



HEADLINES

ARCHIVE

► ENVIRONMENT REAL X-FILES SCIENCE

ABOUT US CONTACT US CONTRIBUTORS EARTHFILES SHOP SEARCH IN DEPTH SUBSCRIPTION

LOGIN LOGOUT

HELP

Printer Friendly
Page

Earth Headed for Warmest Period in 55 Million Years?

© 2006 by Linda Moulton Howe

Our carbon dioxide emissions are risking biological, chemical and climate changes of a magnitude that has not been seen for more than 50 million years. There was ecological devastation, but new species rose from the ashes. Luckily for us, our ancient primate ancestors were winners. Who knows who the winners and losers will be in the next go round?" - Ken Caldeira, Ph.D., Carnegie Institution



Earth photograph by NASA.

Earthfiles, news category.

December 7, 2006 Stanford, California - An extraordinary burst of global warming that occurred around 55 million years ago dramatically reversed Earth's pattern of ocean currents. That global warming event is called the "Paleocene/Eocene Thermal Maximum," or PETM." Back then, Earth's average surface global temperature rose rapidly by about 9 degrees Fahrenheit (5 degrees Celsius) in less than ten thousand years.

In a new December 8, 2006, *Science* journal report, scientists Ken Caldeira, Ph.D., of the Carnegie Institution's Department of Global Ecology at Stanford University, and Mark Pagani, Ph.D., research team leader at Yale University, report they have found that the Earth's global warming 55 million years ago might have resulted from the Earth climate's "high sensitivity to a long-term release of carbon." This finding contradicts the position held by many climate-change skeptics that the Earth system is resilient to carbon dioxide and methane emissions.

For some years, scientists have known that the ancient global warming event, the Paleocene-Eocene Thermal Maximum, caused a massive release of carbon. The temperature rise on Earth lasted for 170,000 years and caused profound changes to the world's rainfall patterns, made the oceans acidic, and affected oceanic and terrestrial plant and animal life, including spawning the rise of our modern primate ancestors.

"But understanding just how much carbon was responsible for the temperature increase and where it came from remained elusive," reports Carnegie Institution. "Now the new calculations used data from carbon found in fossils of ancient land plants and tiny marine organisms known as plankton. 'We can tell that the amount of carbon released to the atmosphere and ocean was more or less the same as what is available today as coal, oil and gas,' Caldeira explains. 'The carbon heated up the Earth for over 100,000 years. If the climate was as insensitive to CO₂ as the climate skeptics claim, there would be no way to make the Earth so warm for so long.'"

The source of the ancient carbon spike is still a mystery. It might have come from massive fires burning coal and other ancient plant material, or it could have come from "burps" of methane from the continental shelves.

Caldeira: "By examining fossils and ancient sediments on the sea floor, we can see that something very unusual happened to Earth's carbon cycle. At the same time, the climate near the North Pole became like Miami, Florida. We can tell it did not take all that much carbon to make this change in climate. If ancient methane 'burps' really occurred, as many believe, a doubling of atmospheric CO₂ concentration would warm the Earth by over 10

degrees Fahrenheit (5.6 degrees Celsius). If that's what happened, we could now be in for a mighty toasty future."

If the source of the carbon release was ancient plant material, calculations indicate that for each doubling of atmospheric CO₂ concentration, the Earth would warm at least 4 degrees Fahrenheit (2.2 degrees Celsius), and possibly twice this much. If ancient methane was the cause, as many believe, our current situation is even more dire. The methane would have become carbon dioxide in the atmosphere within decades. The current research indicates that much less methane would have been available to cause climate change 55 million years ago, which means that the climate of the Earth is even *more sensitive* to added CO₂ than originally thought.

With a continuation of current trends in the use of coal, oil and gas, natural background atmospheric CO₂ concentrations are expected to double around the middle of this 21st Century. The ancient emissions 55 million years ago are comparable to the CO₂ that is expected to be emitted from human activities over this and coming centuries. So, if human-produced carbon emissions continue as they are, there could be a very serious impact on Earth's surface life and species evolution.

Caldeira: "The last time carbon was emitted to the atmosphere on the scale of what we are doing today, there were winners and losers. There was ecological devastation, but new species rose from the ashes. Luckily for us, our ancient primate ancestors were winners. Who knows who the winners and losers will be in the next go round?"

