Friday Forum: New Canadian Catastrophe History & It’s Place in Broader Practice

Friday Forum: March 13, 2026
1h 27m 54s

Keith Porter 00:01:02
All right, welcome. Welcome to Friday forum. Today is March 13, 2026, this is the 238th Friday forum in the series. Series is hosted by ICLR, the Institute for catastrophe loss reduction. We're Canada's leading source for Disaster Resilience knowledge. Our mission is to make Canada more resilient to natural disasters. Each month we present recent research related to that mission. I'm your host. ICLR chief engineer, Dr Keith Porter. I'm speaking to you from London, Ontario. This place is on the traditional lands of the Anishinabek, Haudenosaunee lenapawa and ottawandra nations. Last month we talked about measuring climate and seismic risk in British Columbia. We heard from Dominique SIG iron Finzi and Shelby buck, they told us about the province's disaster and climate risk and resilience assessment. DCR Ra, next month, Rob Moore of the US Natural Resources Defense Council will present his new report an uninsurable country. That's a report in which he describes America's current insurance crisis, and he argues for state level action to reverse it. It's easy to imagine why he's going to be talking about state level action rather than federal action. That's going to be on Friday, April 10, 2026 today in an unusual Friday forum, I'm going to present the I'm going to give the presentation. I'm going to present ICLR's new methodology to estimate Canada's societal loss history. That's essentially just cat IQs insurance loss history, but with some added numbers, ICLR's Cat history adds seven categories of insured, monetary and nonmonetary losses, and then today we're also going to have a panel discussion. You may remember a recent Friday forum about how modestly new code requirements affect us home affordability. We had that presentation, and then we convened a panel to discuss its implications for Canada. I found that panel discussion really fun and enlightening. Panelists were able to talk more broadly about the topic than just the speakers, and I could have done alone. So I've convened another panel for today. So after my presentation, I'm going to be joined by Adam Smith and Laura Twidle, whom you can see on the screen right now. Adam is a climatologist. He led the US effort to quantify societal catastrophe losses. Until recently, he did that as an employee of the National Oceanic and Atmospheric Administration NOAA, but with the more or less collapse of public science in the United States, Adam is continuing his work as senior climate impacts scientist with Climate Central, Incorporated that's a policy neutral nonprofit. Laura Twidle was trained as a meteorologist. She serves as president and CEO of catastrophe indices and quantification. Incorporated apparels company CatIQ compiles insurance exposure and insurance loss data for catastrophe that exceed $30 million that's the data I rely on in the present study. Now before I begin, here's our agenda. Our webinar is going to last 90 minutes. I'll present for about half that time, then the panel will discuss four prepared questions. Then I'll moderate Q and A for the last 15 minutes or so. So please feel free to chat questions into the Q and A box, not the

chat box, but the Q and A box. I'll try to pose your questions in the order that they appear in the Q and A box. So if we get a lot of questions, I may only pose your first one, then move on to others, then circle back to your additional questions. Our webinar is recorded, and ICLR will post slides and. A link to the video in the next day or so. If you have colleagues who couldn't attend, let them know. You can find all that stuff at www.iclr.org/workshops and with that, I will begin my presentation. I'm going to tell you, once again, I'm going to tell you about a new product, ICLR's estimate of Canadian catastrophe losses at the societal level. You'll find the products that I'm explaining in our on our web page. ICLR's web page. See the URL at the bottom of this screen. The cat history has three products so far, a report on the left, a meme in the middle and a data set next to the right. The two young men on the right are my co authors in this work. Here's a brief introduction to explain why we did this work. ICLR has a two fold mission. I alluded to it a little bit earlier. First, we aim to be Canada's leading source for Disaster Resilience knowledge. Recently, we expanded our mission to include helping to bring about change. We try to persuade people to improve safety and reduce damage to buildings and other infrastructure. We developed the this catastrophe history for some context that serves both of these missions, it can help persuade people to invest in resilience. Later, I'm going to show you how we are following a well trodden path. Here are six of many efforts to quantify Canada's catastrophe history, history, the Center for Research on epidemiology of disasters, cred has been recording catastrophe losses worldwide for decades. Public Safety Canada has been doing so for Canada, big insurance concerns like Zurich, Swiss, re a on and IBC have focused on insured losses. CatIQ apparels company has systematized the collection of Canadian insurance losses, and in the United States, NOAA has been tabulating billion dollar losses from about 1980 onward. But there's always more to learn. As Blaise Pascal said, knowledge is like a sphere, the greater its volume, the larger its contact with the unknown. So ICLR is working at the at part of that boundary. Our objective for this study is to estimate these 10 measures for Canadian catastrophe since 1983 l1 through l3 are insured losses, just like IBC and CatIQ reports, we set out to add the losses l4 through L 10. L4 is uninsured, personal property repair costs and uninsured additional living expenses. L5 is uninsured, commercial losses. L6 is uninsured auto losses. L7 is the value of deaths and injuries. L8 is indirect business interruption losses. L9 is externalized, social cost of greenhouse gas emissions associated with performing repairs. And l 10 is the cost to repair utilities and transportation infrastructure again, l1 through l3 they're What CatIQ Already publishes, that they're insured personal property losses, insured commercial property losses, and insured auto losses. Here's how we do that. Table two in the report briefly summarizes where all these numbers come from. It's just a sort of a thumbnail sketch of our methodology. I'm not going to read you this table. I'm going to walk you through parameters, the parameters one by one in the next few slides for l1 through l3 that's the personal, commercial and auto losses we just rely on CatIQ. Laura has graciously given us permission to acquire those data and incorporate them into our methodology. We get those numbers from CatIQ for the period 2008 onward, and before that, we use IBC totals. Here's L for the uninsured personal property and additional living expenses

