More than any other time in human history, mankind faces a crossroads. One path leads to despair and utter hopelessness. The other, to total extinction. Let us pray we have the wisdom to choose correctly.



Woody Allen

Nature Bats Last

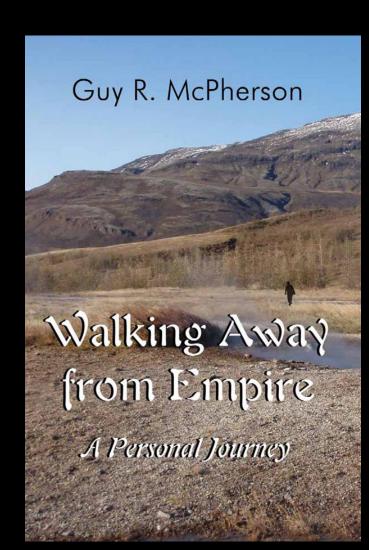
Humans have tinkered with the natural world since we appeared on the evolutionary stage. Our days may be numbered: As the home team, Nature Bats Last.

guymcpherson.com

Good news

Bad news

Astonishingly good news



Good news: collapse

Slow climate chaos

Terminate human-population overshoot

Slow or stop Sixth Great Extinction

Terminate environmental decay

George Perkins Marsh (September 1847): Effects of burning fossil fuels on climate change, urban heat islands

George Perkins Marsh (September 1847): Effects of burning fossil fuels on climate change, urban heat islands

Svante Arrhenius (April 1896, *Philosophical Magazine and Journal of Science*): 1 C temperature increase by 2000

George Perkins Marsh (September 1847): Effects of burning fossil fuels on climate change, urban heat islands

Svante Arrhenius (April 1896, *Philosophical Magazine and Journal of Science*): 1 C temperature increase by 2000

Robert Watson, NASA, to Senate Environment Subcommittee on Environmental Pollution (June 1986): "We can expect significant changes in climate in the next few decades"

George Perkins Marsh (September 1847): Effects of burning fossil fuels on climate change, urban heat islands

Svante Arrhenius (April 1896, *Philosophical Magazine and Journal of Science*): 1 C temperature increase by 2000

Robert Watson, NASA, to Senate Environment Subcommittee on Environmental Pollution (June 1986): "We can expect significant changes in climate in the next few decades"

United Nations Advisory Group on Greenhouse Gases (October 1990): "Beyond 1 degree C may elicit rapid, unpredictable and non-linear responses that could lead to extensive ecosystem damage"

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

United Nations Advisory Group on Greenhouse Gases (1990): "Beyond 1 degree C may elicit rapid, unpredictable and non-linear responses that could lead to extensive ecosystem damage"

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

Positive feedbacks resulting from 2 C warming will lead quickly to 6 C warming

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

Positive feedbacks resulting from 2 C warming will lead quickly to 6 C warming

We're on track to 2 C in 2017 (International Energy Agency's World Energy Outlook 2012)

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Hadley Centre for Meteorological Research (October 2009): 4 C by 2060

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Hadley Centre for Meteorological Research (October 2009): 4 C by 2060

Global Carbon Project, Copenhagen Diagnosis (November 2009): 6 C, 7 C by 2100

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Hadley Centre for Meteorological Research (October 2009): 4 C by 2060

Global Carbon Project, Copenhagen Diagnosis (November 2009): 6 C, 7 C by 2100

International Energy Agency (November 2010): 3.5 C by 2035

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Hadley Centre for Meteorological Research (October 2009): 4 C by 2060

Global Carbon Project, Copenhagen Diagnosis (November 2009): 6 C, 7 C by 2100

International Energy Agency (November 2010): 3.5 C by 2035

United Nations Environment Programme (December 2010): up to 5 C by 2050

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Hadley Centre for Meteorological Research (October 2009): 4 C by 2060