"Our carbon dioxide emissions are risking biological, chemical and climate changes of a magnitude that has not been seen for more than 50 million years. Our work provides even more incentive to develop the clean energy sources that can provide for economic growth and development without risking the natural world that is our endowment."

More Information:

For further information about global warming, please see the **Earthfiles Archives:**

- 11/09/2006 -- Outer Space Sunshade to Cool Earth in Global Warming?
- 09/09/2006 -- Methane - Another Threat in Global Warming
- 08/23/2006 -- Solar Cycle 24 - Headed for Intense X Flares by 2010-2012?
- 08/19/2006 -- Repair of Earth's Ozone Layer Has Slowed
- 07/18/2006 -- 2006 - Hottest Year So Far in U. S. History
- 06/28/2006 -- Half Cats in Destin, Florida, and Beheaded Animals in Rochester, N. Y.
- 06/24/2006 -- "High Confidence" Earth Is Warmest in 400 Years - Maybe Even 2,000 Years or More
- 04/08/2006 -- Recent Caribbean Coral Reef Die-Off Biggest Ever Seen
- 03/17/2006 -- Planet Earth's Ice Melt
- 02/20/2006 -- Mysterious Deaths of Whales in Mexico
- 11/18/2005 -- Is the Sun Heating Up?
- 10/07/2005 -- Warmer Sea Surfaces and Increased Wind Power Are Making Hurricanes Stronger
- 09/29/2005 -- 2005 Arctic Summer Ice Melt - Largest On Record
- 09/23/2005 -- 9 X-Class Solar Flares Between September 7 - 19, 2005.
- 09/23/2005 -- Phenomenon of "Instant" Hurricanes in 2005
- 08/26/2005 -- What Is Killing Amphibians Around the World?
- 08/26/2005 -- Another Cattle Mutilation in Canada
- 08/18/2005 -- Unusual Summer Swarm of Arkansas Copperheads
- 08/05/2005 -- Scientists Puzzled by "Bizarre" Pacific Coast Die-offs in 2005
- 05/11/2005 -- Greenland Sea Cold Water Re-Cycling Has Nearly Stopped. Britain Expected to Become Cooler.
- 05/07/2005 -- Did Milky Way Gas and Dust Turn Earth Into Icy Snowball Four Times?
- 03/25/2005 -- Glow of Distant Worlds Seen For First Time
- 02/26/2005 -- Collapse of Societies: From Easter Island to Iraq - to Western World?
- 02/03/2005 -- Kyoto Protocol Goes Into Effect February 16, 2005. British Scientists Warn Global Temperatures Could Climb Higher Than Earlier Estimates.
- 01/22/2005 -- From U. S. to Arctic - A Sea Change in the Weather
- 01/15/2005 -- Bull and Cow Mutilations Northwest of Corpus Christi, Texas
- 12/31/2004 -- Abrupt Climate Change Occurred Worldwide 5,200 Years Ago
- 11/02/2004 -- North Pole Summers Without Ice?
- 10/15/2004 -- Ever-Increasing Carbon Dioxide Build-Up in Atmosphere Since 1958
- 10/06/2004 -- Is NRC Making Terrorist Work Easier? Radioactive Material Sites On U. S. Government Website
- 09/17/2004 -- Cat 4 and 5 Hurricanes Charley, Frances and Ivan in Four Weeks - Unprecedented in American Recorded Weather History
- 08/27/2004 -- Global Warming Impact On Birds - More Extinctions Expected
- 08/14/2004 -- Oceans Are Absorbing A Lot of Greenhouse CO₂. As Chemistry Changes,

What Happens to Sea Life?