for that, we just scale up the insured personal property losses by a penetration rate. And here, when I say penetration rate, I mean a ratio of n to m, where n is the is the number of personal in personal property policies, according to CatIQ, and m is the total private dwellings According to Statistics Canada. Now that penetration rate varies with time, by location and by hazard, and we try to account for all of that, I'm going to spare you the math of all these little. Indices and whatnot. The interested reader can find all these fiddly details in the report. Here's the uninsured commercial property and uninsured business interruption loss, l5 it's basically the same ID, same idea. We scale up the insured losses by a penetration rate. And the penetration rate here is the number of commercial policies divided by the total number of business establishments. Again, we try to account for time, location and hazard. And here's the uninsured auto losses. The penetration rate here is the number of insured automobiles divided by the number of registered vehicles. The next one is a little bit harder. This is deaths and injuries, the value of life safety. We have to assign a monetary value to deaths and injuries, and that's always fraught. Governments, however, are forced to do it. They have to decide whether costly public policies that improve safety are worth the price. So for many decades, the US and Canada have been quantifying the value of statistical of avoiding statistical deaths and injuries. And the way they do that is that they, the United States, performed a little sponsored, little study on the left that examined how, how much people pay for safety measures, for small improvements to their safety. So if you are willing to spend $100 to increase to decrease your chance of death by, say, one in 100,000 that implies that you value your life at about $10 million on a statistical basis. So this Urban Institute, they did, they examined that sort of thing over many different ways that people spend money to improve their safety that that's a process called revealed preference. And they set an an implied economic value of avoiding the death of an unknown person at an unknown time in the future. That's called a statistical death. They also found a way to estimate the value of non fatal injuries. I'll get to that in a moment that was in the United States now in the mid to late, 2000s the study on the right by chestnut and decibitda borrowed that concept for Canada, and they came up with a Revealed Preference Value of a Statistical Life in Canada. Again, this isn't how much would you pay for me to kill your grandma, it's how much do people pay to avoid small increments of safety for their to avoid small chances of death. Okay, so how do we use that the we get, we count the deaths and non fatal injuries in past disasters from the Canadian disaster database. We assign them values from government guidelines. The Canadian government doesn't seem to quantify the value of non fatal injuries, but the US does. In the US, it has six injury severities, of which one to five are non fatal, and the sixth is fatal, and it values each of the non fatal injuries as a fraction of the value of a fatal injury. And that fraction comes from how long it takes to recover from that injury as a fraction of remaining human life. We use the middle of that of that one to five scale for the factor that we apply in Canada. That factor is 5.75% of the Value of a Statistical fatality avoided. That is to say each injury is valued at 5.75% of a fatality, and we get the value of a fatality from that chestnut and decibita study. L8 is the indirect business interruption. That's the loss that an undamaged business experiences through loss of trade

