

## A CST Perspective on Climate Change



Catholic Social Teaching (CST) affirms that human beings are called to be stewards of creation, protecting and respecting its use and existence. The Vatican's *Compendium of the Social Doctrine of the Church*, published in late 2004, devotes an entire chapter, Chapter Ten, to "Safeguarding the Environment." The chapter begins by focusing on the book of Genesis, which proclaims that God made all of creation "good" and then entrusted it to men and women, "charging them to care for its harmony and development."

The climate, the *Compendium* says, is a universal good shared by all and it must be protected. The science, technology and the "triumphs of the human race" that allow humans to use the earth's resources for development and progress "are a sign of God's grace and the flowering of His own mysterious design." At the same time, they must be "properly applied," not used for humanity's "degradation." The human activity that is causing climate change and putting the earth's resources at risk cannot be governed by market forces or "the maximization of profits," the *Compendium* says. Rather, human technology and resource use must be "subordinated" to "moral principles and values," such as "respect for other living creatures" and "the well-being of future generations."

Global environmental policy should respect the "dignity of all living beings" and the common good of all, the *Compendium* affirms. People in the present and in the future have a "right to a safe and healthy natural environment" and we must take action now to ensure that a healthy earth exists for future generations. Human society must take action to develop renewable alternative energy sources. We should also, both individually and socially, re-evaluate our lifestyles, "break with the logic of mere consumption," and revisit the relationship between humans and the world, which "reveals the mystery of God who created and sustains it."

### This resource includes:

1. The fact sheet, "Climate Change: The Basics," which highlights the findings of the UN Intergovernmental Panel on Climate Change (IPCC) reports on climate change (p. 2).
2. A climate change flow chart demonstrating how climate change occurs, and its effects (p. 3).
3. The activity, "How Will Climate Change Impact People?" which puts a human face on the problem. In the activity, participants consider how the changes that the IPCC predicts will impact real people in different parts of the world. (p. 4-6)
4. A page of helpful links and resources (p. 7).

### EfJ Resources on Climate Change

Several other EfJ resources provide excellent background information on stewardship and Care for Creation and can supplement this resource. They include:

- The "**Care for God's Creation**" EfJ backgrounder which includes scriptural and church document references that form the basis of the CST principle of Care for God's Creation.
- The EfJ article, "**A CST Perspective on Global Warming**," which uses the CST themes and bishops' documents to assess current U.S. environmental policy and includes discussion questions and a prayer.

Links to these and other resources can be found on the last page of this resource.



## Climate Change: The Basics

### What is Climate Change?

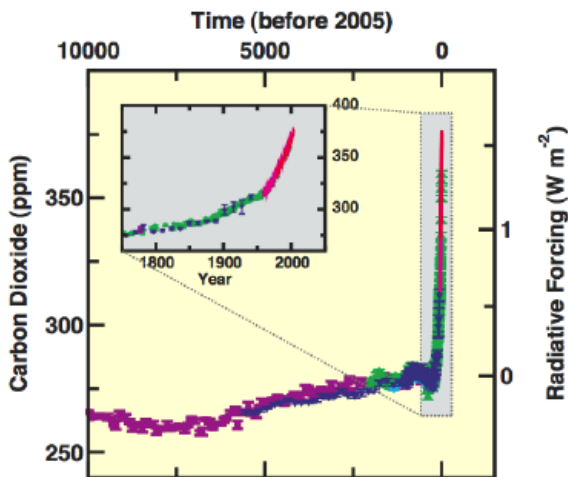
- According to the UN Intergovernmental Panel on Climate Change (IPCC), *climate change* “refers to any change in climate over time, whether due to natural variability or as a result of human activity.”

