Fire and Water: A Year of Climate Conversations

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Announcer: This is Climate One, changing the conversation about energy, the economy, and the environment.

In 2018, climate broke through the headlines... with fire and water.

[Newsclips]

Announcer: And conversations about how to adapt – and thrive – became more important than ever.

Lizzie Johnson: It's really hard to rebuild a normal life when your job is disrupted. You don't have housing. You're trying to rebuild but the resources aren't there.

Sylvester Turner: What we are needing now is funding to build a much more resilient city because there will be another storm, okay. Climate change is real.

Announcer: A Year of Climate Conversations. Up next on Climate One.

Announcer: I'm Devon Strolovitch. Climate One conversations – with oil companies and environmentalists, Republicans and Democrats – are recorded before a live audience, and hosted by Greg Dalton. On this special episode we look back at the climate stories of 2018 by listening to excerpts from a year of climate conversations – beginning with the fires in the American West.

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Higher temperatures and lower humidity, brought on by climate change, are whipping up hotter and bigger wildfires, taking damage to property, people, and ecosystems to a new level. In September,

Greg spoke to Lizzie Johnson, a Staff Writer at the San Francisco Chronicle, where covering wildfires is now a full-time, year-round beat, and to UC Berkeley Professor of Fire Science Scott Stephens, who's written about managing fire and forests in a changing climate. They began their conversation by hearing from Catlin Tucker, a part-time teacher who survived the 2017 Tubbs Fire north of San Francisco which killed more than 20 people and destroyed nearly 3000 homes, including her own. Tucker described what it was like to grab her kids and run for their lives in the middle of the night.

Catlin Tucker: There was no warning. The power had gone off our fan had stopped working. It was warm in our bedroom I thought that was odd but I knew it was windy and went back to sleep. And I woke up the next time around 2:30 and my husband had heard something outside and it was a policeman driving up our road yelling "You need to get out of your houses a fire is coming." I have two kids. My daughter is 11 my son is 9. So my heart was pounding and as we put them in the car it was almost like snow. The ash was thick already the smoke was so thick already. I think I was in shock about the whole thing when you don't have any warning that there could be a fire and then you're evacuated and you're worried about losing your home it's just so surreal. I mean I've obviously heard of people losing their homes in fire. I remember the fire up in Lake County a couple years before. The fire is now part of my story and I definitely still have trauma, are we building in the same place and that gives me some anxiety. People keep saying things like isn't crazy this has happen like so unusual and I can't believe this is happening. And now I feel like because of the choices we're making in terms of our climate, I just feel like stop saying this is crazy, this is so typical like this is the new norm. I think the new norm is gonna be one thing after another and that's what really scary to me is that I know how hard it is to lose a home and have your entire life disrupted because of that.

Greg Dalton: That was Catlin Tucker. She's currently living in the town of Sonoma while her family rebuilds their home in Santa Rosa north of San Francisco. Lizzie Johnson, let's hear about another victim, Ed Bledsoe, 76-year-old man. Tell us his story.

Lizzie Johnson: Yeah so Ed Bledsoe lives at near Redding with his wife and their two great grandchildren. And during the Carr Fire it swept him really suddenly he had just gone down the street to pick up a check from his doctor and, you know, all he was gone for those 15 minutes his wife and those little kids they were 4 and 5 years old they both burned in their home. And it shocked a lot of people just because it came out of nowhere and they were two little kids and they were some of the first victims of that fire tornado.

Greg Dalton: And Scott Stephens, one reason that Ed Bledsoe didn't take those little kids with him that day, it was 113°. So tell us how the high temperatures and a low humidity is kind of amplifying these fires we've seen recently in the West?

Scott Stephens: Yeah we have temperature like that and humidity. What it does is it just sucks out moisture out of fuel. So dead fuel certainly gonna get drier and we know that's happening already just because of climate change and warming. And even the green fuels can have impact from drought. So if you actually make fuel drier, you're just gonna be able to burn it easier and have higher intensity more flame lengths.

Greg Dalton: So climate is making it drier, hotter more, you know, amplifying these fires. Set the stage for us Scott Stephens in terms of the records that we're seeing. Are there really more fires or is it just our perception is it just because they're hitting urban areas. Because nationally there's actually fewer acres burned this year than last year.

Scott Stephens: I hear this a lot like, you know, fire areas up and things of that nature. I think fire

area in California is somewhat variable certainly. I don't think there's a big increase in trend may be starting to see a trend on that but as you said, we're seeing fires impact people. So when fires impact people and communities and kill people as we just heard, we're talking about major impacts. So that I think elevates the whole discussion that happens around fire and there's no doubt fire season is getting longer because of climate change, more variation, precipitation we can have fires on the ground longer that's absolutely true. But it's really impacting people's lives more and I think that's what happened with the conversation.

Greg Dalton: And so why are fires coming to people now more than in the past. I mean what is it about the last couple years that suddenly, now I've been covering climate for 10 years and kind of knew about fire, but it's really become kind of the headline issue the last couple years.