Global Carbon Project, Copenhagen Diagnosis (November 2009): 6 C, 7 C by 2100

International Energy Agency (November 2010): 3.5 C by 2035

United Nations Environment Programme (December 2010): up to 5 *C by 2050*

U.S. Department of Defense (2010): Quadrennial Defense Review includes climate change among security threats

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 2008): 2 C by 2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Hadley Centre for Meteorological Research (October 2009): 4 C by 2060

Global Carbon Project, Copenhagen Diagnosis (November 2009): 6 C, 7 C by 2100

International Energy Agency (November 2010): 3.5 C by 2035

United Nations Environment Programme (December 2010): up to 5 C by 2050

Intergovernmental Panel on Climate Change (late 2007): 1 C by 2100

Hadley Centre for Meteorological Research (late 395). 2 C6/2100

United Nations Environment Programme (mid 2009): 3.5 C by 2100

Hadley Centre for Meteory gical Research (October 2009): 4 C by 2060

Global Carbon Project, Copenhagen Diagnosis (November 2009): 6 C, 7 C by 2100

International Energy Agency (November 2010): 3.5 C by 2035

United Nations Environment Programme (December 2010): up to 5 C by 2050

National Center for Atmospheric Research (January 2011): 16 C by 2100

National Center for Atmospheric Research (January 2011): 16 C by 2100

Paul Beckwith, University of Ottawa (October 2012): 6 C increase within a decade

National Center for Atmospheric Research (January 2011): 16 C by 2100

Paul Beckwith, University of Ottawa (October 2012): 6 C increase within a decade

"rapid, unpredictable and non-linear responses that could lead to extensive ecosystem damage"

National Center for Atmospheric Research (January 2011): 16 C by 2100

Paul Beckwith, University of Ottawa (October 2012): 6 C increase within a decade

Proceedings of the National Academy of Sciences (October 2012): Game theory indicates current climate negotiations won't avert catastrophe

Proceedings of the National Academy of Sciences: Climate change is irreversible (cf. 350.org) (February 2009)

Proceedings of the National Academy of Sciences: Climate change is irreversible (February 2009)

United Nations Environment Programme:

During 2008, global carbon emissions increased

(November 2009)

Proceedings of the National Academy of Sciences: Climate change is irreversible (February 2009)

United Nations Environment Programme:

During 2008, global carbon emissions increased

(November 2009)

Climatic Change: Only collapse prevents runaway climate change (February 2011 – submitted 2007, published online 2009)

Proceedings of the National Academy of Sciences: Climate change is irreversible (February 2009)

United Nations Environment Programme:

During 2008, global carbon emissions increased

(November 2009)

Climatic Change: Only collapse prevents runaway climate change (February 2011)

BioScience: Comparisons with Thoreau's notes indicate 2.4 C increase (February 2012)

Proceedings of the National Academy of Sciences: Climate change is irreversible (February 2009)

United Nations Environment Programme:

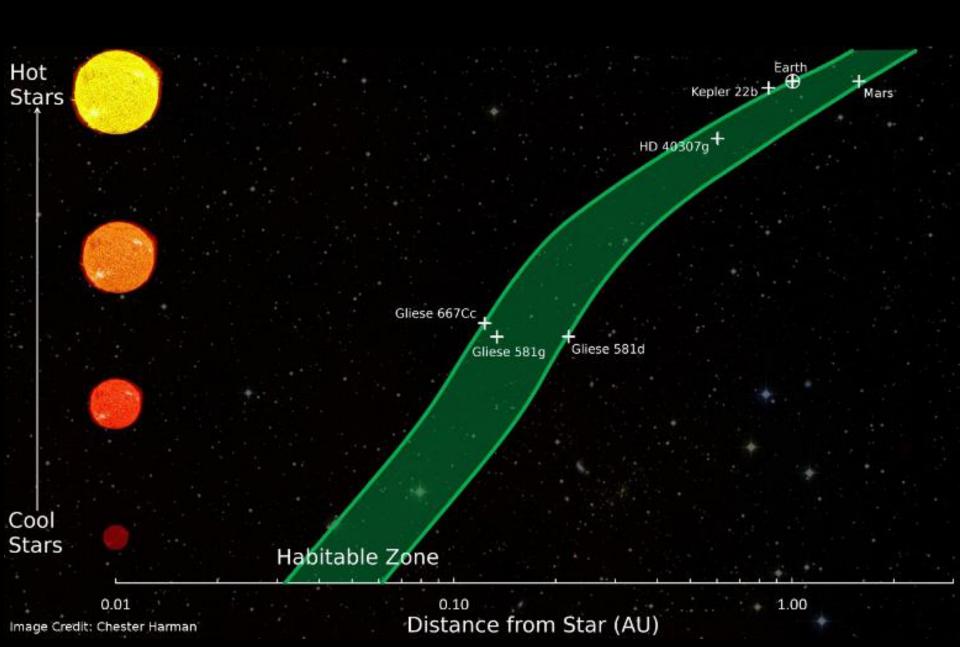
During 2008, global carbon emissions increased

