Resilient Cities

https://www.climateone.org/audio/resilient-cities
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Greg Dalton: Disaster officials at New York City knew for years that rising and warming oceans could create a storm surge that would slam Manhattan. And they felt they had a couple of decades to prepare for scenarios fit for an apocalyptic B movie. Then came Superstorm Sandy. In 2012 the Atlantic Ocean gushed into the New York subway, closed the New York Stock Exchange for days, fried the electric grid in much of the region and cost $70 billion in damage. After the disaster, the cover of Bloomberg Business Week Magazine proclaimed "It's global warming, stupid."

I'm Greg Dalton and today on Climate One we're talking about how climate disruption could hit the Bay Area and what is being done to build communities that are prepared and ready to bounce back. This year we've seen smoke from forest fires and heat waves causing health problems for some people. If El Nino shows up, that could bring another set of challenges for homeowners and the region's roads and water systems. Over the next hour, we'll discuss what individuals, governments and businesses can do to get ready for wacky weather here in the Bay Area. We'll talk about what is being done to protect poor and vulnerable communities that are least equipped to deal with storms, droughts and other events that are amplified by burning fossil fuels. Along the way, we'll include questions from our live audience here at the Bay Observatory at the San Francisco Exploratorium. And this program is underwritten by our friends at the San Francisco Foundation and the Seed Fund. We're pleased that we have with us three guests. Nile Malloy is former Northern California director of Communities for a Better Environment, an advocacy group. Patrick Otellini is chief Resilience officer in San Francisco. He'll tell you what that means. And Laura Tam, sustainable development policy director at SPUR, a civic organization. Please welcome them to Climate One.

[Applause]

Thank you all for coming. Laura Tam, look around the Bay Area, nine counties. What are the vulnerabilities and risks for climate related severe events?

Laura Tam: Well, there's many different types of climate related events that we all have to prepare for.

There's extreme heat, we're expecting climate -- the range of temperatures by the end of the century to be four to seven degrees higher than they are today. There's more extreme wildfires, there's sea level rise, there's extreme storms and flooding which we may get a preview of this year with expected El Nino. And there's the drought that we've been having for so long in California, a preview of changing rainfall patterns and whether or not California is ready for -- is resilience in terms of its water supply. So all nine counties have kind of a different set of risks to deal with but all of them could be impacted by these changes in some ways. If the more bay shore that they have or ocean front they'll have more potentially more vulnerability to sea level rise and the erosion that happens on the coast side. And we all have to prepare for heat and more extreme heat waves, which is something that our built environment has not been built around. We're accustomed to cooler, foggier places, only 10% of housing has access to air-conditioning.

So we have a lot cut out for us and we have a lot to do to prepare.

Greg Dalton: If you could live anywhere on the Bay Area, where would you be -- and price was not

an issue Laura. Where would you live, where would you move to, is there some place that's better than others?

Laura Tam: Well, I think that the closer you are to the coast, the more likely you are to have some of that natural air-conditioning that we have. Although we are expecting and have seen over the last 100 years a decline in coastal fog, I think it's something like we have three hours less each day of coastal fog than we used to have in 1900. So, the coast is getting warmer but I think it's still the coolest place -- it's the best place to cool off and it happens to be where I live right now. So, I'm happy.

Greg Dalton: Close but not too close. Nile Malloy, some communities are more vulnerable than others and they often a lot of times it's the poor communities that are in low lands, near the bay. But tell us who's most at risk?

Nile Malloy: Well, who's most at risk here is, you know, in the Bay Area about 70% to 100% of environmental health hazards are in kind of communities of color like Richmond, Oakland, East Palo Alto and other places like that. So they have this kind of compounded risks. Not only their environment health hazards, air quality and pollution would actually increase but, you know, increase heat and et cetera. But they also have risks of this kind of like access to resources, you know. So the low-income communities don't have ability to have public transit near them. They have concerns about getting transportation, they have a problem on that. Issues of just jobs. There's a lot of joblessness and I think sometimes we talk about climate change; unemployment is really part of that too. How can you actually afford to be able to take action on behalf of yourself and your family? Access to clean and healthy food, you know, healthy food options are a concern in the community. And also various other health ailments, that I think a lot of our communities actually have, you know, if you have an obesity problem or if you have other, you know, asthma or other respiratory illnesses or things like that. That triggers concerns around how to be able to basically move and maneuver yourself out of that.

So I think those are some of the issues that we've been addressing and work is that some of the social vulnerabilities are just there and when you compound it with climate change, you're even more at risk. And so some of the work that we've been trying to do, is trying to really assess in this community base, you know, the community bases where these vulnerable communities are at, just trying to figure out what do they actually need, what kind of resources, the capacity that they need. And do kind of community based training and education in those areas. Just kind of figure out how they need to prepare, how they need to address the risk and also how to connect it through their real day to day lives. You know, climate is a new like another compounded issue that's facing communities. How do you address this issue when you have other concerns about your health, access to healthcare, immigration issues, et cetera?

How do you talk about climate in that real time sense? So we're talking about preparedness and what need to do to be prepared is pretty much, you know, kind of ten types of priorities probably like in the last priority what's it about. How do we prepare for climate change, you know. So I think the reality is that, you know, the vulnerabilities are existing. And so how do we really move the conversation forward to really get them to talk about climate, understanding sea level rise, understanding heat issues. Talking about the drought which is a very popular issue and talk about energy, you know, a lot of people talking about clean energy as well. So how do we talk about those things in relation to the challenge of the climate change but also addressing their social vulnerabilities?

Greg Dalton: We did a program at Climate One called Green Latinos and one of the learnings from there was to frame climate as a health issue rather than polar bears and grandchildren. But you talk

about a health issue that brings it home for a lot of people.

Nile Malloy: I mean working in Richmond, California, you know, you had the largest greenhouse gas polluter in the backyard, Chevron. And so, dealing with that, there's the history of the community knowing about health asthma risks, health concerns, cancer, cholesterol, breast cancer and other related issues. And so anything around that already have the resisting elements talking about climate change is another thing. It's like oh I understand that because I see it's a big major polluter.

But other communities like in Oakland there's no major polluter like that, you know, so in our work we talk about diesel trucks. We're talking about particular matter 2.5, which actually cause trigger asthma related issues and how they're in close proximity to neighbors. And since we also scan that in terms how it connects to food, where did your food come from. A lot of our food just comes in, just gets shipped into us. So we talk about goods and how do our goods come in our community. So, when we talk about vulnerabilities, it's really like grounded in like their real-time health issues primarily but also at the end of the day it's about really the climate, how do you get to the climate issues through various needs?