Scott Stephens: I think there's a couple of things. One is just bad luck, you know, we're getting fires in places where it is having them run at communities 100,000 people, 50,000 unfortunately and then they're hitting communities. The other part still is we're building in areas that are just more vulnerable. A great example, Napa Valley had a fire in '81 that actually burned maybe 50, 60 houses. The same perimeter 2017 burned 600 in that realm, you know, so you're seeing so many more people living in places that are beautiful, but they're fire places. So we're seeing them really have vulnerabilities and fires hitting them.

ANNOUNCER: Scott Stephens, Professor of Fire Science at UC Berkeley. While epic wildfires raged in the West, the southeastern part of the country was hit by ever-more powerful Atlantic storms. In September Hurricane Florence brought heavy rain and extensive flooding to the Carolinas, and in October Hurricane Michael became the third most-intense Atlantic storm to make landfall in the contiguous United States.

In February – well ahead of hurricane season – Greg Dalton welcomed the mayors of three cities on the frontlines of these mega-storms: Sylvester Turner of Houston, where Hurricane Harvey had recently dumped an unprecedented fifty inches of rain; Steve Benjamin of Columbia SC; and Francis Suarez of Miami. Greg asked Mayor Suarez, who had just been elected Mayor the previous fall, about his victory speech the night he won, in which he talked about jobs, transit, crime, housing… and climate.

Francis Suarez: We are Ground Zero for resiliency and climatic events that affect our quality of life. And I think what we're seeing is other parts of the world and other parts of the country are using that as sort of a counter brand against the city of Miami. And so they're saying, you know, yeah the city is great the low taxes, whatever, but don't go there because you're gonna be underwater. And so as mayor and as a father, you know, I have a four-year-old and a baby girl that's on the way, you know, certainly it's a concern that, you know, that impacts us on the short-term and impacts us in the medium-term, and certainly of course you wonder and you worry about the existential threat to the long-term viability of the city. So I sort of we passed right in my election what they call the Miami Forever bond which was in part a resiliency bond where our voters did something very unusual, they voted to tax themselves. Because the issue is so acute and it's so macro that, you know, they voted to create $200 million of resources for us to begin meaningfully dealing with our climatic events which include a range of things from king tide flooding to tidal surge during hurricanes to annual rainfall that is significantly greater than what we've experienced or what we have a capacity to experience. So I think any mayor responsibly should have made this and should make this a major priority, particularly if you're the mayor of Miami.

Greg Dalton: Mayor Benjamin, tell us how climate is it only sort of these frontline cities that are thinking about climate change Miami, Houston, you know. As we look around the country, where does climate rank in terms of traditional concerns for mayors, potholes, jobs, housing?

Steve Benjamin: It ranks very high. Climate mayors caucused, well over 300 mayors signed up. I'm also helping lead as one of the co-chairs of the mayor of Salt Lake City and the mayor of San Diego and Mayor Suarez is a former neighbor, the former mayor of Miami Beach, Philip Levine, mayors for 100% clean energy, those of us who are committed to clean and renewable energy. We've been joined by 200 of our colleagues all across the country who recognize that Washington DC may dilly dally at times and some of that dysfunction has the state government policymaking or the lack of policy-making. But mayors have to get the job done every single day and that's regardless of party, regardless of geography. In my city, our council voted unanimously, we vote unanimously on almost nothing I might add, unanimously to invest in new storm water infrastructure, $100 million to address our top problem areas in our city. We're gonna issue our very first green bond, you know, in the heart of the old south a deep red state. And I would tell you that our citizens are a lot smarter than people think they are, a lot more engaged and certainly care a great deal more about preserving the earth that we've inherited, but as Mayor Suarez mentioned, protecting it for our children yet to be here.

Greg Dalton: Mayor Sylvester Turner of Houston. I have to admit I was surprised when I saw that you are leading a group of mayors supporting the Paris climate accord being, you know, Houston, oil and gas companies, a lot of those oil and gas companies are trying to slow down the transition to a clean energy economy. So why are you back in Paris?

Sylvester Turner: Well number one it's the right thing to do. That's number one. And number two, we all want to leave a world better than the world that we inherited, okay. And so that's important. The science is real. We do need to make changes. And coming from Houston, the energy capital of the world, you know, we recognize that you can't just continue to do things the same old way and expect something different. That's not going to take place. And so it's in all of our best interest. And quite frankly, when you look at renewable energy and solar there are more jobs created in that arena than in the old traditional arena. And then when we look at the fact that we all are trying to build a more resilient city, what we want in the city of Houston, we want a stronger and more resilient city. And I don't think there's a better place to be able to make the argument that you can be the energy capital of the world and you can also place a great deal of emphasis on recognizing that there is climate change and looking at alternatives and making your city stronger and resilient. And the two don't necessarily have to be at odds with one another.

ANNOUNCER: Houston mayor Sylvester Turner on how his city is recovering, rebuilding, and preparing for the next mega storm. Although these hurricanes are economically devastating to the people and places they hit, in some parts of the world rising temperatures and seas will produce more moderate weather and even economic gains. In May, Greg Dalton asked about who wins and who loses in a warmer world with Katharine Mach, a Senior Research Scientist at Stanford, and Solomon Hsiang, Chancellor's Associate Professor of Public Policy at UC Berkeley. Greg asked him about the economic cost of a hot day.

