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Global Warming

FOR

DUMMIES®

Learn to:

- Understand the science behind climate change
- Recognize the causes of global warming
- Consider the consequences for the planet — both immediate and long-term
- Reduce your carbon footprint

Elizabeth May
Zoë Caron



***Global
Warming***
FOR
DUMMIES®

Global Warming FOR DUMMIES®

**by Elizabeth May
Zoë Caron**



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About the Authors

Elizabeth E. May has been recognized by the United Nations for her work in the environmental movement, both in June 1990 with the Global 500 Role of Honor for Environmental Achievement and on International Women's Day, March 8, 2006 by the United Nations Environment Program as one of the leading women in environment globally. Since 1997, she has served as a Commissioner in the Earth Charter Commission, co-chaired by Mikhail Gorbachev and Maurice Strong. Dr. May assisted in organizing the first international, comprehensive scientific conference into the climate change threat, in June 1988, hosted by Canada. She was engaged in the negotiation of the Montreal Protocol as Senior Policy Advisor to Canada's Minister of the Environment. She was a member of the International Policy Advisory Committee, World Women's Congress for a Healthy Planet, Miami, November 1991, served as an advisor in many capacities in the preparation for the United Nations Conference on Environment and Development (the Earth Summit), and was a board member for nine years for the International Institute for Sustainable Development.

Dr. May was Executive Director of Sierra Club of Canada for seventeen years, before leaving that position in 2006 to enter politics. She is currently the Leader of the Green Party of Canada. Dr. May is a lawyer, an author of six published books on Canadian environmental issues, and, most importantly, a mother and grandmother. Among many prestigious Canadian awards and honors, Dr. May has received the highest citizen honor in Canada, the Order of Canada, at the Officer level.

Zoë Caron has worked on initiatives to green university campuses through the Sierra Youth Coalition's Sustainable Campuses and the Energy Action Coalition's Campus Climate Challenge. Zoë is a founding member of the Canadian Youth Climate Coalition and past youth delegate to United Nations Climate Change Conferences in Canada and Kenya.

Identified as an emerging leader on climate change, she was profiled among colleagues as "The Next Generation" in Vanity Fair's 2007 Green Issue. She works with Students on Ice Expeditions, bringing students from around the world to the Arctic and Antarctic to learn about the importance of these regions to the rest of the planet. She currently writes for the Green Content Creation Group and serves on the Board of Directors of the Sierra Club of Canada.

Dedication

Elizabeth dedicates this book to her children and grandchildren, in hopes that by the time the youngest of you is old enough to read this book, the prognosis will be very different and far more hopeful.

Zoë dedicates this book to every individual who has dedicated her or himself to advocate climate change issues since the 1980s to bring the global community to the level of awareness we are at today.

And it goes without saying that they both dedicate this book to you, the reader, for making the choice to read about climate change.

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Introduction

On Monday, the newspapers tell you the ice caps are melting, and people everywhere are about to be swept off in a giant flood. On Tuesday, you hear a radio interview with a scientist who says global warming is all a hoax. Wednesday finds you standing in the grocery line, listening to people muttering about how strangely warm the weather has been outside recently. By Thursday, you just don't know what to think anymore.

Think of today as Friday — the day all these stray pieces come together right here in your hands, thanks to *Global Warming For Dummies*.

Global warming is already changing the environment, the economy, and people's ways of living. The changes aren't over, either, and the more that changes around the world, the more you have to understand what global warming is. But you know what? It's really quite exciting. Although global warming is connected to scary scenarios featuring soaring temperatures and worsening hurricanes and monsoons, it's also a link to a better future. Global warming is opening doors for the development of new types of fuels, leading the shift to reliable energy sources, and creating a vision of a greener tomorrow. And the best part? You're right in the middle of it all, helping to make those changes.

About This Book

Global Warming For Dummies is your guide to climate change. We use *climate change* and *global warming* interchangeably in this book, though they are slightly different things, as we discuss in Chapter 1. This book gives you the basics so that you can understand the problem, relate it to your daily life, and be inspired to start working on solutions to this complex and important issue.

In this book, we explain the concepts behind global warming clearly and simply by using the latest, most credible science, mainly from the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). The IPCC is a team of more than 2,000 scientists who assess peer-reviewed climate change science and compile the assessments into a number of reports. These reports are mainly to inform the politicians and bureaucrats at the United Nations' decision-making table, but anyone looking for detailed scientific information on climate change can read them. The IPCC is the most credible source of climate change information in the world today. (We discuss the IPCC in greater detail in Chapter 11.)

Although this book covers what global warming is and its impact on the world, *Global Warming For Dummies* isn't just about the science. The book also looks at a wide range of solutions to tackle climate change. We explore everything from the big-picture solutions that governments can implement to a slew of practical, can-do-it-today solutions for you at work, at home, and on the road.

Foolish Assumptions

We wrote this book assuming that you know zero, nil, zilch about global warming. You don't have to look up the definitions of big, ridiculous words or drag out your high school science textbook to read this book.