with damaged businesses. We quantify that as a factor of all the foregoing losses, all the ones that I've talked about so far, and that factor comes from a US study that I led in the late 2000 10s for the Federal Emergency Management Agency. That study used a kind of economic analysis called input output analysis. The factor varied by hazard, and we just sort of take the the middle of the road, since most of them are around 10% next we quantify the losses that property repairs externalize on the rest of society through greenhouse gas. Gas emissions. Here's a little bit of background. The authors on the left mag wood and others estimated that a the average building and its contents contain about a half a ton of CO two per square meter of building. That's they actually dealt with the building. And we can add a little factor for the contents, Environment and Climate Change. Canada prices that embodied carbon at $266 per ton. So we can quantify the social cost of carbon as the property loss times the value of its embodied carbon. That is to say we take the property loss, we convert to tons of carbon, and we apply ECCS per ton, social cost of carbon to come up with this l9 loss here. And then finally, we deal with utilities and transportation infrastructure losses Ottawa's Disaster Financial Assistance arrangements, DFA has been paying for a large fraction of the losses to utilities and transportation infrastructure. We don't know those expenditures year to year, at least, they don't seem to be readily available. But we do know the total for a period of between 2009 2015 and we also know the property loss for that same period from the foregoing losses. So we use the ratio of those two to get a factor that's utilities and transportation infrastructure repairs as a fraction of property loss, and then we apply that factor as a constant to every year and multiplied by the the property loss, and that is our L, 10. Now all the foregoing monetary losses are reported in current or then year dollars. So losses in 2008 are reported in $2,008 we want them in constant dollars, meaning 20, $25 so we inflate everything using the consumer price index. Now, CPI, Consumer Price Index is not just one thing, it's actually many. There's a CPI for each thing in a basket of goods and services for each year, we use two of those CPIs. We inflate building damage by the CPI for shelter, and we inflate everything else, using the CPI for all items. There's no CPI for buildings. That's our methodology. Now let me summarize the results. We calculate l1 through L 10 for each catastrophe. We don't publish those catastrophe by catastrophe numbers so as not to reveal CatIQ proprietary information. But then we sum by year. The report shows the yearly sums. Here are the first 18 years. You can find the data set shown here online at this URL. Just go to the URL, look for the highlighted thing that says data set. You get this. You can get this little spreadsheet. Here is the plot of the totals in billions of 2025 Canadian dollars. We fit a smooth curve to the total. That's the red line. It's an exponential function, a constant times euler's Number. E raised to a constant times the year. That's an exponentially rising thing. That means that next year's loss is this year's loss plus a constant percentage of this year's loss, and that constant percentage is 9.4% so next year's loss is estimated to be this year's loss times 1.094 that's that red curve. We can ask some interesting questions about the results, like, how big is each loss category relative to the total? Here's a pie chart that answers that question. It reflects the total of losses since 2008 just under half the total is insured loss. Two thirds of the rest is uninsured property, additional living expenses and

direct business interruption. The balance comes from indirect business interruption, 8% carbon, 4% utilities and transportation infrastructure, 4% and the last little bit is casualties or deaths and non fatal injuries. We can ask, what are the leading hazards? Now, this little pie chart is kind of tricky. CatIQ doesn't know how much of any given catastrophe comes from repairing damage due to water or due to winds, etc. It knows that the loss is totaled this many dollars, and it knows that the catastrophe included water, or it included wind, etc, so it just flags the perils involved in each catastrophe. This pie chart tries to reflect that we tabulate the total for all catastrophe that involve each peril. Material. So this pie chart shows the sums relative to each other. So there's, there's some overlap. Some of the 21% of wind storm is also some of the 30% of water. So this, this is a kind of a conceptual pie chart, or it's, it gives a sense of relative contribution from the different perils with big overlaps. Now we can interrogate that red exponential curve that I showed you before. Its current value is $9.2 billion per year that, it turns out, is 3% of the country's construction spending for last year, which means that every year, climate disasters wipe out the equivalent of two weeks of construction, at least in recent years now, Canadian losses are increasing at about 9.4% per year. At least 9.4% that means that they that the total losses double every eight years. That's nine times faster than the population is growing. It also is five times faster than the economy is growing, the GDP and it happens to be three times faster than construction investment is growing. Now, the fact that losses are outpacing population GDP and construction spending should be worrisome. It means that in a few years, climate disasters are going to wipe out, for instance, four weeks of construction spending, then eight weeks of construction spending and 16 repairs are going to eat up a bigger and bigger chunk of our construction investment, a bigger and bigger chunk of of the economy. We can ask about the insurance protection gap. I'm going to define insurance protection gap here as uninsured losses, as a fraction of total losses. An earlier pie chart pegged the long term average since 2008 is about half. But you can see that in recent years, the gap is more like a third. And we can talk about the riskiest provinces. Here are the totals since 2008 by province and territory, Alberta leads, then Ontario, New Brunswick, Manitoba, etc, we did some quality assurance just to make sure that there was nothing, no glaring errors in our calculations, we did spot checks of a low A high and middle sample from all those years since 1983 and they agree with hand calculations, because a lot of these calculations had to be done with a computer. We compared our I1, plus I2, plus I3, those the insured losses from 2008 onward. We just compared them with IBC, because they come from the same origin, CatIQ. So that's not surprising. It just means we didn't do our we did our math correctly. We checked that our total for 2015 to 2024 matches the figure estimated by Swiss Re. We came up with $24.3 billion in US dollars. Hence we Swiss Re estimated Canadian losses as $25 billion for that same period, we estimated our insurance protection gap that was 39% at the time that we calculated it, and that compares well with Swiss res estimate of 37% and we also invited a sniff test from Laura at CatIQ, Adam At Climate Central, and another colleague from Munich Re and they all felt that there was nothing glaringly wrong with the numbers that that we were showing them at the time. Okay, so what? So what are the uses of a study like this? Other than the you know,

