

Permanently Temporary: Living with Rising Seas

<https://www.climateone.org/audio/permanently-temporary-living-rising-seas>

Recorded on August 26, 2018



Announcer: This is Climate One, a conversation about powering America's future. Reactions to sea level rise for people living along the coast range from "I don't see any sea level rise," to "Grab your scuba gear."

Larry Goldzband: We need to plan for 2 feet by 2050 and probably between 4 and 7 feet by the end of the century.

Announcer: The catch is, there is no final height that we can plan for, because the oceans will continue to rise.

Elaine Forbes: There will be more and more flooding on every coastline all across the nation, all across the world. And as the scale ramps up, just saying, we'll pour money at this problem is not going to be possible.

Announcer: So, how do we prepare for a coastline that will be Permanently Temporary? Up next on Climate One.

Announcer: Climate change changes everything - including the world's shorelines. With the melting of Antarctica's ice and the Greenland ice sheet, projections for the seas to rise dramatically and quickly are increasing. How is this impacting our coastline?

Welcome to Climate One - changing the conversation about energy, economy and the environment. Climate One conversations are recorded before a live audience and hosted by Greg Dalton. I'm Claire Schoen.

Announcer: Watching the news about rising seas due to climate change and the flooding that follows makes us wonder, Where will it stop? The problem is there is no upper limit to sea level rise .

Elaine Forbes: It's very overwhelming to think that there is no end to the rise in the tide. You know that it's not 6 feet, it's not 5 feet, it's not 4 feet, it's into perpetuity just change and chaos and big

storms.

Announcer: That's Elaine Forbes, Executive Director of the Port of San Francisco. She talked with our host, Greg Dalton at a recent Climate One event. Finding solutions to an ever rising tide requires us to face thorny questions. Like, What is this going to cost? Who's going to pick up the tab? And who will be the winners and losers?

Nahal Ghoghaie: What folks refer to as disadvantaged communities or low-income communities of color, they have been subjugated to the disproportionate environmental burdens of development. And they're mostly along the waterfront, they're closest to the waterfront.

Announcer: Nahal Ghoghaie is Bay Area Program Lead with The Environmental Justice Coalition for Water. She joined Greg's conversation, as did Larry Goldzband, the Executive Director of BCDC, the Bay Conservation and Development Commission, which is a state agency responsible for protecting the Bay's coastline.

Here's Greg and his guests.

Greg Dalton: Larry Goldzband, let's talk about how high, how fast. You mentioned sea level rise and people say how high, how fast.

Larry Goldzband: If I could tell you that I'd go to Del Mar tomorrow and bet on the ponies. But what I can tell you is that what the state of California has decided is that we need to plan for 2 feet by 2050 and probably between 4 and 7 feet by the end of the century.

Greg Dalton: 2 feet by 2050. So that's in less than 30 years, when seas rose about 8 inches in 100 years. And I'm just trying to run the math here. 8 inches in a century, 2 feet in 30 years.

Larry Goldzband: Yes, so that's three times that. And the other thing to think about is that those projections which are based on really some marvelous scientific work are just that, they're projections.

Greg Dalton: And is this linear or is this gonna be more exponential where it could happen really suddenly. Do we know?

Larry Goldzband: No. Nobody really knows because it's all projections. But if you take a look at the curve, it goes up.

Greg Dalton: Elaine Forbes, what's at stake? A lot of people think, okay, "Little bit of flooding downtown San Francisco. I don't go there. I don't live there. What's at stake?"

Elaine Forbes: So that's the thing that I think people don't realize is how important shorelines are to the communities behind them. I manage 7 and a half miles of waterfront property. And it's incredible how many assets are behind the seawall. We're talking about regional transportation, you know, 500,000 passengers a day. We're talking about \$101 billion dollars of economic activity or value that the seawall provides flood protection to. We're talking about systems that serve the region that serve the city, utilities, water systems, wastewater systems, emergency response planning for the city post disaster. So people may think, "Oh I love the waterfront it's fun to come down and visit but, you know, that's nice." Without flood protection, our line of defense there's so many externalities that occur for everyone.

Greg Dalton: For example, flushing the toilet, right?

Elaine Forbes: Yes.

Greg Dalton: You know the wastewater plants are near the water and, Elaine Forbes, if I live on a hill, when you flush it goes down to somewhere by the Bay.

Elaine Forbes: That's right. So we have a lot of gravity driven systems that have outfalls here. So, you know, I'm working on figuring out how to pay for a line of defense. It's such an expensive proposition if we don't act because everything behind it then would have to respond instead.

Greg Dalton: So you think the seawall is expensive. Think about, you know, bailing out the BART tube or something like that.

Elaine Forbes: Exactly.

Greg Dalton: Nahal Ghoghaie, tell us about the people who are most vulnerable. Those areas around the Bay that contributed least to this carbon problem and they're feeling it first and worst.