We also assume, however, that you know global warming exists, that you recognize humans contribute to this problem, and that you want to understand why global warming is happening.

How This Book Is Organized

This book is divided into six parts, covering everything you need to know about the causes and effects of global warming — and the solutions.

Part I: Understanding Global Warming

This part sorts out what global warming actually is. If you want to understand the science behind why the world's climate is changing, check out these chapters. We take a look at the infamous greenhouse gases and explore how they're changing the way the climate works. We also consider some of the other factors that are shaping the planet's climate and explain why scientists are almost entirely certain that humanity's production of greenhouse gases is heating up the atmosphere.

Part II: Tracking Down the Causes

Part II explains where all the greenhouse gases we talk about in Part I are coming from. Two major offenders exist: fossil fuels (¾ of the problem) and deforestation (¼ of the problem). In this part, we investigate where fossil fuels come from and why they have such a huge influence on the atmosphere. We also look at where and why deforestation is happening, and why it's a major cause of climate change. Finally, we investigate how businesses

and individuals have unwittingly set climate change into motion through emitting greenhouse gases.

Part III: Examining the Effects of Global Warming

In this part, we look at how global warming is creating changes around the world. We review what has already happened because of climate change and consider what the future might hold. From natural disasters such as floods and storms, to mass extinctions in the animal world, to the heavy toll global warming could take on humanity, the picture's pretty grim if civilization keeps doing what it's doing. Fortunately, people can change direction — so keep reading!

Part IV: Political Progress: Fighting Global Warming Nationally and Internationally

Not everyone loves politicians, but in this part, we look at how their work can go a long way to help fight global warming. First of all, we consider how governments at every level — from presidents to mayors — can help cut back on greenhouse gas emissions. Then, we look at how countries can work together to tackle this truly global challenge. The economic challenge of global warming is particularly daunting for developing nations. In the last chapter of this part, we investigate developing nations' situations and see what steps they're taking to be part of the solution to global warming.

Part V: Solving the Problem

Solving global warming is requiring a lot of changes on a lot of different fronts, which is why this part is the longest in the book. Some of these changes are quite modest; most are quite major. First, civilization needs to shake its addiction to fossil fuels and find new, cleaner renewable energy sources. Happily, those energy sources are out there (and in this part).

Businesses and industries play a major role, too; we look at how they can cut back on their greenhouse gas emissions and make money, to boot. Another part of solving the problem is raising awareness. Non-government organizations have a big role to play in getting people's attention. So, too, does the media. Some of Hollywood's biggest stars are getting involved, as well, lending their stellar wattage to the cause and adapting conscientiously eco-green lifestyles. And most importantly, it's down to you, the reader, and the countless ways that you can contribute to the fight against global warming.

Part VI: The Part of Tens

No *For Dummies* book is complete without the Part of Tens. Think of these lists as quick little hits of global warming wisdom. We cover ten things you can do right now to fight global warming, profile ten inspiring people who are leading the charge against climate change, debunk ten myths about global warming, and offer ten great online resources. Flip to these chapters whenever you need a fast bit of information or a quick jolt of inspiration.

Icons Used in This Book

Throughout this book, you see little icons sprinkled in the left margin. These handy symbols flag content that's of particular interest.



When you see this icon, it means disagreement exists over the topic being discussed.



This icon marks feel-good stories and major advances in the fight against climate change.



This icon marks a piece of information that's important to know in order to understand global warming and the issues that surround it.



This icon marks paragraphs in which we talk about serious issues that humanity needs to deal with as soon as possible.



Don't worry about reading paragraphs with this icon. This icon flags material that we think is interesting, but might be a little too detailed for your tastes.



Ready to make a difference? This icon points you to simple solutions that can help you reduce your greenhouse gas emissions or become a part of a bigger solution.

Where to Go from Here

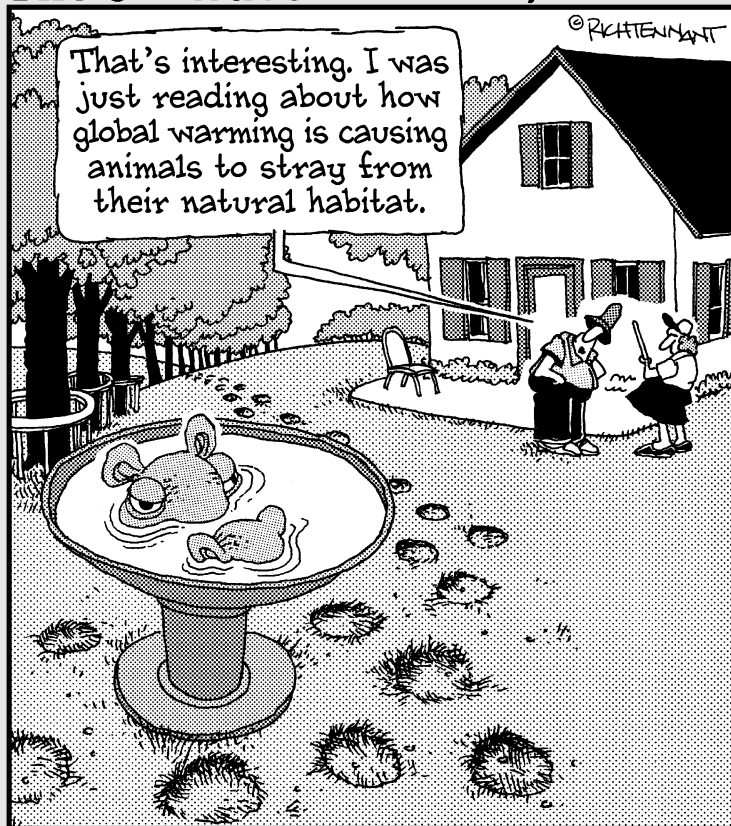
If you're entirely new to the subject of global warming, you likely want to read this book the old-fashioned way, starting at the beginning and working through to the end. If you already know something about the subject or want to find out more about a specific topic, you can just open this book up at any chapter and start reading.