we can interrogate this. That the other thing, well, we can ask ourselves, we can use this study to forecast how much cat insurance is going to be required. Pasic publishes periodic studies of the likelihood of financial contagion, and they talk about the reinsurance the size of of the reinsurance market, and how big a catastrophe it would take to cause financial contagion. So the chart on the right shows that red curve, that's the the red curve is actually the average. What I've plotted here is the median loss, the trend line for the median loss and a tread line for the median plus 2.65 standard deviations. That's a goofy sounding number, but it means that the dashed curve is the loss that we can that one would expect to be exceeded one time in two. 250 This is the 250 year loss, and that's something like the reinsurance demand. In order to keep Canadian insurers from going bankrupt, this curve would be the total nationwide catastrophe reinsurance requirement. Here's a chart that my colleague Paul Kovacs produced, the red this the red curve is US economic losses. This is from Adams data from Noah and Climate Central. It is scaled down in proportion to Canada's population. So the red curve is us, losses scale to Canada's population. The gray curve is that same. Red curve shifted to the right by 15 years it's just the same that's us. Losses shifted 15 years later, the gray curve is us losses, not Canadian losses, and the purple curve is Canadian losses, the Canadian per capita losses align very closely with the United States, just lagging by 15 years. So the our cat loss history can tell us something about Canada's future. Because if Canada's future 15 years from now looks like America's present today, we can maybe look at what's happening in the United States today and say that's where we're headed 15 years from now, if we don't do something different. Okay, so why would we be worried about America's situation, and that 15 year lag? Well, the United States is suffering from an insurability crisis. You may recognize the chart on the left from a New York Times article from about 14 months ago that showed non renewal rates across the country, with a looming insurability crisis in Canada, Florida and the southeastern United States. The dark colors there the middle picture shows the cover of a recent study by the US Natural Resources Defense Council. I alluded to that at the beginning of our talk, that's the study by Rob Moore and NRC says that is calling the United States an uninsurable country. It says that currently, seven to 13% of US homes are uninsured, and that fraction is much higher for lower income people, more than a third of people who live in manufactured homes don't have property insurance since 2020 according to NRDC, 1.2 million US owners turned to state insurers of last resort. That's less insurance, less ability to recover in some interrupted work that was partially finished but not completed for the Federal Emergency Management Agency, some colleagues and I estimated that it might take one to $10 trillion to reverse America's resilience problem. That is to say, mostly from retrofit it would take about one to $10 trillion of retrofit work to avoid the coming insurance crisis in the United States, and our cat history says, Well, you know, if our future is like America's present, then these numbers can tell us something about Canada's Future. We can ask if Canada is going to be insurable in 15 years. This curve here and the black jaggedy one, the black jaggedy one is a five year running average of us catastrophe losses, that is to say, Adams data divided by annual construction investment. So the y axis here is weeks of construction investment that are lost to