Greg Dalton: Patrick Otellini, you are the chief resilience officer of San Francisco. So tell us what you do, what that means and how San Francisco is getting ready for earthquakes, can't forget about earthquakes and other things that could be coming our way?

Patrick Otellini: I'm really glad you mentioned earthquakes because my other hat that I wear for the city is the director of earthquake safety. And I think that that maybe somewhat unique to my colleagues around the globe right now that are being appointed as chief resilience officers. And I think it speaks to the local nature of how people are interpreting what resilience means and how are we going to develop a position that in my mind is kind of part expert on particular subject matters but I also think it's ridiculous to think that a person in my position would be an expert on all things in this space. So I've always said that I can see this role more of a conduit than anything else. It's not necessarily my job to be the expert on sea level rise; it's my job to know who's working on sea level rise both on the community and in government and try to connect those folks together. And try to create that cross-communication that doesn't often happen in government silos. So I think that's just as much of a role around that as it is traditional hazard planning and things of that nature.

Greg Dalton: And San Francisco, let's talk about San Francisco because Mission Bay in fact I remember interviewing Mayor Lee and others saying the city just put billions of dollars of new property into Mission Bay, it's landfill, it's close to the bay and yet no real scientists or the city doesn't really know what are we planning for. How many inches of sea level rise by what year? So how can the city, what's the city assumptions and what are we planning for, Patrick Otellini in terms of sea level hazard?

Patrick Otellini: Well I think when you talk about any type of development, you really get back to what are the minimum standards. And in this case our minimum standards are governed by the building and planning codes. So I think you're seeing, you know, where you would take something like earthquakes where seismic safety and our modern codes have been around for 30 plus years. We started to develop our codes in such a way that now we can design for that. I think sea level rise, we're sort of where we are now kind of like the seismic community was 30 years ago. We've done some great work in this space. The city is the first city in the nation to pass capital planning guidance on city level rise. So if we're at the city department going to the well for more capital planning funds, we have to do sea level rise planning.

Now that's just the first bite of the apple. That needs to be translated into what really make sense

for folks, but you mentioned Mission Bay, you know, my great grandfather worked on the railroads in Mission Bay. And there was a reason why there was no building there. There was local flooding all the time, it's a bunch of mud but also you saw the private sector start to respond during the development boom out there. You'll almost never see a basement in Mission Bay. Almost every single building has a slab on grave with piles that go down anywhere from 75 to 150 feet. You also saw some innovative things that you've never seen in building in California, you know, people are starting to put their emergency generators on the second floor instead of the first floor. And these are all wise decisions but they're completely voluntary at this point. So I think the big challenge in front of us with sea level rise just to figure out what make sense to mandate for say new buildings, but also that doesn't really do us a lot of good when most of our cities are already built out. We have to come up with a comprehensive strategy to address existing buildings. And that, in my mind is the more complicated issue, you know, how do you take an old building and start to adapt it for sea level rise, it's a lot easier said than done.

Greg Dalton: Laura Tam, one of the missing links here is clear numbers from the scientific community. Because scientists have ranges, maybe it'll be this much or maybe that much, we're not really sure depends on how fast Greenland melts, et cetera, et cetera. So there's scientific uncertainty and I've talked to developers who say give me a number, I'll build to that. But you can't get a hard number from science -- so do scientists need to change? Talk about that tension frustration getting that clear number from science.

Laura Tam: Well, I think that, you know, there is a lot of uncertainty around that trajectory of climate change. And a lot of it depends on how good we are as a world at controlling greenhouse gas emissions. And we'd like to stay optimistic and hope that maybe we can control it to a level where like the baseline of sea level rises only reflects the omissions we've already omitted and that's maybe four to six feet of sea level rise. But, you know, we right now are, I mean, we could become more hopeful perhaps about hoping that the world would collaborate and you see efforts by the US and China and others leading up to Paris this December to try to come up with the way to try to get emissions within that two degrees guardrail but of safe climate change.

But I think that, you know, there is a lot you can do even within the level of uncertainty that we have. You can adopt a more conservative standard and you can do scenario planning. So, developers can say and this is exactly what Patrick is referring to at the city of San Francisco's capital planning guidelines that say, what kind of thing are you building? Is this a thing that's going to be there in ten years, in 50 years and 100 years? Depending on the lifespan of the asset or the thing that you care about or you're building, you can design for ranges of sea level rise that we may expect to see by that time. So if you're building say, a kiosk at a waterfront park, you maybe don't have to build in four to six feet of sea level rise plus another four feet for a storm surge because you can rebuild that thing rather cheaply or it's not that important. If you're building Treasure Island or the Bay Bridge, you want to think longer term and you have to be able to respond to a range of scenarios. And I think developers are starting to get a lot smarter about that and you see in various projects around the bay, people trying to manage for a range of potential future scenarios.

Greg Dalton: Let's talk about the tech community; Silicon Valley, it's the engine, economic engine of the area in many ways the country and the globe. Patrick Otellini, your dad was CEO of Intel, some people just think that the tech companies are just going to, they don't think that long term, they're just going to pick up and move. Is that fair?

Patrick Otellini: You know, I don't think it's fair to categorize tech in that context. I think it's all companies that are starting up right now, all entrepreneurial efforts --

Greg Dalton: Fair enough, yes.

Patrick Otellini: -- there's never a guarantee that they're going to be of -- have that long lasting footprint. And I also think we're building buildings in a way that's also not meant to last either. I think this conversation has really started to change though. Because I think now you're starting to see the private sectors think about business continuity in a way they never did. I think, you know, maybe ten years ago they started to be this big push for making sure buildings were LEED rated.

And I think you saw really the tenant community demanding that. You know, you weren't going to lease out this ten-story brand new shell of a building unless it was LEED platinum. So it was really the market that drove that. And that was great for, you know, your typical climate change interventions on a building for solar, for clean energy by reducing the footprint of those systems. But then also you have to layer that over with other hazards, we happen to live in earthquake country. So even if you have some beautiful net zero building and it's not ready for a seismic event well there goes the continuity of your operations.

