

Cli-Fi 2015

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Greg Dalton: Welcome everyone. Thanks for coming out to join us this evening. This is Climate One, changing the conversation about America's energy, economy and environment. I'm Greg Dalton and today we're discussing climate fiction in literature and film. During the Cold War the specter of nuclear Armageddon was portrayed on screen in stories ranging from *Dr. Strangelove* to the 1983 TV megahit *The Day After*. Today, climate disruption is catching on in Hollywood. Recent movies portraying a world gone crazy on carbon include *Snowpiercer* and *Interstellar*. In literature, Barbara Kingsolver's 2012 novel *Flight Behavior* was set in the small town where Monarch butterflies migrated north from Mexico in a warming world. And science fiction author Kim Stanley Robinson has written several books featuring a trashed climate, most recently the novel *2312*. Over the next hour we will talk with Kim Stanley Robinson and journalist Jason Mark about climate fiction and climate reality. Along the way, we'll include questions from our live audience at the Commonwealth Club meeting today in Lafayette. Author Kim Stanley Robinson is perhaps best known for his *Mars* trilogy. His climate-themed work includes *Antarctica* and *Forty Signs of Rain*. *The New Yorker* magazine called him the greatest living science fiction writer. Jason Mark is editor of the *Earth Island Journal* and recently penned a column on Cli-Fi published in *The New York Times* Op-Ed page. Please welcome them to Climate One.

[Applause]

Welcome both. Kim Stanley Robinson let's begin with your story. You went to Antarctica and that was part of your kind of climate awakening. Tell us about your time down in Antarctica, it was about, what, 20 years ago?

Kim Stanley Robinson: Yes, it was almost exactly 20 years ago. Thanks Greg. I was sent to Antarctica by the National Science Foundation that has an Antarctic program for artists and writers, and so after my Mars books I applied, got accepted and spent the two months down there. That was November and December of 1995. So, I was a roving reporter and I followed the scientists around and spent a lot of time in the field camps and a lot of them were doing what they called climate change research because Antarctica is one of the poles. The poles are changing faster than anywhere else on earth for reasons that aren't well understood, and I would ask them, how fast could climate change affect us and they would say oh really fast and I'd say well how fast do you mean? And they'd say well two or three thousand years. And so that's fast for geologists but it's slow for us, and I couldn't think of a story. And when I got back from an Antarctica I wrote a novel about Antarctica that only just began to discuss climate change, but sea level rise is implicated in that because the West Antarctic ice sheet is unstable down there and could come off and sea level rise quite quickly. So, that was one aspect of the story. And another one was when they took the Greenland Iceland cores at the turn of the millennium they got 800,000 years of really good atmospheric data year-by-year and they found that there had been abrupt climate change which the National Research Council put a report out on. And what they meant was that the whole world had gone from a climate that was warm and wet new the end of the last Ice Age to cold, dry, windy in 3 years. And they postulated that the stalling of the Gulfstream had been the cause of this. And I thought okay, 3 years is a story that I can tell, so that's what I wrote *Forty Signs Of Rain* and got more and more interested in this notion of tipping points were although climate seems stable there are certain things that can happen that would rapidly change climate.

Greg Dalton: And Jason Mark, tell us how you started to notice climate fiction or Cli-Fi as an emerging genre in film and literature.

Jason Mark: Well, again, so you know I cover the environment pretty broadly which obviously includes climate and energy, and just as a moviegoer, as a novel reader, I just started to notice it popping up more and more. Not necessarily always as an explicit theme although sometimes but often is a plot point, something that maybe like launch the novel or launch the story or launch the film. And I thought it was interesting that it seemed that what either film directors or, in some case, novelist were doing was almost using it like background and then staging their story on top of that. And that's in some ways more interesting than, you know, a book about climate change. It's almost like it's in -- especially in books that for lack of a better description would be called science fiction -- especially in science fiction books where there's sort of a more ambitious imagining say of the future. And some of those books it seemed to me like it was just kind of background and that was really interesting because it was almost like the future that we're foretelling for ourselves that we can so easily imagine for ourselves.

Greg Dalton: And one of the more recent ones was *Interstellar*. So, let's talk about that, you know, the premise there. Kim Stanley Robinson, what did you would you think of *Interstellar*?

Kim Stanley Robinson: Well I really disliked it. I thought it was a pretty dreadful movie in a lot of ways. If you presented it as climate fiction, then the world has a problem, the solution was magic. We can't go faster than light. We can go through wormholes and even if you granted that bit of magic which already is fantasy thinking, you would only be able to get a few people away from earth and you'd be leaving Earth to go to a place that look like Iceland because it was filmed in Iceland.

So the plan A would never work in that movie and the plan B wouldn't work either, so it was as if the filmmakers were saying if -- since this is a science fiction movie we can be stupid and get away with it because it's just science fiction. And so I was offended by it because science fiction is actually a very intellectually powerful genre and it doesn't have a whole lot of patience for stupidity. So this is like a kind of 1930's power fantasy movie and we're well past that now, we're 80 years past that kind of thinking.

Greg Dalton: Jason Mark you ended your *New York Times* piece by saying there is no Planet B. *Interstellar* is about escaping. Some people -- some humans escape as eggs, fertilized eggs I think, to the next planet. What did you think of *Interstellar*?

Jason Mark: I guess I'm glad to hear Stan say this. I mean, in some ways I thought it was kind of a horrible movie, not just because of the sort of magical realism around the wormholes and traveling faster than light, but the way that the director in some ways kind of ham handedly set up some of the philosophical dilemmas. It wasn't that sophisticated, I didn't think. But yes, my bigger point there that I wrote about in the *Times* was the science-fiction premise is not that earth's going to be in big trouble. That was just the launching point for the film. The real thing that is implausible or that is in a way kind of politically undigestible is that some small fraction of us are going to launch off into the next planet. And well, maybe some lucky stranded few will.

Greg Dalton: The one percent.

Jason Mark: Or the, you know, .001% but what about the 7 billion rest of us? And in a way this is kind of like the recurring theme of some of these movies. I thought *Snowpiercer* in fact did that kind of well because that movie, if anything, had this sort of more interesting class dimension, right?

