

Climate Change and Human Extinction - A Personal Perspective

with Professor Emeritus Guy McPherson

Peak Moment TV episode 262

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Janaia Donaldson: Hi, Welcome to Peak Moment. I'm Janaia Donaldson.

Late in 2012 we watched a video by Guy McPherson about climate chaos. I was stunned. I immediately called Guy to see if he could talk with us and I'm glad he's here today. Thanks for joining us.

Guy is the Professor Emeritus of Natural Resources and the Environment at the University of Arizona for twenty years, a conservation biologist and an author of thirteen books including *Walking Away from Empire* and *Going Dark*. [turning to Guy] And your blog is Nature Bats Last. We'll catch up on those things...So thank you, thank you for being here.

Guy McPherson: It's my pleasure.

JD: I see you as an independent scientist at this point, not being beholden to a university, to an organization, to money, to government. You've taken on a rather daunting, Paul Revere-like calling to bring together the data on climate chaos that we aren't seeing or that's hidden away from the mainstream. Tell us what most of us don't get to see.

GM: Well, I was twenty years in active service at the University of Arizona. I left about five years ago. And subsequently that has liberated me to pursue information in ways in which I didn't have time or cultural incentive to pursue when I was in active service. There's a lot of self-censorship that goes on in this society and it happens in universities too—imagine that! Of course, I didn't have time, interest, or inclination to pursue the kinds of information I've been pursuing since then.

It was in 2002 that I was editing a book with a colleague on climate change, and I reached the conclusion that we were headed for human extinction by 2030 or so. There was no good reason for that. We certainly didn't have the data, the models or information. I suppose it was largely intuitive, I guess.

Then a year or so later I discovered the concept of global peak oil and I realized that it's a Hail Mary pass. This set of living arrangements might go away in time to prevent our own demise in the near term.

Well, that was a long time ago. Civilization not been terminated, has not ended. It keeps going, and going and going. Now we've triggered 30 self-reinforcing feedback loops, positive feedbacks. Informed analysis of one of those indicates that we're looking at a 4°C rise above the beginning of industrial revolution by 2030, and 10°C by 2040. That's just one - that's methane from the Arctic Ocean. There are 29 others. And you multiply those together - and they're multiplicative, not additive - and it looks like we might indeed not have long as a species on this planet.

JD: That's what stunned me. Near-term human, and not just human extinction. It's inconceivable. It's unthinkable. And we'll later talk about how does one respond with that from the inside. You do long presentations and you also have an evergreen document where you're keeping track of studies and data. I noticed that a year ago you had 15 or 16 [feedback loops] on that list. And just in this one year there are more factors, so that it seems to be going exponential with more and more data coming in.

GM: That's right. The first self-reinforcing feedback loop reported in the mainstream scientific community was methane leaking out of the Arctic Ocean in March 2010 as reported in *Science*. That was the only self-reinforcing feedback reported in 2010.

In 2011 there were 4 more. 2012, there were 6 more. 2013, 16 more. So far here on February 23, 2014, we know about one additional one *and* we know a lot more about those earlier ones. Science is starting to catch up with reality. We're starting to accrue evidence about each one of those self-reinforcing feedback loops. You're right, a year ago there were a dozen or so.

I delivered a presentation outside of Amsterdam in early August of last year, less than 6 months ago, we were at 19. Now we're at 30.

JD: Which is inconceivable!

GM: Geologically things are playing out in real time at this point.

JD: Can you give our viewers some highlights of what you're presenting so that they can get a sense of the data?

GM: We know it is 40 years from cause to effect - 40 years from greenhouse gas emissions until temperature rise. So that the temperature rise we're seeing today is a result of emissions in 1974.

There are a couple things that are important about that. We are not going to slow down this train. The emissions from the last 40 years have not caught up to us. In fact, we've emitted more greenhouse gas emissions in the last 29 years than in the previous 236 years combined. Those 29 years aren't even baked in yet - they're baked into the cake, but they are unaccounted for at the level of temperature.

Another facet is that emissions from 40 years ago are being exhibited with temperature rise today. I don't know about you, but I don't feel particularly guilty for things I was doing 40 years ago when I was 13 years old. I didn't know, and almost no individuals in this society knew, where we were headed 40 years ago and thought relevant action would have something to do with terminating industrial civilization.

JD: I think there's also a lot of unintended consequences. We don't know. We're clever apes and like to experiment and so that oozing black stuff that came out of the ground, what might it do? And here we are!

GM: Yeah it's incredibly attractive. Going after the technology, burning all those fossil fuels, makes life wonderful in the short term, for us individuals.

JD: So we've got the temperature lag going to accumulate and hit us increasingly every year and there are other feedback loops as well. What I think you said here is that we are on course to be at a higher number of degrees C warming planetarily even by 2030 or 2040.