catastrophe, to natural catastrophe in the United States, and the dashed curve is just a smooth curve fit to the jagged D line the US flag there shows where they are currently. American losses are currently absorbing about a month of construction investment per year, and that figure is doubling every 15 years or so. So in actually 13 years, American catastrophe losses are going to absorb two months of construction investment. The Canadian flag there is showing exactly where Canada is at two weeks of construction investment, loss to catastrophe, and you can see that the lag between two weeks of construction investment and four weeks of construction investment. Is 15 years, just like Paul Kovacs said, total losses are falling. So this chart is saying that we are when it comes to when we divide the catastrophe losses by construction investment. Once again, we are on same track as the United States. So this strengthens the idea that we are following in that we will see that we might see the same insurability crisis 15 years from now that the United States is experiencing today. And we can ask ourselves, with curves like this, what's it going to take to inflect that curve to turn it back downward again. Well, this is canon. This is ICLR mantra we advocate for fixing our resilience problems with, first, with a resilient building code. That is to say, if you as we to stop creating more loss a resilient building code will prevent the building stock 50 years from now by being more of a problem than it is today. Now, a resilient building code is necessary, but not sufficient, and it has problems. It has problems. It has this huge turning time. Climatologist use 30 years of data to set building code requirements, the last 30 years of data, and it takes 10 to 20 years for code change to go from request to actually appearing in the building code. And then, because we only add about 1% to the building stock per year. It takes about 40 years for the building stock to reflect a code change that we make today, at least in half the buildings. So if we are going to rely just on code to inflect that growing curve, we're already decades too late, maybe 50 years too late, and that means that to turn the corner, we are going to have to invest in retrofit. If we scale down the that FEMA abortive study by population, then that suggests that we might need to spend somewhere between 100 billion and a trillion dollars to retrofit existing Canadian buildings so that we don't follow the US into its insurability crisis. And all of that is going to take collaboration with finance, insurance, real estate, government, builders, etc. Okay, so those are some of the big things that I think we could do with a study like this. Let me tell you some of the acknowledge some of the limitations of our study. There are some philosophical limitations that affect the study's persuasive power. First of all, we are measuring catastrophe with money, and that undervalues the suffering of poor people. It says that a home that's worth $10 million is 10 times as bad when it fall down, falls down as a home that is worth a million dollars, and that's 10 times as bad as a home that's worth $100,000 that's number one second these I've only included 10 loss measures only. That's a lot, but it ignores potentially large losses. It doesn't quantify psychological injuries. Psychological injuries might have a monetary value that compares with all the property losses we don't know. It ignores domestic violence, when people are rendered homeless or when they're put under stress, domestic violence increases, and that produces injuries and deaths, catastrophe losses increase homelessness, and homelessness leads to injuries that are not quantified in the Canadian

disaster database. Our disasters produce smoke and smoke injures and kills people, and those deaths and injuries don't show up in the Canadian disaster database. Canadian disasters affect they produce losses to agriculture, to livestock, and they kill our pets. We don't quantify that at all, that those losses ignore indirect business interruption. Sorry, actually, they don't ignore indirect business interruption. That sets from an earlier version. We've actually got indirect business interruption in our in our figures and I1 through L 10 do not reflect the loss of productive business investment. All right, this is a tricky one that's not indirect business interruption. This has to do with the fact that when that the money that goes to repairing property is normally invested in. Productive investments, things like factories and real estate and whatnot, that produce additional value. When you withdraw that additional that productive investment to pay to repair things that were fine yesterday, you lose the multiplier effect that productive investments provide that multiplier effect can be 50% or more. So this is a subtle opportunity cost that comes with repairing damaged property. And finally, another philosophical limitation is that we've got a fairly weak distinction between losses from rain, hail, wind and debris, owing to our limited ability to distinguish sources of loss and there are some methodological limitations. These are the four that jump out at me. Most obviously. Number one, we have an inconsistent public record of utility and transportation infrastructure repair costs and emergency response costs. That's the DFA figures that I told you I got for a limited period of time, and I don't have year to year. I'm using a constant factor for indirect business interruption, whereas, you know, in ideal world, I could be doing input output analysis, or computable general equilibrium or something to do fancier estimates of indirect business interruption. There's no treatment of uncertainty and there is no treatment of disaster mitigation. With that, I'm going to conclude my presentation, and I'm going to invite our the panelists to turn the cameras back on, and we'll talk about these questions here. And of course, we can go in whatever direction seems to make sense. So the four questions that the panelists and I prepared in advance, are shown here, and we'll go through them one by one, maybe spend five minutes on each first question, do we share interests? The three of us serve different constituencies, insurers, in Laura's case, the Canadian public in ICLR's and American an American audience in Adam's case. So we've got different audiences. But my question to the panelist is, do our products reinforce each other in some way, maybe serving some common interests? And I'm going to ask Laura to take a stab at that answering that one first, what do you think, Laura, do we have common interests?

Laura Twidle 00:37:47
Absolutely not. I'm just kidding. For sure. I think the combination of the data sets and what our mandates are overlap, and if groups are able to look at the data together, it certainly provides a holistic picture that one data set on its own might not be able to provide. So if the holistic picture can be there, which is now amazing that ICLR through your work, Keith, that we can see the economic and uninsured loss portion. There's so much value into that I'll hold there. I have a few more comments, but that's the short answer.

Keith Porter 00:38:34
Okay, thanks, Adam. What do you think?