Saying, well the people in the front of the train are all going to party and the proletariats in the back

are going to be eating ground-up bugs in these protein bars. So the director's kind of saying there is no escape. You know, we're all on this kind of train rattling around and around together and the people in the caboose at some point are going to say enough and stage a rebellion, which is kind of what they do.

Greg Dalton: Let's talk about the premise for *Snowpiercer* because that was timely this week. It's been in the news, would you like to -- Jason Mark set that up in terms of geoengineering.

Jason Mark: Sure, so I'm sorry for folks who are listening who haven't seen the film, the film launches with a botched geoengineering experiment. And so read your newspapers or websites today. National Academy of Sciences put out a big report about geoengineering which is also called atmospheric geoengineering. This is the idea that we could engage in large scale, planetary scale changes to the entire either atmosphere or the oceans, to either A) deflect sunlight back away from the planet which is called albedo manipulation, that we could spray sulfur particles in the stratosphere that will bounce sunlight away in the planetary version of pulling down the shades, or perhaps we can dump tons of iron filings in the ocean, plankton will gobble up all the CO₂, they die, they'll drop to the bottom of the sea floor sequestering lots of carbon in the process. *Snowpiercer* I thought was kind of cool because it was the first real large budget film that launched with the geoengineering premise. And so that film starts out with us over correcting and turning earth into kind of the version of Hoth from *Empire Strikes Back*, right, a giant snow globe.

Greg Dalton: Kim Stanley Robinson, thoughts on geoengineering whether that's something that is intellectually interesting, something that we ought to pursue on a research basis as the Scientific Academy recently said?

Kim Stanley Robinson: Well it's being researched now, so it isn't a matter of should or not, we're researching it already. Immediately everyone brings up the problem of what they call the moral hazard. That if you think that there might be some way out, some silver bullet solution to too much carbon dioxide in the atmosphere, that we won't decarbonize fast enough. You'll think to yourself, well we can go ahead and burn carbon because we have the silver bullet at the end of the game. So, the moral hazard has to be taken into account but I think everybody is right from the get-go. And some geoengineering methods that have been proposed are clearly dangerous like seeding the oceans because the oceans are already in trouble because of acidification and overfishing, and to put another factor in there, you could risk destroying the food chain in the oceans by a byproduct. And then since one third of our food comes out of the oceans humanity will be in terrible trouble. You should not mess with the oceans.

Now, this atmospheric stuff is a little more interesting because although *Snowpiercer* didn't want to go there with, and I can see why for the sake of their story, the sulfur dioxide that you put up in the atmosphere is going to come down to earth. It's just like what a volcano does, so after the most recent big volcanic explosion temperatures were three or four degrees lower for a two or three years, and then the sulfur dioxide settled out. So, in other words we could run experiments and if they were doing bad things then 3 or 4 years later we'd be back to where we were anyway. And so I think people will be discussing this more and more because it's relatively inexpensive and relatively technically achievable. I still -- even the researchers don't think it's a good idea. It doesn't solve ocean acidification. It doesn't push the main problems, which aren't even about climate control but are about environmental destruction more generally. So we talked about climate change because in a way it's comforting. Because if there were only climate change you can imagine you go over to the thermostat on the wall there and you shift it down and you change the climate and you can get rid of a problem.

But if it's complete biosphere destruction, if it's a mass extinction event that we are causing by all of

our habits put together, then it's much scarier than the thermostat on the wall. And so I think one of the reasons we talk about climate change so much is that it's a metonymy or synecdoche for the larger environment problem and it's the one that seems most amenable to a silver bullet fix. What we really need to do is talk about the entire environmental crash that we're causing and climate change is just one part of that problem.

Greg Dalton: And a lot, it's a very dark story. Do people really want to read about all that doom and gloom stuff? How do you write about it in a way that's not a real downer? I mean, you want to sell books after all.

Kim Stanley Robinson: Well there's dystopia and there's Utopia. Science-fiction splits very neatly. It does both and it's obvious because it comes right out of our lives and our own thinking. Everybody's a science-fiction writer; everybody plans science-fiction out of their own lives. And Utopia is your hopes, if I do these things and things go right I'll get to a good state, and dystopia are your fears, if I keep doing these bad things and bad things result I'll get to this bad state. So both utopias and dystopias are very, very useful and they're actually pretty popular. People read dystopias they think, well at least it isn't that bad now, or they think well no this is kind of dramatic and interesting, at least they're not in a boring suburban life like mine. This is really a category error because any step away from civilization actually gets more boring and more dangerous as you think about trying to get enough food and trying not to get mugged. You begin to realize that the things that we don't like about civilization would get worse if civilization went away rather than better. So there's a lot of complicated things going on with reading stories, but people do love to read science-fiction stories because it's a natural impulse to think, what will the future bring?

Greg Dalton: This year I believe is the 40th anniversary of *Ecotopia*, what was that for people who are not so familiar with it?

Kim Stanley Robinson: Well Ernest Callenbach of Berkeley wrote *Ecotopia* 40 years ago this year and so they're bringing out an anniversary edition. It was a story of a rebellion of Northern California and Southern Oregon, sort of the State of Jefferson. And there used to be bumper stickers that said keep the U.S. out of Ecotopia. And there are things were just being done in an environmentally conscious way with the best technology of the 1970's and it was a very inspirational book. It changed people's lives, it changed their thinking. I think what it was, was the '60s generation was growing up in thinking how do I live my ideals how do I take care of my kids? So you get these Ecotopian thinking. But then the '80s came and *Ecotopia* didn't know about the '80s. It didn't know about the Reagan-Thatcher counterrevolution and the incredible amount of the growth of globalization and late capitalism. So now *Ecotopia* looks a little bit quaint. But on the other hand the ideas are still very strong and the book should have a nice 40th anniversary.

Greg Dalton: So *Ecotopia* didn't know about the Wolf of Wall Street? Okay.

Kim Stanley Robinson: Right.