### Is Climate Change Happening?

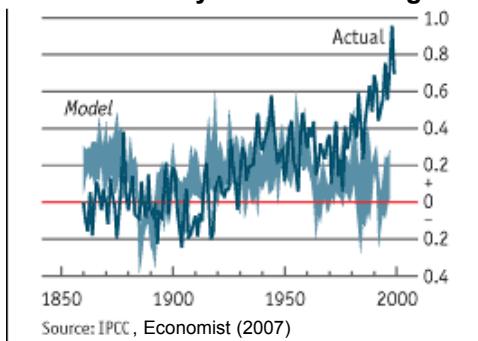
- Yes. An IPCC report in February 2007 stated: “*Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.*”

### Are Humans Responsible for Climate Change?

- Although some climate variation is natural, the IPCC report confirms that real and alarming climate change *due to human activity* has occurred since 1750.
- The graph below shows the steep incline in carbon dioxide concentration since industrialization began in 1790 due to human consumption of fossil fuels and changes in land use.
- There have also been huge increases in methane and nitrous oxide, due to human agriculture. Methane levels have increased by 148% since 1790.



### Temperature change predicted by tracing natural variations in solar and volcanic activity vs. actual changes.



Melting ice caps (BBC Science & Nature)

*“The scientific evidence for global warming and for humanity’s role in the increase of greenhouse gasses becomes ever more unimpeachable. . . and such activity has a profound relevance, not just for the environment, but in ethical, economic, social and political terms as well. The consequences of climate change . . . will impact first and foremost the poorest and weakest who, even if they are among the least responsible for global warming, are the most vulnerable because they have limited resources or live in areas at greater risk.”*

Archbishop Celestino Migliore, Vatican Representative to the United Nations, May 10, 2007


### What are the Effects of Climate Change?

Evidence of climate change is everywhere:

- Eleven of the last twelve years (1995 -2006) rank among the 12 warmest years since 1850, when temperatures began to be recorded. Warming over the last 50 years is occurring twice as fast as warming over the last 100 years. (See chart on bottom left.)
- Rising temperatures are changing the temperature of the global ocean as it absorbs more than 80% of heat added to the climate system. Warmer oceans and temperatures have contributed to the melting of the ice sheets of Greenland and Antarctica, as well as the glaciers and ice caps, thus contributing to sea level rise.
- Other changes observed by the IPCC due to climate change include widespread changes in: precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones. (See the flow chart on page 3.)



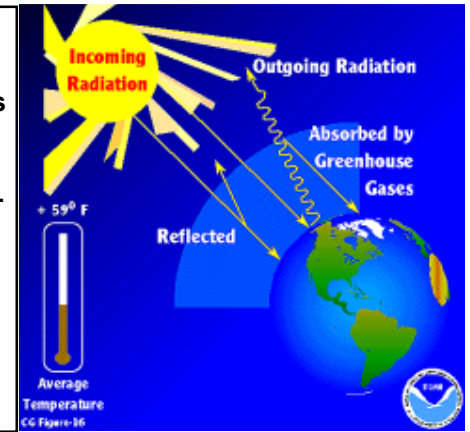

# How Does Climate Change Work?



Human activities (such as burning fossil fuels, changes in land-use, and agriculture) add greenhouse gases (carbon dioxide, methane, nitrous oxide) to the air.



After sunlight (shortwave radiation) passes through the earth's atmosphere, longwave radiation is given off to go back into the atmosphere. Some outgoing radiation is absorbed by naturally-occurring greenhouse gases in order to warm the earth. However, human pollutants have greatly increased greenhouse gases in the atmosphere, trapping high levels of outgoing radiation.

The higher levels of outgoing radiation trapped in the earth's atmosphere means changes in the earth's temperature (a.k.a. "global warming").




One result will be changes in weather, patterns.

Some species may become extinct.



Higher temperatures will lead to the melting of ice sheets, glaciers and ice caps, which in turn will lead to a rise in the sea levels.



Higher sea levels will lead to the flooding of many cities worldwide.



Source: New Orleans, LA (<http://www.wvltv.com>)

Reduced rainfall will lead to drought in many countries, which will impact food production.



Changed weather patterns will also mean an increase in the number and intensity of storms and natural disasters.



Other species will flourish, with new disease vectors expected to develop.



## How Will Climate Change Impact People?

The IPCC report predicted many changes because of human-induced climate change. Some of these changes include:

1) By 2099, temperatures are expected to increase by 3.2-7.2 degrees Fahrenheit (1.8-2.4 degrees Celsius).

