

Ways & Means Transcript—S4E4—Calculating the Cost of Climate Change

Emily Hanford: From the Sanford School of Public Policy at Duke University, this is Ways & Means. I'm Emily Hanford, and this is the fourth and final episode in our series about policy ideas for understanding and responding to climate change.

Sound: "we're here..." Door shuts, seagulls, feet crunching on gravel

CC: We're standing on the Freeport Town dock and we're looking East out across the Harraseeket River. It's just a really protected bay.

EH: This is Chad Coffin. He's a clammer in Freeport, Maine. He started as a kid, digging clams with his dad. Now he's a commercial shell fisherman. All the fisherman out here, they have nicknames for each other.

CC: They call me the Griz, because I'm kind of like a grizzly bear. I'm pretty happy when I'm out clamming. It's kind of like a grizzly feeding on salmon.

EH: Clamming is a big part of the culture here in New England. Fishermen dig clams nearly year-round.

CC: The only thing that really stops clamming...that really would stop you from going clamming, would be ice. And it's never any fun to dig clams in the rain because of the mud pools up with water. And clams don't siphon freshwater. So the thing about clamming is you actually see the siphon holes in the mud, you know where they are. And when it rains, you don't see that. So, there's not a lot of people that go in the rain...there's a few, but not many.

Emily: The clams caught here on the Maine coast are soft shell clams, also known as steamers or longnecks. People eat 'em steamed and also fried, in clam rolls with tartar sauce. Maine clammers have traditionally bagged about half of the nation's entire soft shell clam harvest. But the harvest has been declining for years, and in 2017 it was the lowest in 87 years - just 1.4 million pounds. Restaurants across New England were feeling it.

TV news story: *The owner of Fred Shanty, another New London summertime hotspot, says he's never seen anything like this. "It's been tough because I have been getting half what we order. Guys are telling me they usually catch 100 bushels a day they're down to 30." A shortage at sea causing a fried food dilemma on land.*

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Emily: What happened to all the clams? Scientists point to climate change. The Gulf of Maine has been getting warmer. It's a huge body of water that stretches from Boston, Massachusetts, all the way past Bangor, Maine. It's warming faster than 99% of the world's oceans, and that's wreaking havoc on the species that live in the area, including clams. One problem is predators that eat the clams have multiplied like crazy – take the green crab.

Chad remembers when he first realized the green crabs had exploded. He was working in some mud flats where clamming is usually good in the five hours between the tides.

CC: **So, you're digging clams that whole time, you're bagging, you dig them in a bucket and you dump them in a bag. And when the tide comes over them,**

you go out and you bring the boat around to where the bags are and you wash them up and put them in the boat. And we'd pick a bag up, and just the tide being on it for maybe 10 or 15 minutes, there'd be hundreds of green crabs on the bag, in the bag, outside the bag, going crazy. And it was just like wow! It was hard not to notice that there might be a problem. That was 2012.

EH: 2012 was the year of a record-breaking heat wave in the Gulf of Maine. Water temperatures hit the 80s here in the Harraseeket River. Green crabs were everywhere, eating up the clams. Chad decided to do something about it.

CC: **I convinced the town to buy me and some other guys 200 crab traps. We were going to eradicate crabs here. And we did it.**

EH: Or at least they thought they did. The fishermen trapped lots and lots of big green crabs. But Chad found out later that big crabs were only part of the problem. The traps couldn't catch the small ones.

CC: **It's not all these big crabs that we catch in traps. It's all the little crabs that are eating all the tiny, tiny clams. Trapping was like a total waste of time. It's really fascinating in a way because we think that everything's just gone. But in fact, it really isn't. It's still here, it's still settling, it's still powering the ecosystem, it's just that the human predator, there's nothing left over for us. The clamming has dropped off so much here in Freeport that all three wholesalers have closed within the last 10 years too, so there's no place to sell clams here in Freeport anymore. So, the infrastructure's been collapsing as well.**

I applaud all the people that are working on reducing carbon emissions. But the reality is it's not going to happen overnight and you know, fisheries are going to look a lot different than they have, especially in New England. They already do. They're basically gone.

EH: As the ocean warms, an entire industry is dying in New England.

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On this episode of Ways and Means, we look at how changes in our climate are leading to changes in our economy – not just on the coast of Maine, but all over the world. And we ask: Who will take the hardest hits financially as our world heats up – and can anything be done about it?