Solomon Hsiang: What we found is that a hot day, over the whole 24-hour cycle is above 85 Fahrenheit. We see that people earn roughly $20 less at the end of the year, okay. Now that's just from the temperature there's nothing else, that's not related to anything else and that's per man, woman and child. So the analogy is okay every time it's a hot day I take 20 bucks and I just throw it away right because I'm just not gonna earn that money at the end of the year it starts to accumulate. And then you say okay well next year is gonna be just hotter and hotter and hotter and all that money that you could've been putting in the piggy bank, right and accumulating interest over time is all gone.

Greg Dalton: Katharine Mach, speak more to that inequity that's happening where the poor who contributed least are getting hit first and worst.

Katharine Mach: Yeah. So this question who's most at risk it comes down to a lot of different things when you're in a low income country context without the state support capacity there on the ground or the level of economic development to keep things chugging ahead. But I think this question of inequity is also really, really important. What a lot of social scientists like to say is that first of all, not all poor people are vulnerable and not all vulnerable people are poor. And the flipside of that is that wealth is not necessarily protection. So if we think about what's unfolded here in the U.S. whether it's the fires in Northern California, Sandy in 2012 in New York City or all of the cyclones striking the gulf coast over the past year, even within the city going block to block. You can have very different outcomes depending on are the elderly and infirm are the people who are most marginalized able to access resources from cooling centers to medical attention when systems start to fail in tandem.

Greg Dalton: And some of those systems to the point of breaking down. It's so hot in Phoenix that airplanes could not take off. It gets so hot that train tracks subways have to slow down. At what point we're gonna get to infrastructure just literally melting?

Katharine Mach: Melting or collapsing I think there are many profound ways where we have built our societies for stasis and stability and now we're in an environment of change. So what is that look like across the U.S. in Alaska for example, the ground is melting, right. The permafrost is thawing and whether it's pipelines or roads or buildings literally the ground is collapsing. And that's something we can see already there are astounding pictures of buildings tipping into the sea as you have the Arctic sea ice thawing, waste coming on shore. I think this question of heat is a really important one and that we certainly haven't designed everything for 118°F in Arizona come July, what have you. And that plays out in many profound different ways in particular in these environments where we've got transport and tight interconnection with electricity and tight interconnection with communications. And when you get a failure in one of those oftentimes it reverberates.

Announcer: Katharine Mach from Stanford University on winners and losers in a warmer world. You're listening to a Year of Climate One conversations. Coming up, we'll hear from more of Greg Dalton's guests, and the many ways they can help us respond to the climate crisis.

Christiana Figueres: I realized my commitment and my task here is to change that global mood. And of course I can't change the global mood before I change myself, because as we know all change starts with self.

Announcer: Adapting and thriving – when Climate One continues.

Announcer: We continue now with a look back at A Year of Climate One Conversations. From fires and floods to hurricanes and hot temperatures, 2018 put climate on the front page in ways it hadn't been before. It also forced people living on the front lines of the brown economy to confront what Berkeley sociologist Arlie Hochschild calls the Great Paradox: people in need of help from the federal government, but who are deeply distrustful of it. Hochschild's most recent book is *Strangers in Their Own Land: Anger and Mourning on the American Right.* She was joined on the Climate One stage by Eliza Griswold, a journalist at The New Yorker and author most recently of *Amity and Prosperity: One Family and the Fracturing of America*. Greg Dalton asked Arlie Hochschild about ways to get around the Great Paradox in order to reach people whose lives have been impacted by America's craving for energy.

Arlie Hochschild: In writing *Strangers*, I met an extraordinary person. His name was General

Russell Honoré. And he was a rescuer in 2005 of the victims of Katrina and he now has become an ardent environmentalist. He's leading the environmental movement. And I watched how he talked to non-environmentalists and he did not by arrogantly kind of disregarding the values and symbols of the people he is talking to but by acknowledging them and doing what I would call a symbol stretch. I'll give you an example. He was talking to a group of Lake Charles' businessmen whose mantra was freedom, freedom. They didn't want anything to do with environmental regulations. So freedom to invest your money. Freedom to make a lot of money. Freedom from onerous regulations. Freedom. And so he is talking to them. They don't like environmentalists, don't even like the word. And he says this, I woke up this morning and I looked out at Lake Charles, I saw a man in a boat and that man had his fishing line out. But that man is not free to lift up an uncontaminated fish. I thought, you genius. Oh, I followed him around for the next day, you know, just how do we do that. We need to do that with patriotism, not to say oh you're silly to be patriotic. No, of course not. We're patriotic too but what does patriotism mean. Doesn't it mean a free press, doesn't it mean an independent judiciary, doesn't it mean democracy. I mean you start with the symbol and you apply it more broadly.