2) Sea levels are predicted to rise by 11-17 inches (28-43 cm).

3) The intensity and frequency of tropical storms and heatwaves will increase.

4) Rainfall will increase by up to 20% at high latitudes and diminish in the tropics. However, even in the tropics, rainfall may increase in intensity.

**Activity:** Catholic Social Teaching urges us to take a person-centered approach to social problems, considering how real persons are impacted by faulty systems and structures. As the international community and countries like the U.S. continue to debate how climate change can best be dealt with, families will continue to feel the impacts of human-induced climate change. Consider the information provided in the boxes on this page and the next. Then use the discussion questions that follow to consider how climate change will affect the families highlighted



The family in the photo to the left is from the coastal region of Kenya. Many families in the coastal regions were displaced after severe weather and flash floods in May 2007.

### Kenya: Country Information

**Location--** Eastern Africa, bordering the Indian Ocean.

**Climate--** Tropical along the coast; arid in the interior.

**Geography--** Areas along Indian coast are 0 miles above sea level; the highest point is Mt. Kenya, at 5,199 miles above sea level, which features glaciers. Most agricultural activity occurs in the Kenyan Highlands.

**Weather patterns--** Affected by reoccurring drought; flooding during rainy season.

(Photo source: <http://www.cp-pc.ca/english/kenya/family.html>;  
Country profile source: [www.cia.gov](http://www.cia.gov))

As people of religious faith, we bishops believe that the atmosphere that supports life on earth is a God-given gift, one we must respect and protect. It unites us as one human family. If we harm the atmosphere, we dishonor our Creator and the gift of creation. The values of our faith call us to humility, sacrifice, and a respect for life and the natural gifts God has provided.

- US Catholic Bishops, "Global Climate Change: A Plea for Dialogue, Prudence, and the Common Good," 2001





(Aizar Raldes / AFP-Getty Images)

Javier, Goya, and Aide are farmers in the mountains of Bolivia. Many families in this mountainous, land-locked country make their living harvesting soybeans, coffee, coca, cotton, corn, sugarcane, rice, and potatoes.

## Bolivia: Country Profile

**Location--** Central South America.

**Climate--** Cold and semiarid in highlands; humid and tropical in low areas.

**Geography--** Andes mountains reach over 20,000 feet, while the lowlands of Amazon Basin are only 300 feet above sea level.

**Weather patterns--** Flooding is a problem during the wettest months of the year.

(Source: CIA Fact Book, 2007.)



The Onotoa Family is from Kirbati, a small group of Oceanic islands. Many families here have had to reinforce their sea-side homes with sandbags as the coast erodes due to climate change.

## Kirbati, Oceania: Country Information

**Location--** The Republic of Kirbati is a small group of islands in Oceania, in the Pacific Ocean.

**Climate--** Tropical, hot and humid.

**Geography--** The islands are made of low-lying coral and include interior lagoons. The islands are surrounded by extensive reefs.

**Weather patterns--** Typhoons can occur at any time, and tornadoes occur occasionally.

(Photo source: PBS; facts from [www.cia.gov](http://www.cia.gov))

## Discussion Questions:

1. Pick one of the families in the case studies above and consider how climate change will impact:

- a. The family's livelihood/occupation
- b. The family's access to food/ability to produce food
- c. The health of family and community members
- d. The land the family lives on/their home
- e. The community or village the family lives in
- f. Future plans that the family might have
- g. Family structure (e.g. How might the above changes affect the family's ability to remain together and/or change family member roles?)

*(When you are finished, see p. 6 for some actual ways the IPCC predicts that climate change will impact people in these geographical areas.)*

2. How could climate change potentially impact a country's economy? How might this, in turn, impact the families above?
3. How is the global village affected when stress is put on one part (the local village)?
4. How do the CST principles of global solidarity, stewardship, the common good, and others fit into this discussion?
5. How might the futures of these families be different if governments and aid organizations provided assistance to deal with the effects of global warming?
6. Whose responsibility is it to change global energy use patterns and slow the effects of climate change? What should be done?