Nahal Ghoghaie: Right. Well at the Environmental Justice Coalition for Water we are managing the disadvantaged community involvement program to work with community leaders. And right now we have 12 communities and they are what folks refer to as disadvantaged communities or low-income communities of color. They have been subjugated to the disproportionate environmental burdens of industry, development. And they've actually developed quite a strong network amongst themselves leading their communities and their neighborhoods in, you know, attending City Hall meetings and fighting industry on ensuring the air and the water in their communities is not contaminated anymore. And so they're actually quite savvy. I would consider them experts in their own right. And they're mostly along the waterfront, they're closest to the waterfront and closest to industry.

Greg Dalton: And do they think that people in power are hearing their voices?

Nahal Ghoghaie: So my job is really to build that bridge between the, you know, the agencies, government and community leaders. And so our job is also to give a little bit more confidence in the California State Department of Water Resources, to give them more confidence and help them build their trust amongst communities, while also building that relationship and that trust, so that community leaders can also apply for future funding and be seen as experts and as leaders who can manage these types of programs.

Greg Dalton: Because I've talked to some of those leaders who say, "Well, you know, communities of color got shafted in the fossil fuel economy, why is it gonna be any different in the renewable energy economy?" This idea of a just transition, you know, what's been happening is nothing new to them and they think like we're not at the table in the brown economy and we're not at the table in the green economy. I'm wondering if that you think that that's changing.

Nahal Ghoghaie: I am an optimist. I do see the expertise. Permaculture for example, this is kind of a philosophy of living directly off the land that you're on. You have rainwater harvesting, you know how to grow the crops that are native. You can work with your neighbors building that community, you know, the network within your own neighborhood is something that I think has been kind of overlooked. We've been letting technology manage pretty much everything we do these days. And so this is kind of exciting for me because I've always looked to kind of the tribal indigenous way of doing things, of being stewards of the land. And so I do see that that, you know, the place space wisdom is coming back and it's being re-recognized or, you know, recognized as a strategy forward in

climate change.

Greg Dalton: Back to the way our grandparents lived. And when systems are volatile or unreliable maybe, you know, kind of that local independence makes sense.

We're talking about sea level rise at Climate One. I'm Greg Dalton. My guests are Elaine Forbes, head of the Port of San Francisco. Larry Goldzband, who runs the Bay Conservation and Development Commission, a state agency and Nahal Ghoghaie, from the Environmental Justice Coalition for Water.

We sent a reporter to the downtown waterfront in San Francisco to learn what visitors and residents have to say about rising seas.

Male Speaker: The sea, the sea is coming. Oh man, it's a little complicated because this is the one of the most important cities in the world. Many people will be, you know, die.

Male Speaker: I live across the street on Spear Street and we're actually, I think our apartment is probably below sea level already. I'm not an owner, I probably would not buy down here because I think it is gonna be a problem.

Female Speaker: Oh we are at Book Passage in the Ferry Building in San Francisco on the Embarcadero looking at the Bay. The Ferry Building is going to be partially underwater. In my lifetime.

Male Speaker: Well yeah of course I mean, yeah, it's gonna be water here all the time. When we got too much rain last year I think, I was kind of concerned about it because actually we have overflowed over there by Pier 23 down that way I think.

Male Speaker: It happens in Yemen last, I think last three months or four months ago. And a lot of building is damaged and people there died. I am here for three years in California, San Francisco. I'm here working in Ferry Building near to the sea. And I watch, I don't want to see this. I want to see all the buildings safe, all the country safe.

Male Speaker: I think it could happen much sooner than we think. You know, I see them, you know, on a really high tide with the mild storm water splashing over, you know, on the Embarcadero already.

Female Speaker: It's hard for me to picture what the economy of our major coastal cities will become. I get fearful and then I go do something else.

Greg Dalton: Those are residents and visitors along the San Francisco waterfront downtown San Francisco. A lot in there, but Elaine Forbes, I wanna pick up on that last comment is that." I look at it, I'm scared and I look away." So how do you sustain a personal and an organizational focus on something that most people want to just, can't look at.

Elaine Forbes: Not deal with. So it's very overwhelming to think that there is no end to the rise in the tide. You know that it's not 6 feet, it's not 5 feet, it's not 4 feet, it's into perpetuity just change and chaos and big storms. Those kinds of thoughts are very discouraging. But I do in the back of my head realize that if we don't figure out a stable future for our planet, we have catastrophe

coming. But I can work with my team to make our waterfront safer to engage the community to make investments today that will make a safer place, more resilient place and a place we can leave to our children.

Greg Dalton: So you break it down into an actionable piece because the whole thing is just too overwhelming to look at.

Elaine Forbes: It is. So I focus on, we're gonna figure out coming together pretty soon and we're gonna change our behavior and we'll have some kind of stable future. So we are going to prepare the shoreline for what we know is coming.