Adam Smith 00:38:38
Yes, absolutely. Looking at weather and climate extremes or other types of perils, nationally, globally, regionally, for different parts of society, for different industry sectors, the more high quality, homogeneous data we have, and products that inform or that are informed by that data, I think the better for a host of decision makers, from the homeowner All the way to the board of some large company. So this presentation has been great, and I find that when I reviewed the white paper many months ago, I was really happy to see a lot of commonality between the variables and even the methods behind the variables in the data that we've historically done for decades the United States, and continue to do now with the nonprofit Climate Central, and how other countries like Canada and others around the world are also taking similar approaches to really capture the signal, and there's always noise and uncertainty around the data, but the more commonality we had in terms of data structures, methods and kind of The focus for why we're trying to do this analysis. What might the outputs be? I think it's a kind of a rising tide that lets all boats in a positive sense.

Keith Porter 00:39:51
So how would you say, I mean, if you can, I ask you to put into a short sentence one common interest. I. Laura, what? What do the three of us have in common in, you know, eight words or less,

Laura Twidle 00:40:07
eight words, then Okay, can I do? I'll do one sentence. The we're created by the industry and and for the industry and resiliency is a is a big piece that the industry should want the country and their policyholders to get more involved in. So I'd say that the shared interest is around more data might be able to produce more opportunity for resiliency. Awesome.

Keith Porter 00:40:38
Adam, do you have like, a real short sound bite?

Adam Smith 00:40:43
I would say that the more data, methods and products that are synergized in a constructive way to inform how changes in exposure, in vulnerability and the influence of climate change, amplifying some of the frequency or magnitudes of these extremes on society, on industry, those are big problems, and the more data and products we have to inform how to manage those problems, the better we all are collectively.

Keith Porter 00:41:16
So I'm sorry that way. I sprung that on the panelists, this eight word business. They didn't, they didn't they tell them I was going to ask them that beforehand. So that's on me. So if I can try to distill it sounds like you're saying we share a common interest in promoting resilience. Yes. Okay, great. Lori said you had a few more thoughts. Do you want to offer those now? You got a minute or two

Laura Twidle 00:41:46
sure it's kind of like down a rabbit hole, maybe in terms of an area that's still outstanding or maybe more challenging for us to make or have a lack of data currently in Canada on and, and for for me, it's, it's around limitations of what you know the data sets provide and, and from the category standpoint, it is a threshold. A catastrophe is at the threshold of 30 million of insured loss. And and Keith, your data is based off of that and, and so when groups come looking for disaster information or impact based data, but there's, there's a gap that exists for maybe, you could say, like the far northern communities, where they could be evacuated by wildfires, or Maybe there's been some impacts there from it. Or if we're looking at before, maybe like 2017 when the industry really started to roll out in mass, the overland flood flood product. Again, our data is just based on insured loss data. So if the insurance gap is large in an area where there's been an impactful event, we might not capture that. So I think it's just important that the limitations are known for whoever's

Keith Porter 00:43:10
consuming that data, and maybe in that respect, you know somebody who comes to you and says, Oh, but Laura, you're not capturing you're not reflecting the fact that the insurance penetration is very low up north. You can now say, Well, you know, go to ICLR, don't they'll tell you about that awesome second question about the different ways that we talk about the this quant, different ways that we quantify catastrophe losses, different experts inevitably develop idiosyncratic solutions to a problem just you know reflects the interest and the personality of of the investigator. Each investigator is going to have bring his own, his or her own personality and and and take on the problem. And that can be a problem, because the more people who are saying something slightly different, the more there can be the appearance of experts disagreeing, and people hate experts disagreeing, they call that ambiguity aversion, that hatred of of people saying, appearing to say different things called ambiguity aversion has ambiguity aversion caused you problems. For instance, Adam, you know, NOAA or Climate Central says this figure, but Munich Re says that figure. I'm going to lead, I'm going to let Adam start answering this question, Has this been a problem for you?

Adam Smith 00:44:55
Yes, I would say generally Yes, because just the complexity of the data landscape. And how you're trying to first analyze and then communicate what you've analyzed to a vast array of

decision makers, or just from the general public to the to academia, to the private sector to federal agencies. And I think one framing is that so to do this type of analysis, first for any country, requires a broad array of public and private sector data and partnerships, as you've done here in Canada as well. And, you know, picking out the best data series that are homogeneous over space and time. So we've had always a conservative bias as far as including any data, because it would have to go all the way back to 1980 which is when this, the billion dollar disaster analysis for United States, began, and even though we have over the near half century, had a robust, consistent series of data that are homogeneous over space and time, that's conservative, but it's also it's comprehensive from a data perspective, but it's Conservative from a real world perspective, because we can't measure everything we would like to measure. So, yeah, I think the uncertainty is really a challenge in multiple dimensions of this type of analysis, and the more that we can all get on the same page and have combined best practices, I think, is the better in what we're trying to communicate. Awesome.