- 08/01/2004 -- Sixth Straight Year Hundreds of Birds Die at Roestler Lake, North Dakota.
- 02/27/2004 -- Abrupt Climate Change: Scenario from A Pentagon-Commissioned Report
- 02/23/2004 -- Is There Liquid Water on Martian Surface?
- 01/02/2004 -- Earth's Speeded Rotation Puzzles Scientists
- 11/29/2003 -- Glaciers Are Melting Around the World So Fast That Water Supplies Could Be Threatened
- 10/29/2003 -- Fifth Intense Solar X-Flare - What's Happening On the Sun?
- 05/30/2003 -- Scientists Surprised by Common House Fly Fossils in Antarctica
- 01/05/2003 -- What Are the Grooves in the Martian South Pole?
- 12/14/2002 -- Arctic Rivers' Fresh Water Flows Could Change Atlantic Ocean Current
- 11/14/2002 -- What Happened 12,000 Years Ago That Killed So Many Animals?
- 10/21/2002 -- Mt. Kilimanjaro's Ice Cap Is Melting Fast
- 08/27/2002 -- August 2002: Severe to Moderate Drought in 37 States
- 07/20/2002 -- Extinctions of Earth Life Are Accelerating Rapidly
- 06/04/2002 -- EPA Admits Humans Burning Fossil Fuels A Big Factor in Global Warming
- 03/30/2002 -- Drought Worsens in United States
- 03/21/2002 -- Antarctic Peninsula Is Melting - And So Is Arctic Ice
- 02/13/2002 -- January 2002 Warmest On Record For Whole World
- 01/30/2002 -- Latest Satellite Data Shows Surprisingly Thicker Ross Ice Shelf in Antarctica
- 01/05/2002 -- Global Warming Update - Could Increasing Carbon Dioxide Gas Be Transformed Into Limestone?
- 12/22/2001 -- Scientists Warn That Climate and Earth Life Can Change Rapidly
- 06/09/2001 -- Environmental Updates and Colt Mutilated in Leitchfield, Kentucky
- 05/25/2001 -- Federal GAO Report Does Not Rule Out Cell Phone Dangers
- 04/18/2001 -- April Environmental Updates
- 03/24/2001 -- Alps Permafrost Melting
- 03/21/2001 -- Earth Hasn't Been This Warm Since the Pliocene 3 Million Years Ago
- 03/04/2001 -- Disappearing Glaciers - Evidence of A Rapidly Warming Earth
- 02/25/2001 -- Environmental Updates
- 02/18/2001 -- Environmental Updates and Mysterious Deaths of 2000 Atlantic Brant Geese
- 02/07/2001 -- 94% Decline In Aleutian Islands Sea Otter Population
- 01/28/2001 -- U. N. Global Warming Forecast: Up to 10.5 Degrees F. Hotter At End of 21st Century
- 01/07/2001 -- Dinosaur-Killing Asteroid Punched 22 Miles Through Earth's Entire Crust
- 11/26/2000 -- Environmental Updates
- 10/30/2000 -- Science, Environment and Medical Updates
- 09/10/2000 -- Arctic Ice Melt Threatens Polar Bears
- 09/10/2000 -- Largest-Ever Antarctic Ozone Hole
- 07/09/2000 -- The "Cell from Hell" Is Back in North Carolina Estuaries
- 07/02/2000 -- Brown Tide Devastating Long Island's Great South Bay Shellfish
- 06/17/2000 -- Spring 2000 - Hottest On Record in U. S.
- 05/07/2000 -- Serious Drought in the Great Lakes
- 04/20/2000 -- Severe Arctic Ozone Loss and Deep Ocean Warming
- 03/12/2000 -- Environmental Updates and Mysterious Fires Near Scott, Arkansas
- 01/13/2000 -- Computer Projections About Earth Weather 2000-2100
- 01/09/2000 -- Global Warming Alert from NOAA and U.K.
- 12/25/1999 -- Y2K Nuclear Concern and Global Warming Update
- 09/26/1999 -- Could Ancient Microbes in Polar Ice Cause Epidemics?
- 07/25/1999 -- Maryland Fish Kills; Global Warming; and Warm Oceans and Disease
- 06/04/1999 -- Global Warming Linked to Increasingly Warmer and Wetter Winters in Europe & Western North America
- 05/05/1999 -- Two Antarctic Ice Shelves Almost Gone
- 04/09/1999 -- Strange Lights In Missouri
- 02/28/1999 -- Chickadee Beak Deformities in Alaska
- 01/24/1999 -- Global Warming

Websites:

Carnegie Institution, Dept. of Global Ecology: <http://globalecology.stanford.edu/DGE/CIWDGE/CIWDGE.HTM>

Credits

Copyright © 1999 - 2009 by Linda Moulton Howe.
All Rights Reserved.
www.earthfiles.com

earthfiles@earthfiles.com

Republication and redistribution of the contents of this screen or any part of this website are expressly prohibited without prior Earthfiles.com written consent.

**[Privacy Policy](#) | [Terms & Conditions](#)
[Refund Policy](#)**

**Copyright © 1999 - 2009, Earthfiles.com / DigitalEyeCandy.ca
All rights reserved.**