

[MUSIC PLAYING]

NARRATOR:

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- You know, Charleston's always had our special relationship with waters, a sea port town.
- A storm surge is like climate change and sea level rise on steroids. It comes very fast.
- A little rain, with a high tide, you have to stay inside.
- We are a community that will answer the call when a crisis or a tragedy occurs.
- Climate change is here now for emergency managers in a city that wants to lean forward and be proactive.
- We have to be smarter and more strategic for those who are developing and are renovating their homes.
- Fairly simple technologically and economically feasible measures taken now throughout the world will avert immense displacement and hardship 50, 100 years from now.
- Climate change is something that's going to affect us in so many ways. And particularly in the low country one of the issues we're concerned about is rising sea levels.
- You see this beautiful harbor behind us. In the last 100 years, it's already known that it's risen 18 inches. Over the next 30 to 40 years, it's projected it could easily rise another foot and a half to two and a half feet, 18 to 30

inches. So if you look at the existing, quote, "nuisance flooding" that we have, if you add another two feet on top of that, it's projected that downtown Charleston and major parts of west Ashley and, really, coastal South Carolina, could not only have nuisance flood, but flooding that directly impacts our daily lives.

- What people maybe or maybe not connecting is that the extreme weather precipitation events, the extreme rain events that we're having, if you couple those with those extreme high tides, you could go from what was a nuisance flooding event five years ago to a flash flooding event today. And it can happen very quickly.

- I think that people are finally grasping that we're not just talking about rise in temperature, that when we talk about climate change, we're talking about drought, erosion, storm events, and of course sea level rise.

- We try to stay away from the discussion of what's causing climate change and just say, let's look at the reality. And let's look at what the records show us. And if you look on NOAA's website, they've got documentation from the early 1900s that show that the tide has risen in Charleston, a little over a foot every 100 years. And we expect that to at least be the baseline of what will happen.

- It could be that the climate change rates that we're seeing now and sea level rise rates that we're seeing now may be too fast for the habitats to reform and for the animals to adapt. I don't think we know yet whether that's true.

KEVIN MILLS (VOICEOVER):

We can no longer afford to think about this as an issue that's wildlife conservation or a people and property issue. It's everyone coming together to contend with

something has serious and profound effect on our future.

- So in 1837, Mayor Henry Pinckney offered a \$100 gold coin, a medal, to whoever could come up with a solution to flooding in the peninsula of Charleston. No one ever won the prize. And I just became mayor about six months ago. And it's a great honor to serve.

And Mayor Riley only left me one thing in the desk. He cleaned it out so well. There was a pair of scissors for ribbon cuttings, so he left me that. Been using that already. But I don't think he even knew that I found this gold coin down in the bottom drawer. And so the offer's still good. I got a \$100 gold coin here who can ever figure out the flooding problem in Charleston.

LAURA SULLIVAN CABINESS (VOICEOVER):

And I think it's interesting to point out too, a lot of these problems happened because we filled creek beds in over time. So Lockwood Boulevard wasn't there until 1950. So it became an impedance then for drainage interior to the city. And many of the areas that you see in the city that flood so badly, like Fishburn Street and Wentworth Street, you can literally lay over the old map of the city that shows where the creeks are. And that's where the flooding is the severest.

GEORGE SEDBERRY (VOICEOVER):

I can remember going to Folly Beach back in the '80s and seeing chimneys and brick foundations of houses sticking up out of the sand on the beach. There used to be a row of houses out there. And there was another road out there. Well, that's all gone. But the houses are still on Folly island. And the beach is still there. And the animals that use that beach are still there. They've just moved a little farther west.

MARK WILBERT (VOICEOVER):

We get 38 king tides in 2016. Well, that's gonna cause some water down on Lockwood. It's gonna cause some water over by the citadel and other neighborhoods in and around the city. You're gonna get water. But you add an extreme precipitation event to that, which are-- they're increasing-- and I don't have the statistics, but these statistics are really scary, how quickly they're increasing. You add those to a king tide event and what was individually something that was manageable now becomes an emergency event.

