. Mass production and increased trade suddenly meant that the impact of each person's labor was magnified, leading to more of everything, including people. The primary energy source for the industrial revolution was fossil fuels (oil, gas, coal) which when burned to create energy also released into the air the carbon that had been stored underground for ages.

View THIS 6-MINUTE VIDEO.

The Anthropocene Era:

- The complex changes set in motion by the Industrial Revolution resulted in the arrival of

the Anthropocene Era. This term is an unofficial unit of geological time used to describe the most recent period in earth's history during which human activity began to have a significant impact on the earth's surface, atmosphere and oceans.

- Shortly after WWII, conscious changes were made regarding our economy. A quote from Victor Lebow, a retail analyst of that time, summarizes the plan to ramp up our economy. "Our enormously productive economy …. demands that we make consumption our way of life, that we convert the buying and use of goods into rituals, that we seek our spiritual satisfaction, our ego satisfaction in consumption …. We need things consumed, burned up, replaced and discarded at an ever-accelerating rate." Thus, planned obsolescence (designed for the dump) and perceived obsolescence (staying in style) became such a part of our lifestyles,

that, today, only 1% of products bought are still in use 6 months after the date of sale! Watch this 20-minute video at StoryOfStuffy.org which will explain our current linear material economy. Even though it was released in 2007, it continues to be relevant. And this is a good website that has many interesting videos.

- As climate scientist Katharine Hayhoe says: "Our planet has a fever, caused by our lifestyle choices since the dawn of the Industrial Revolution. The news is bad: Antarctic glaciers are accelerating into the ocean, coastal towns are flooding, polar bears are starving, forests are burning, islands are disappearing, and species are going extinct. If we aren't able to change our habits at the fundamental, systemic scale needed, the consequences for humanity will be incalculable." (Saving Us by Katharine Hayhoe)

- You might take a moment to consider how you and your loved ones have benefited from the industrial revolution and the linear economy.

Section Four: The Essentials of Life: Water, Air, Soil and the Response from One Faith Community

- The Book of Resolutions of the United Methodist Church presents models for applying an active faith to daily life in ways that can impact the world around us. In the 2016 Book of Resolutions, # 1033, Caring for Creation: A Call to Stewardship and Justice, the United Methodist Church speaks regarding the essentials of life: air, water and soil. Following are excerpts from the section entitled “Our Vision”. More detail can be found HERE.

● Air

“We believe clean air is a basic right and necessity for all life. Air pollution puts at risk the health of our communities and threatens to forever alter the climate. To ensure that future generations inherit a legacy of clean air we support efforts to protect our shared atmosphere by reducing emissions that contribute to ozone depletion, acid rain and climate change. We advocate ratification and enforcement of agreements to reduce harmful emissions with particular emphasis and accountability by the most developed and historic emitters.“

● Water

“We believe water is a sacred gift from God and a basic human right. We advocate integrated, sustainable management to reduce or eliminate factors contributing to limited water quantity and poorer water quality. We call for measures

to preserve groundwater sources, to address polluted runoff that threatens water quality and safety and for effective enforcement against illegal pollution." (You might like to evaluate your own water footprint using THIS TOOL.

- Soil (land)

"We are to tend God's land and care for all creation's creatures as faithful trustees with a commitment to preserve its goodness and diversity for future generations. We encourage economic and agricultural practices that conserve and promote the improvement of land resources, production of healthful foods, and preservation of a clean environment. We call on governments to support careful management of agricultural lands, protection of forests, and preservation of biodiversity among both plants and animals."

You might take a moment to consider how well we as a society are doing at tending to creation.

And how is your government doing at protecting air, water and soil for all?

Section Five: What About Denial of Climate Science?

Below are the results of the Six Americas Survey published in Sept. 2021 by the Yale Program on Climate Change Communication. This depicts the percentage of the U.S. population at each stage of belief about the climate crisis. This continues to be updated, so check their website for current percentages. Which of the 6 categories of belief best describes where you are right now?

- ALARMED (33%)
- CONCERNED (25%)
- CAUTIOUS (17%)
- DISENGAGED (5%)

- DOUBTFUL (10%)
- DISMISSIVE (9%)

What Is the debate? According to climate scientist, Katharine Hayhoe, the topics involved in the debate over the veracity of human caused climate change include among others:

◊ the nature of global warming (its positive, negative, and/or neutral effects)

◊ the extent to which human activity is responsible for climate change

◊ the scientific models used to predict future climate change

◊ the pace at which climate change may be occurring

◊ and the debate over the policies needed to impact climate change

Who are dismissives (the 9% of the U.S. population with the least belief)? To again

quote Katharine Hayhoe, dismissives are "people who will discount any and everything that might show

◊ climate change is real,

◊ humans are responsible,

◊ the impacts are serious,

◊ and we need to act now.