Greg Dalton: Larry Goldzband, you have a much broader geographic responsibility. It was a couple hundred miles of coast. How do you grapple with the scale of that, thinking about all of the property at risk. Billions and billions of dollars sitting right there.

Larry Goldzband: So just to set a little context that the Bay right out there is actually larger than the city of Los Angeles. And it has somewhere between four and 500 miles of shoreline in BCDC's jurisdiction which is about half the linear length of the California coast. So it's pretty big. The good news is that in a poll that was just published by the Public Policy Institute of California within the nine counties in the Bay Area over 80% of the people who were interviewed said that rising sea level is either a somewhat or very serious problem. So we're very fortunate at BCDC in that we don't have to fight a tide. At least not that kind of tide. Unlike some of my peers who work in the Gulf States or who work on the East Coast or the mid-Atlantic. So I think the way we tend to look at it is that, yes, it's a region and it's a big region, but it's very different when you take a look at different parts of the shoreline. And so you have to figure out what can work in different parts of the Bay. And I think Elaine is right, if you want to just step back and take a look at the whole thing then the eyes get wide and you just want to take a drink or three or four. But the fact is, is that if you take it in smaller bites, then you can probably get through what you need.

Announcer: You're listening to a Climate One conversation about the impact of rising sea levels. Not all boats rise equally with the tide. Coming up, Greg asks Elaine Forbes, Who gets to decide where to protect the coastline? And where to retreat?

Elaine Forbes: It feels like with every major problem it always hits low-income people and people of color hardest and this is definitely no exception. And if we thought about the globe we would really start thinking in those terms.

Announcer: That's up next, when Climate One continues.

Announcer: We continue now with Climate One. Greg Dalton is talking about managing our coastlines in the era of climate change with Elaine Forbes, Executive Director of the Port of San Francisco; Larry Goldzband, Executive Director of BCDC, the Bay Conservation and Development Commission; and Nahal Ghoghaie with The Environmental Justice Coalition for Water.

Here's your host, Greg Dalton.

Greg Dalton: Nahal Ghoghaie, where's the money gonna come from? You know, Silicon Valley and San Francisco. Lots of money. That property will get protected. The money will come somehow. But for areas that don't have as much money where is the money gonna come for low income, East Palo Alto, Vallejo, Alameda, low income areas. Where is the money gonna come from?

Nahal Ghoghaie: We're asking the same question. But I think, you know, luckily we're in a state that has a you know very long history of environmental justice. And I'm part of a legacy of environmental justice leaders who have made an impact at the state level to ensure that some of the tax dollars is going to these low income communities making sure that they are protected. I also do believe in the idea of getting the private sector to invest a little bit more with their, you know, the various forms of corporate social responsibility campaigns that they have and finding a way where the private sector knows that they're impacting a certain neighborhood and therefore finding a way to offset the impacts.

Greg Dalton: One example is Facebook has expanded toward the Bay and, Nahal, they have given the Zuckerberg Foundation, what, gave \$3 million to East Palo Alto. Tell us about that.

Nahal Ghoghaie: Yeah. So one of our outreach partners with the Proposition 1 program is in East Palo Alto. And they had a moratorium on development based on the fact that they didn't have enough water rights to develop new housing. And that was partly due to the fact that Facebook's headquarters had already utilized all of the water that the whole area could use. And so they're pretty much taking over all of East Palo Alto. And so after a long fight I think it was several years, the Zuckerberg Foundation as well as the city of Mountain View either they paid or gave water rights to East Palo Alto recently. So it's a recent win but it was, you know, it's a long fight in the making. And so I wanna give a shout out to Tameeka Bennett and Youth United for Community Action for leading that program.

Greg Dalton: Larry Goldzband. Your organization has a map that I actually have on my desktop on my computer. I've had it there for years. And it shows Yahoo, Google, Facebook, Oracle, all the tech companies in the Silicon Valley, which is very low-lying. It's the most challenged, I believe part of the Bay. It's protected by earthen berms that are vulnerable to earthquakes, etc. It's like, you know, it's like kids at the beach kind of stuff. What are those companies doing to recognize to be partners for the stewardship of their corporate campuses and the homes of their employees?

Larry Goldzband: Well I think that's a great question and that's why I'm really happy that my wife who's a senior attorney at Intel is on the third floor. I think that the real issue there is what is the private-sector responsibility versus what is the public sector responsibility? Flood control, if you want to talk about actual, honest to gosh flood control, has always been a public sector responsibility at least post World War II as far as I know. There is no Bay Area wide flood control agency. We have I think 27 flood control agencies or 21, I don't remember what the number is, scattered around the Bay. And for the most part they deal with riverine flooding as opposed to actual bay flooding. Because remember the Bay is like this big shallow bathtub, right. And so if you have a big storm and you have an El Niño or you have rising sea level, the water is gonna come at you not only from the Bay, but also down the hills. And when they meet that's where you have the issues or at least a lot of the issues. So I think that there needs to be and there has been a pretty good discussion among policymakers about what the actual role should be of public versus private flood control issues. I think that the one thing that is really, really helpful and I want to give a shout out is that the Bay Area Council and Silicon Valley Leadership Group have taken this on. And they've taken this on pretty much head first.