Greg Dalton: There's an author, George Marshall, who has written the book that has influenced my thinking and others. It's called *Don't Even Think About It: Why Our Brains Are Wired to Ignore Climate Change*. And he wrote, he's a British journalist, he wrote in the New York Times had a forum on climate fiction, he said that Cli-Fi will reinforce existing views rather than shift them. If you are a skeptic you will think that well yeah this is all fiction, it's fantasy, it's not made up. If you're climate conscious and accept climate science, he says that the overblown storylines of climate fiction may objectify the problem. So Kim Stanley Robinson do you think that climate fiction will change people's minds or perhaps harden them?

Kim Stanley Robinson: Well, it's a really serious question about reader response. It's so hard to tell and it's really hard to generalize because everybody takes these things differently and there is confirmation bias as we were discussing that you tend to take in the information that reinforces your already existing philosophies. It's just the way that we are.

So you read a fiction that in which the climate is changed in the future you might find it reassuring; well I'll be dead before that happens, so that's their problem not my problem. On the other hand, you could take it as a warning, you could think, well I want a decent life for my grandchildren and I rate my grandchildren's lives as importantly as my own as a philosophical or moral position. So at that point, imagining what it would be like can be vivid. You spend time living in that world because that's what fiction does. You are in a different world. It's telepathy, it's time travel. Reading fiction is a very powerful experience. So I believe that if it's done right it can change one's view. You come back to reality and you have a kind of double vision. You have your normal daily vision and then you have your science-fiction vision, the future, interposed on it or behind it, so you get a kind of 3D in time. And it helps you to make decisions about what do I do today to help the situation for my grandchildren? So the science-fiction double vision, the temporal 3D, the 4D vision is really a useful tool for figuring out what to do now. It's a philosophical tool.

Greg Dalton: And we'll get to some of those questions what we do now later in this program. Jason Mark, your thoughts on whether climate fictions reinforces existing views or if it can open minds?

Jason Mark: I mean, I would be cautiously optimistic; I'm going to generalize here. I would be cautiously optimistic that it can change minds because I think it's a little bit of I guess what you can call asymmetrical warfare. Because, okay all the kind of policy magazines and then the journals and the think tanks and daily newspapers, those all have these pretty obvious signifiers, kind of where it is coming from. So someone is going to say that's coming from *The New York Times*, that's you know from maybe left of center, maybe that's some people's stereotype. Oh that's coming from *Fox News*, okay that's going to be rightist and they've all got all these signifiers. Well, a big blockbuster motion picture film, it's just popcorn, right?

It's like people might not have their guard up as much. That would be my hope. That it might be able to come in from a side door and maybe get people to think about things differently. I mean, we know that confirmation bias works at the multiplex too. *American Sniper* is bigger in the South and in Texas and in parts of the West than it is doing in New York and California. People go to see the art or the entertainment that perhaps is already speaking stories that they want to hear. But I do have a hope that something like Stan's work or perhaps even a Barbara Kingsolver -- Barbara Kingsolver's kind of again got her own signifiers -- but maybe it could come sort of at a 45 degree angle. Come from your peripheral vision, you don't have your intellectual guard up and who knows. It might not move a denier to being James Hansen, but it might take someone who is maybe a little bit skeptical say about the science of anthropogenic global warming and climate change and get them to maybe think about things a little differently.

Greg Dalton: Although I took my kids to see *The Lorax* the film and I think *Fox News* called out *The Lorax* a bit because it was antibusiness or something. Kim Stanley Robinson, any thoughts on what Jason Mark just said?

Kim Stanley Robinson: Well I would agree with what Jason said there, it's one goes to a work of art a little bit more open and then also the interaction is one of immersion. For a while there you're living other people's lives, you're paying attention to it with an empathy. Especially with books you have to imagine it yourself. And what you imagining is well what was it like to live in the year 1800 during the Napoleonic wars and what did it feel like for them, not the facts but the feelings. So it's a very emotional business and once you get to the emotional level you begin to process in a different

way than you do when you're reading the news in a more cognitive sense. So, there is at least that going on, that when you talk about how would it feel you immerse yourself in a work of art, then when you come out that art will be cross checked against your own reality and against all the other works of art - all the other books that you've read, all the other movies that you've seen. And people are very sophisticated that and they even are pretty good at giving the political orientation of the work of art that you can unpack all that stuff you can decode it very quickly. But it's also put into everything else that you experienced, and then it becomes one more datum you've lived one more life. That's the magic of art. You've managed to pack in one more of your 10,000 lives by reading another book, by seeing another film.

Greg Dalton: Jason Mark, this might be more effective telling stories than fact-based journalism of the kind that you and I practice. Maybe we ought to get new jobs or something, tell some stories, write some books.

Jason Mark: I should go to a fiction workshop. Maybe I should go to a fiction workshop.

Greg Dalton: Right? Because the idea of piling on more facts, of so many facts -- there's the confirmation bias that Stan mentioned -- piling on more facts, is that really going to change someone's mind versus immersing themselves in a world that they might have some empathy?

Kim Stanley Robinson: Well, the postmodern literary critics would tell us that we're all doing the same thing. We're all telling stories and they're just different genres. So from your platform you're saying well these are facts. But immediately the orientation of the facts, the sequencing of them, the emphases that you have, mean that you're telling another kind of a story that's summarized rather than dramatized. And summary has enormous power. Dramatized scenes are like a movie in your head you have to read 500 pages to pass a couple months. Summarization can quickly give you abstracts and make a story that crushes down a whole lot of different elements and so you can do it in 1000 words rather than 360,000 words. So, I would say that we're basically doing the same thing and it's the same thing that all of us do, we tell stories to each other. We're addicted to stories. They're one of the main ways that we comprehend the world. Our religions are stories, whatever our psychologist tells us are stories, philosophy is stories, and it's just a question of do you believe them or not.

And you sort of believe them all conditionally but you rate them against all the other ones that you've heard and you come up with your own personal philosophy. So I would say there's not a whole lot of difference except for genre differences and each genre has its own particular power.

Jason Mark: I would say on this note that --

Greg Dalton: Jason Mark.