And I see this in San Francisco particularly with the hotel industry, you know, we've talked to the hotel industry, San Francisco is almost entirely relying on tourism sector here. You know, they have not evaluated their buildings for structural damage. And when you start to talk to them about what is the cost for your hotel to be down for a day and what is the cost for to be down for a month. You start to see the light bulbs go off. And so I think it's not necessarily a tech problem, I think it's a new economy problem. I think if we were say having an accounting boom instead of a tech boom, you know, we could talk about it that way as well. So I think it's really just about a matter of thinking about what smart business actually looks like.

Greg Dalton: That would be very exciting, an accounting boom, yeah.

If you're just joining us, we're talking about resilience in the Bay Area with Patrick Otellini, Chief Resilience Officer of San Francisco, Nile Malloy, former Northern California Director of Communities for Better Environment and Laura Tam with SPUR. I'm Greg Dalton.

Let's talk about what each of you are doing, what an individual can do to be ready for resilience, you know. Patrick Otellini I think you want everyone to have water and food and earthquake kit. How can people get ready for, we've seen a lot of fires this season that are climate driven. What does preparedness mean for the individual in a climate context?

Patrick Otellini: Well I think if you're preparing for every disaster, you're well prepared. And I think that's what it gets down to, I think you look at how, traditionally we've messaged around these issues. And this is where I think the Department of Emergency Management in San Francisco deserves a lot of credit. They previously had a website called 72hours.org and it was very doom and gloom, I mean even the website itself was black and red and very adventurous.

And what they did is they took that and they flipped it. And they said, you know what, having an emergency kit is actually just as important as me knowing my neighbors across the street. Those social bonds and those connections that we have in our community are really what get us through. Yes, having supplies is important, making sure your foundation is bolted and your house has been retrofitted. I mean these are all very important, very real steps. But I think this focus, you know, when we start to message it in that way, you can turn people off. And I think this message of, you're actually probably more prepared than you think. Most folks don't have an earthquake kit but most folks have 72 hours' worth of supplies in their house. So it's just the way of thinking about that I mean, yeah, there's something to be said for consolidating not touching it but I mean I think that's also part of it too, is trying to figure out what it means to really bring our community closer together because that's how we survive the disaster.

Greg Dalton: Heat is a big one. We had some hot days, 2015 will likely be the hottest year on record on earth. Nile Malloy, in 2006 there was a heat wave in California, 126 deaths, two deaths in the Bay Area that were suspected to be heat related of men in their 40s. So it's not just elderly people, so lot of people don't have access to air-conditioning, so what's going on the communities you're in touch with to get ready for heat that's going to get hotter?

Nile Malloy: Yeah, I mean a few things. One is just thinking about the social safety nets, you know, in African-American communities and other communities it's a church. And so people will try to figure out how you create cooling centers in the community so people can actually go to, physically get in there, having a cooling center in the community using a church or a school, some kind of space where people can cool off. Another thing you just like say you hydrate, lot of water, you get out your homes, you know, get a fan, people always want to solarize their home, you know, all of the different type of things you use, fans and everything to cool down. There's also been conversations too, to pretty much just try to figure out who has AC in the community, you know. Multiple families like if you're on the city block, who has an air condition on that city block who actually can share or come to their, you know, share food and things like that.

So very like community, grassroots kind of neighborhood level ideas that's been bubbling up, but the cooling centers been like the primary thing. Like trying to find designated locations in a community where people can actually go to cool down, share food and have a good time.

Greg Dalton: And so research shows that survival people who are connected to their neighbors are more likely to survive Laura Tam, after a disaster than people who are isolated. Research shows that out. I know my neighbors and we have a Google doc of their phone numbers which will be great unless the internet is out which are probably may well be. What else can people do to build resilience and that connectedness that helps people in tough times?

Laura Tam: Well I agree with what Patrick said, I mean any preparing for an earthquake which is what San Francisco and other cities have tried to get us to focus on is the same thing as preparing for other types of emergencies. But I think that it also, it speaks to, you know, we visit and participate in institutions all the time that are not our homes and our immediate families. And so having, like asking the question of what they're doing to be prepared. Like your children's schools or your library or your community center places like that that are you could ask the question, help to bring support a conversation around resilience building and having a plan in case those institutions aren't ready. I think that's important as well what you said earlier about knowing the people around you and who might need extra help. I think there's also some important communications tools that the government or public agencies can also support to help bring messages to people who may be less well connected or who may just be getting their information through the news.

Greg Dalton: Patrick Otellini, one of the lessons of Katrina was don't expect the government to be there, people need to be kind of prepared on their own for I think people now are saying what five days, used to be three days. So what can we expect from government in a crisis in the Bay Area?

Patrick Otellini: I mean I think even if you don't use the Katrina example. Even if you have a government that has proactively planned, you still have to plan on being on your own. Because you don't know what this disaster is going to look like. I think of, you know, my team and I we're just back in New York last week looking at some of the recovery efforts from Sandy still. And in Red Hook in Brooklyn, you know, they have one of the largest public housing projects there and they had buses outside ready to evacuate people. So the city had done their part but no one got on those buses because it wasn't messaged properly, they didn't have community input. So I think even when you are well-prepared from a city standpoint, you're still never going to be perfect. And so and I think people need to realize that and realize that no matter how well we do this, we're still going to

have this period where we're on our own and need to lean on each other.

Greg Dalton: Nile Malloy, do people in Richmond, Vallejo, the communities you're involved with, do they expect the government to come down and make it better?

Nile Malloy: You know a lot of us don't expect the government to come over. We're very, you know, self-autonomous; we try to invest in the resource we need to sustain ourselves. And so a lot of people are individually taking on this thing around just for being prepared on for themselves and so that's what most people think. I do think the aftermath, people want to see where, what's the aftermath look like, after it's all said and done, I survived, I'm here; what are the resources available, how's my insurance going to kick in, how that's going to help me, you know, how is, how can I, what other resources are available. So I think that part of education need to be more embedded versus like people are going to be prepared for what they need to prepare for.

Greg Dalton: Laura Tam, resilience also had some upsides, lots of good things, positives can be created. One example is restoring wetlands which are natural bumpers and buffers. They can protect from storm surge and actually restore ecosystems. So tell us about some of the ways that if this is done right that there's some really positive things could be done, it's not just about less bad.

Laura Tam: Yeah, absolutely I mean resilience looks like a better city where more people can afford to live there and have better health and all the good things that you'd want to see. We would have greener streets, we would be able, we would have more trees, we would have wetlands that are sustained on the shoreline.