We must . . . encourage and support the "ecological conversion" which in recent decades has made humanity more sensitive to the catastrophe to which it has been heading. Man is no longer the Creator's "steward" but an autonomous despot, who is finally beginning to understand that he must stop at the edge of the abyss.

- Pope John Paul II, speech on Jan. 17, 2001

## 1. Impacts of Climate Change on Northern Africa<sup>1</sup>

- **Sea Level** - The IPCC report predicts that sea level rise on the East African Coast will increase flooding; response to such disasters will cost countries up to 10% of national GDP. As sea level rises, coastal crops will be affected. In Kenya, a one-meter (3.28 feet) rise in sea-level will cause \$500 million losses in mango, cashew nut and coconut income.
- **Rainfall/Water Access** - The IPCC report predicts that climate change will put 1.8 billion more people in Africa at risk of water stress by 2080. Due to decreased rainfall and water in some areas, desertification is likely to occur: arid and semi-arid lands are likely to increase by up to eight percent. Other areas will experience increased rainfall of seven percent, which could lead to flooding.
- **Weather Patterns** - By the end of the century more frequent and intense tropical storms in the Indian Ocean are predicted to occur, especially the southern part, with an up to 20 percent increase in cyclone activity because of the rise in sea temperatures.
- **Climate/Temperature** - Changes in climate and temperature will mean that parts of East African countries such as Kenya, Ethiopia, Rwanda, and Burundi that are not currently at high risk of malaria will become “highly suitable” for malaria mosquitos by the 2080s. According to the report, net crop revenues across Africa could fall by as much as 90 percent by 2100, with small-scale farms suffering the most.



## 2. Impacts of Climate Change in Latin America<sup>2</sup>

- **Rainfall/Weather Patterns** - The IPCC report predicts that in some parts of Latin America, including parts of Bolivia, climate change will cause increased rainfall, increasing flood frequency and intensity, crop yields, and land erosion for mountain farmers. In other parts of Latin America, rainfall may decrease, leading to desertification.
- **Temperature** - Increases in global temperatures are already causing the melting of glaciers in Bolivia, Peru, Colombia, Chile, and Argentina. In the next 15 years inter-tropical glaciers will disappear, limiting water availability and hydropower potential. Higher temperatures will bring about new species of crop pests and human diseases.
- **Biodiversity** - In the Amazon’s tropical forests, plant and animal species diversity will decrease as the climate changes. Ecosystem composition and biome distribution will also be impacted.
- **Note: Coastal Regions** - The IPCC report also focused on the coastal regions of Latin America and the Carribean, noting that these areas will be the most vulnerable to weather changes, such as rain and windstorms and hurricanes, and to the rise in sea level.



## 3. Impacts of Climate Change on Asian-Pacific Islands<sup>3</sup>

The IPCC report describes islands worldwide as being in the front line of climate change.

- **Sea Level** - The IPCC reports that by the end of the century, global sea levels are expected to rise drastically and this will particularly affect islands like Kirbati, which will experience flooding and erosion. This may greatly impact island infrastructure such as buildings and airports, which are often close to the shore. Reduction in island size because of sea level rise will be a key challenge for islands, which will reduce the thickness or depth of freshwater pools on the islands. Rising sea levels may also raise water tables (underground pools of water) higher than the surface, increasing the evaporation of available drinking water.
- **Rainfall** - By 2050, the average rainfall on Kirbati is expected to be reduced by 10 percent. This will reduce the freshwater store on the island by a fifth. It will also impact the islands’ abilities to produce agricultural crops.
- **Weather Patterns** - More typhoons and intense weather may impact islands like Kirbati. Although cyclones will not necessarily increase in number, wind speeds are expected to increase by 10 percent and the rainfall from the sea that is poured on the islands during these storms by up to 25 percent. Such storm surges are expected to lead to salt contamination of freshwaters.
- **Climate/Temperature** - Temperatures in the Northern Pacific are expected to rise between 1-4 degrees Celsius by 2100. Many islands have unique biodiversity and by 2050, diseases that affect coral reefs and sea life could increase as result of rising surface sea temperatures. The Pacific islands will also be more vulnerable to invasive plant species, such as sim weed.