- The King tide that happened last October actually flooded Harborview Road. And I've lived there for 27 years and never seen Harborview Road topped before.

- The effects of climate change are on temperature, on ocean acidification, and it affects the fish, the fishery, and the habitat that those fish live in and the communities that depend on those fisheries as well.

- Well, we're seeing a tremendous loss of habitat. Climate change is one of the biggest factors in that. The Barrier Islands have lost a lot of habitat. We've lost over 2,000 acres of front beach habitat on Caper main. This is impacting our nesting birds. The sea birds and the shore birds nest right on the ground. Overwash of these nests and loss of habitat is causing failure, repeated failure of these birds.

Our nests, our sea turtle nests, we have to move so they don't wash away. It's very alarming, truly alarming to me. I've been there for a long time. And it's very sad. It's like losing an old friend.

SUSAN L. HITCHCOCK (VOICEOVER):

Cultural resources experience the same climate change effects as our natural resource counterparts. And when

we talk about climate change, we're not just talking about sea level rise. We're talking about all kinds of different events.

Let's just look at the Charleston area. We have Fort Sumter. We consider that a nationally significant resource, not only because of the start of the Civil War. But let's think about the legacy of enslavement. But what would you do compared-- let's say that structure, that building sitting out in the middle of the harbor versus the life ways on the Barrier Islands. How would you prioritize that? Would you say one is more important than the other? So there's a lot of uncertainty.

GEORGE SEDBERRY (VOICEOVER):

Fisheries are worth about \$200 billion in the United States and employ 1.7 million people. So when these fisheries start to change and move out of the region and take that economic impact with them, it affects our local communities that are involved in, not just the fishermen, but the restaurant trade, tourism, and other aspects as well.

- Lives and livelihoods are at stake. So when you think about the fishing industry, for example, if we lose this barrier protection of our salt marshes, the salt marshes themselves are nurseries for all manner of species that sustain the fishing community and sustain human health and consumption.

So the short answer is we're all in this together. The solutions for human and industry and commerce are also the same solutions that will protect wildlife and wild places. So we have to think expansively.

- Fish do have temperature preferences. And if the water's too warm or too cold, they'll just move. In the

southeast, for example, we see many fish moving farther north, because the water's is-- their temperature preference is now farther north. So fish that supported important fisheries-- or still support important fisheries off of South Carolina, things like blueline tilefish, are now supporting fisheries of of Virginia and Delaware and New Jersey.

But we still believe that they're gonna be vulnerable. You know, there's only so many places they can move. And when they try to move, there's already species there occupying their niche. They might be able to move. Or they might just be vulnerable and those are big unknowns. We haven't tested vulnerability in a lot of these species.

So initially, the conversation is about understanding what it means. What does climate change mean? What does that mean for me in my daily life? That means water levels might rise higher than how my house is built right now.

- Of course, climate change is going to have a tremendous effect on our cultural resources, particularly in our coastal parks. But it could be any park really, because when we look at the climate change science, we know it's not just coastal effects, drought, erosion, storm events.

These are things that are not limited to the coasts. So all of our park projects are being affected by climate change. And that's how-- I think that's the reason why the National Park Service has implemented a climate change response strategy. And it's science, mitigation, adaptation, and communication.

A lot of people sort of want to focus on the difference between mitigation and adaptation. When we think about mitigation that means we would actually make a change in reducing the carbon footprint, which is sometimes easier said than done. Adaptation is when we look at reducing vulnerability. And that's where maybe we can be-- have a better outcome, but not necessarily.

- It's hard to envision exactly what's going to happen as a result of climate change. We can-- scientists are making some great predictions. I think those predictions are getting better and better. But we have to constantly watch those and readjust as time goes by.

Even though we have some pipes that are from the 1880s, the average age is 38 years right now. So we've been systematically replacing that. And it's not something you can do in one year, five years. It takes a 20-year planning cycle and longer. So you have to keep your eye on the ball, so to speak, to make certain that infrastructure does not fall behind and being replaced in a timely manner.

- What we have to show is that we do have a commitment. We have to make priorities. We have to take into consideration changing and changing demographics and development plans and things like that. And really, we have to relate it to the people, because the people have to pay for these projects.