Greg Dalton: And these are kind of the Chamber of Commerce of Silicon Valley.

Larry Goldzband: Of Silicon Valley and San Francisco and the region. And they totally get the fact that jobs these days can be exported, but at the same time there is such a pull to the Bay Area that the Googles and the Facebooks and so on, they are here and they don't wanna move.

Elaine Forbes: And Twitters.

Larry Goldzband: -- and the Twitters. And so as a result, you're going to see more and more of those kinds of discussions. And ultimately, there's going to be a public charge to protect that which is built which should be protected.

Greg Dalton: And there was an effort to do that. Measure AA was a region wide effort, and it was a \$10, \$15 something parcel tax, which means that the people listening to this paid the same amount as the Google headquarter.

Larry Goldzband: Per parcel.

Greg Dalton: Per parcel. So, Elaine Forbes, is that equitable that, you know, a big corporation and a retired homeowner paid the same dollar amount to protect the Bay?

Elaine Forbes: Am I allowed to answer no?

[Laughs]

I think no. But it is terrifying to me as someone working on funding this, cause I'm having a heck of a time figuring out the funding for our project, \$5 billion seawall project.

Greg Dalton: That was B -- billion.

Elaine Forbes: B, with the billion and that's 3 miles. And I have another four and a half-miles to think about too, And we have been definitely making development part of the solution. So any developer on port property is paying a shoreline tax. I've also thought about a special tax to charge specifically the businesses, 500 acres of property getting flood protection from the sea wall. So they pay a bit more. Then I've been thinking about the federal government through the Army Corps of Engineers. And the state, the state built our harbor there is an economic interest of the state. And then the localities as well. So my problem, my \$5 billion problem, no one source is gonna pay for it. So it's kind of a necessity that I'm going to all these various places but I do think the private sector absolutely has to be a critical component of any funding solution.

And we need to get going in putting in critical life safety improvements first because I have a dual problem, dual threat. And most shoreline communities have more than just the flood problem. So I have an earthquake hazard because the shoreline was built before modern seismic standards. And then a flood problem, oh I have a third problem, aging infrastructure, hundred year old seawall.

Greg Dalton: Nahal Ghoghaie, I wanna get you in here in terms of communities that often may not see that they have a stake in this infrastructure. Is this on the radar of the communities you're talking to?

Nahal Ghoghaie: If you know what types of questions to ask and how to frame the conversation, you will see that there is more understanding than you would've expected. When we meet with community leaders we try to do it from a community-based solutions perspective which is very open ended discussions. It's facilitated discussions, kind of talking about what's going on in your neighborhood what are some issues you are noticing. And then we take their answers and we share that with the folks that are data scientists, the people that can draw the nexus between water, sea level rise, climate change issues, so connecting community leaders with technical leaders and seeing where there is a connection there.

Greg Dalton: So much of the climate conversation is complicated, it's cerebral, it's damn polar bears, right. Things that just seem very remote for people particularly if you're trying to work a couple jobs, you know, get the kids to school, pay the rent. And so I'm interested Nahal in terms of

how you bridge that language from the climate conversation which came out of environmentalism, which is viewed as white suburban elites, right the sole hiker in the woods and the pretty butterfly like that's far away from where a lot of people are.

Nahal Ghoghaie: Uh huh. So one example is working with communities on addressing the issue of homelessness. You wouldn't think initially when you're talking about water issues that people would start talking about homelessness. But when we have these facilitated conversations we're just asking open-endedly, "What is something happening, what's the problem in your community?" And homelessness is becoming a larger and larger issue in the Bay Area. And we can make that connection for them. We can say, you know, I know that our funding is water related, it's from the Department of Water Resources. So we can't exactly go to housing and say let's create more housing for your issue but we could say that we can turn it into a sanitation issue. We can talk about water quality, Bay health and then we can find the funding to address the problem.

Greg Dalton: If you're just joining us we're talking about sea level rise in San Francisco and beyond. Our guests are Nahal Ghoghaie, Bay Area program lead with the Environmental Justice Coalition for Water. Larry Goldzband, head of the Bay Conservation and Development Commission, a state agency in California and Elaine Forbes, Executive Director of the Port of San Francisco. I'm Greg Dalton.

Larry Goldzband, there are gonna be some really hard decisions about places to protect and abandon or retreat. And who's gonna make those decisions to protect or walk back development along the coast? Who's gonna make that in our democracy?

Larry Goldzband: You know, when you talk about managed retreat, which is really what you're talking about. It's not easy, but you can talk about numbers. You can talk about the value of property you can talk about avoided costs. You can talk -- and I sound like the MBA student who I once was.