◊ Facts cannot convince someone whose identity is built on rejecting climate science."

What arguments do dismissives use and how can we respond? Katharine Hayhoe, shares these responses to frequently raised alternative explanations for the warming of the earth's surface:

◊ "Is It the Sun? In order for this to be true, the sun's energy would have to be increasing, and it is actually decreasing."

◊ “What About Volcanoes? Volcanoes primarily cool rather than warm the earth by creating aerosols that act like an umbrella to cool the earth.”

◊ “Orbital Cycles? These are caused by periodic variations in the earth’s orbit around the sun. These cycles alter how sunlight falls on the earth, which in turn triggers the growth and retreat of the ice sheets. These cycles occur on a regular basis about every 100,000 years and the next major glacial maximum was due to begin about 1500 years from now. But since the planet started warming about 150 years ago, that is no longer anticipated.”

◊ “A Natural Cycle? These natural cycles help distribute energy around the planet by moving heat between the ocean and the atmosphere. They warm one part of earth while cooling another. But today the entire planet is warming, as is the ocean.”

View the first three minutes of THIS SLIDESHOW by Dr. Craig Cogger of Washington State University, part 8/9. Resources for further study are included.

View THIS SHORT VIDEO about natural climate solutions by Greta Thunberg and George Monbiot:

CREATION JUSTICE TIPS

- Are you regularly in a queue to pick up a child or grandchild from school? Fluctuating temperatures can entice you to turn on the engine one day to run the air conditioner and the next to crank up some heat. Emissions from idling cars, however, send particulates into the air, which research has shown negatively affects the cognitive development and performance of children. Keep the engine off while you wait.

- We may need them. We may love them, but… cars emit carbon dioxide, polluting the air and contributing to climate change. Become mindful. (Do I need to drive everywhere every time?) Try alternatives—carpools, combined trips, public transit, walk, bike.
- Become an “environmental thinker.” At home, at work, at school, at church, in your organizations, with your friends, through your voting—approach any opportunity with a creation-care mindset. Speak up with ideas. Help others see the possibilities and take action.
- What’s your toilet tissue made of? Trees! Globally, making toilet paper wipes out 27,000 trees daily. Fortunately, you have other options: tissue made of 50–100% recycled paper or bamboo! Browse “sustainable toilet paper” to get the scoop.

- It’s an outdoor party—lots of people, including kids, having a good time. Go ahead and use plastic cups. But put out a bin, labeled Cups Only. Afterwards, wash the cups. With children, you don't have to worry about a possible broken glass. Just recycle any damaged cups, if possible. But think Reuse before Recycle.
- Support your local farmers. When you buy homegrown, you not only get fresh food, you also minimize carbon emissions in the transport. The #1 source of carbon emissions, fossil-fueled transportation drives the climate crazy.
- Whales are the new “canaries.” Opening their mouth to filter the ocean water for food, they are getting plastic instead—and dying. Oceans and marine life need our help. Take action—sign petitions, make calls, use social media—to pressure corporations, cruise lines, and local, district,

and federal governments to stop plastic pollution.

- If you love seafood, you'll also love Monterey Bay Aquarium's Seafood Watch, a program that helps consumers and businesses choose seafood that is fished or farmed in ways that support a healthy ocean. A free wallet-sized card identifies best, good choices, and what to avoid. Go to SeafoodWatch.org.
- How is your church known in the community? What if the roof supported solar panels? Not only would the church generate electricity and savings, but it would also be generating a buzz about being a faith community that truly cares about creation. Investigate the possibilities; remember that costs continue to come down as demand goes up.
- According to the 2019 U.N. Report on Climate Change, what we eat matters.

Current food choices cause 25–30% of greenhouse gas emissions. Meat, especially beef, is the single food with the greatest impact. Choose more of your food from grains, fruits, vegetables, and nuts.

Critical Beliefs Underlying This Curriculum

1. Individuals can make a difference, especially as part of a large grassroots movement which you are helping to create by participating in this study.
2. In addition to individual actions, we can make a difference by influencing governments, corporations, organizations through our votes, our voices and our pocketbooks.
3. Talking about the climate crisis is critical. Share your thoughts and stories with friends, family, acquaintances and on social media.

Additional Resources for Further Study:

Documentary: The Human Element, free on Tubi TV

If you are interested in knowing more about how to evaluate the validity of arguments, THIS VIDEO by climate scientist, John Cook, may be of help.

Video: How Sure Are Climate Scientists Really? (24min)

Report: Climate Change Disinformation

Article: Climate Deniers.

HERE you can see the various risk factors for your home/location.

Website: World Emissions Clock