- And so ultimately, it comes down to economics, which is one of the things that's mentioned. We may have to literally raise that house, build a new foundation, which means it costs more.

So fortunately, the city has grant funding available to help persons with that. Sometimes it means that person might have to contribute a certain portion of those dollars to that house renovation. And literally, what might have started out as a small renovation becomes a substantial rehab in order to ensure that we're really making that house sustainable for the long-term.

LAURA SULLIVAN CABINESS (VOICEOVER):

We're not going to be able to engineer ourself out of everything. And we really need to be seizing the opportunity with all of the development that's going on right now, as quickly as possible, to get people to think about what will happen with their development that's happening, if we have one and a half, two and a half feet of sea level rise.

- When we develop a plan, develop those plans for the most vulnerable people first. They should be our priority, because when we build a development we build a development around that community and that development affect those most vulnerable people.

- What we really need to focus on are vulnerable populations, our elderly, our disabled, our economically challenged. We know they're our most at risk population. We just know that. They can't get out. A lot of them don't have cars, most of them don't have cars. Let's not say a lot. Most of them don't have cars. It takes neighborhoods, it takes churches, it takes communities to look after them and make sure that somebody's looking after them. And that's very difficult to do as your city is changing as rapidly as our city is changing.

- And we try to get neighbor to look out for our neighbor. And then, we have individuals that go around checking on the senior citizen and making sure that they all right,

because our senior citizen are very vulnerable, especially the real senior citizen, 80 and above.

- The city's taken a look out, about 50 years, And at 50 years, most of the predictions kind of say, you can expect one and a half to two and a half feet of sea level rise. And then, the drainage projects we're doing, as you build these fortifications around the city, you have to be able to get the storm water that falls from the sky out.

And you have to be able to keep the seawater out of the drainage system. So the drainage systems that we're putting in place right now are gonna be key in allowing us to continue this hardening, as I would say, at the edge of the city.

SUSAN L. HITCHCOCK (VOICEOVER):

We know there will be loss. And we have to be ready for that. I mean, we don't have the answers yet. But in doing vulnerability assessments, we can maybe hope that we can make better choices, if we have to make this hard choices.

- Now, we can-- we can deal with this. But it takes planning. And we need to conduct research to find out what's moving around and what's staying still. And we need to be able to have flexibility in our management plans to maintain these sustainable fisheries.

We need more cooperation between states and between regions and among agencies, so that we can continue to manage these fisheries for sustainable use. It's not like the fish are gonna go away. They're just gonna move someplace else and they're gonna be replaced by things that we haven't figured out yet.

- We're on a listening tour right now to understand the needs of our audiences. And people learn in different

ways. They receive information in different ways. So for some audiences, we're going to be reaching out through where they live and through their community centers and through their churches and in public gatherings. For others, we're gonna use social media and technology to engage them.

Right now, we're creating a suite of Citizens Science apps. These are downloadable products that will allow everyone to become a scientist and join in the effort with us to measure king tides and to monitor water quality and assess the health of wildlife populations. And we think through this level of direct engagement people will understand what's at stake and also feel like they can be part of the solution.

- So you look at your policies of development and redevelopment and properties that were built in the wrong place. I mean, one mitigation may be that we have to purchase some of those properties. And we're applying for grants to do that in some properties that were flooded out last October. So it's a combination of planning, policy, and building codes to prepare for the future.

LAURA SULLIVAN CABINESS (VOICEOVER):

You know, we're gonna have to fortify our edges. So we're working right now to restore the seawall, the low battery seawall. We replaced the corner section of it a couple of years ago. Now, we're working on the low battery. And we're looking at building it two and a half feet higher.

ANDY FAIREY (VOICEOVER):

We are systematically addressing that issue through master planning. And with that master planning, we are looking at our critical infrastructure, places that are all in-- have low elevation. And we're adjusting the elevation of that infrastructure to be higher than the

predicted storm surge for like a 100-year storm or a category 5 storm. And so that infrastructure, over time, is being elevated, which will make it sustainable during that gradual sea level rise that comes from climate change.