But there are other costs that really need to be talked about and those are the social costs. We can look at East Palo Alto and say if nothing had ever been developed in East Palo Alto, you'd have a gorgeous marsh that would allow for a tremendous amount of sponge effect and help rising sea level and so on and so forth. But the fact is people built stuff there. And it's not so easy to look at a place whether be East Palo Alto or Belvedere in Marin County overlooking the Bay.

Greg Dalton: Where there is multibillion-dollar.

Larry Goldzband: Where there is multigazillion-dollar houses and say, well it's time for you to pack up and go. And that's because, especially in a place like East Palo Alto, which is an underserved community, you have neighborhoods and community. And people live there and they live close to the aunt and uncle who might take care of the kid when he or she comes home from school. And the church that they go to or the synagogue or the mosque or whatever is probably pretty close to them, and it's probably near where their job is. And so all of a sudden if you're starting to uproot people because somebody and it's going to be a public sector that's going to ultimately figure this one out, says we need to do managed retreat, then you have a huge social dislocation cost, huge, which is not measurable really in terms of dollars. And one of the things that BCDC has done, our state agency has created a planning program the Adapting to Rising Tides Program which, you don't look at an asset first, you know, like a wastewater, you look at people. And you have to figure out how people work and how people live together and that's the way you start a process.

Greg Dalton: Elaine Forbes, let's get you on that. Your territory very wealthy San Francisco is more on the defend versus retreat area. How do you see that, areas that will be protected and areas

where like we're not sure, you know, who's gonna pay the money to protect those certain areas?

Elaine Forbes: I think that this issue of the expense that's gonna come up and telling communities to move who've been there for generations, perhaps and it's just like, it feels like with every major problem it always hits low-income people and people of color hardest and this is definitely no exception. And if we thought, if we move from the United States and thought about the globe. We would really start thinking in those terms. So I think these questions at some point we're going to have to engage and be rational actors and not spend incredible dollars to keep small numbers in a place. But, I don't think that's for a government actor to say on their own. I really think that communities need to work together to make these decisions over time.

And I will say one other thing. When I got into this world and realized my new port director hat was being sort of a sea level rise person and so will every port director coming after me. I thought I don't wanna design the waterfront for the next generation. I want the next generation to design the waterfront. And I still fundamentally feel that way that we need to set a frame and do flood protection and do incremental changes and have regional solutions or regional governance and community outreach. But, but I do think we have to prepare and engage to answer these big questions.

Greg Dalton: Nahal Ghoghaie, do you in the communities you talk with really trust a government to make good choices. A government that pushed Indians off their land and, you know, do you really trust American democracy right now to make these kinds of choices?

Nahal Ghoghaie: Depends on what scale you're talking about.

[Laughter]

But I do think, my organization, one of our main tenets is to bridge the gap between communities who don't typically trust the government and the government. And we're still struggling with that especially with managing this, it's \$6.5 million that we're managing for the whole nine County Bay Area. And now that we are the holders of that funding that government funding, we're starting to be seen a little bit more as the government representatives. So it's been a difficult place for us but we have to remember our core values of who we are and how we were established. And to keep you know, encouraging community leaders to join the conversation.

Greg Dalton: I've interviewed a lot of people. One of the more memorable ones was Bill McKibben who said, "You know, we won the argument 20 years ago. This is about power. Fossil fuel companies hang on to their power." Larry Goldzband, there is also power at stake in who gets to make these decisions cause there's some people who want more regional power but that means taking power away from mayors and city councilmembers and county commissioners. So, I'd like to hear you on regionalism and the willingness of local officials willing to give up a little power so that a region like the Bay Area or Houston or New York can act in a more regional way. Have you ever come across a local person who's willing to give up power to you?

Larry Goldzband: [Laugh] So let me remind the audience of one thing which is that BCDC was created in 1965 because there was no unifying force around the Bay. So the key here I think is yes, we need a regional governance system. It doesn't mean you need a regional authority but you need a regional governance system because the way you described it Greg, it's a zero-sum game. I give up power as a local official to somebody else and I get, you know, diddley. Well, that's not the way it's gonna have to work. What's gonna have to happen is that everybody's going to have to be invested in the system and everybody's going to have to get a return.

Greg Dalton: Power-sharing.

Larry Goldzband: And everybody is going to have to give up something in order to get a lot more. We're not at that point yet in the Bay Area. I mean we have somewhere between 41 and 66 cities that touch the Bay. And so what we're going to have to figure out how to do and what we are doing is working with, not against, but with local governments and helping them create incentives and helping them actually have skin in the game to help us deal with regional problems.

Greg Dalton: Elaine Forbes, I wanna talk about the insurers, the lenders, you know as long as companies and building owners can get their insurance and can get a loan, it's business as usual. Because it's hard to focus on something like sea level rise because it's always like, "Yeah, we'll deal with that next quarter" or "The next CEO will take care of that."

Elaine Forbes: Right. I've actually heard that.

Greg Dalton: Have you?