There's a lot -- we would have renewable energy, I mean there's a lot of positive sides of resilience. The challenge is figuring out how to finance and scale it up. I think with respect to the wetlands that you mentioned, you know, we have lost over 90% of the wetlands that used to fringe San Francisco Bay. And there's been a big effort over the last ten years to figure out how much we need to restore to sort of save the bay in a way. And looking at, more recently looking at the impact of climate change on those wetlands, it looks like we have to speed that restoration effort up quite significantly. We need to buy many more thousands of acres and restore them to tidal function if we want to maintain the bay's adaptive capacity. So there is a lot we can do and there's actually an effort in all nine counties at some point to pay as a region for wetland restoration to help both protect us from future flooding as well as to restore the sort of natural heritage.

Greg Dalton: There's a plan for that to be on the ballot of the nine counties in 2016, a small parcel tax to fund wetland restoration that kind of provides some buffers for communities.

I want to go to our lightning round and ask each of you a yes or no question. We're talking about resilience at Climate One at the Exploratorium today. Nile Malloy, people who contributed least to climate change could be hurt most by its impacts, yes or no?

Nile Malloy: I'd say yes for now.

Greg Dalton: Laura Tam, the Bay Conservation and Development Commission a state agency that regulates the bay waterfront, caved to property developers who don't want rising seas to impact their business? Some rules are --

Laura Tam: Do I have to answer this in one word? I would say no. I would say no.

Greg Dalton: Patrick Otellini, San Francisco should construct new buildings in the bay along the Embarcadero to protect existing property and generate funds for defending downtown?

Patrick Otellini: No.

Greg Dalton: One idea out there is sort of basically do a Hong Kong move and create some new property which protects the piers, certainly I don't think the Exploratorium would like that. But Patrick Otellini, while we're on that, what's the status of the piers now, are they defended? You know, there's seismic, there's a seawall underneath San Francisco's waterfront, is that as strong as it should be for earthquakes and sea level rise?

Patrick Otellini: Absolutely not. I mean we happen to be sitting a couple of hundred yards away from what I consider the Achilles heel of San Francisco. We have a seawall that most people don't even know about because you rarely see it and it runs pretty much from Aquatic Park down To AT&T Park. And it's a 100 years old, it's not ready for an earthquake, it's not ready for sea level rise even now when we have some of our king tides or big storms we see inundation on the Embarcadero. It's got every major utility passing through it, oh yeah, and it's also got the BART Transbay tube that takes hundreds of thousands of people in and out of San Francisco every day. So I mean if you talk about one piece of infrastructure where we start to see it hit every box on the hazard list, it's our city seawall.

Greg Dalton: How much does it cost to fix it?

Patrick Otellini: On back of a napkin sketch, I think we're talking about $4 to $6 billion so it's very real money to do a piece of infrastructure like this.

Greg Dalton: And where does that money come from?

Patrick Otellini: Well I was hoping we're going to get a grant from Climate One but I --

[Laughs]

Greg Dalton: Yeah, yeah, right. Over 20 years, yeah. Yeah, back to that thing in the -- Laura Tam, property developers will have expanded responsibilities in the era of rising seas?

Laura Tam: Yes.

Greg Dalton: They will embrace those responsibilities wholeheartedly?

Nile Malloy: No.

Laura Tam: In the Bay Area, we are not debating the existence of climate change. If we can scale up the capital planning guidelines that Patrick talked about so that people can know kind of what they're building and what to plan for based on what they're building, I would say that they would have no problem with that.

Greg Dalton: Patrick Otellini, a stronger role for government will be necessary to adapt to severe weather and coastal disruption?

Patrick Otellini: Yes.

Greg Dalton: Nile Malloy, wealthy people living on the hills far from the bay may think they're insulated from storm surges, floods and other severe weather events?

Nile Malloy: Yes.

Greg Dalton: But their food gets to the store and roads that maybe flooded and ports that maybe disrupted.

Nile Malloy: Okay.

Greg Dalton: You have answered.

Nile Malloy: You answered that for me. [Laughs]

Greg Dalton: Patrick Otellini, the San Francisco Giants $1.6 billion waterfront property development near the ballpark will add new meaning to the term "splash zone."

[Laughter]

Patrick Otellini: Yes.

Greg Dalton: Patrick Otellini, the Golden State Warriors' new arena will be a great venue for water polo?

[Laughter]

Patrick Otellini: Possibly.

Greg Dalton: Nile Malloy, if Oakland redevelops the coliseum in Oracle Arena and waits a few years, they will have the waterfront sports complex city leaders have long wanted?

Nile Malloy: Yes. Sort of.

Greg Dalton: Alright. That ends our lighting round.

[Laughter]

How'd they do? I think they did pretty well.

[Applause]

[CLIMATE ONE MINUTE]

Announcer: *And now, here's a Climate One Minute.*

To avoid or adapt to climate change – which strategy will best ensure our survival? Hunter Cutting of the non-profit communications firm Climate Nexus believes we can and should focus on both. The more our communities have been tested by extreme weather events, like Katrina and Sandy, the more we're learning to bounce back. And as Cutting points out, Americans have always seen change as "the new normal."

Hunter Cutting: *We are good at change. It's one of the signature characteristics of our species. It's definitely part of the American fabric and the culture is that we are very adaptable. American ingenuity is not just a buzzword it's -- you can watch the last 200 years of our history and see it in action. So I think, you know, it's a bit of a balancing act, right? We're going to have to reduce emissions to avoid catastrophic changes, and they're catastrophic. The temperature increase that we will see may not sound like much, like eight degrees may not sound like much. But that's about the amount of temperature change that we saw that ended the last Ice Age and would have crocodiles live in the Arctic. I mean, so we really don't want to go there. Two degrees of*

temperature change -- that we can do. We can adapt to that much. It's doable.

So I think we have to do both. We have to mitigate to avoid the catastrophic and adapt to what we can't avoid. Adaptation is just going to be part of what we do now, going forward in the future.

Announcer: *Hunter Cutting, of Climate Nexus, spoke with Climate One in March of 2015. Now, back to Greg Dalton and our live audience at the Exploratorium in San Francisco.*

[END CLIMATE ONE MINUTE]

Greg Dalton: Let's talk about Treasure Island. It's a unique place in the middle of the bay, Patrick Otellini; it's obviously going over a redo from a Navy base to a new community. Could that be a model for a resilient community? They've actually I think taxed themselves -- well there's no one out there, a few people out there except a few kids playing Little League. But how is that a model for what a new community might build and prepare for sea level rise and climate change and pay for it?