Jason Mark: I think sometimes it can also -- some art, especially if the satire is too obvious, the allegory is too obvious, can push buttons. I think a good example would be Pixar's *WALL-E*, which I loved *WALL-E*. I thought it was very good. I went, she's not listening, I went with my sister-in-law. She was grossly offended by the film. She felt that the depiction of ordinary Americans as basically fat, stupid and lazy if you've seen the film, was aimed at her. She really came out of that film very turned off. And there was a subcurrent of criticism around *WALL-E*, part of which did come -- I mean, I saw a very harsh review in *The National Review* online. But, you know, there was a subcurrent saying, "Wow" -- and it's a cartoon. That it had so little subtlety that that might -- you know, people's guards is going to come back up.

Kim Stanley Robinson: Sure

Greg Dalton: We are talking about climate fiction in Climate One. Our guests are Jason Mark, editor of *Earth Island Journal* and Kim Stanley Robinson the author. I'm Greg Dalton. While we're critiquing things, Kim Stanley Robinson I would like to get your view on a book that was quite influential, it involved actually a talk at the Commonwealth Club, and that was Michael Crichton's *State of Fear*, which really attacked environmentalists and basically said climate change is bunk. What did you think of that book?

Kim Stanley Robinson: Well, I thought that was a dreadful novel. And this is the thing, as a work of art you couldn't believe a single sentence of it. Scenes would happen that when you rated them against your reality principle, like could this happen, you would have to flunk it in every page. The scenes it was presenting were unbelievable just on the strict sense of, do people do this in the real world that I know? And no they don't. So it was a very political attack and maybe it's like the opposite of *WALL-E* although you know this is probably my own confirmation bias. I thought *WALL-E* was a masterpiece.

Jason Mark: I thought *WALL-E* was great. I loved it.

Kim Stanley Robinson: Although I saw it in a small town where there was not applause at the end and I think it was similar to your sister-in-law's reaction. The people were feeling a bit offended by that view of ordinary Americans. But you know, Jonathan Swift was a very angry guy too and that's how satire works, you exaggerate things to the point of grotesque. Like *The Triplets of Belleville*. There is an animated view of ordinary Americans it's even worse, and you have to be able to take it and do the translation. But people are very sophisticated in their consumption of art because everybody watches so much, everybody reads so much. So people, I think, are capable of making these judgments and translations.

Greg Dalton: How do you talk to a climate skeptic if you come across one?

Kim Stanley Robinson: I say to him, when you're sick do you go to the doctor? That's what I would say. Because a doctor scientist and medicine is science, it was kind of the first science. And everybody knows that medicine cannot always cure you and sometimes it's confused, and so it's a really good lesson in science. Science is not just facts nor is science settled in stone nor is it some godlike power to comprehend the world. It's just science. It's an attempt to understand things by reproducibility and by all the other parts of the scientific method. And when you're sick and when you're scared for your life you run to a scientist. And if I get climate skeptics that I'm irritated enough with I will really press them on this point. Because they'll have to admit that a doctor walks up to them and say, look you don't have any symptoms yet but you've got a cancer. I've got to poison you within an inch of your life and it will kill the cancer before it kills you. And the client skeptic will say yeah poison me, you know, I take your word for it and I don't want to die.

So then the scientist comes up, what if it's the same doctor, and says look the planet's sick, your grandchildren are going to be living miserable lives if we don't do these relatively minor fixes that are actually quite economical and a lot of fun. They re-engage with the world, they're kind of a project; it's pretty cool, what's the problem with it. And so this is the way that I would try to squeeze the issue -- that everybody believes in science even the so-called anti-science skeptics.

Greg Dalton: There's a couple I've seen in one of your novels where there is some scientists working at the National Science Foundation and they're wrestling. Congress is not doing anything, like today, and they wrestle with something was whether they should go outside the parameters of their scientific discipline and become advocates, become activists. And I think some scientist today wrestle with that boundary. Jim Hansen has clearly crossed that line, become an activist, and some people think it has discredited him. But to get Kim Stanley Robinson on that, and then Jason Mark.

Kim Stanley Robinson: Well, I think it's a dangerous thing because as a scientist you want to actually be speaking with the authority of the scientific method and talk about what science can really assert, which is always probabilistic. So once you do a James Hansen, although I admire him greatly and I think he's done the right thing for himself, it's kind of a retirement move. And now he's James Hansen, he's not NASA. And what you would want is something like what came out today from the National Research Council, I think it was, where it wasn't any individual that said this, it was the National Research Council putting out a report that has been peer-reviewed, that was written by a dozen people based on the research of 10,000 people, and it says this is the best that we can tell you right now about the situation. And what I would like to see is all scientists go to their professional associations and have them agree to put out statements about climate change and what we can do about it that are authorized by the entire scientific body; the American Chemical Society, the AAAS, the National Association of Sciences. And in fact like 135 scientific organizations worldwide have all spoken on this already. But the more they do it at speaking as the scientific community rather than as an individual like Hansen the more power I think it has to shape public policy.

Greg Dalton: Jason Mark is that right do institutions -- can people empathize with an institution versus a human like James Hansen?

Jason Mark: I mean, I guess I would mostly agree with Stan. I think James Hansen has done an incredible thing, he has been an incredible voice and he has shown real, especially in the past years, a form of moral leadership. But in general I do think folks, especially in the hard sciences, are better served probably sticking to their findings and then finding translators or interpreters, i.e., journalists or novelists or other folks who are going to go out and then get their findings out to the broader public. You know, the AAAS is actually meeting like this week, I think, in San Jose their annual convention, and most of the folks there I think it's pretty to say they're not even personally comfortable in that role. They would much rather stick to their findings. The problem is that the academy values does not put a lot of premium on hard, fast, strong conclusions. That's setting yourself up to have the next researcher come along and poke a lot of holes in your theory which sort of hedge things a little bit. You say this is what we found but, you know, we're not entirely certain. You're never entirely certain, that's kind of the I think the inbuilt culture of a lot of sciences and so that does work very well on drive time radio, doesn't work very well on the nightly news and certainly doesn't work that well on Twitter. So, I would think of a guy like Michael Mann, who has really stuck to his research, he has been dragged against his will, because of the kind of hockey stick and the email-gate, I don't know if you folks follow this, but anyway --

Greg Dalton: He's been attacked by politicians and others and drawn it into a political fight.