Eliza Griswold: I think that's brilliant. I also think, you know, that one of the ways to do this is through a conversation about rights. In the book these two heroic husband-and-wife lawyers who are no environmentalists, I mean Kendra and John Smith. Kendra is a corporate defense attorney for railroads. She mostly deals with asbestos cases. And they take a case that defends Stacey and others against the companies and against the Pennsylvania against the government itself all the way up to the State Supreme Court. And they're trying, what their argument is they know they're gonna face a conservative Republican bench at the State Supreme Court level and they know that the argument that's going to work is what are our God-given rights. Right, these are all inalienable rights and in Pennsylvania, one of the rights in the Constitution is the right to clean air and pure water. And that has been on the books since the 70s, but it's largely been decorative it hasn't had any teeth. And because of the Smiths' case and their apt argument about our right to clean air and pure water the conservative Chief Justice of the Pennsylvania Supreme Court found in their favor. These are just terms to change.

Greg Dalton: George Lakoff is a Berkeley linguist who also says that purity is a key to unlocking to finding common ground using that conservative frame.

Eliza Griswold: So is the idea of conservation. Prudent use of resources for the next generation is a much better thing than liberal -- also here's something you might not think about for people who are living in rural places who hold conservative values. For people who live in cities to come out to them and tell them about the environment they're just gonna flip you the bird because oh you are so divorced from the land you care so much about the land that you live in New York City, what a joke. That's their understanding and just I mean another way to just flip the script and see that for a second that's the understanding.

Arlie Hochschild: And it's not that they're against regulation just to follow this out. For example, Ducks Unlimited that's regulation, but because they love hunting and know every kind of duck and what kinds of birds and, you know, what number of days and what month. They don't mind that regulation at all.

Announcer: Arlie Hochschild and Eliza Griswold, authors of two books that paint an honest portrait of a misunderstood America. The deep divisions in our country are often at their most visible in Washington DC. Yet Republicans and Democrats are not always as divided on climate as Washington politics makes it seem. In February Greg Dalton welcomed two guests from opposites side of the aisle who've found common ground advocating for clean energy. Debbie Dooley was one of the original founders of the Tea Party and is a staunch supporter of Donald Trump. Christine Pelosi,

daughter of Nancy Pelosi, is Executive Committeewoman of the Democratic National Committee. They agree that being good stewards of the environment should not be a partisan issue. So Greg asked Debbie, who used to be on the board of the Tea Party Patriots, whether she gets any flack from her Tea Party friends as she advocates for climate-friendly choices in energy markets.

Debbie Dooley: No. I mean, you know, to be honest no. But I can remember during, I think it was President Obama's last State of the Union address. He kind of referred to me, you know, when he said, "Hey, in Georgia, Tea Party members agree with me on energy." And he talked about green eyeshade, and I had a text message on my phone "President Obama just was talking about you in his State of the Union address" no because when you stop and think about it the key is education. When people find out the facts, oh they're totally on board. They don't like electric monopolies. If you go into a conservative or Tea Party meeting and you make the big corporations or the electric monopolies, the bad guy instead of the Kentucky coal miner the bad guy. You're gonna have a much more receptive audience. I'm having great success among Tea Party activists.

Greg Dalton: On the impacts of fossil fuels. You grew up in Louisiana, Deepwater Horizon. Tell us, you know, what's happened. Louisiana is feeling a lot of impacts with coastal erosion, sea level rise. The move has the news has moved on from the Gulf Coast from 2010, but its impact still being felt there with the people you know?

Debbie Dooley: Well just recently there was a bipartisan group of elected officials in Louisiana that are suing the big oil companies over erosion of the marshlands. And the reason marshlands are important in Louisiana is because when a hurricane comes slamming in from the gulf, you know, the marshlands are a buffer they kind of help slow the hurricane down. So people are deeply concerned because there is if you look at the map satellite images you can't say that the marshland and coastlines aren't evaporating. So, you know, people are waking up, it's taking them time but conservatives are waking up when it comes to that.

Greg Dalton: Why is there such a gap between the Republican rank-and-file in the country and their elected leaders. We heard that the Trump voters support research into renewable energy want to attack carbon pollution, and yet that's not what people in Congress and even the administration are doing.

Debbie Dooley: Follow the money.

Christine Pelosi: I think she's right. I would echo that on the Democratic side before you get to me. Same thing, follow the money because I think that our activists are against fracking. The strangest thing a few years ago in 2014 when I came out against fracking, I actually got death threats on Twitter, who threatens to kill somebody over opposition of fracking? But it was interesting because as it turns out, you know, where California, we're San Francisco, earthquake country, hopefully not during this broadcast. But when you look at the earthquakes that are happening the USGS studies that earthquakes are happening in Ohio, they're happening in Oklahoma and that do have a connection to fracking. Again, follow the money. We only really won the rhetorical point when the head of Exxon as it turns out opposed fracking on his block because he just bought a new house and he didn't want to contaminate his drinking water. And so he said see, alright now there's a market-based solution for you but it's still there. So I do think you have to follow the money in both parties and say if you took out the big money and you took out the money that's funding the think tank based studies and you just looked at the facts, I would bet you most of the decisions would be made closer to where the people are which I think there is a climate action majority in the country.