Billy Pizer: All of my research has focused on something related to climate change policy over the last 25 years.

EH: This is Billy Pizer. He's an environmental economist and professor at Duke University's Sanford School of Public Policy. He's been studying climate change since 1996.

BP: And I remember when I first started working on it and a colleague said to me, "Well, you better enjoy working on this now because they'll pass legislation and deal with the problem and then you'll have to find something else to work on."

EH: Well, suffice it to say we didn't solve climate change back in the 90s and Billy Pizer has had plenty of work to do.

One of his specialties is estimating what the financial consequences of global warming could be. In other words, he's trying to add up all the future

costs. And that's really hard. For one thing, there's a lot of uncertainty about exactly how much the Earth will warm.

BP: Even if we predict a likely average temperature increase of three degrees, there's some probability, maybe 1%, that we might see six, seven, eight degrees of warming, which would be pretty dramatic

EH: So here's what economists do. They build a whole bunch of different models based on different increases in global temperature. Then, with the help of powerful computers, they can forecast the costs associated with each of those temperature changes. Something else they can do is zero in on how climate change may affect particular geographic areas and particular industries.

BP: We can both get some measure of economic activity as well as some measure of climate impacts in order to put that together and say what's going to happen in that localized area?

EH: You can actually go online now – to websites like the Climate Impact Lab -- and find a map that shows what climate change could mean in your state. In Maine, for example, there was no such thing as a really hot summer day for centuries. Historically, zero summer days over 95 degrees. But the Climate Impact Lab maps shows that by the end of this century, there will likely be at least 3 and as many as 14 days over 95 degrees in Maine. Economists use these temperature estimates to start adding up a bunch of possible costs.

BP: And they can go through sector by sector and say, well, how much will mortality change? How much will agricultural productivity change. All these different categories—energy usage from air conditioning—how much will all this change? And what's kind of cool about this is you can

see, well, in certain parts of the country that are currently cold, you actually see some economic improvements. In other parts of the country, the southeast, the southwest, where it's already fairly warm, you see a lot of economic costs. There are sectors of the economy that are particularly sensitive to climate change.

EH: Those sectors include agriculture and construction that depend on the weather. And industries that rely on natural resources – like clamming in Maine.

Sound of clamming

CC: Right now, we're on Bartoll Island. The tide is coming in pretty good now. You can see a guy actually over there dragging to the shore, way over. See him over there on the mud?

We're back with Chad Coffin. The warming climate means it's harder and harder to make a living as a clammer. And that means fewer work options for a group of people who don't necessarily have a lot of other options for work. You didn't need a lot of education or money to be a clammer.

CC : You know, typically you just need a clam hoe, which is anywhere between \$50 and \$100, and a \$10 sled, and ten 50-cent bags and a pair of \$100 boots, and you're in business.

EH: As the clams have died off, Chad has found other ways to supplement his income. He works with climate scientists to set up and monitor their field experiments. He's also the head of the nonprofit Maine Clammers Association. He even started an aquaculture business – an oyster farm. Oysters are thriving in Maine as the water warms.

CC: **You know, the key to everything is really identifying and developing methods that will work in a different climate. There's a lot of people that are getting into aquaculture. And there's no question that it's a big part of the future of fisheries.**

EH: But Chad says not many fishermen are adapting like he has -- perhaps in a bit of denial about what's going on, assuming they're powerless to do anything about the changing climate.

CC: **The problem is that the people that are most dependent on fisheries are the ones that don't believe it. "Geez. Well, nobody knows. There's not much you can do." I mean, that's the general attitude of a fisherman. So, it's all these educated people or people from out of state that are building oyster farms or getting the grants to do this or that or whatever. It's not everyday average clammers or fishermen.**

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EH: But it's a lot of average, everyday people who are likely to be hit hardest by climate change. And figuring out just how hard they may be hit is where Billy Pizer's work comes in. He's the environmental economist from Duke. What he's trying to show is the future cost of doing nothing about climate change – to push policymakers to do more, now, to try to stop it.

Take hurricanes for example. Scientists predict that as the earth's temperature rises, we'll have more frequent and violent hurricanes. Is there a way for economists to demonstrate how much it will cost if we do nothing about climate change and there are more hurricanes? Billy says some fellow economists tried to figure that out.