Elaine Forbes: The next CEO will take care of this. Yes. So I think that this is a classic example of the pricing not being there yet. So the insurance companies aren't noting the risk. The lenders continue to lend. And so I think that I don't know if the private sector thinks the public sector will solve the problem, or if they're just not pricing it yet because these projections are always moving and they haven't been flooded yet but it's coming.

And I think it's incumbent upon the public sector to explain to the private sector that pretty soon your rates are gonna skyrocket or you won't be able to buy insurance and what that might mean to their portfolio. So it is coming, I don't know when it's coming but it will be priced in.

Greg Dalton: And what can an individual property owner do. We're sitting in a \$30 million building at one of the lowest points on the Bay, nonprofit, and we think, "Okay, we know but what can we do?" because the government has to solve that. No property owner can do this.

Elaine Forbes: Well you can spearhead my CFD formation for the downtown property.

Greg Dalton: CFD.

Elaine Forbes: Community Facilities District -- sorry, it's a special tax. So property owners can vote to tax themselves and Community Facilities District is a way in California and I think there are special tax provisions in every state where property owners can tax themselves for specific purpose. So that's one thing you can do. I think private property owners should also ask their government what they're doing and what their plan is and how to engage in that plan and that conversation.

Greg Dalton: And the reality is, I've interviewed the mayor of Miami out here on this stage. And, you know, talk about any city that's really in trouble. But property development is still happening in Miami, you know, the tax base has gone up and up and up and no elected politician's gonna say, "Stop the party, right or we're gonna have to retreat." No elected officials gonna do that.

Elaine Forbes: We haven't done that to date. I mean we've said okay, there's been a hurricane there's been a fire there's been a flood, let's pour money and let's rebuild let's come back. But the money will dry up because there will be more and more flooding on every coastline all across the Bay Area, all across the state, all across the nation all across the world. And as the scale ramps up, just saying, we'll pour money at this problem is not going to be possible. But when we look at who's already in the queue and who's approved and the cost of those projects that the federal government already has a call on, it's very daunting. And the time will change. It's already coming.

Announcer: This is Climate One. You're listening to a conversation about dealing with a sea level rise that has no upper limit. Coming up, Greg Dalton asks Nahal Ghoghaie about the role of local residents in adaptation plans.

Nahal Ghoghaie: You know what, you live here and if you want to continue living in this neighborhood we need your local expertise.

Announcer: That's up next, when Climate One continues.

Announcer: You're listening to Climate One. Greg Dalton is talking about how shore lines are changing due to sea level rise, with our guests Elaine Forbes, Executive Director of the Port of San Francisco. Larry Goldzband, Executive Director of the Bay Conservation and Development Commission, and Nahal Ghoghaie, Bay Area program lead with the Environmental Justice Coalition for Water.

Here's Greg:

Greg Dalton: Larry Goldzband, there is a city south of San Francisco called Foster City where they decided to tax themselves. San Mateo County has done this. So tell us some examples of citizens who have said we got to pay for this now and reach into our pocket and do something.

Larry Goldzband: Well Foster City is an example. The people who have bought homes in Foster City and who have lived there for a long time, or even the newcomers recognize that their life is essentially controlled by levee. And so, Foster City residents voted to tax themselves in order to raise the height of their levee. And they used in a letter from BCDC saying that, if you're going to do this you need to raise it to a certain level to make sure that you account the rising sea level, because why would you go halfway? And that's basically what Foster City did. People taking it upon themselves to do something to protect their community.

Greg Dalton: And anyone who's flown in to San Francisco airport, you look down there's like it's right there on the water. There's like boats right in front of people's yards, it's surrounded by water. Larry Goldzband, as you look around the country, what other cities are doing a good job preparing, planning. Who do you look to as like, ah, they're doing it right?

Larry Goldzband: I like Boston. I think New York has done a great job and Florida. I mean we talked about Miami but you have a four County pack there that's actually trying to really work hard at things. The difference is that most of those places have experienced flooding. And so as a result, they have an idea about what flooding really means. We haven't an experience flooding really a lot at least nowhere near the magnitude and the storms nowhere near those magnitudes. And so when you talk to people about rising sea level they haven't really experienced here in the Bay Area what it really means to see water in their front yards or sharks in their backyards as the Hayward Interpretive Center talks about it.

And so that limits how we can talk about it. Now remember, and this is the thing I always like to say, unfortunately, is it took 25 years for the Bay Area to replace the east span of the Bay Bridge after Loma Prieta.

Greg Dalton: Big earthquake, yup.

Larry Goldzband: How are we going to be able to convince folks that we need to do something prior to an El Niño combined with a king tide combined with say a 25-year storm?

Greg Dalton: Elaine Forbes, what happens during the next hundred year flood in San Francisco?