Patrick Otellini: Aside from the fact that the Irish community would be very upset that you didn't mention Gaelic Football in Treasure Island --

Greg Dalton: Oh there's rugby and Gaelic football --

Patrick Otellini: No, I think we started to see lessons learned in Treasure Island in the way that they're designing, especially at the shoreline which I find fascinating. You know, it's about building this adaptable shoreline. So they're not going to build for 2,100 today but they're putting steps in place that as the sea start to rise, you're going to be able to adapt that shoreline. And I think that's a unique thing. I think we don't really necessarily have that luxury on the San Francisco waterfront in all of its parts, but I think when you can have like you do here or like you're starting to see at it at the 100 point shipyard at Candlestick Point. I mean those are areas where you can think about the shoreline a whole differently and you can look at more things like wetland restoration or adaptable berms or adaptable shorelines.

Greg Dalton: Nile Malloy, Hunter's Point, they're building up 55 inches, they're planning for flooding. They're going to have no garbage trucks rolling around, they're going to have like these vacuum tubes, it's kind of like the Jetsons out there where you put your trash in recycling. But there's a community that's going to be well, pretty well positioned relative to some older ones if they do it right.

Nile Malloy: Yeah, I believe so. I've worked with a couple of community based organizations who've been involved with the process for the transformation of that area. Some pros and cons that developed out, but the reality is it will be more resilient to more climate impacts from that standpoint from sea level rise.

Greg Dalton: But some of the people who are there may not, they're now may not be there then --

Nile Malloy: May not be there. I mean, you know, San Francisco is -- you can talk a lot more about this.

Greg Dalton: The housing -- yeah --

Nile Malloy: The housing issues.

Greg Dalton: So is housing connected to responding to climate change? Because maybe people think that's a separate issue but you think it ought to be connected.

Nile Malloy: Well, I think, you know, it's kind of like a human rights issue. You know people need have a right to housing, healthy food, access of water, you know, we need to figure out what is something affordable to be in the Bay Area. I mean outside of that people are going to be moving out and we see this trend over the last, you know, three or five years that people just, you know, kicked out. Can't afford it, you know, moving further out on east or the north.

And that's just the reality of what's going on. I mean San Francisco is probably one of the -- I think one of the richest places in the country by far right now, and there's gaps, income level gaps. And so we think about bouncing back or being able to respond. You look at all those social inequities in that we have that climate concern.

So it's a resilience issue in a traditional sense and how you'll be able to bounce back, you know, have the resources for it. But it's just also a growing trend that's happening in the city. I mean, and so climate change is going to keep coming, heat level, you know, all of the different kind of concerns, but the housing is an ongoing issue and there's lot of organizations towards to fix that.

Greg Dalton: Laura Tam, there's a term called managed retreat that people talk about. Looking out for sea level rise and storm surges and the idea is that some places would be defended and some place will be abandoned and gradually can't afford to protect everywhere. So are some communities are going to be protected more than others?

Laura Tam: That's a great question. I don't think we've solved the question of there's not enough resources to protect everyone. I don't think we've gotten to that point yet. And I think that there are some places, and you see a little of this happening now on the coastline where it's much more erosive and like places are completely unprotectable and they're going to fall into the sea and there's like a life safety threat there even today. That's where managed retreat is a sensible tool now because you can't protect it, there's nothing you can do in the face of the ocean. On the Bay Shore and especially in places where we have a lot of vulnerable communities I think we have to take a protective approach. I think we have to figure out the ways that we can protect the most people. And I don't think we've decided yet that we have to do any managed retreat in the Bay Area right now.

Greg Dalton: So we're not sure yet. But Nile Malloy, already there are people in the Central Valley who are walking away from their homes because there's no water and that's affecting property values and that's happening now.

So how far are we away from, you know, water starts to get into Richmond, Alameda, Vallejo, East Palo Alto and there's no seawall and the government doesn't have the money or say it'll take ten years to do it and people are walking away from their homes?

Nile Malloy: I mean Central Valley has a lot of challenges and that's one of the main issues are water, and then there's this kind of antagonistic relationship between do you grow more, you know, and not enough resources and can people actually get livable water, drinkable water. And so I've been hearing a lot of different things about getting water trucked in and people just trying to basically get by. They have showering centers; people can go to take a shower and not running water in their homes. And so that manageable retreat thing is kind of happening because there is this thing of there's a reality that I think we're starting to feel with the climate issues that are there resources for these, you know, these areas, this, you know, Central Valley in particular. So, I think there's going to be an ongoing conversation of trying to figure out how do we get more resources from the state to come to the Central Valley. There's a different couple of climate adaption bills that came out recently. I'm not sure if that's going to really help safeguard that issue. But at the end of the day, those are going to be ongoing to start, I'm not sure if they can sustain the trucking in of

water to support certain communities in the Central Valley.

Greg Dalton: And Patrick Otellini, how about in San Francisco you have to assume that downtown is going to be protected. There's a lot of money and power here but other parts of the city, is the city going to have to make some tough choices even within the city about areas who gets saved first, who gets protected first and who's at the end of the line. Is it going to be Hunters Point?

Patrick Otellini: You know I think managed retreat is never going to happen in San Francisco when you see the kind of property values that we have today. I think it makes too much sense for people to hang on to that no matter what. And so I think that looks very different. I also think that you layer over something like that with an earthquake, that's where I get scared, that's where you see what happened in New Orleans.

Some of you are familiar with the infamous Green Dot program, where basically they said oh because of where you sit in the flood plain, we're not going to rebuild your community. How do you tell a community that you're not going to rebuild for them in their exact same space where they lived there their whole lives? That's an injustice. So I think managed retreat makes sense on paper for a lot of reasons but I think when you lay over that community aspect, you alienate too many people and often it is the communities that you do not want to alienate and they can't afford to stay. And so managed retreat, really means they're moving somewhere else.

Greg Dalton: So within the region, I mean can this happen without wealth distribution? Because Vallejo, East Palo Alto, they don't have enough money so the money's got to come from outside which means you're taking it from somewhere else. Is that going to happen with, Patrick Otellini, within the Bay Area wealth distribution to save where the wealthier more resourced regions help those who have fewer resources?