GM: Yes, based on a single feedback - that of methane release from the Arctic. And methane is coming out of the Antarctic. It's being released from the permafrost, or the permamelt as we should properly call it. Just that one source, methane from the Arctic, from the sea floor in the Arctic, leads us to 4°C, a temperature beyond which humans have never existed on the planet. By 2030.

JD: 4°C doesn't sound like a lot. It's the difference between Alaska and L.A. But humans have never existed on that hot a planet?

GM: We haven't existed above 3.5°C above baseline (the beginning of the industrial revolution). Why? Because all sorts of weird things start happening when you heat up the temperature to a certain amount.

When we came out of the ice age, out of the Pleistocene into the Holocene, the temperature warmed a couple degrees C. That temperature rise, which subsequently stabilized, probably accounts for our ability to develop civilizations. Civilizations arose several places around the globe at around the same time, a few thousand years ago, probably because the temperature became stable and warm enough to grow grains. That's a hallmark of civilization, the ability to grow grains and to store them. Therefore to control the food and get you through the hard winters and so on.

So if civilization was locked in - and I'm not sure it was but it's been locked in now for a few thousand years - then industrial civilization was just one step further, one more step towards that convenience of having stuff we like.

So, here we are, sort of unwilling participants in this system that takes us to the abyss. And almost nobody knows we're even headed for the abyss.

JD: I want to go back to your saying that a lot of things can happen if we get beyond 3.5°C, like...

GM: We're already seeing it. At 0.85°C above baseline temperature, we're already seeing the polar vortex. The UN advisory group on greenhouse gases warned us about exceeding 1°C in 1990. They said

that's truly dire and catastrophic. James Hansen has joined that party just within the last couple of weeks. He switched from 2°C being truly catastrophic to 1°C as going to do serious damage.

I think we're already done. If 1°C was the target, then 0.85°C is close enough that it's taken us over the cliff. What kinds of things do we see from that? We see high temperatures locally that are sufficient to cause proteins to denature and therefore kill plants.

JD: There goes agriculture.

GM: Yes, bingo! In addition, you see temperature swings that are so severe. Here's an example: I lived in Tucson for more than 24 years. Two of the last four winters have been so cold that 80- to 100-year-old citrus trees died in Tucson, Arizona. Because the jet stream is meandering far greater than it used to be because the temperature gradient has broken down between the Arctic and the Amazon, the equator.

So now the jet stream that used to blow across Canada and the northern United States with these cold fronts, and they'd sweep across the country in four or five days and be done with it. Now we have the jet stream meandering, this huge amplitude and dragging cold, cold temperatures down from the Arctic to Mexico City and destroying all the vegetable production for winter vegetables as far south as Mexico City. So those are the kinds of things that are going to lead to our extinction as a species: these extreme temperature events including high temperatures that denature proteins, and temperature extremes including cold temperatures that kill land plants.

In addition we're acidifying the ocean to such an extent that we're killing the phytoplankton. Phytoplankton are the base of the marine food web. Without phytoplankton, without significant numbers of phytoplankton, we don't get any food from the ocean. We might have jellyfish, a few.

JD: So what I hear you saying is that what's going to lead to the extinction of humans primarily is the destabilization of environmental factors for food growing.

GM: That's going to be a really, really big one. Now where I live in the Southwestern interior of a large continent in the Northern Hemisphere, the most rapid place to warm up, probably what will happen is that temperatures will rise to 130° or 135° Fahrenheit one of these days. Not that great a difference over the historical record. That will denature the proteins in all the plants. So all the plants will die. Then the winds will start blowing and we'll have the Dust Bowl that never ends. So me and my neighbors, everybody who lives there, will literally choke to death. If they don't die from the food, they'll die from the inability to breathe. There were thousands of people who died in the Dust Bowl of the '30s because they were breathing in more solid matter than air.

JD: Is there anything else on the story of the factors leading towards extinction that you want to share here?

GM: There are a couple of things that I think are pretty important. There's this contrarian view that the temperature has stabilized within last 15, now 16, years. That 1998 was the hottest global temperature year. That's based on land surface records. But as it turns out a paper from about a year ago points out in Geophysical Research that heat actually accelerated but has just been hidden in the oceans. The oceans account for over two-thirds of the surface area of the planet. We just have our thermometers on land so we've missed this.

JD: So the oceans are soaking it up. Getting more acidified. And, who knows what else.

GM: And getting a lot hotter in addition to being more acidified. That releases methane, for example, from the Arctic Ocean. A couple weeks ago we could see methane concentrations in the atmosphere concentrated in the Northern Hemisphere [shows diagram on computer]. This a lot of methane. At the beginning of the industrial revolution we experienced about 700 parts per billion methane in the atmosphere. We're now routinely at over 2000 parts per billion. That's global average. A couple days ago we were at about 2400 parts per billion in some recording stations.