BP: **And they had a model that captured how much more frequent they were going to be and how much more powerful they were going to be. And they had a model of economic loss based on historical data of how much damage was caused by these different types of hurricanes. So they put together all this information to try to figure out how additional climate change would lead to more damages.**

Emily: Hurricanes don't just destroy buildings and infrastructure, they kill people. And so do warmer temperatures. Economists have calculated how many more deaths there may be in the future if we do nothing about climate change now.

BP: **We have these studies that tell us how many more deaths are likely to occur on a day that's 95 degrees as opposed to 80, as opposed to a 70 or whatever. And so if we have projections of how temperatures are going to change, we can do calculations of how many more deaths they're going to be in the future.**

EH: This is the kind of bottom-line, nuts-and-bolts information that policymakers should have when they're considering new policy ideas.

BP: **Like right now we have to decide whether or not we're going to invest more in renewables and pay more for renewables than natural gas. And doing that will cost us money right now, but it will mean less carbon dioxide in the atmosphere. That carbon dioxide in the atmosphere and the**

temperature change and climate change that it causes are going to persist for centuries.

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EH: It ultimately gets down to the question – do we want to spend some money now, or lots more money later? Billy Pizer and his fellow economists are trying to make this tradeoff concrete with their calculations of the future cost of doing nothing. And when you're Billy and you've seen the numbers on what the costs might be, it's a no-brainer that we should be doing something now.

BP: So economists, like myself, have been arguing since the beginning of time for policies that put a price on emissions as widely throughout the economy as possible.

EH: That means the more CO₂ a power company emits, the more that company pays. And the way that company covers its increased costs is to pass it along to customers who then pay more every time they flip a light switch.

BP: And the basic argument is that climate change is caused by 300 million people making decisions every day about how much energy do you use and what kind of car to buy and things like that. And it's very important that we decentralize the incentives so that everybody can make better choices. And these policies that put a global price on emissions wherever they occur, ideally throughout the world, would really save the world a lot of money and presumably allow us to pursue even more reductions than we might be able to pursue if we pursued more expensive policies.

EH: In other words, if we were all forced to start paying something for climate change now, maybe that would compel us to reduce our energy use. Billy argues that because we have failed to enact policies like this on a scale large

enough to make a difference, we may have to resort to radical actions to combat climate change

BP: **Forget the CO2 in the atmosphere, let's inject things into the atmosphere that will reflect sunlight and reduce the amount of solar radiation that's actually hitting the surface of the planet. So whether you're talking about mirrors or particulates or something that would just make the atmosphere more reflective and therefore lower the amount of energy that's coming into the planet and warming the planet and changing the climate.**

EH: Billy says he hopes that civilization doesn't have to resort actions like this. First of all, there's no guarantee they'd work. We would have to keep doing these injections to keep the climate stable. And they'd introduce a whole bunch of new risks. The better solution is to put a price on climate change now and make sure that policymakers and the public understand just how much it will cost future generations if we do nothing. And this needs to be an international effort.

BP: **Almost every other problem that we've solved we've solved kind of internally to our nation. Cleaning up the air quality you know and the industrial centers of the country are cleaning up the water system in the country are cleaning up hazardous waste sites. Those were things that as a country we could recognize as a problem and we could solve them. And here we have a problem where the climate change that we feel is going to be as much a consequence of what we do as what China does. And this idea that somehow we have to coordinate with not just China but all the other countries around the world in order to figure out what we're going to do and not make our efforts worthless...that makes it really, really hard. Somehow there has to be a global—you know not just a global agreement a global trust really—that we understand what each other are doing and**

we believe them we trust them and we're working together to solve the problem.

EH: If you enjoyed this series of stories about policy ideas for understanding and dealing with a changing climate, please tell your friends about us, and ask them to subscribe.

To find out more about what we do, head to our website, waysandmeans.org. You can see photos of clambers in Maine and find a link to a terrific series of stories by the Portland Press Herald called "Mayday: Gulf of Maine in Distress."

Ways & Means is produced by Carol Jackson, Alison Jones and Karen Kemp. Our associate producer and graphic designer is Melissa Carrico. Production assistance by Sydney Colopy.

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Thanks for joining us. I'm Emily Hanford.