Jason Mark: In a way that he has really not wanted to be. And I think he's kind of tried to just stick to his findings and know that that's kind of where his authority comes from. He's had to get down to the hurly-burly in some ways, but he has really tried to say this is what my research has found.

Kim Stanley Robinson: I've had this impression that the scientific community has been shocked. That around 2002 they raised their hand, they said folks, world, the biosphere is burning down something needs to be done. And they were ignored. And capitalism just rolled on saying we need profits, we need shareholder value, we'll strip mine the world, what happens 100 years from now is somebody else's business, but I have a fiduciary responsibility to do everything I can to maximize profit. And the scientific community said but wait, the biosphere actually is our physical infrastructure. We are actually implicated with it. We live off of it. We can't do without it. You can't monetize it. If you destroy it you can't pay to replace it later. These are all fantasies and so we actually need to deal now. And now I think in the last five years or so you've see more and more

scientists and more and more scientific organizations trying to make something more vigorous than raising their hand at the back of the room and saying we've got a problem. It's an ongoing situation and it would be interesting to see what happens.

Greg Dalton: And --

Jason Mark: And not limited to climate, right? It could be vaccinations. It could be evolution. It could be a lot of different things in which there's a pretty strong undercurrent. The Scopes monkey trial is what, more than a century ago or something, but we're still replaying it. So, there's still a pretty strong undercurrent and culture. And in fact what --this is maybe going a little far afield Greg, but I mean, there's a number of people in this country whose confirmation bias when it comes to climate change, that reaffirms their belief that we may be living in the end times. It's a not insignificant, I don't remember the polling numbers exactly at the top of my head but it's --

Greg Dalton: The rapture is coming.

Jason Mark: The rapture is coming. I mean, it's like twenty, thirty percent of Americans think the climate change could be a symbol of that.

Greg Dalton: That's right. That's one piece of the American population. We're talking with Kim Stanley Robinson and Jason Mark at Climate One, I'm Greg Dalton. What you do in your own life to try to be part of the solution? Jason Mark, what do you do to walk the walk in your own life?

Jason Mark: You know, I try to ride my bike and use mass transit as much as possible and keep the car, we do have a car, but parked on the sidewalk there. I got a parking ticket the other day in fact, we've got to move it because I haven't moved it in a little while. And I think most importantly try to eat lower on the food chain. You know, I do eat meat but I've sworn off beef. I don't think, knowing what I know about beef cattle's environmental footprint, especially their climate footprint, it's much higher than pigs or chickens. And so on I've sworn off beef and try to stay on my bike as much as possible.

Greg Dalton: Kim Stanley Robinson?

Kim Stanley Robinson: Yeah, I agree with Jason and those are things that one can do. We're in a Mediterranean climate here and it's easy to reduce your carbon burn without being grossly inconvenienced. It's not so easy in other parts of the country, but things can be done. I also keep a garden and so that means composting and so it's a kind of nice recycling of our copious wastes. And actually if you keep a vegetable garden it will quickly scare you, because things go wrong that you don't understand. And agriculture is nowhere near as much of a controlled thing. It's not industrial even if we try to treat it industrially. So you keep a garden and it makes you respectful and it gives you a little stab of fear. And it also grows you some good food, that's another advantage of our climate, year-round food production. And so I enjoy that and I try to spend a lot of time outdoors. I think actually in climate like this you can you can work outdoors, you can recreate outdoors, you can eat outdoors. It's seldom that you get driven indoors.

Greg Dalton: Speaking of recycling, are your books recycled -- printed on recycled paper?

Kim Stanley Robinson: All too often.

[Laughter]

Kim Stanley Robinson: Pulping is common in paperbacks.

Jason Mark: I couldn't agree more. I mean, I think you know Greg I co-founded 10 years ago Alemany farm in San Francisco, the largest farm in San Francisco and I strongly believe that just a smidgen of being your own food producer is probably the number one thing to -- not the number one thing but among the top things to kind of build an ecological awareness. Because you have to very quickly become a hydrologist and meteorologist and, you know, a bug scientist and a little bit of a plant scientist and a little bit of a plant scientist. I think you become more physically aware of our surroundings and you realize that we are in a dance with wild nature. And I think that's why you see so much cultural sort of force behind the kind of micropollen, you know, sort of trend around sustainable food. You just have like a pot of herbs and one tomato plant, it's going to blow your mind.

Kim Stanley Robinson: In this context I think it's good to maybe bring up GMO foods. Because here's a huge discrepancy between the scientific community and the general public, and I think there's a category error going on. Genetically modified foods, we've been genetically modifying plants ever since humans were humans in terms of hybridization. So if you clip them with little microscopic scissors rather than hybridizing them the act is not hugely different. And I think when people are objecting to against GMO foods is not that the foods have been manipulated, the plants have been manipulated, but that the seeds and the genes are then owned by a company. So what you're objecting to is not science but capitalism. And this happens a lot. A lot of anti-science, especially from the left, in America is an objection to ownership of the public good and so it's an objection to capitalism not an objection to science.

And if you de-strand those two you begin to see this big cosmic battle, at least I do, in which the science is a force for trying to understand the world and make it more comfortable and better balanced with nature and capitalism is strip mining for private profit of the one percent as it's practiced now and it's basically been its historical role all along. I mean, it's been necessary, it's been good, and yet it was never designed it just came into being and now it's destroying the earth.

We have to change it. So GMO -- the food of the future is going to be a combination of organic gardening and genetically modified organisms and there's a good book called Tomorrow's Table about this. And it transcends the current political differences about what to like or not like so that organic people and genetic engineers are going to be working together to make sustainable food. In the current context that sounds confused, in the future it's just going to be doing what's necessary to feed the 7 billion. So people have to open up their minds and think how can we bridge to a future that's truly in balance and sustainable? We have to do some weird things along the way, including opening up our ideas to the possibilities that peculiar combinations are going to happen in the near future.