Elaine Forbes: The Muni Embarcadero station floods. So we have a catastrophe in the regional transportation system. And again that will impact most people who need to get to their jobs that day and don't have the ability to call in and say, hey, I couldn't make it, and they need that income that day. So low income people will be hurt the most. Then will get the system up and running and we'll clear out the flood and the storm will pass. But that's a major, major impact from the hundred year storm. That's a very, very big impact. So we are working with the Army Corps of Engineers on that problem right now. And there are lots of interesting things you can do some temporary and some more permanent. So you can put out movable barriers and you can make these smaller scale changes that can protect the community and buy yourself runway. A lot of it is sort of buying yourself runway before you have to make much more large-scale change.

Greg Dalton: And the town of Hoboken, New Jersey after super storm Sandy they were offered a bunch of federal money to protect them. And they looked at those big walls and said, nah, no thanks. They turned it away. We don't want your money. We don't want those walls and they're kind of letting it ride.

We're gonna invite your participation for your questions or brief comment. Welcome.

Male Participant: Good evening. Steve Kedivar. Thanks very much. I do hear change is coming, I agree. The key change that really need requirement a priority change, at the federal government level. United States is not poor, it's rich. \$1.7 trillion will be invested in the next 30 years on nuclear weapon modernization. So there's money but there's not enough priority.

Greg Dalton: Thank you. Who would like to respond to that?

Elaine Forbes: I can on a positive note because I agree that the inaction out of Washington D.C. is very disheartening. But I will say we did get the New Start from the Army Corps of Engineers which is a federal agency. And I think they've changed their terminology they've crossed out climate change and I think they put in climate something. But they know that it's a rising tide and they're here and they're studying our problem and even though the politicians are being ridiculous, the bureaucrats are not. And so they are continuing to work with communities on current flood, future flood. And so I think there is hopefulness because now we can see it, you know. Miami is underwater on sunny days, so they know.

Larry Goldzband: There's also if I can give another bit of good news. The National Oceanic and Atmospheric Administration which runs the coastal zone management program, of which BCDC and the Coastal Commission, the Coastal Conservancy are part, actually had its grant-making program increased this past fiscal year by the Congress. And that was due in large part, I believe, by the action of Southern Republican governors and mid-Atlantic Republican governors who understand the federal state partnership and understand how their coastal zone management agencies work with the federal government on issues like resilience. And so you're seeing different sort of different combinations of people working in different ways.

Greg Dalton: And there are other Republican governors who protected investment tax credits, production tax credits, a lot of the tax breaks for clean energy in the most recent budget.

And our conversation is about rising tides at Climate One. I'm Greg Dalton. Elaine Forbes is Executive Director of the Port of San Francisco. Larry Goldzband is Executive Director of the Bay Conservation and Development Commission, a state agency responsible for protecting the coastline. Nahal Ghoghaie, is Bay Area program lead with the Environmental Justice Coalition for Water.

Let's go to the next question. Welcome to Climate One.

Male Participant: Thank you. Good evening, I'm David Capelli. I'm the Millennial Policy Commissioner for Miami-Dade County. My question regards to how are you engaging millennials and communities of color in your work around infrastructure from research, design, build, planning and implementation. What is that look like from an economic development perspective and what is that engagement look like?

Greg Dalton: Nahal Ghoghaie.

Nahal Ghoghaie: So I would have to start with one of the groups that was a part of that Resilient by Design program. I think that they hit the nail on the head when it comes to working with communities on, you know, building their capacity and showing them that they are able to become leaders and to become the technical experts that their communities need. So they worked with communities on permaculture and design, anything from understanding just how to build a bioswale which is, it's a way to mitigate flooding. They learned a little bit more about the issues of toxins on the, the watershed of just the flooding that's happening from the upper watershed and how there is a superfund site in Marin City which is north of the bay in the North Bay.

And I think it's just education and saying, you know what, you live here and if you want to continue living in this neighborhood we need your local expertise and there are jobs out there you can learn, you know, we're helping with our Prop 1 program on capacity building, which will include applying to grant funding, learning how to write a proposal, learning how to become an incorporated 501(c)(3) little steps along the way and eventually leading to green jobs. So through my job I've also worked with Measure AA and helping that ballot measure to educate the community on how they can get more involved and giving them a priority on funding. So that's \$25 million for the next 20 years at least and making sure that community leaders know how to apply. And making sure they even know that the funding is there for them and giving them the type of technical expertise so that pretty soon they'll be able to just lead their own programs and help save their communities.

Greg Dalton: Larry Goldzband.

Larry Goldzband: And let me say the state government side, we're working together with a number of other organizations in a very transparent, very public process to actually figure out how the San Francisco Bay plan, which is our regulatory framework, whether and how it should be changed, amended to ensure that environmental justice issues are considered by the commission in a way that is appropriate to its authority and its jurisdiction. We're doing that openly.

Greg Dalton: The waterfront in San Francisco a lot of things come together there. It's a big tourist destination. It's also a place for offices and commerce, tours. It's also a place where commuters are bicycling to work, including myself and we often hear that, oh the sea level rise there's gonna be some construction work, "So the bike improvements can't be made because there's gonna be construction for the sea." How do you balance current and long-term needs like that?