JD: Is that about changing the atmospheric composition, or is it just about the heating, or...?

GM: That's a result of heating, releasing methane into the atmosphere. Methane is more than 100

times more powerful a greenhouse gas than carbon dioxide in the short term, in less than twenty years. So every part per billion of methane is a really big deal. That leads to acceleration. These self-reinforcing feedback loops - they self-reinforce! It's warmer, the more the methane emerges. The more the methane emerges, it gets warmer. It gets warmer, the more methane comes out.

JD: Runaway, and non-linear. It's a complex system with all kinds of things tying together, but it's on runaway.

GM: That's right. This runaway event is the sort of thing that James Hansen worried about in his book, *Storms of My Grandchildren*, and didn't think it would happen in the near term. But that book came out *long* before we knew about these 30 self-reinforcing feedback loops and we had evidence that we'd triggered them. The acceleration is astonishing.

JD: I've been keeping an eye on this since 1990 and McKibben's *The End of Nature*, and in the last two to three years it feels exponential to me.

GM: I update regularly an essay on my website, Nature Bats Last, the "Climate Update and Summary" essay. I updated it again this morning. I have to update it every few days because the information keeps pouring in. I ran across two more journal articles in the last few days. And it's never any good news.

JD: Tell us about this piece. [shows chart on computer]

GM: Planetary scientists for a long time assumed and reported that the Earth was in the middle of the habitable zone for a star the size of our sun. It turns out (a paper in *Astrophysical Journal* last year in March) points out actually the Earth is on the *inner* edge of the habitable zone. Which indicates that if we change the atmosphere ever so slightly, we could push ourselves out of that habitable zone towards Venus.

It turns out that we have *not* changed our atmosphere a *little bit*, we've changed it a lot! We're barely, we're within 1% of being uninhabitable. We've now altered the atmosphere to such an extent that I can't even imagine that we have not triggered runaway as a result of that large change in atmospheric chemistry in a planet so close to the edge anyway.

JD: Some say, civilization will go down, humans may go down, but the Earth will survive. What you're saying is "not necessarily: Life may not continue."

GM: That's right. As we know, Venus went Venus. If we look at an analysis done by Malcolm Light in December of last year [2013] where he actually applies an exponential function to methane release in the Arctic and consequent temperature rise. He takes us to temperatures similar to Venus in 2096. That's this century. So we're not going to do well.

JD: That's staggering. When you first had that intuition and you began gathering the data that validated what your intuition was...how did you take this? How did you respond inside to this?

GM: Horrified. I was much younger then. I mourned for our species. It was strange because people couldn't understand that. It's such an abstract concept. I'm a conservation biologist, and extinction is not merely an abstract concept to me, because I've been documenting the demise of other species for a long time. So it's not just abstract.

But people couldn't understand why I would have so little empathy for their dying 85-year-old grandmother who had a full and rich life and seven children, but I was mourning this other thing that they couldn't even wrap their minds around.

That was not the first thing that made me a social outcast, but it was another indicator that I was thinking a little differently than other people. So I mourned for months, and nobody even noticed I was grieving. I didn't know what to call it. In fact, it was only recently a little over a month ago that I went to a grief recovery workshop, and learned that in fact what I was experiencing was grief. In this culture, we assume grief comes from two things: death of somebody close to us, and divorce/separation. Well, there are more than 40 sources of grief, and...

JD: ...And you added a new one here.

GM: Right. AND it wasn't my favorite thing.

JD: I hear you. When we read Lovelock with a similar prognosis, even without the data – for months I was grieving for the loss of beauty, and life, and the variety and diversity.

GM: It took me a really, really long time to deal with that. In part because I didn't seek therapy for it. Probably no therapist would've understood what I was going through. Then a lama in Winnipeg, Lama Jerry, saw a four-minute film clip shot by Pauline Schneider, who is making a movie about my efforts. In those four minutes, he said it became obvious that I had reached a point of acceptance. That up until that point I'd been angry, confused, lashing out, frustrated. I was experiencing all these emotions. Then he said "in October of 2013 you finally let go and you became a much more centered human being." He said, "I saw that," and his response was, "I have to get him up here, we need to talk."

JD: Does that match your experience of yourself? What he named there?

GM: Yes, I didn't have any identifier or tag or moniker to put on it. I just knew I was a different human being than I was. Part of that was because I realized that it's not my fault. As a lifelong teacher, I assumed that it was my job to teach everybody in the world what they need to do. And of course I was the teacher, so of course they'd listen to me and do what I told them.

JD: [laughs] That it's not your fault that the IPCC and all the governments of the world and all the people of the world don't hear this and get it?