ANNOUNCER: Christine Pelosi, Executive Committeewoman of the Democratic National

Committee, and daughter of Nancy Pelosi. You're listening to a Year of Climate One Conversations. Trying to build coalitions between Republicans and Democrats is one thing; what about trying to find common ground among 195 countries? That was the task for Christiana Figueres, former Executive Secretary to the United Nations Framework Convention on Climate Change. She led the negotiations at the Copenhagen summit in 2009, which failed to yield a comprehensive agreement, and the triumphant Paris Summit six years later. In between she found herself exhausted, emotionally drained, and ready to pack it in. At a Climate One event in September, Greg Dalton asked Figueres when she felt she'd hit bottom, and how she got back up.

Christiana Figueres: I do remember the first press conference that I had when, you know, we were all still writhing from the pain of Copenhagen. And I was asked by a journalist and I had not done my press training so my press team was sitting there, you know, going like, oh my God, what is she gonna say. Because the question was, so Ms. Figueres when do you think we're ever, you know, do you think we're ever gonna be able to reach a global agreement? And the first thing that came out of my mouth was, not in my lifetime.

Really helpful. And my press team was like frozen over there. Let's get her some press training. But Ihad never thought about the consequences of not having a global agreement. And the moment that it came out of my mouth, I kind of looked at myself, you know, when you have a distance, hold it who is that person who just said that because that is so irresponsible and is so unacceptable. And that's the moment when I said, right; my commitment here is to change that because I think I had voiced the global mood on climate change. And I realized my commitment and my task here is to change that global mood. And of course I can't change the global mood before I change myself because as we know all change starts with self.

Greg Dalton: But a few years into the job you were having a difficult personal time. Tell us about that.

Christiana Figueres: Also, yeah, I mean, everything comes together, right. It's a wonderful package that life gives you. The United Nations terms, at least for the climate convention, a three-year term, and at the end of my first term I was asked by the Secretary-General will you do a second one. And I was like, can I think about that because I was having a traumatic situation in my personal life. I was exhausted from working 27 hours a day, eight days a week. And I just thought, you know, this process really need someone who can come with just incredible strength and renewed vigor. And I was seriously thinking of saying, thank you but, you know, let's find someone else. And as life would have it, my brother and sister who have lived in Costa Rica their whole life expressed their interest in celebrating my sister's 50th birthday that was August of that year by coming to Europe to see a glacier for the first time in their life. And I thought, wow, that's so beautiful, right. So I said, my treat, you come up, I will organize the whole thing. So they came over and we went up in the gondola in Austria. We went up in the gondola. And I remember coming to the point in the gondola where you begin to see the top of the mountain and I just totally lost my breath because there was nothing like white. There was no ice. It was a completely brown bare top of the mountain. So, you know, a completely iceless glacier is not what you expect. And the impact was so deep on me that I remember stepping out of the gondola with my brother and sister and just falling to my knees right there and saying this is a lesson learned. It doesn't matter if I'm exhausted. It doesn't matter, you know, if I'm in full pain, I just gotta do it. So after we got down I called the SG, the Secretary-General, and I said, sir three more years of service, here we go. And sometimes you just really need those knocks to understand that we're not here to just embark on the easy stuff, I mean, honestly, right, how boring would it be if you're just here for the easy stuff. This is something that needs to be changed and it is going to be changed. How exactly, we never know at the beginning. But you've got to say this situation is unacceptable. It is morally unacceptable. It is financially stupid. It is environmentally terrifying. It is humanly unacceptable.

ANNOUNCER: Former UN climate negotiator Christiana Figueres, refusing to give in to climate or personal despair. But is despair necessarily a bad place to be? As a soldier in Iraq, Roy Scranton taught himself to meditate as a way of accepting the possibility of his own death, so that he could then tell himself okay that's done, now what do I do? His recent book, *We're Doomed. Now What?* Is a similar mediation on what he sees as the death of our way of life. Earlier this year Greg Dalton asked Scranton whether a change of consciousness could help us come to terms with climate despair.

Roy Scranton: The question that sort of sits with me and that I can't stop thinking about is why are we so afraid of letting this go. This is all gonna change and that's manifest. And yet we cling to it desperately. We refuse to accept its passing. We can walk up to the precipice and think about it for a moment and then we have to do something. We have to get up we have to go fix something, we have to coordinate, we gotta do something because this is really -- it can't happen like that, right. We're not going out like that, right. We're a better nation, we're a better civilization, we're a better species, we're better beings than that, right. We're not just gonna let this happen to us. And then we go back, right, we go back right into the same things we were doing the day before, right. We have a feeling and then we react to it and we're stuck in this cycle of emotions and reactions, right, because we keep denying denial. We keep saying no, I'm not gonna think about what it would mean for all of this to go away. I'm not gonna think about what it would mean to my family or my friends, because it's scary and it makes you sad and there's no good solution at the other side, right. This is all just possible and in fact inevitable, right, we're mortal beings, right. Loss is just a part of being human. And that this world and this way of life is evanescent, right. We're a growth of carbon scum on a rock in the middle of space, right, which is beautiful what we've done, right. And there in that space of negativity, right, in that meditation on the nothing, right, and on letting all this go, going through the process of willing to just let it all wash away. Then in that space I think something new might emerge. That space is where new thoughts are possible, right, new visions of the future that aren't just reactions to another vision we don't like, right. I think going into the hard dark difficult thing and staying there, right, as much as we can, is the only way I think that we're gonna come up with something new, some new way, some better way to deal with the realities of the situation, right, to deal with what is going to be objectively a difficult time, right, for everybody. So I'm all for despair. I think it's a good place to be.