(November 2009)

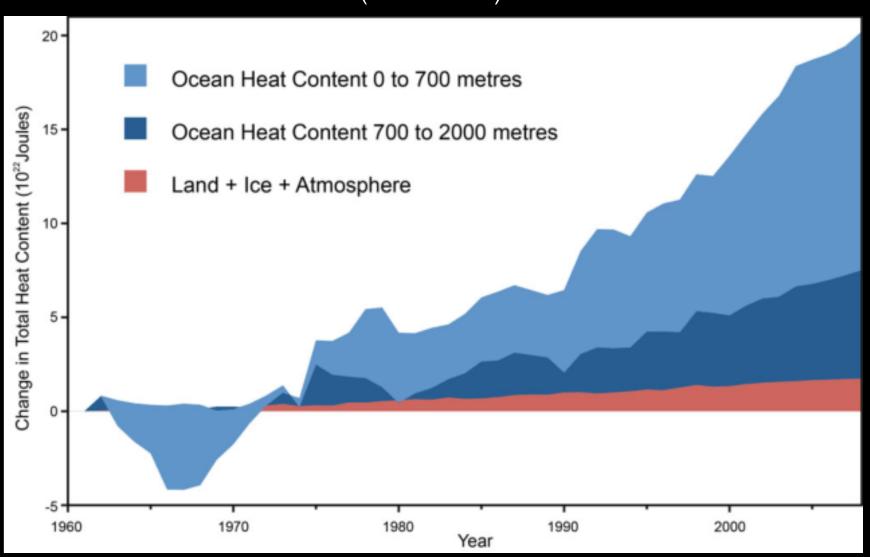
Climatic Change: Only collapse prevents runaway climate change (February 2011)

BioScience: Comparisons with Thoreau's notes indicate 2.4 C increase (February 2012)

Astrophysical Journal: Earth is within 1% of inhabitability (1.5 million km) (March 2013)



Geophysical Research Letters: Acceleration during last 15 years (March 2013)



Arctic Ocean methane hydrates (Science, March 2010)

Arctic Ocean methane hydrates (Science, March 2010)

equivalent to 1,000 to 10,000 Gigatons of carbon (vs. 226 Gigatons thus far)

Arctic Ocean methane hydrates (Science, March 2010)

Atlantic water → Fram Strait (Science, January 2011)

Arctic Ocean methane hydrates (Science, March 2010)

Atlantic water → Fram Strait (*Science*, January 2011)

Siberian methane (Tellus, February 2011)

Arctic Ocean methane hydrates (Science, March 2010)

Atlantic water → Fram Strait (*Science*, January 2011)

Siberian methane (Tellus, February 2011)

"rapid, unpredictable and non-linear responses"

Arctic Ocean methane hydrates (Science, March 2010)

Atlantic water → Fram Strait (*Science*, January 2011)

Siberian methane (Tellus, February 2011)

