

Dealing with Climate Change: A Moral Imperative

Dr. Ray Weymann, Ray.Climate@charter.net
Cambria Unitarian Universalist Church, February 10, 2019

#1 title

First, I want to thank you for inviting me to be with you here this morning and to share my thoughts about a challenge facing all of humanity. It is impossible to cover all the aspects of this topic in a short time, so if you want more information you can email me or go to my website which I have shown here.

#2 outline Here is an outline of the things I would like to discuss. I am posting the text and slides for today's discussion on my website since I may not have time to cover all of these topics.

I was asked to suggest which of the UU's "seven principals" were especially relevant to today's topic, and I mentioned three of them: the 2nd, 4th and 7th and I've tried to organize my remarks around these three.

The 4th principle commits us to **"A free and responsible search for truth and meaning."** There are basic truths—or 'laws' if you will—to be found in nature, and some of these laws are at the root of understanding why humans are causing a profound and rapid change in the Earth's climate. So, let us briefly review some of these laws which are at the basis of climate change.

#3 The Basic Science:

#4 energy cartoon. This simple diagram captures the essentials of how energy flows through our climate system, and it is a change in this energy flow that is responsible for our changing climate.

We get 99.99% of our energy from sunlight, represented by the downward green arrows. The yellow up arrows represent the approximately 30 percent of this energy that is reflected back to space by clouds and snow and ice, while the rest warms the land and ocean. The earth stays in energy balance by radiating away that energy in the form of infrared radiation ("heat"), represented by the upward red arrows. Gases in the atmosphere, notably water vapor and carbon dioxide, block some of this radiation. This is called the 'greenhouse effect.'

By burning coal, oil and natural gas, humans are causing the amount of carbon dioxide in the atmosphere to rapidly increase, increasing the blocking and thus warming the earth further. This is the basis for our current rapid warming and associated change in climate. I should emphasize that there is NO uncertainty in this basic description. The only uncertainty is the precise amount by which the earth will warm as more carbon dioxide is dumped into the atmosphere. I'm going to show a portion of a little video which shows that carbon dioxide does indeed block much of this infrared radiation. [#5 Co2 video.](#)

I am going to show just one graph to drive home how dramatically humans have changed the composition of our atmosphere, beginning with the start of the industrial revolution but vastly accelerating with the increase in population and the increase in energy consumption, especially in the developing world. [#6 co2 increase.](#)

To summarize, here is the basic science underlying our changing climate: [#7science summary.](#)

[#8 Some of the most common myths](#)

This basic understanding is not new—it has been realized for a century. Despite this, many misconceptions persist about climate change. Here are the 5 of the most common: [#9 common myths.](#)

Myth: Climate has always changed (“Like ice ages; we are just experiencing a natural cycle.”)

Fact: The speed at which humans are altering the climate is FAR greater than natural climate change—decades, compared to tens of thousands of years for the ice ages.

Myth: For every 10,000 molecules of air, only about 4 of them are carbon dioxide molecules, so such a small fraction can't possibly influence the earth's climate.

Fact: The nitrogen and oxygen molecules making up most of the air can't absorb infrared radiation, and their number is irrelevant. What counts is the number of CO2 molecules. The notion that just because the fraction of a substance is small it can't have a big effect is erroneous. The fraction of lead atoms in drinking water that can do serious damage is **far** less than the fraction of CO2 molecules in our atmosphere.

Myth: The sun is causing the present climate warming.

Fact: Extremely accurate measurements of the sun's brightness from space show that the sun's average brightness has actually been *decreasing* slightly during the last several decades, just when the earth began to warm most rapidly.

Myth: It will be too costly to switch away from fossil fuels for our energy.

Fact: Many studies have shown that the cost of impacts from NOT reducing fossil fuel use far exceeds the cost of switching away from them.

Myth: Climate Science is still too uncertain to take any action at present

Fact: There is **NO** uncertainty about the basic facts described above. While there are regional uncertainties about the impacts, unless greenhouse emissions are swiftly curtailed the negative impacts will be severe. The longer we avoid action, the more severe the impacts *because the change in the composition of the atmosphere we have caused lingers of hundreds of years so warming continues.*

#10 title Climate Change Impacts

Here are just a few of the most severe impacts from a changing climate. It is important to point out that we are **already** experiencing many of these

#11 impacts

Increasing severity and frequency of heat waves. Rising sea levels. More severe droughts punctuated by heavy downpours and floods. Negative impacts on many important crops. Local food shortage and costs contribute to social instability. Increasingly severe wildfires. Spread of pests and disease-carrying insects. Heat plus warmer winters allowing pests to thrive causing forest loss. Increasing harmful ozone and other pollutants posing health hazards, especially asthma. Melting mountain glaciers and increased soil evaporation. Several possible abrupt and potentially catastrophic "tipping points" may be crossed.

I mentioned the three UU Principles that were especially relevant to today's topic. Here is the 2nd: **Justice, equity and compassion in human relations**

This is relevant because of the ironic fact that the countries most affected by many of these impacts are the poor and undeveloped nations and they have contributed virtually nothing to the cause of climate change. Prime examples are the low-lying

island nations in the Pacific and Indian oceans whose very existence is threatened by rising sea levels.