ANNOUNCER: Roy Scranton, author of *We're Doomed. Now What?* You're listening to a Year of Climate One Conversations. Coming up, we'll cure the climate blues with some techno-optimism as Greg Dalton asks about climate-friendly innovations from for getting around town, powering your cell phone, and eating meat without animals.

Mike Selden: What we're doing is taking what was previously medical technology like 3-D organ printing and applying it to food. So the technology exists it's just a matter of dropping the cost to the point where people can afford it.

ANNOUNCER: Cool clean tech and more – when Climate One continues.

Announcer: You're listening to A Year of Climate One Conversations. In May, Greg Dalton welcomed three members of the new generation of entrepreneurs who are fighting global warming by advancing clean technology. Gabriel Kra, Managing Director at Prelude Ventures. Lidiya Dervisheva, an Associate at G2VP. And Davida Herzl, co-founder and CEO of Aclima. Greg began by asking Davida how Aclima is using hyper local data to better understand our environment.

Davida Herzl: Last year we published the results of a major study in partnership with our partners

at Google, the Environmental Defense Fund and the University of Texas, where we proved that our methodology where we take our sensing platform what we refer to as our environmental intelligence platform instrument vehicles and then drive around communities and cities to be able to take a snapshot of pollution sort of the urban scale, but at hyper local resolution so we can understand emissions down to the scale of a parcel. We can understand risks to pollution exposure down to that level.

Greg Dalton: And do some companies who are emitting pollution are they trying to push back against because that kind of transparency hasn't been available before, right? So are polluters pushing back?

Davida Herzl: So, you know, I think what's happening is that industry is really coming to terms with the fact that these new technologies are becoming broadly available. And instead of pushing back what we're really seeing is one, a hunger and a desire to really understand this data because in many instances, it can actually help companies reduce their own emissions. But also I think there's been a massive gap in the marketplace for this kind of environmental risk data, right. Environmental risk is now financial risk. Not just to society at large but to a lot of these companies and the emitters themselves, who now are embracing this development and really engaging in conversation with us. That's the approach that we're taking and seeing.

Greg Dalton: Gabriel Kra, you invested in a company called Ripple Foods by a couple of veteran entrepreneurs. Tell us what they're doing trying to do Ripple Foods.

Gabriel Kra: Well Ripple Foods makes pea milk and a lot of other non-dairy products. The two founders, each of whom were successful entrepreneurs, took a look at how dairy is produced. Milk, yogurts, cheeses; it turns out there's a lot of carbon embedded in that production ecosystem. Raising cows takes a lot of energy and carbon and then cows produce a lot of methane in how they digest their food. So if you can just take cows out of the dairy equation then you can actually save a lot of energy and impact climate change. But you're not gonna do that just by telling people to drink something that doesn't taste good. So Neil and Adam make a delicious frothy nutritious milk product that is made entirely out of plant protein. And so this thing, this company it impacts tons of people's lives. We get calls we get testimonies from parents who are saying, "Wow, my kids couldn't drink milk and now they have a delicious product that they want to drink." But we don't want to just go after the part of the market that was already drinking dairy alternatives. We're going after the mainstream market and we now have traditional milk or unsweetened milk, we have chocolate milk we have vanilla milk. We have yogurts that are launching, we have half-and-half and not only are we selling this but we're saving CO2 and we're making a bunch of money. So it's kind of for us the best kind of thing the best kind of company to invest in.

Greg Dalton: Lidiya Dervisheva, lot of wealth is expected to be created in this transition from fossil fuel economy to a cleaner economy and yet Silicon Valley kind of walked away from clean energy. Tell us about that.

Lidiya Dervisheva: Sure. So the fund that I work for is called G2VP, G2 Venture Partners. And we spun off from the Green Growth Fund at Kleiner Perkins what used to be the clean-tech fund started back in 2008 at the dawn of clean-tech when everybody was investing in solar and new biochemical biofuels and that was kind of where all the hype was. And what ended up happening is that a lot of these investments didn't really transform into these, you know, unicorns that everybody was expecting; not everybody made their returns in fact, many people lost a lot of money. And that sort of led to this second-generation the Cleantech 2.0 movement that's one way to call it which is sort of like a new way of thinking of what clean-tech means and what you can perceive as clean-tech. So it's not only the way we generate energy. So it's not only, you know, solar, wind, tidal and fusion

and so on but it's actually the way we use energy the way we conserve energy. The way we figure out better ways to use the resources that we currently have. And that's where a lot of new interesting business models come in. And that's where what we are focusing on G2 is how do we leverage these new business models. How do we, you know, create new exciting startups out of technologies that already exist, but apply them in a new creative way with, you know, amazing teams and scale these companies.