GM: Right. It took a long time. I had to walk away from teaching and spend nearly five years away from it, to realize that I can't change the world. It's all I can do to change myself, and not necessarily in a good way. So I need to let go of this notion that I can, with a pair of tights and a cape, save the world! And I can't. I don't even have the tights or the cape.

That made me feel more relaxed about it. Also the 40-year lag between cause and consequence was also another piece that says, "It's not your fault. Forty years ago we didn't know. So we're trapped. So let go or be dragged." So finally I did.

Interestingly this lama, his teacher had all of his students, as one of their final lessons, watch a body decompose. He told me that and he said "You've been watching the body decompose, watching the body decay for a long time. So finally you've reached this understanding of impermanence."

An awesome analogy. I learned so much when I spent a few days with him in his dharma center group.

JD: When you present this information to audiences, and I'm sure that people are also rocked and deeply moved by this possibility that it's happening on our watch. That we're looking at the end story on our watch, likely, and that the young people of today... what kind of future are they going to be? There's already uncertainty, and it's even more uncertain. What kinds of advice or perspectives do you give people about how do we live through this?

GM: I frequently point out the line from Edward Abbey, the iconoclastic writer from Tucson: "Action is the antidote to despair." So yes, I expect people to despair. It's horrifying. It's horrible. Dealing with our own death is difficult enough in this death-denying culture. But to deal with *everybody's* death? That's a heavy load.

JD: And every animal you know, and every bird you know, and every fish there is. Everything.

GM: Yes. We're just destroying every aspect of this living planet. That's horrifying. And grief-inducing if you care, if you have any empathy at all. What to do about that?

We could crawl in a corner and do nothing. Or just continue with business as usual. That's what most people do. Their takeaway from my message is, well we're all going down anyway, so I'm gonna keep doing what I've been doing, even if it is a job I hate, because I feel I need to earn some money and save for a retirement that'll never come. And all that.

So the advice that I give is to let go. That action is the antidote to despair. So let's do something! If

you're damned if you do and damned if you don't, then *do*.

In fact I think this is incredibly liberating. If this is the end, then why don't you *not* do what culture screams at you to do? Why don't you do something different instead? Why don't you take your last dollar and throw yourself into the arms of strangers, into the arms of humanity, and say, "Listen I'm doing this weird thing, and I don't have any money, so can I sleep in your barn?" Or whatever!

I think it's incredibly liberating because we don't have to be bound to culture anymore. If we're the last human beings to occupy the planet, and I strongly suspect we are, then why don't we exhibit some humanity for a change?

JD: And maybe an exalted kind of humanity, if you will, at our best. Giving the kind of compassion, the random acts of kindness, liberate a stream, find what we love, or where we love or who we love, and serve that. Share it.

GM: Yes. When I see and read about people in hospice – and I think we're all in hospice now – when I see the actions of those people, I don't see money-grubbing. I don't see people accumulating shoes. I see people giving things away. I see people acting with kindness and compassion, for which humans are renowned! And which we respect in human beings.

So I think that's great. These are people who are accepting their own deaths and integrating them fully. How do they act? They don't act like the banksters on Wall Street. They pursue love. They do what they love. They pursue lives of excellence. Let's do that.

I don't know what that means for you, but I know what a life of excellence means for me. It means pursuing the kinds of questions Socrates pursued, until they killed him for it. That's what it means for me, asking questions of this culture. I spend a lot of time traveling because I'm still a teacher at heart. I'm trying, still, to have questions answered that are rattling around in my brain. For me that's what a life of excellence is. For you, if it's accumulating as much gold as is humanly possible, well maybe I'm not as big a fan of that form of excellence as I am with others. But I think there are many things we can do, many of them outside the shackles of this culture. Let's do that for a change.

JD: You actually talk about that we're here at an incredible moment. The Chinese curse, "may you live in interesting times", which are both a challenge and blessing, opportunity and danger. And it appears that we're here at a rather unique time.

GM: Yes, there are three Chinese curses. The third most dire is "May you live in interesting times." It's a curse, the third most dire. The second most dire is "May you attract the attention of the government." Given the surveillance security state in which we're embedded. And the most dire one of all is "May you find what you are looking for." I'm not there yet.

JD: "May you find what you are looking for." I love your notion that we at this time are getting to watch something none of our predecessors did, like watching a movie. Tell us your analogy there.

GM: We're at the end. We get to see the end. I can't imagine a situation where we're not among the last of our species on the planet. Already five million people a year die early deaths because of climate change. That's up from 400,000 a year two years ago.

I suspect we get to see the end of this movie. Nobody else in human history gets to see the end of the movie. They walked out, they left, the power went out, whatever. They didn't get to see the end. We get to see the end. We get to see how humans act in the face of their own demise. What could be more exciting than that? What could be more humane than that?

JD: What a call to the best in all of us. Thank you. That's what a Peak Moment is.