Greg Dalton: And on reforming or modernizing, sort of changing capitalism there's some people, there's people establishing B corporations, a lot of people trying to make large corporations be more sustainable. I was with a group of people yesterday who said we understand the models are broken, we don't know how to replace them. Kim Stanley Robinson, how would you reform or fix capitalism? You mentioned a couple times that it's the problem.

Kim Stanley Robinson: Well it is a very hard thing to discuss in detail because we have to make it up. It's a work of science fiction, but there are some guides. What if everything was -- the necessities of life for human beings were all regarded as public utility districts. So, this gets back to social democracy and even to socialism. The idea that food, water, shelter, clothing are all public goods and should be run of the people, by the people and for the people.

Then capitalism, as we practice it now would be in economic terms what they call pushed to the margin, the marginal activity. So the toys, the games, the iPhones, they could still run the way that they run now but the things that people need to live, like healthcare, are not profit motive driven but

are just simply part of the public good that we do for each other. So, this sounds radical but since 2008 it doesn't sound anywhere near as radical as it used to. Because in 2008 we saw that the so-called free market system can crash and that nobody understands it anymore and that is also destroying the earth. It persistently undervalues the natural world and human labor. So these are the things where you can cut costs by not paying for them when you make your goods. So, humans get immiserated and the natural landscape gets thrashed. So paying for those would be a matter of reorganizing our priorities and it would be a big job, but it will also just be changing the laws. And we change the laws all the time, so it isn't that radical or crazy. I'm not really calling for revolution; I'm calling just for a political program that changes the laws to make things more sustainable and more just.

Greg Dalton: And some of that is already happening -- ecosystem services is an area where companies are starting to realize that it's worth in their self-interest to pay to protect their watershed upstream so that the water that comes into their factory is clean and that nature provides all sorts of services are of benefit to companies. And there's even markets that are starting to come up and develop around these areas where they can make money and people can trade and that sort of things so there is actually is happening in some respects.

Kim Stanley Robinson: Yeah, paying the true cost is one way to think of it. And then that would mean a carbon tax. But it isn't really a tax, it's just paying the true cost. So paying the true cost of carbon would just be putting a bigger price on it, putting the real cost on it, the cost of its wastes.

And another great idea comes out of this recent book by Thomas Piketty, *Capitalism In The 21st Century*. If you have progressive taxes that's great, we should have progressive taxes. But if the taxes were not just on income but on capital assets, if there was a progressive tax on capital assets -- this is the scary idea out of Piketty's book that scared Wall Street, that scared the economists, that scared capitalism in general and the right wing. If there was a progressive tax on capital assets wealth would tend to flow back towards to everybody that made it. And it would not tend to accumulate in a pyramid at the top in the 1%. It's simply the more capital assets somebody has, the more they get taxed and eventually they get equalized. Anybody making more than \$100,000 a year is actually going into unhappy land rather than happy land according to scientific studies, so nobody needs to complain about this. It's a perfect plan, it's something we can all do. It's a political program right? And it's now within the window of acceptable discourse. If I said this 10 years ago you would say, oh my god these hippie science-fiction writers, you know, they're just so crazy and it is true, but now it's within the window of acceptable discourse. I can say it in this library, I can see it on TV, Piketty can say it and become a bestseller and speak all around the country about it. That's the big shift since 2008 and Picketty's just one part of it. But he's done an astonishing thing to mean that we can discuss these issues without sounding crazy but actually sound rational.

Greg Dalton: Maybe we'll find out in our question and answer period here in Lafayette how many members of the audience I'm looking out here how many people over \$100,000 want to see some of their wealth redistributed. But we'll get to that point in the audience question period coming up soon. We're here talking at Climate One with the author Kim Stanley Robinson and Jason Mark, I'm Greg Dalton. You can listen to podcasts of this and other Climate One programs in the iTunes Store.

Kim Stanley Robinson -- our language has been changing around severe weather that's been happening recently; derecho, polar vortex, atmospheric rivers, I never heard of these terms a few years ago and now they're part of everyday knowledge. So how you see the language changing as sort of severe weather becomes part of our daily lives?

Kim Stanley Robinson: Thanks for that Greg because I've been noticing that myself and I think it's

fascinating. This atmospheric river that in California has become the latest word. I think we used to call it Pineapple Express and it's a kind of an El Niño effect but we're seeing them now. What I think used to be called a storm is now called --

Jason Mark: Rain, it used to be called rain.

Kim Stanley Robinson: Rain. So, I like it. I like it because it's scientific. Science is always making up new words, mostly out of Greek and Latin, in order to be a little more precise about the physical world. So, an atmospheric river is a metaphor, right? But it's a very powerful and clear metaphor as to what's going on across the Pacific and we're going to get more of those. And polar vortex is one that didn't exist when I wrote *Forty Signs of Rain* and now I see it come into being, so that will keep happening I think.

Greg Dalton: Jason Mark?

Jason Mark: Yeah, I mean those are sort of like creations of the producers at CNN in some ways. They just keep repeating them over and over again until it becomes a self-fulfilling prophecy. I think what's interesting in the weather coverage -- and we have some extreme weather events, especially the tornadoes in the Midwest and incredible rain events in parts the country. But it seems like especially if you watch cable news or you follow that the Twitterati on Twitter, so much churn about, oh my god this blizzard's going to hit New York, and then it's kind of like a nothing sandwich.

I don't know what's going on there but there does seem to be -- I don't know, I mean some sort of new heightened attention around weather and perhaps it is because there have been some extremes that have truly I think frightening to people, the tornadoes being the most obvious one. Tornadoes have been out of season, tornadoes have been especially large. Something there is -- maybe it's because we got the Weather Channel 24 hours a day.

Greg Dalton: Yeah, climate change is going to be good for the Weather Channel. You used a phrase in your New York Times article of storm porn, right?

Jason Mark: Right.

Greg Dalton: It's become the new sort of, you know, disaster to show on cable TV. Let's go to our audience questions. Welcome to Climate One.