Patrick Otellini: I mean I think it just begs the conversation that government has to do better about thinking about how we design policy around these issues. You know, I currently oversee the city's soft story retrofit program. This is a seismic program retrofitting apartment buildings that are all subject to rent control. So we know that if this building collapses in an earthquake, the new building is not subject to rent control. To give you an idea on the numbers, this ordinance is going to affect about 15% of our population, about 120,000 San Franciscans. So you think about that with an equity lens, you know, we lose these buildings in the earthquake, we have a 120,000 San Franciscans that previously enjoyed their rent controlled status and now have to compete with market rate rents that are the highest they've ever been in our history.

So I mean I think that's one of these interventions where, you know, yeah, we're not doing wealth distribution around that but we're thinking about who's more vulnerable and especially in a city where 70% are renters and don't have the authority to make these decisions whether it's retrofitting a property. That's where government has to play a very careful role but has to play that ultimate role of looking in the public's interest and the public good and design regulations around that.

Greg Dalton: After Katrina, a lot of people obviously left New Orleans and never came back. If that happened in San Francisco, people would never be able to buy their way back in, Patrick Otellini. So what is the city policy after a disaster? A lot of times the federal government wants to get people out, what's the plan here?

Patrick Otellini: I mean that's something I'm really excited about that the mayor's uniquely focused on is making sure that we keep 85% to 95% of our population here in San Francisco after a disaster. You're completely right, the FEMA concept is evacuate, take control of the situation and let people come back. Well guess what, people are barely hanging on right now in our apartments.

And so if we have to relocate say to Sacramento for six months, we're never moving back to the city that's the reality of it.

So what we have to do is we're faced with some really unique challenges, we're also very dense city, we don't have a lot of open space. So the mayor's plan is very simple, it's to keep people in their homes whenever possible. If we can't keep the people in their homes, keep them in their neighborhoods. And if we can't keep them in the neighborhoods, keep them in San Francisco. And I think that's an approach that looks at a variety of different options, there's not one particular intervention that fixes that population problem, it's a myriad of things. It's making sure that we're getting people, you know, their homes repaired quickly in some sort of a rapid repair style program like we saw after Sandy in New York. It's making sure that people have those lifelines to be able to come back. It's also making sure that maybe you're going to be in a hotel for a while or you're going to be on a cruise ship for a while. I mean there's a lot of different ways to get bites of that apple but I think that's what we have to do. It's not going to be a one size fits all approach to disaster housing.

Greg Dalton: If you're just joining us Patrick Otellini is the Chief Resilience Officer of San Francisco. We're talking about building a strong bay area in the climate era at Climate One at the Commonwealth Club coming today from the San Francisco Exploratorium. I'm Greg Dalton.

Nile Malloy, what lessons should be drawn from Sandy and Katrina about keeping people where they are, letting them come back and letting those communities bounce back from those disasters?

Nile Malloy: I mean, you know, this is the ten-year anniversary of Hurricane Katrina and, you know, I still have friends who just couldn't comeback. And that's just the reality, not for any other, maybe not even for financial reasons just the psychological trauma around it which is really interesting as well.

And I think, you know, the ability to bounce back for some of these folks it just pretty much being, you know, the comfort of home, you know, the sense of home, place. And for all of us we have a place that we know that's really home. And so I think that is pretty much what draws people back and they find ways to draw back either staying with their relative or trying to help rebuild that they have insurance and resources to help do that. But I do think we need more kind of government support and interventions to make that possible. And I think, you know, it needs to be planned out with the community to really be engaged in that process because obviously people having personal stories and experiences, I mean there's things that we gravitate and learn from Sandy and Katrina that people have very personalized issues that enabled them to come back. And so I think that needs to be communicated in trying to figure out what kind of policy or regulations going to help shape that. And also how to bear in mind what resources there is available from the government to actually enable that to happen.

Greg Dalton: Laura Tam, we've been talking about not enough water and droughts and heat. I want to talk about if El Nino continues to materialize in this weather year and there's too much water, what set of issues is that going to bring? We've been used to sort of not enough water, talk about too much water.

Laura Tam: Yeah, I mean it's a different kind of disaster but it could very well happen. I mean the way that El Nino, if we do get more precipitation in this El Nino and there's a chance that we won't; I think you've maybe have all seen that there's a 50/50 chance that the warm ocean, the warm weather phenomenon is going to result in more rain or snow. So assuming that we do get more storms and there's too much water, there is, you know, where the rubber's going to meet the road, so to speak on that problem is along the bay where a lot of our water ways meet the mouth of the bay. That's where the flood control channels hit the sea.

And oftentimes you have to deal with two problems at the same time. Getting storm water and rain water out of places; meanwhile, the bay is surging because we're having a storm surge. So you have a hard time pushing that water out. So, I mean a lot of things can be done right now to prepare and anticipate that this kind of flooding could happen. There's, you know, lots of places need to have the flood control channels all over the, all over the region are full of trash and debris and vegetation and trees and stuff because people haven't had -- they've been able to neglect them for the last few years. Those things need to be cleared, there needs to be space made --

Greg Dalton: The fire will take care of that.

Laura Tam: Oh God, one disaster or another.

Greg Dalton: Yeah, this is the happy hour here at Climate One.

Laura Tam: Well, so those things need to happen and then, you know, we need to all do a good job of being mindful of like the vulnerabilities that exist when there are storms. There's many people maintain and manage their own trees. There's a lot of underinvestment in urban trees and they can fall down and have limbs that drop and other things. There's also a lot that we could be a lot more that we could be doing over the long term to try to withhold the rainwater further up in the landscape and in watersheds through green infrastructure and other treatments to the streets that enable us to sort of reduce the flow that's coming out of flood control channels. So, we can't really implement that very quickly this year but again we can work on the flood control channels and making them as clear as we can. And in some places like in East Palo Alto, they're talking about putting up inflatable dams along the creek for extreme events.

Greg Dalton: Laura Tam is a policy director at SPUR. We're talking about resilience in the Bay Area. I was talking to a homeowner in Marin recently who said they live along a creek and they wanted to get rid of some of the vegetation because they worry about a fire, and then they thought oh well, if El Nino comes, that's going to make our flood worse what do I do, these different things. What gives you hope, what are some bright spots? Before we go to audience questions I want to ask each of you what's, you know, a place, where something is happening really smart, where there's real progress being made we can say, ah that's where we need to go, that there's an inspiring person or direction. Laura Tam?