ANNOUNCER: Saving the world – one clean-tech start-up at a time. Ripple Foods isn't the only company trying to reduce the carbon footprint of our diets. This summer Greg Dalton spoke to Mike Selden, CEO and cofounder of Finless Foods, a startup that's developing a way to make tuna that comes from a lab, not the ocean. And Pat Brown, founder and CEO of Impossible Foods, maker of the plant-based Impossible Burger. Greg began by cutting right to the chase.

Greg Dalton: Mike Selden, how are you gonna make tuna without a fish?

Mike Selden: Cutting right to it, yeah.

So saying entirely without a fish is not a hundred percent what we're doing, right. We are taking a small sample of meat from a real fish but the idea is one sample from one fish once. Pulling it out of that fish just isolating the cells that grow the fastest and then growing them up in large quantities in the same way they grow inside of the fish. So these cells already exist inside of the system that we are taking them from and in the system they already do this function, which is to become meat. We're just taking this process from inside of the fish and replicating it outside of the fish. So it is in every way replicating the same sensory experience of meat because it is really fish meat.

Greg Dalton: And what stage is your company and when will there be products available. I think you're gonna start with little pieces of sashimi, right. When are you gonna be out in the marketplace?

Mike Selden: Yes, we're a very young company we just started last year. We've already made some good progress but we're still in an R&D stage we're doing some initial sampling last year in September we had the first ever tasting of fish created without needing to kill any fish. And that was like really exciting. So since then we've moved over to Emeryville just over the water and we now have a lab and a staff and we're moving forward in order to basically drop our costs because really what we're doing is taking what was previously medical technology like 3-D organ printing and applying it to food. So the technology exists it's just a matter of dropping the cost to the point where people can afford it. And so we intend tto have a product ready for market by the end of 2019. But we'll probably see it actually available in mid-2020.

Greg Dalton: Pat Brown, your company is more mature. Tell us about your journey from Stanford medical professor to entrepreneur wearing a hip-hoodie and –

-- you change your white coat for a green hoodie.

Patrick Brown: Yeah, so for most of my adult life I worked as a basic research scientist microbiologist. I was at Stanford medical school for about 25 years as a professor and loved that job and had zero interest in business and very little interest in food. I mean, I like to eat food but I don't think about it when I'm not eating it, but I had a sabbatical little over eight years ago that gave me time to sort of step back from what I was doing, which was, you know, basic molecular cell biology and genomics and cancer research and stuff like that. And try to think of what's the most important thing I can do given the things I'm capable of doing, which is limited set of things. How can I have the highest positive impact on the planet and I very quickly realized that the use of animals as a

technology for producing food is by such a humongous margin, nothing comes close, the most destructive technology on earth. Probably the most destructive aspect of it is that right now it occupies about 50% of earth's land area either grazing or feed crops, cows outweigh every wild animal, every wild vertebrate left on earth by a factor of 10. And we are very and the total number of living wild animals on earth according to the World Wildlife Fund has dropped by half in the past 40 years. There's half as many wild animals on earth today and that's pretty much across-the-board mammals, birds, reptiles, amphibians. And it's almost entirely due to our use of animals as food. And what I realized was, you're not gonna solve the problem by telling people to change their diets. And the only way to do it is to beat the incumbent industry in the market, develop a better technology that's much more sustainable but it has to also produce more delicious, more nutritious, more affordable food because that's how you win in the market. And I was sure that that was doable although I didn't know how to do it at the time but I felt like it. Nobody else was really trying and so I would just go all in on it and I founded this company and start putting together the just by far the best R&D team ever to work on food and studying meat as if it were a disease. I mean just the way that we would study cancer in my old lab trying to understand the fundamental mechanisms that underlie the flavors and textures and juiciness in biochemical term so that once we understand the mechanisms we can find plant derived proteins that are more sustainable that have the same salient properties and make a product that outperforms meat in the ways that consumers care about.

ANNOUNCER: Pat Brown, creator of the meatless Impossible Burger. Another sector where old behaviors and technologies are being challenged is transportation. Electric scooters, skateboards, and bicycles have been sprouting on sidewalks and in parking spaces all around the country. Greg Dalton talked about these new wheels in town with Megan Rose Dickey, a senior reporter with TechCrunch, and Sanjay Dastoor, cofounder of Boosted Boards and CEO of Skip Scooters. Greg asked him why this is all happening now.

Sanjay Dastoor: It's a few things. So I think there's broadly this push towards the bike lane being a way to solve a lot of the transportation needs, especially the density or a campus or a dense neighborhood. And I think a lot of that comes from whether the car lane is serving us better over time, or worse. And I think there's a lot of evidence that suggest that the car lane is less and less of the best solution for certain types of trips, especially in cities. And as cities get more dense and as, you know, e-commerce delivery trucks are blocking lanes or as Lyft and Uber cars are pulling over there's a sense of well is the car lane really the fastest, most effective way to get around. And so the bike lane has seen a growth in popularity. So if you look at the even long-standing programs like Citi Bike in New York using ridership grow and the popular to the program increase. And then separately there's a technology component to this. Now everyone has a smartphone, they can hail a car just, you know, by pushing a few buttons on that phone. You can embed those same phone components into a vehicle for very low cost. And now these vehicles can have GPS, they can have sensors to detect if they fallen over or not. They have full time, you know, SIM card, cellular connection to the Internet that's all been brought about by smartphones. And so if you look at the cost of building something comparable to the Segway from 15 years ago in performance it's much less expensive today. And then it's also being used in a way where people feel oh this is actually a better solution for me than the car that I used to use.