Male Participant: Thank you, my name is Raymond Welch, I'm the author of a Cli-Fi book called *A Change in the Weather*. And what you were just talking about in terms of the atmospheric rivers is actually the premise of the book. It's a story about family who gets caught up in an America turned upside down because the jet stream changes so radically that the seasonal highs and lows shift around the globe and agriculture fails. Economic collapse, right wing takeover.

I wonder if you agree with me that the imminence of climate change is much closer than people think. My book occurs in 10 years.

Greg Dalton: So, Kim Stanley Robinson your book was 2013, it might be much closer, smaller number.

Kim Stanley Robinson: 2312.

Greg Dalton: Yes, 2312.

Kim Stanley Robinson: What I would agree with is this: the first time we have a food crisis, it will

change everything. Because there will be panics and there will be hoarding. And as soon as there's hoarding there's a lack of social trust because the whole supply chain gets messed up and it's very hard to reestablish. Once people get into a hoarding mentality hardly ever goes away. People hold onto that their whole lives.

So - and we only have 6 months' worth of stored food for the population of the world right now, so one food crisis and everybody will be that much more nervous about everything.

Jason Mark: What I think is interesting, yes we could hit a sudden tipping point that would ruin some harvests and that will get people's attention real quick. I think what's interesting is the way in which the large agribusiness companies -- I'm mostly thinking of Monsanto and Archer Daniels Midland -- have paid very close attention to climate change, have made a lot of investments in startup companies that are doing weather forecasting. And the head of ADM says, I'm not gonna get into what he thinks is an academic debate about whether not climate change is happening. They're seeing it and their clients, and/or their vendors that are selling or growing these bulk commodities, are seeing it as well. Last year this country had one of the biggest soybean harvests in history, right? So I mean, but again you could have a tipping point in you could have a couple of big failed harvests in the major commodities that yes I think would get people's attention very, very quickly.

Greg Dalton: Many people forget but we had rationing of rice at Costco just what, 5 or 6 years ago when those big Australian droughts hit the rice market globally and there was rationing at a Costco. People forget.

We're talking about climate fiction at Climate One, I'm Greg Dalton. Our guests, Kim Stanley Robinson the science-fiction author, Jason Mark of the *Earth Island Journal*. Let's go to our next audience question.

Female Participant: Hi, my name is Jessica Lovering and I work in an environmental think tank but I study nuclear power to mitigate climate change. And the reason I mention that is that I also run a very large dystopian book club in San Francisco. And we've noted that fifty years ago a lot of the post-apocalyptic fiction was very nuclear war focused. And it's moved over time, you know it went through plagues, but now it's very -- there's a lot of dystopian fiction about climate change. And it seems like for my generation that's the big essential threat that people are worried about when no one's really thinking about nuclear war anymore as realistic threat.

So, my question is do you -- you kind of mentioned GMOs that, you know, if you take out that capitalism aspect we might need to reconsider GMOs to solve the food crisis or to help with climate change adaptation. And the same thing is sort of going on with nuclear power. You know James Hansen is a big nuclear power supporter because he's so worried about climate change. So my first question is do you think that climate change really is in the main existential threat that we're worried about now? And do you think that's going to make people sort of change how they feel about other risks, like GMOs or nuclear power or I don't know, other things.

Greg Dalton: Thank you. Jason Mark.

Jason Mark: I mean, I guess I would agree with what you said earlier, that climate change gets so much attention, I mean yes it is an existential threat because it's in some ways easier to wrap our minds around then in fact the collapse of the entire biosphere because of the sixth mass extinction, because of what's happening especially with the oceans. Our magazine's got an upcoming interview with Dr. Sylvia Earl. You listen to Sylvia Earl for five minutes and you're just like starting to get really bummed out. I think actually, yes, people are going to start rethinking some of these technologies and how they feel about them. But in a way climate change is the most obvious

symptom of larger problems that are happening system-wide on multiple earth systems. You know, there's some people who've got this kind of model of tipping points, well how many biological biosystems tipping points have we crossed? They say four of nine. Some even if these I think you don't even think about. How much nitrogen is out in the biosphere? Are we over -- we've created all this synthetic nitrogen in the form of fertilizers and then it all washes out into the biosphere. That pretty academic compared to think about I drive in my car and I'm spewing effluent that goes somewhere.

So to answer your question, I think it's all of these kinds of systems that are crunching at once. And that's what's gonna get people to start reconsidering some of their antipathy or opposition to various technologies.

Greg Dalton: On the getting bummed out thing I want to ask both of you -- this gets pretty dark knowing as much as you know about the climate reality in the in the biosphere, how do you avoid -- what gives you hope? How do you avoid getting depressed? Do you drink alone? Can you tell us?

Kim Stanley Robinson: Drink with others.

Greg Dalton: Yeah, share the misery, yes okay.

Kim Stanley Robinson: No, life is robust. It's only extinctions that are irreversible and ocean acidification. So, there's many, many reasons for hope. It's a natural human activity. But I want to say about the nuclear question because it's an interesting I've never read a really detailed analysis of how much carbon saving is there really from nuclear. But I would also agree with Hansen in this: it would be better than burning coal and we can also think of it as a bridge technology. One more generation of nuclear run by the U.S. Navy that has been doing nuclear since 1945 without, I mean occasionally they'll lose a bomb, but they've never had a nuclear accident. So in other words if it's run for the public by the public and not for profit, nuclear can probably be safe and be a bridge technology to even cleaner technologies. One more generation of nuclear is not going to break the bank on destroying the world and yet it might save us a crucial amount of carbon. What I'd like to see is an analysis of that. And Amory Lovins says that we are already so close to really excellent clean energy that we don't need nuclear, we can just go straight to the forms of clean energy. But energy is important in that we waste it like crazy, 12,000 watts a year for Americans, 300 for people in Bangladesh. In the developing world energy means refrigeration, means health.

So we need energy bad and we can't just say let's not have energy. So nuclear, maybe it's a bridge, maybe it's unnecessary. I have never read a really good analysis.