- We have a great county emergency management program, where there's all the information that any citizen would need. But the challenge really is getting to all the different communities in Charleston. Charleston is a very diverse community and diverse meaning different geographic locations, people from Charleston, people not from Charleston, a wide range of economic backgrounds. And all of those different communities bring unique sets of challenges with them, in order to prepare to move out of the city in case we need to do that.

- It's going to affect diverse audiences in different ways. Some people receive their information from social media. Some people receive their information from churches. So our role is to go out in the communities and to make sure that people are informed about this issue, that they have the tools that they need to really plan for their own safety and those around them.

ARTHUR LAWRENCE (VOICEOVER):

In the city of Charleston, we have over 150 neighborhood association. And if we can get all those neighborhood association to work together and have information session quarterly and bring people up to date of what's occurring in their neighborhood, I think that'll be a great-- a great start for the community.

So we're doing some good things there, informing the community of where to go, what agencies is available, and what agency you need to contact in the case of emergency.

- The education needs to be enhanced across the board, with our builders, with our architects and our engineers, because we aren't quite meeting what we need to, relative to giving them the house that we knew will last for the next 100 years. We don't know exactly when sea level rise and the climate change will impact us directly. And so we-- we're literally having to plan against a science that is not defined.

- And I think it starts with individuals. It goes to communities and then municipalities. You can't take it any higher than that. The federal government can come in and give you what they want. But they're really here for afterwards. If we don't take the actions in our community to do what we need to be prepared, shame on us.

- Individually, there's all kinds of people telling you what you can do. You can eat your veggies and ride your bicycle and recycle your bottles and cans and take shorter showers and so forth. If you want to work out of a global level, you need to tell your senators and congressmen that you're concerned about this issue and you want them to take action.

- The citizens have to ask their leadership and their elected officials to make this important. And I think we need to think about it across the board in everything we do.

- We need to elect public official who represent the city of Charleston and represent the different-- different areas of the city to buy in on climate change, if they're not on board already. When candidates are running for office, that's just one of the things that we want on their platform, that they have tried to get money available to the city.

Especially to help those people that are not fortunate as other, because those are the people that are really gonna get hurt, the people that don't have the necessary flood insurance, storm insurance, or anything like that. So we're working with elected official to make sure that happen.

- Some of those persons that are of low and moderate incomes are those that are most vulnerable to this issue. Those are the persons that we assist, from my department. Those that are low and moderate income, we have funding from the Department of Housing and Urban Development.

- From an emergency management standpoint, one, we can influence or we can help to influence and inform planners as they look at new developments within the city, as we look at road issues that are in the city. But also there's things like informing the citizens about flood insurance issues, about having their home insured for floods in case we do have an event. And we're gonna have an event. We're going to have an event. And if we do, having that insurance is so important.

- To go above and beyond what FEMA recommends, because we realize in the coastal regions that we have an extra foot or two to deal with other areas may not.

- More than 50% of our projects end up being funded by grants, either through the state or the federal government. The cities invested a significant amount of ourselves to be ready to apply for those grants. But without those grants we wouldn't be building or fixing the drainage on Highway 17 and Septima Clark Parkway and over near Burke High School and around the Medical

University. So it's really important. And working with the Corps of Engineers is also very important.

- What we're trying to do in the Park Service is take each part and do a vulnerability assessment. Where the science side is also every park is having an inundation study done for sea level rise. I believe every park is also doing a vulnerability assessment, not for sea level rise, but for individual species, both mammals and vegetation.

So we're trying to, I think, break it down into more manageable pieces so that we can-- maybe at the end we can put together a strategy that will work.

KEVIN MILLS (VOICEOVER):

This week, we announced the resilience initiative for coastal education. Its acronym is RICE. And that's really an homage to the West African slaves who came across about 200 years ago with a tremendous reverence and respect for a delicate balance between land and sea and in an ingenuity that resulted in an unprecedented rice culture. And what we want to do is take that same ingenuity and that same respect for land and sea and apply it to this most significant and profound environmental issue of our time.

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