Keith Porter 00:46:21
Laura, have you? Has anybody come to you to complain about how your number is different from somebody else's number?

Laura Twidle 00:46:28
More like questions as to why it's it's something where like and I'm sure maybe Adam can speak to this too, but I can't speak to how another group you know produces their number. We we use this ground up approach where we collect and maybe it's like an easier discount the amount of work that goes into like creating the cat loss or the exposure databases, but like, we're looking at one very specific subset of the loss, where it's the insured data, and so we're using this ground up approach where we're taking that data, aggregating, extrapolating, and we have some proxy information and other information in market share and everything that goes into it to produce our totals. The The nice thing is, like, we know where that number comes from, and if there is difference between groups. We can tell them why we have confidence in what this looks like. I'd say maybe we're not direct competitors with us, but I'm sure everyone on this call, and including yourselves, has seen with the US or Caribbean hurricanes. And we're seeing a lot of numbers come out from different modeling groups and and other interested groups that are creating those numbers for different reasons before an event happens, or right as soon as event happens. And they're producing those numbers for, you know, different reasons. You know, they might be trying to notify the insurers themselves on what the loss payout might be for that event. Maybe it's related to parametric or cap on products, and those numbers are based on forecasts, so like what the real time data is showing and their secret sauce, and how they create that and and as long as the users of that data or information understand the assumptions and the limitations that go around it, it's a great way to get a magnitude of an event to give a heads up, but just have expected, expectations that the number might wiggle around Where ours is different in that it takes. The downside is that it

takes several weeks for us to publish number because we're relying on the claims data to come in, and we don't ask the companies to submit the data the day it happens, because they haven't received all their claims data yet. So it would be a lot of extrapolating off very few data points for us. So downside that, you know, we we take three weeks to push out an estimate, but we just have it's used for a different purpose. There's just more confidence in that it probably won't wiggle as much. It's just it takes longer for us to to get there.

Keith Porter 00:49:19
Yeah, and my, in my in a past career, I worked for a company called equi cat. It's one of the big cat modelers. This is in the in the 1990s and at that time there was RMS a IR and equa cat were the big three cat modelers, and they would every disaster that occurred, they would come out with different numbers. And you know there one tended to be high and one tended to be in the middle and one tended to be in the bottom. And you could use people. Making reinsurance purchase decisions. Had to decide between them and to decide, okay, are we going to buy our reinsurance based on RMS number or a ir's number or echo cats number? And it would just the differences. Would just drive them nuts, and would drive regulators nuts too, because we had to explain, for instance, to the state of Florida why the three models were producing different numbers in the state of Florida, had to make regulation to use the models for rate making purposes. So you can see how that would be real problematic. When one modeler says, here's the annual loss of average annual loss for this house, and another one gives a number that's three times as high, and another one gives a number that's 1/3 as high. It was very difficult. Adam, do you have any last thoughts about this ambiguity version problem before you go on to the next question?

Adam Smith 00:51:08
Yeah, I was going to highlight there's a, maybe a general data dynamic in that the larger the magnitude or the intensity, which translates to the, you know, the cost, whether it's insured or uninsured or both, of any peril impact, the bigger the magnitude and intensity tends to make the data latency and iterations increase. Therefore there's more ambiguity at first. Let's say in the first maybe three months, six months, even as you know, as you know, a lot of industry companies will re survey the marketplace to try to nail that down. I think the LA wildfires in January, jails and five is just the latest example, but often tropical cyclones the United States are the event types that really take a while to kind of finalize in terms of the insured loss data. So I think that, yeah, it's just, it's just an education and a communication effort that maybe, you know, we all in this type of field that do similar types of work could better articulate and maybe even write a general best practices paper together to help educate vast audiences about what this is, what it isn't, And what we're trying to do.

Keith Porter 00:52:22
I think it's a wonderful idea, and that leads in very nicely to the third question, Should we align

our methods or products or terminology? Now, I want to be cautious about, you know, inviting uniformity here, because independent work accelerates innovation when I work independently, Laura and come up with my own approach, I may come up with something interesting that isn't sort of what Laura was concerned about. The more we try to align our work, maybe the less innovation we'll get. On the other hand, aligning our work would could reduce that ambiguity problem. What methods or products or terminology do you think is most important to share? Laura, do you have some like, if we were to all agree today on like, three terms or three products or something, what would those three things be?