Greg Dalton: A lefty who loves the U.S. Navy.

Kim Stanley Robinson: I do!

Greg Dalton: Okay, let's go to our next audience question.

Male Participant: I'm Peter Teague from San Francisco. I spent the last six months reading almost nothing but Kim Stanley Robinson.

Kim Stanley Robinson: Oh my god.

Male Participant: Thank you for a fabulous 6 months.

Kim Stanley Robinson: You haven't exploded?

Male Participant: It really has been an incredible pleasure reading you. And I love your incredible breadth of knowledge. It's just mind-boggling to me how many subjects you cover seriously and in very interesting ways. And there's also, I think there's a bigness in your writing. There's a generosity in your writing. Your appreciation for different perspectives I think for me has made me think about issues, as I read about Mars in the future I'm thinking about issues here in more creative ways and I really appreciate that. I have actually read I think all of your work except for the climate work and I've avoided it frankly because I feared losing that wonderful artist and gaining an advocate and reading an advocate. My question is, how do you write about climate without becoming an advocate who writes a polemic?

Kim Stanley Robinson: Well, my solution was to try to do it as black comedy. And thank you for your comments by the way, I appreciate that very much. And my climate trilogy *Forty Signs of Rain*, *Fifty Degrees Below*, *Sixty Days and Counting*, you've done well to dodge those. It's a mess of a novel, because I was trying to do many things. But I thought maybe a black comedy about global warming would be a good idea, I'm not so sure. But I have squeezed those books down to a single volume that has improved them markedly I think, embarrassing but true. And so this fall there will be a book called *Green Earth* that will be that climate trilogy squished down by about fifteen percent, and I think it's markedly better, so you might try it out then.

What I did there was what I usually do, is try to put a bunch characters with different views into the situation and see what they say. So there's a lot of Buddhists in that book trying to influence the National Science Foundation as being their quickest way to changing the world. And so by making it a black comedy I thought maybe I could deal with it without getting overwhelmed.

Greg Dalton: You're also publishing that book, Kim Stanley Robinson, a few months before the Paris Climate Summit, where potentially there might be a global deal on climate, if that's a conscious timing on your part. What do you hope will happen in Paris?

Kim Stanley Robinson: I hope for a grand deal. Everybody is saying this is an important one and they say that every time, but somehow maybe the groundwork is set, China seems on board. I don't know, what you think?

Greg Dalton: Jason Mark.

Jason Mark: I'm very cautiously optimistic. I do think the China-U.S. bilateral opened up some breathing space in the room. People who were like really -- a lot of people were talking about that like 2 or 3 years ago. I first heard that in I think 2012, that this China bilateral was going to come and that was going to hopefully be a little bit of a logjam. Interestingly now, it's the Indian government that's really now kind of holding firm and is going to be I think a bigger problem. And obviously that's a billion people who are in general energy poor and that's got to get figured out. I don't know, that's one those hopeful deals. You got to keep -- we gotta keep being hopeful and hope that there is a binding or close to binding -- I don't know. I mean, it's got to be -- it it's not binding it can't just be commitments. There's got to be some sort of thing that -- we need a science fiction writer to imagine what goes in between just paper commitments and binding agreements that can stick.

Greg Dalton: Yeah, but having U.S. and China rowing in the same direction is a big change. It's a big change; it's a game-changer.

Jason Mark: It's a big change. It helps.

Kim Stanley Robinson: Just to have a meeting that's high-profile is good thing no matter what

happens. And as to these coal countries India, Australia, Canada -- the coal is like bombs tied around to their chest. They walk into a meeting and they say look, you do what I want or else I'm blowing up my coal. So, it's a kind of a climate terrorism to get their political ends. So you have to pay them off because they do need the energy, so then it becomes a political act. Okay we'll trade you, keep your coal in the ground. We need to keep 2000 gigatons of fossil fuels in the ground or else we've cooked the planet. And Hansen is very good on this. Go ahead and burn all the oil on earth, but don't burn the coal because there's way more coal and that will cook us.

Greg Dalton: And that's where we come back to nuclear where the U.S. can provide nuclear to India keep the coal on the ground. There might be a grand bargain there. Let's go to our next audience question. Welcome.

Male Participant: Yeah, I'm James Callun with Virtually Green and years ago I worked with a little company called Maxis that developed something called SimCity which arguably I would say was largely responsible for at least a whole section of time wasters who ended up knowing a tremendous amount about systems and having to solve things by looking at things as an integrated system. You could not win that game by just throwing police stations at something or just throwing employment, everything connected. And I think it really caused a paradigm shift and even a lot of skills in youth and other people who spent an ungodly amount of time playing it. These days you have incredibly powerful multiplayer games online. Zynga released Farmville, for example. 37 million people in 3 months were playing it and they're paying for the privilege. And I would argue that there is -- that that context for storytelling for your stories for example is untapped.

Greg Dalton: So the climate positive Utopian games.

Kim Stanley Robinson: I agree with you that someone needs to do it. It can't be me, because there's an almost an existential difference between narratology and ludology. The difference between stories and games is profound. And I actually did a kind of nausea when I contemplate the choices and games. And my kids can do it, I can't do it. I need the story to be the story. And so I read novels compulsively and I write them where the story is the story. And when I was a bookseller selling "choose your own adventure" in the '70s, I used to hate those books with a passion because you can't choose your own adventure, the story chooses it for you. So I agree that there is a platform there for gamers and people who understand ludology to get it right and to teach people things. It's a wonderful genre but it's not my genre.

Greg Dalton: There is an organization called Cool the Earth. It teaches and goes into the schools around the country, K through 8th, they partnered with the founders of Guitar Hero, a very successful videogame, and did a climate game for kids to try to -- I haven't played it -- but people are kind of going down that path.

Greg Dalton: We have to end it there. Thanks to Kim Stanley Robinson, author of *2312* and Jason Mark, editor of the *Earth Island Journal*. I'm Greg Dalton you can listen to this and other Climate One podcasts in the iTunes Store. I would like to thank our audience here at the Commonwealth Club in Lafayette and those listening online. Thank you all.

[Applause]