Part I

Understanding Global Warming

The 5th Wave

By Rich Tennant



In This Part . . .

If you have questions about the science behind global warming, this part is the place to start. We introduce you to greenhouse gases, explain why they're vital for life on Earth, and provide you with a blueprint that explains just how they're heating up the atmosphere. We also investigate why scientists are certain that greenhouse gases are the cause of the global warming that we're experiencing today, and we consider some of the other factors that could be contributing to climate change.

Chapter 1

Global Warming Basics

In This Chapter

- ▶ Getting to know what global warming is all about
 - ▶ Figuring out what started climate change in the first place
 - ▶ Investigating the changes global warming might bring
 - ▶ Examining the role governments can play in fighting global warming
 - ▶ Finding solutions to the problem
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The phrase “global warming” hasn’t been around long, but climate change, as it’s also known, is nothing new. In fact, it has been a constant throughout history. Earth’s climate today is very different from what it was 2 million years ago, let alone 10,000 years ago. Since the beginnings of the most primitive life forms, this planet has seen many different climates, from the hot, dry Jurassic period of the dinosaurs to the bleak, frozen landscapes of the ice ages.

Today, however, the planet’s experiencing something new: Its climate is warming up very quickly. Scientists are certain that this change has been caused by emissions produced by human activities. By examining previous changes in the Earth’s climate, using computer models, and measuring current changes in atmospheric chemistry, they can estimate what global warming might mean for the planet, and their projections are scary.

Fortunately, Earth isn’t locked into the worst-case-scenario fate yet. By banding together, people can put the brakes on global warming. This chapter explains the essentials of global warming and what everyone can do to achieve a greener future.

Global Warming 101

When “global warming” became a household phrase, *greenhouse gases*, which trap heat in the Earth’s atmosphere, got a bad reputation. After all, those gases are to blame for heating up the planet. But, as we discuss in Chapter 2, greenhouse gases in reasonable quantities aren’t villains, they’re heroes. They capture the sun’s warmth and keep it around so that life is possible on Earth. The

problem starts when the atmosphere contains too great an amount of greenhouse gases. (In Chapter 3, we look at how scientists have determined the correlation between carbon dioxide in the atmosphere and temperature.)

Heating things up with greenhouse gases

Human activities — primarily, the burning of fossil fuels (which we look at in the section “The Roots of Global Warming,” later in this chapter) — have resulted in growing concentrations of carbon dioxide and other greenhouse gases in the atmosphere. As we explain in Chapter 2, these increasing quantities of greenhouse gases are retaining more and more of the sun’s heat. The heat trapped by the carbon dioxide blanket is raising temperatures all over the world — hence, *global warming*.

So far, Earth has seen a 1.4-degree Fahrenheit (0.8-degree Celsius) increase in global average temperature because of increased greenhouse gases in the atmosphere. Unfortunately, the amount of greenhouse gases that human activities produce grows daily. So, humanity’s current behavior is driving temperatures up at an alarming rate. Temperatures in polar regions, such as the Arctic, are experiencing temperature rises that are twice the global average.

Investigating other causes of global warming

Global warming is a very complex issue that you can’t totally understand without looking at the ifs, ands, or buts. Scientists are certain that the rapid changes to climate systems are due to the build-up of greenhouse gases, and they can’t explain the current rates of global warming without factoring in the impact of human greenhouse gas emissions. Other elements play a role in shaping the planet’s climate, however, including the following:

- ✓ **Cloud cover:** Clouds are connected to humidity, temperature, and rainfall. When temperatures change, so can a climate’s clouds — and vice versa.
- ✓ **Long-term climate trends:** The Earth has a history of going in and out of ice ages and warm periods. Scientific records of carbon dioxide levels in the atmosphere go back 800,000 years, but people can only give educated guesses about the climate earlier than that.
- ✓ **Solar cycles:** The sun goes through a cycle that brings it closer to or farther away from the Earth. This cycle ultimately affects the temperature of this planet, and thus the climate.

We go over these other issues in greater detail in Chapter 3.