Greg Dalton: Megan Rose Dickey, transportation is a big sometimes number two expense for some people after housing. Is scooters and bikes kind of making mobility more affordable and accessible for low-income communities?

Megan Rose Dickey: I would definitely say more affordable but accessibility kind of depends on the company itself. And like one example so with Jump bikes which sold to Uber, they first launched in a low-income area in the city of San Francisco to just to kind of more deliberately say like, hey we want to make sure that this is accessible to low income people from the get-go. And then once we

know that that's going to work there then we'll kind of broaden out the like the pilot program essentially. And that is part of the requirement for San Francisco's permitting process to show okay how are you gonna make sure that your that this form of transportation is accessible to underserved communities.

Announcer: Thoughts on the new urban mobility. Now, no Climate One retrospective would be complete without a quick tour of the Lightning Round. That's the part of the show where Greg Dalton puts his guests through the gauntlet with a few "hard-hitting" true/false or word-association questions. It's a chance for the experts to throw caution to the wind – mostly.

Greg Dalton: We're gonna go to our lightning round in which we ask quick questions and quick answers. The first one for Debbie Dooley. A liberal you'd like to go out drinking with.

Debbie Dooley: Al Gore.

Greg Dalton: Okay. Christine Pelosi, a conservative you'd like to go out drinking with?

Christine Pelosi: Debbie Dooley.

Debbie Dooley: Can I change my answer to Christine?

Greg Dalton: Sanjay Dastoor. What comes to mind when I say scooter-bros?

Sanjay Dastoor: Unfortunate.

Greg Dalton: Megan Rose Dickey. Zombie cars.

Megan Rose Dickey: Dramatic.

Greg Dalton: Pat Brown. Grass fed beef.

Patrick Brown: Clean coal.

Greg Dalton: Mayor Turner. South Carolina Governor Henry McMaster.

Sylvester Turner: Oh, that's Mayor Benjamin's problem.

Greg Dalton: Mayor Benjamin. Suppose a relative bequeathed you $1 million. Would you spend it on an oceanfront condo in South Florida?

Francis Suarez: You couldn't get one for a million dollars.

Greg Dalton: Debbie Dooley, a liberal you'd like to take sport shooting at a firing range.

Debbie Dooley: Probably Bernie Sanders.

Greg Dalton: He's, yeah, gun state, Vermont. Christine Pelosi, a conservative you'd like to introduce to dreamers in their home.

Christine Pelosi: Well, provided that ICE wasn't far behind, Mike Pence.

Greg Dalton: Lidiya Dervisheva. True or false. Venture capitalists are not as smart as they think they are?

Lidiya Dervisheva: False.

Greg Dalton: Davida, you have a fully stocked earthquake disaster kit in your home. True or false?

Davida Herzl: False. I like risks.

Greg Dalton: True or false. Katharine Mach, many natural scientists need to learn how to speak plain English?

Katharine Mach: True.

Greg Dalton: Sol Hsiang, true or false. Economists are people who don't have the personality to be accountants?

Solomon Hsiang: True.

Greg Dalton: Mike Selden. True or false, fish is your generation's cigarettes?

Mike Selden: True. And I say that all the time. Did you take from one of my talks?

Greg Dalton: Yeah, when we talked on the phone.

Mike Selden: There we go.

Greg Dalton: Sanjay Dastoor. True or false, one day a big automaker will buy an electric scooter company?

Sanjay Dastoor: True.

Greg Dalton: Last one. True or false. Megan Rose Dickey, you recently visited a tooth straightening startup and found out you needed a root canal?

Megan Rose Dickey: Yes. But what does that have to do?

Greg Dalton: I don't know. I just saw it on your Twitter feed so I figured --

Megan Rose Dickey: Yeah, root canal is done I have my crown. It was a whole thing but, yeah.

Greg Dalton: Things you do for your job. Let's give them a round for getting through that lightning round.

Announcer: Just some of the unfiltered truth and bare-knuckle journalism that went on at Climate One in 2018. We hope you've enjoyed this look back at a Year of Climate Conversations with some incredible speakers. To listen to any of the complete programs, visit our website, climate one dot org, where you'll also find photos, video clips and more. And be sure to subscribe to our podcast to hear more conversations about energy, the economy, and the environment.

Greg Dalton: Climate One is a special project of The Commonwealth Club of California. Kelli Pennington and Sara-Katherine Coxon direct our audience engagement. Tyler Reed is our producer. The audio engineers are Mark Kirschner and Justin Norton. Anny Celsi and Devon Strolovitch edit the show. I'm Greg Dalton, the executive producer and host. The Commonwealth Club CEO is Dr. Gloria Duffy.

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