I should point out as well that this inequity is present right here in the U.S. where some of these impacts—heat waves and health impacts for example--are disproportionately borne by the lowest income segments of our population whose carbon footprint is smaller than the more affluent among us.

The third of the UU Principles I noted was the 7th:

These climate changes of course affect far more than human beings. The combination of climate change and destruction of natural habitats and other human destructive activities is causing an alarming rate of loss of species. As some of you may know, life on our planet has, over vast geologic time, undergone five major episodes of species extinction, but many ecologists are now calling the present situation the 6th major extinction.

A less commonly recognized impact of rising carbon dioxide levels in our atmosphere is the absorption of some of this carbon dioxide by the oceans, changing ocean chemistry and referred to by ocean chemists as “ocean acidification.” This, in combination with warming oceans and pollution, is impacting critical ocean food chains and causing severe damage to coral reefs, as shown by these two slides: #12, #13 healthy, dead coral. Coral reefs are important habitats for marine life and a vital food resource.

These impacts are why I noted the 7th of the UU Principles which calls us to have “Respect for the interdependent web of all existence of which we are a part.”

It is these Principles that I believe justifies referring to dealing with climate change as a moral imperative.

#14 title Communicating about climate science

Although many U.S. citizens support prompt and significant action for dealing with climate change, it still ranks low on the priority list of the majority of Americans. Hence, the political will to act on the Federal level is still lacking. Therefore, communicating the truth and urgency of the situation to citizens across the nation is important.

#15 Advice on communicating about climate science: know your audience.

As in most situations, the best strategy depends upon who you are talking to. Many people are uninformed, but interested in knowing the facts, especially as the effects of climate change are becoming more and more obvious. But for many, simply presenting facts has little effect, especially those ideologically predisposed to oppose any effort to reduce greenhouse gas emissions. And indeed, for those who are hard-core 'climate change deniers' here is my advice: **#16,17 save your breath.**

#18 skeptics, but not hard core. For those who are skeptics but not truly 'hard core', social research shows that simply stating facts is generally not effective. Finding some shared cultural values that you have that are affected by a changing climate can be helpful. Here are some examples on the approach to take:

#19 examples of approaches.

A key point is to identify things of mutual interest and value, perhaps fishing, or child health and safety.

Here are some other approaches:

The U.S. military and intelligence agencies recognize climate change as a 'threat multiplier' to national security.

Renewable energy is one of the most rapidly growing sources of jobs and there are huge opportunities for technical advances in sequestration of CO₂, renewable energy generation and especially energy storage. Newer, safer and more economical nuclear energy technologies are also being developed.

Many large corporations support switching to renewables and insurance companies recognize the reality of climate change.

The link on the bottom of this slide is to a wonderful video illustrating this concept.

#20 open-minded but uninformed

In addition, though, there is a significant portion of the population that is open-minded, but simply uninformed.

Here are some tips from social science research on speaking to such people who may have heard, and accept, some of the myths I mentioned: **#21 Inoculation against myths. #22 emphasize strong consensus.**

#23 religious objections: Finally, I have occasionally encountered resistance to dealing with climate change among some fundamentalists Christians: It goes something like this: **#24 biblical quote**.

Should you encounter folks who have this objection, you might refer them to this statement, found on the website shown: **#25 evangelical statement**.

Incidentally here is a link to similar statements from many religious groups. **#26 link to faith-based statements**

#27What Must We Do?

#28 List of actions:

On the individual and family level, I think nearly all of you know the many ways in which we can reduce our carbon footprints. This is important--not just in and of itself--but as an example to others, by showing them this can be done with very little inconvenience or net costs over the long run.

Here are just a few things, all of which reduce emissions: Weatherize your home (saving heating and cooling costs), install solar panels if possible (but orientation is important for morning fog-prone areas); invest in low- or zero-emission vehicles; take the train instead of flying; cut down or eliminate meat consumption, especially beef; install LED lighting in your house.

On the local city level, the cities of San Luis Obispo and Morro Bay are joining forces with a group in Monterey county in a program called Community Choice Aggregation. These programs give participating entities the option to generate or purchase a mix of low or zero emission electricity and each household can choose what mix of electricity generation they wish to purchase.

But we must realistically acknowledge that these actions by themselves are not sufficient. This is a GLOBAL problem and will require global leadership on the part of the United States Government, in terms of example, diplomacy, and technical innovation which is shared. While it is not forthcoming, we must look to

City, and State governments and forward-looking businesses to fill that void. The State of California is a leader in this effort.

Ultimately, however, I believe political change must occur and to bring this about requires political involvement by citizens.

Some final remarks

Humans, being responsible for creating this problem, also have the capability, unique among all life on our Earth, to solve it. I called dealing with climate change a moral imperative and cited two of the UU Principles in support of that. But there is to me an equally important consideration that I could not find explicitly stated in the UU Principles. And that is the moral obligation to preserve a livable planet for our children, grandchildren and generations to come the world over.