Elaine Forbes: That's a really important question. I mean I think every public official has a requirement to figure out if they can leverage other projects if you're in the same geography. But in general, for the seawall project because a lot of it is gonna be underground. A lot of it will be those soil improvements with some flood protection measures. We want to move ahead with other projects that improve life on the Embarcadero. So we don't want to lose what we have. We want to make bike improvements and other kinds of improvements as a city because those big scale urban form changes that we're gonna need to make to protect our line of defense are several decades down the road.

Greg Dalton: So bike lanes don't need to wait for the seawall.

Elaine Forbes: No.

Greg Dalton: Larry Goldzband, tell us about the importance of wetlands and how nature can be kind of natural shock absorbers to impact some of the storm surge and cushion this could've happened, you know, we hear about oysters protecting, oysters beds protecting New York City, etc. Can Mother Nature help us?

Larry Goldzband: Mother Nature can help us if we act quickly. And if we have enough room in various places in order to create large what are called horizontal levees in which will allow the levee to actually accrete meaning to gain the ability to actually have plants and so on and so forth, and to create that sponge affect. And that sponge effect is very, very real. And it is not like a seawall. But in order to protect both the built and natural parts of the Bay, you're going to have to create both natural and man-made structures to do so.

Greg Dalton: And one man-made structure that got a lot of attention a few years ago I keep hearing about this was Goldilocks. The idea that there's some big magical gate put under the Golden Gate Bridge, and wouldn't it be nice if we could just like this one piece of magnificent engineering could save us all this trouble, Larry Goldzband, why can't Goldilocks come to the rescue? Or can Goldilocks come to the rescue?

Larry Goldzband: Well, I mean one of the really interesting things, and Will Travis my predecessor at BCDC talks about this all the time, is that you're going to need both large and small solutions to this issue. Goldilocks would be a large solution, but it would also cause large amounts of difficult decisions to be made. And so I would argue that as we look past the next 20 or 30 years sort of in that next generation that Elaine talked about, you're gonna start seeing discussions about larger types of protection.

Greg Dalton: So people look to the Thames or some sort of grand engineering...

Larry Goldzband: Sure. There's Thames, there's Venice, you know, and the Netherlands has its way. But, you know, there's an awful lot of pressure flowing through the mouth of the Golden Gate. Huge amounts of pressure going back and forth. And so from an engineering perspective that would be macro in the biggest sense.

Greg Dalton: I talked to a homeowner who owns a home in Malibu and she knows about climate change and she bought another lot next door. She's doubling down in Malibu. I'm like really? And she thinks that with cement and steel she's going to protect herself. What does that do Larry Goldzband, is she gonna be successful?

Larry Goldzband: In the short term if she can build the seawall, if the Coastal Commission lets her.

Greg Dalton: What does it do to her neighbors?

Larry Goldzband: Well that's a really good point. And one of the things that BCDC is doing is in the next or so we're going to be having a public process about changing our regulations to make sure that just as you have to do a vulnerability analysis on your project and what it means you're also gonna to take a look with your neighbors and what your project means for the neighborhood.

Greg Dalton: Because you can build a wall but it kind of screws your neighbor.

Larry Goldzband: It can.

Greg Dalton: Next question. Welcome.

Male Participant: Hi, my name is Micah. I live in San Francisco. When we talk about these huge problems of huge scale and the solutions and interventions to go with them. It's hard for me to reason about the prices and the costs. Can you put them in familiar terms like a levee costs \$15 per parcel saved or the cost of the seawall is X dollars per citizen of the Bay Area.

Greg Dalton: Elaine Forbes.

Elaine Forbes: [Laughter] I knew you're gonna turn to me. \$500 million buys you three quarters of a mile for a new seawall. So that's something you can think about. I think that the ways in which we communicate the cost of these things is going to be very important, not only because we have to find the money but I think also this wake-up call that I spoke of earlier that we're having to deal with this because of inaction. And I'm not a scientist by any measure, but from what I understand there's disaster coming. But if we don't fix what we're doing, it's catastrophe. So we need to say we have to understand the cost of sea level rise and the cost of climate change so we can change our behavior to stabilize the planet. So I think it's very good question and it will cause me to want to express it more clearly in the future.

Announcer: Greg Dalton has been talking about sea level rise in a changing climate with Elaine Forbes, Executive Director of the Port of San Francisco; Larry Goldzband, Executive Director of BCDC; and Nahal Ghoghaie, with the Environmental Justice Coalition for Water.

To hear all our Climate One conversations, subscribe to our podcast at our website: climateone.org, where you'll also find photos, video clips and more. If you like the program, please let us know by writing a review on iTunes or wherever you get your podcasts. And join us next time for another conversation about energy, economy, and the environment.

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

Climate One is produced in association with KQED Public Radio.