Amazonian drought (*Science*, February 2011)

Arctic Ocean methane hydrates (Science, March 2010)

Atlantic water → Fram Strait (*Science*, January 2011)

Siberian methane (Tellus, February 2011)

Amazonian drought (Science, February 2011)

Peat decomposition (*Nature Communications*, November 2011)

Antarctic methane -- 10x carbon in northern hemisphere (*Nature*, August 2012)

Antarctic methane -- 10x carbon in northern hemisphere (*Nature*, August 2012)

Russian forest and bog fires (NASA, August 2012)

Antarctic methane -- 10x carbon in northern hemisphere (*Nature*, August 2012)

Russian forest and bog fires (NASA, August 2012)

Cracking of glaciers accelerates in the presence of increased carbon dioxide (Journal of Physics D: Applied Physics, October 2012)

Antarctic methane -- 10x carbon in northern hemisphere (*Nature*, August 2012)

Russian forest and bog fires (NASA, August 2012)

Cracking of glaciers accelerates in the presence of increased carbon dioxide (Journal of Physics D: Applied Physics, October 2012)

The Beauford Gyre apparently has reversed course (U.S. National Snow and Ice Data Center, October 2012)

Antarctic methane -- 10x carbon in northern hemisphere (*Nature*, August 2012)

Russian forest and bog fires (NASA, August 2012)

Cracking of glaciers accelerates in the presence of increased carbon dioxide (Journal of Physics D: Applied Physics, October 2012)

The Beauford Gyre apparently has reversed course (U.S. National Snow and Ice Data Center, October 2012)

Exposure to sunlight increases bacterial conversion of exposed soil carbon (*Proceedings of the National Academy of Sciences*, February 2013)

Antarctic methane -- 10x carbon in northern hemisphere (*Nature*, August 2012)

Russian forest and bog fires (NASA, August 2012)

Cracking of glaciers accelerates in the presence of increased carbon dioxide (Journal of Physics D: Applied Physics, October 2012)

The Beauford Gyre apparently has reversed course (U.S. National Snow and Ice Data Center, October 2012)

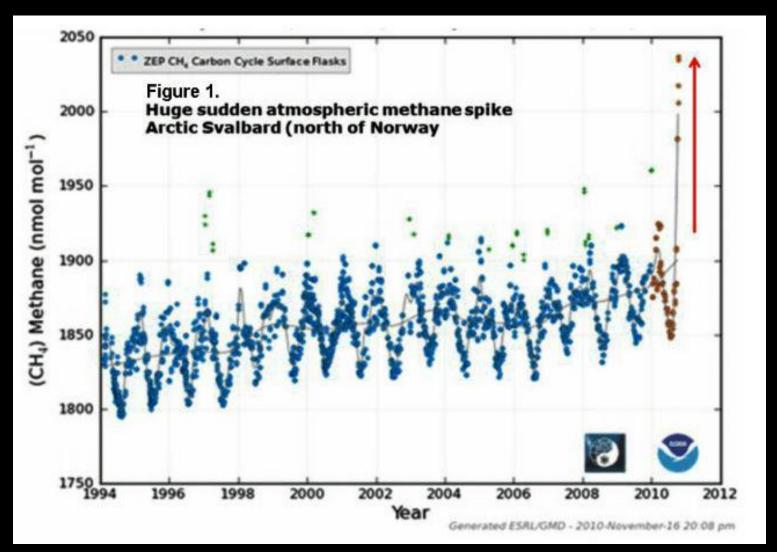
Exposure to sunlight increases bacterial conversion of exposed soil carbon (*Proceedings of the National Academy of Sciences*, February 2013)

Summer ice melt in Antarctica -- highest level in a thousand years, and the most rapid melting has occurred in the last 50 years (*Nature Geoscience*, April 2013)

Arctic drilling fast-tracked by Obama administration (August 2012)

Atmospheric Arctic methane

Arctic Methane Emergency Group: Extinction by mid-century (9 February 2012)