Laura Tam: Yeah, I always come back to San Francisquito Creek which is a creek that is on the border of Santa Clara County and San Mateo County. And there was a disastrous flood in 1998 I think. And the agencies and people realized that having a creek that sort of between two counties and a bunch of different cities like that was not being well-managed and there's a lot of flooding. And a lot of it was in East Palo Alto which is a vulnerable, socially vulnerable community. So, they formed a joint powers authority among all of the cities and counties to try to develop some planning for the creek and they've done an incredible job of trying to realign the creek channel and to actually reduce enough, to do bunch of wetland restoration in the bay where the creek meets the bay. And to move around sub-levies in that area to not only provide a bunch of wetland restoration but also to enable a bunch of vulnerable homes behind that levy to have to not participate in the National Flood Insurance Program because they would no longer be vulnerable to extreme flooding. So I think that's a really bright spot I like to raise that out that particular project all the time and, you know, I think that it sets a great example for the Bay Area.

Greg Dalton: Good one. And most people never heard of probably heard of San Francisquito --

Laura Tam: San Francisquito Creek. That's San Francisco and mosquito.

Greg Dalton: On the way there huh. Nile Malloy, bright spots.

Nile Malloy: Well, I'm just happy I think just the social resilience; I'm really excited about how people are collectively come together talking about these issues around climate change and how people are prepared about it. And we've been forming a regional collaborative called the Resilience Community Initiative which is several community-based organization, looking at equity throughout the region and trying to figure out the different priorities, you know, from the planning to the development of programs and policy to also the implementation and the funding streams coming from the state. And how we can actually center the gravity around how they can support equity related issues.

I'm really excited about the continuity and the hope and the passion about that and also what's being developed from that community perspective, like being prepared, being ready and deepening into the climate change discussions.

Greg Dalton: Patrick Otellini, any ideas, bright spots outside the city of San Francisco? You can say how great San Francisco is doing but--

Patrick Otellini: I had to include us a little bit. One of the things that I'm really excited about which I think you'll see more in 2016 is this idea of doing a regional design competition looking at the bay and looking at the infrastructure that buts up to the bay. This is an effort that we've been working in the city of San Francisco but also other cities in the region and SPUR has been a partner working with Rebuild by Design, the non-profit that helped run a lot of design competitions after Sandy, to say okay, let's talk about this from a community perspective. Because earlier, as you kind of jokingly mentioned this kind of Hong Kong idea of building out into the bay, you know, obviously anything that we talk about at this waterfront is going to be highly contentious and very political. But guess what, if it's the community driving the design, and we have a unified voice on that, well then suddenly those politics start to become decoupled, and that becomes less contentious. So I'm very excited because we've given ourselves paralysis when we talk about these big pieces of infrastructure because they're really hard issues to deal with. But if we start to get the community involved around that and get that critical mass, all of a sudden we have a plan to move forward and the financing just becomes the last piece.

Greg Dalton: Nile Malloy, one example of that in Richmond is the Greenway, tell us about that and how it's doing multiple things at once making the place better?

Nile Malloy: Well the Richmond Greenway is kind of an old, kind of a train track that's actually been developed out. And basically is a lot of community based organizations are pitching in, they are growing food, they have bio swales, they're talking about climate change; it's youth ran, youth engaged. And they go through training and curriculum and they, the core aspects of it is about how to be more resilient, how to make Richmond more resilient and use this as pretty much a pilot site of what actually can they enable and be happening in the community.

And so it just really getting a lot of life of itself, you know, working with city government, you know, the health department and non-profits and they recently got some state funding, some property four dollars to help streamline their projects for the next few years and so it has a lot of energy. And they've been have a lot of kind of training there and the city of Richmond is actually doing that climate action planning processes. And so the interconnection with that cadre of folks working on bikes, public transit, green urban agriculture and things like that it's just giving lifeblood and talking about climate in that mix.

Greg Dalton: We're talking about getting ready for climate change in the Bay Area with Laura Tam

from SPUR, Nile Malloy from, formerly from Communities for a Better Environment, and Patrick Otellini from the City of San Francisco. I'm Greg Dalton.

Let's go to our audience questions welcome to Climate One.

Female Participant: Hi. So, thank you so much it's been a really great presentation. I've been following a lot of the adaptation work going on at the state level. And we have the executive order that came out with Governor Brown back in April that had a lot of great targets on greenhouse gas reductions but also about how the state can become more resilient.

We've had three as Nile has mentioned three bills go through the legislature now on the governor's desk hopefully going to be signed soon. Also trying to implement and move forward on emulating the strategies the state has come up with on adaptation planning but they lack funding. And, I'm curious one, if you guys have been tracking the bills with the executive order, how you see those touching down in the Bay Area and two, if you're thinking about funding streams for resilience work especially the natural infrastructure which is mentioned in both the executive order in two out of three of these bills, how is this going to come to the Bay Area?

Greg Dalton: Patrick Otellini, Sacramento going to save us, help us?

Patrick Otellini: Of course. No I think it's something to think about where not only do we have these very aggressive bills that have been put forth in a very good way. But I also think you're starting to see efforts at the federal level affect efforts at the state level and what I mean by that is the National Disaster Resilience Competition where HUD has put forth a billion dollars to help cities that have been affected, or help, excuse me, entities that have been affected by disaster. In this case the California, state of California is one of those entities and we've been assisting the governor's office on this. Now does that mean we get money here in the Bay Area, if we do that application right? Yes, because what states are being asked to do is leverage funds in a way so this grant is paying for some of these funds but it's also the state putting their money where their mouth is. And that's looking very different across the country because sometimes we have counties that are entities, sometimes it's a city, but in this case, it's the state of California. So to do something like that where there is a billion dollars at the table suddenly becomes very real money that we have access to.

Greg Dalton: Another money piece of this Patrick Otellini, is your position and 99 others around the country were created by the Rockefeller Foundation. So tell us how philanthropist are coming in and providing money to cities to hire people, create new positions that didn't exist and they couldn't pay for it. And what are some of the tensions around that?

Patrick Otellini: I think it's also important to note that it's a hundred cities around the world.

So we have this incredible position of cities that are facing tremendously different resilience challenges. But what's amazing is meeting my counterparts in these other cities and having these conversations with them. It ultimately boils down to some very similar core issues. And so I think that's been the interesting dynamic that's coming around that. Now, the grant itself, you know, pays for a cheap resilience office for two years and also helps the city develop a resilience strategy. So I'm actually out of grant funding as of April 1st, I'll be the first CRO that runs out of grant money because I was the first one appointed. And I think what you're seeing in the city of San Francisco now is to say we found value in this position and they're absorbing that into the budget and creating a place for that to live. You know, with my existing position, I already have staff; I already have a budget so it's not as big of a lift for the city as it is in some. In some cities, you're asking them to totally change the way they have done government. Who is this voice that's an agitator, this voice

that's an advocate, how do we incorporate that? And so I think that will look very different around the world and I think we'll see some cities embrace it and build programs to support the CRO, and I think we'll see others that say two years was great, thanks for the time, thanks for the grant dollars, see you later.