<sup>1</sup> Science Daily and UNEP, 2007, <http://www.sciencedaily.com/releases/2007/04/070410141336.htm>

<sup>2</sup> Science Daily and UNEP, 2007, <http://www.sciencedaily.com/releases/2007/04/070410135944.htm>

<sup>3</sup> Science Daily and UNEP, 2007, <http://www.sciencedaily.com/releases/2007/04/070410135159.htm>

# Links to Learn More about Climate Change

## Informational and Interactive Websites

- **National Geographic** has an interactive climate change map that shows how different parts of the world will be affected by climate change. See: <http://green.nationalgeographic.com/environment/global-warming/gw-impacts-interactive.html?fs=plasma.nationalgeographic.com>
- **The BBC website** has an interactive temperature map which allows visitors to move a slider to show how temperatures are expected to warm in different parts of the planet through 2099. See: [http://news.bbc.co.uk/2/shared/spl/hi/sci\\_nat/04/climate\\_change/html/climate.stm](http://news.bbc.co.uk/2/shared/spl/hi/sci_nat/04/climate_change/html/climate.stm)
- An interactive feature on **the BBC website** shows how the greenhouse effect works with moving arrows: [http://news.bbc.co.uk/2/shared/spl/hi/sci\\_nat/04/climate\\_change/html/greenhouse.stm](http://news.bbc.co.uk/2/shared/spl/hi/sci_nat/04/climate_change/html/greenhouse.stm)
- **Time magazine** has an interactive chart that shows the impact of climate change on different parts of the world: [http://www.time.com/time/2007/climate\\_change/](http://www.time.com/time/2007/climate_change/)
- **The Intergovernmental Panel on Climate Change's** groundbreaking report was released in three parts in 2007. All three parts are available on the IPCC website at: <http://www.ipcc.ch>.
- **Google Earth** uses satellite imagery that allows users to "zoom in" on geographical locations across the world. At <http://earth.google.com/scholastic/index.html> a climate change lesson is available, which allows users to visit various sites in the U.S. being affected by climate change. Google Earth also has a feature to view geographical locations over time--illustrating the impact of climate change. To download Google Earth, go to: <http://earth.google.com/download-earth.html>.
- **UNEP and Greenpeace** have partnered to create a powerful online film detailing the changes caused by climate change. See: [http://www.green.tv/pole\\_to\\_pole/](http://www.green.tv/pole_to_pole/).



## Catholic and Ecumenical Resources on Climate Change

- **The EfJ backgrounder on "Care for God's Creation,"** including scriptural and church document references that form the basis of the CST principle of Care for God's Creation, is available for download at: <http://www.educationforjustice.org/bin/view.fpl/1200/article/1757.html>.
- **The EfJ article, "A CST Perspective on Global Warming,"** uses the CST themes and bishops' documents to assess current U.S. environmental policy at: <http://www.educationforjustice.org/bin/view.fpl/1200/article/3830.html>.
- **The U.S. Conference of Catholic Bishops'** official statements on the environment, from 1991 and 2001, are both available at: <http://www.usccb.org/sdwp/ejp/bpstatements.html>.
- Pope John Paul II's 1990 message for the World Day of Peace, entitled "**Peace with God the Creator, Peace with all of Creation,**" is available at: <http://conservation.catholic.org/ecologicalcrisis.htm>.
- The most recent **address on climate change by the Vatican's Permanent Observer to the United Nations,** Archbishop Celestino Migliore, is available at: <http://www.zenit.org/english/visualizza.phtml?sid=107495>.
- Learn about ecumenical initiatives to promote stewardship by visiting the **National Council of Churches Eco-Justice Program** website at: <http://www.ncccojustice.org/>.
- **The EfJ resource, "Christians, Muslims and Jews: Working Together to Heal the Environment"** highlights the common foundations for stewardship of the three monotheistic world religions: <http://www.educationforjustice.org/bin/view.fpl/1200/article/3768.html>.