Atmospheric Arctic methane

AMEG (Malcolm Light): Extinction by mid-century (9 February 2012)

"methane release will accelerate exponentially, release huge quantities of methane into the atmosphere and lead to the demise of all life on earth before the middle of this century"

2031 Northern Hemisphere

2047 Southern Hemisphere

Atmospheric Arctic methane

AMEG (Malcolm Light): Extinction by mid-century (9 February 2012)

"methane release will accelerate exponentially, release huge quantities of methane into the atmosphere and lead to the demise of all life on earth before the middle of this century"

2031 Northern Hemisphere

2047 Southern Hemisphere

"rapid, unpredictable and non-linear responses that could lead to extensive ecosystem damage"

Near-term human extinction?

The Guardian (Oliver Tickell): "On a planet 4 C hotter, all we can prepare for is extinction"

(11 August 2008)

Near-term human extinction?

The Guardian (Oliver Tickell): "On a planet 4 C hotter, all we can prepare for is extinction"

(11 August 2008)

BP Energy Outlook 2030: 4 C in 2030 (January 2013; synthesis by Barry Saxifrage for the 30 January 2013 edition of the Vancouver Sun)



Now what? The political response

Barack Obama (14 November 2012):

"If the message is somehow we're going to ignore jobs and growth simply to address climate change, I won't go for that"

Now what? The political response

Briefing presented by Alliance of Small Island States (AOSIS) at Conference of Parties 15 (Copenhagen 2009):

"THE LONG-TERM SEA LEVEL THAT CORRESPONDS TO CURRENT CO2 CONCENTRATION IS ABOUT 23 METERS ABOVE TODAY'S LEVELS, AND THE TEMPERATURES WILL BE 6 DEGREES C OR MORE HIGHER. THESE ESTIMATES ARE BASED ON REAL LONG TERM CLIMATE RECORDS, NOT ON MODELS."

Bruce Springsteen: "In the end what you don't surrender, well the world just strips away"

Bruce Springsteen: "In the end what you don't surrender, well the world just strips away"

Zen: Let go, or be dragged

Bruce Springsteen: "In the end what you don't surrender, well the world just strips away"

Zen: Let go, or be dragged

Popular culture: Carpe diem

Bruce Springsteen: "In the end what you don't surrender, well the world just strips away"

Zen: Let go, or be dragged

Popular culture: Carpe diem

Nietzsche: "Live as though the day were here"

Really good news

DNA assures our unique stature

(i.e., you get to die)

Really good news

DNA assures our unique stature

Richard Dawkins: "In the teeth of these stupefying odds it is you and I that are privileged to be here, privileged with eyes to see where we are and brains to wonder why."

I live outside mainstream culture

In agrarian anarchy

I live outside mainstream culture

In agrarian anarchy

At the edge of empire

I live outside mainstream culture

In agrarian anarchy

At the edge of empire

Off the grid

I live outside mainstream culture

In agrarian anarchy

At the edge of empire

Off the grid

In a straw-bale house (mud hut)

I live outside mainstream culture

In agrarian anarchy

At the edge of empire

Off the grid

In a straw-bale house (mud hut)

Promoting a gift economy

I live outside mainstream culture

In agrarian anarchy

At the edge of empire

Off the grid

In a straw-bale house (mud hut)

Promoting a gift economy

(Your mileage may vary)

Nature Bats Last

Humans have tinkered with the natural world since we appeared on the evolutionary stage. Our days may be numbered: As the home team, Nature Bats Last.

guymcpherson.com



transitionvoice.com

Beyond Reskilling

Preparing for an ambiguous future

beyondreskilling.org

It is far better to grasp the universe as it really is than to persist in delusion, however satisfying and reassuring

Carl Sagan

It is far better to grasp the universe as it really is than to persist in delusion, however satisfying and reassuring

Carl Sagan

Those who are able to see beyond the shadows and lies of their culture will never be understood, let alone believed by the masses

Plato