Greg Dalton: And what does this open in terms of philanthropists coming into government and saying we want this to happen and we're going to pay for it. What kind of accountability in governance question is that?

Patrick Otellini: I mean it's a very difficult tension and it's something that we see every single day and we tried to balance it out in a really smart way. But I mean you have, though on one side government systems sometimes are clunky and clumsy and things like procurement, going through the RFP process can be very onerous and take two years before you actually get starting on the work that you wanted to do two years prior. So I think philanthropy can play a role in accelerating that and helping us jumpstart a lot of projects through those dollars. But I also think there has to be a tremendous balance. I think our job as public servants is to be that watchdog and make sure that the public sector is not for sale. So I think trying to balance that out is a very tricky thing, it's probably one of the hardest things that I have to do. And I think every city is starting to figure out how to do that in their own way and that speaks to the goals of that particular city and what's really in their hearts when they start to do this work.

Greg Dalton: Let's go to our next audience question, welcome to Climate One Exploratorium today.

Male Participant: It seems to me there's like a gambler's fallacy at play here where you chase good money after bad. Particularly FEMA funds when the overall sea level and trends are punctuated by individual episodic events. So in Pacifica, we spent millions of dollars armoring cliffs that not only ruined the beach for walking but are now just sitting there ready to gnaw away when the next good storm comes in.

Laura Tam: Yeah, FEMA is designed to like put back what was there and to protect us -- give us information about today's risk. It's not about future risks, so they're looking at like the hundred year storm of today, they're not looking at the hundred year storm of tomorrow which includes another 12 or 36 inches of sea level rise. So I think that we have to have like a pretty intensive national policy conversation about what to do about the fact that some of our institutions are not setup to rebuild with resilience in mind.

Greg Dalton: Patrick Otellini, is it going to take some really bad Bay Bridge falling down kind of event before people reach into their pockets and pony up the cash as needed?

Patrick Otellini: FEMA is rarely accused of being innovative or forward thinking. And so I think that we start to see different responses from the federal government side where they actually start to deserve a lot of credit because there's been some great voices in FEMA after Sandy like folks like Brad Garrett who ultimately took this concept that guess what it's going to be cheaper to make someone's house habitable than to put them up in a hotel or put them up in a shelter. So what they were able to do, normally that would be covered under what FEMA considers personal assistance so it would be helping the homeowner. Well, guess what, it's actually helping the public. So they were under public assistance which is the government financing stream. So it didn't affect that FEMA payout that that homeowner ultimately got and they were able to leverage funds from the city to repair those homes. We all know the advantages of being back in your own bed, you may not have power, you may not have hot water but you're at home. I mean, psychologically that's a really big improvement. So I think to see them be forward thinking in that way and I mean when we're talking about these federal regulations, I mean, have you ever read the Stafford Act? I mean, this is

something that is not very flexible. So I think to be able to be in an organization like that that's notorious for being so rigid and to come up with these innovative programs is a breath of fresh air and I'm really excited to see what they're doing at that level.

Greg Dalton: Let's go to our next question at Climate One.

Male Participant: You guys mentioned things about upgrading infrastructure and making sure that everything that we need to get the resources that we need, be it water or even roads for transport, we need to upgrade those things. But exactly how much effort and how much, I guess, willpower is there right now towards getting those infrastructure upgrades and the materials required to get those things done and in place? How can we drive those things more towards environmentally preferable purchasing?

Greg Dalton: Patrick Otellini.

Patrick Otellini: Yeah, I think when we're trying to do those particular types of investments, yeah, it's a political will question and I think politicians are going to do what the people who elected those politicians say. And so I think that's--

Greg Dalton: Or the people who pay for their campaigns.

Patrick Otellini: Exactly, yeah. But that's the public dialogue, right, and I think that's where we get to hold our elected officials accountable and hold our policy makers accountable. In San Francisco part of the reason why our procurement process takes so long is because I think we've been very diligent in adding those kinds of checks and balances along the way. So I ultimately think once you get through that turmoil you actually have a great product to go forward. But I think we can do things on the government side to try to streamline it as well. So I think this is a balance that we're always struggling with to get it just right.

Greg Dalton: So as we end here, last word from what an individual can do either to kind of reduce climate change or get ready for the impact. Laura Tam, what's the takeaway for an individual, what can a person listening to this one thing they should do after they stop listening to this program?

Laura Tam: Vote. I think that's one of the most important things, vote and then spread the message. I think it's really -- many people or actually the drought has accelerated in terms of what people are starting to care about water issues much more than they ever did. So sometimes when you have bad attention, it could create some public change. But talking to people about it and spreading the word is really an important message.

Greg Dalton: Nile Malloy.

Nile Malloy: I will say the same thing like community organizing, really engaging your neighbors and other folks about these issues and voting, I mean, I was going to say the same exact thing, I swear. So I think those are two critical things. We've got to hold our elected officials accountable, I mean, you get the right people in office and right people in the staff positions to really represent the will of the change that we see in the future and that's really happening right now. So I just really think those are kind of the two main issues.

Greg Dalton: Patrick Otellini.

Patrick Otellini: I mean, living in San Francisco so often we don't know our neighbors and so to kind of steal both of your answers, I think that's something that's so important. I think back to when I first moved to my current neighborhood about 10 years ago, it wasn't unfortunately until there was

a drive-by shooting on my block where I actually got to know my neighbors. And that's not a unique thing. Tragedy brings us together all the time. And unfortunately sometimes that's what it takes and so it's a real challenge to try to do that with the absence of that tragedy. So one thing, go introduce yourself to your neighbors.

Greg Dalton: Great place to close. We've been talking about building stronger communities in the bay area at Climate One today here at the San Francisco Exploratorium with Patrick Otellini chief resilience officer in San Francisco, Nile Malloy formerly with the communities for better environment, and Laura Tam with SPUR. I'm Greg Dalton. You can listen to this and other Climate One podcasts on our website climateone.org. I'd like to thank our audience here in the room, our funders from the San Francisco Foundation and the SEED fund and all those listening on KQED and other stations. Thank you all for coming and listening today.

[Applause]