Laura Twidle 00:53:24
I'm thinking about what we had done in January for the first time, Keith and that was around the and the press release of what happened in 2025 the year before, and producing some sort of annual summary that has that holistic approach of the insured side, which maybe has a bit more or it can get into a little bit more detail, just because it's just the one data set, and then having that component of the rest of the economic loss there with the uninsured part that you're calculating on the year, I think that has a lot of importance in the industry, where the biggest gaps for policy making underwriting may also prevent or prevent present opportunities for other unique products to enter the market, to maybe help close some of the gaps that exist. So that's the one that comes to mind, right off the bat. And then you I'll say, I get asked a lot to show the annual loss by peril, quite a bit. And Keith, as you you presented earlier in the slides, the challenge with the data set is that we don't have the specific claims data by peril, so we have the event loss. Province, and we have the perils listed that are associated with it in order of what caused most damage. But the companies don't submit the actual insured or the if there was a severe thunderstorm event, what was exactly related to water, what was exactly related to hail, and what was exactly related to wind, you know, the severe storm cocktail. So we have to go into what caused the most damage, or do some sort of a split. But So presenting some sort of the chart with the annual loss by peril from the insured loss side and then the economic loss side, with the same idea where the biggest increase is, and maybe that presents What the greatest areas for improvement are, or focus areas for for groups to interested parties to look a bit more closely into

Keith Porter 00:55:58
Awesome, yeah. Great idea. Adam, what are your thoughts about aligning methods, products to terms,

Adam Smith 00:56:05
yeah, I guess first, I think, from kind of a data perspective, in terms of, Well, historically, as I understand it, you know, the the industry, the insurance, reinsurance, cat modelers, brokers, you know, they're historically worried about the tails of the distribution, you know, the really big events that the big historical events, oftentimes, these are tropical cyclones. Last year, it

was a, you know, the LA wildfire was the costliest year on record United States, first time that's ever happened, largely because we didn't have a land called hurricane, potentially, but also it was a high magnitude event. So the tales of distribution are historical drivers of understanding that actuarial science and the data and better products and services, but in the United States, and maybe this will, maybe your forecast, Keith, in the last 15 years would it'll change also the secondary perils, like severe convective storms, hail being a big driver within that in the United States have become, in aggregate, almost like one or two hurricanes or tropical cyclones hitting the United States, so that that the mass of the distribution also is something that is getting on the radars, maybe more on the insurance than the reinsurance layers for risk analysis, I think there were like $50 billion plus of severe convective storm losses last year United States. So understanding both the tails and how perils and regions are changing with the mass of the rest of the distribution, the high frequency, low impact, I think both of those are areas that are increasingly important for different geographies, different industries to understand. We even know the hail is moving, you know, from the central United States in Canada is getting, you know, into that because of the expanding effect of of Cape. So, yeah, I think that we all have many different issues to grapple with and how best the data can help us find solutions to these issues, and then communicating that that's where we all, I think, find ourselves, but then finding some common ground as far as, what are these common problems and maybe some common solutions that we all independently do our analysis On, and have that distribution of results and solutions, I think is very helpful for decision makers. Cool.

Keith Porter 00:58:27
So if I can try to recap, Laura, you think that we could work together to tease out contributors to catastrophe loss, how much came from hail, how much came from water, etc, and Adam, it sounded like you were saying we could work together to sort of quantify the distribution of losses the body and the tails. To get that right

Laura Twidle 00:58:53
with my comment and I rambled, as I do a little bit, so just to clarify the perils that would have the greatest differences between our produced charts might identify areas for focus and for the industry or the public sector to really dive into as to if, in a large event does happen in this area again, how can we make sure that, you know, they're more resilient or protected for fast recovery? Gotcha.

Keith Porter 00:59:33
So that's that would be the point of teasing out the losses by peril, because that allows you to target locations. And you know, sort of features of buildings that would resist the damage buildings and so on. Cool last question, Should we align our dissemination efforts? Again, we serve distinct audiences, but we share some. Um, what if any shared communication could advance our different missions now, Laura, you already said we're already doing an annual, you

know, a press release. We did our first one in January, and I'm so glad that you like that, and ICLR is, is keen to do that every year, but Adam, you know, Climate Central, we haven't attempted to align our dissemination efforts in any way. We haven't, you know, had any shared communication channels, etc. Is there any point in trying to do that?

Adam Smith 01:00:43
Yeah, I think absolutely, it's just a matter of matching up research timelines. For example, one thing we'll be able to share pretty soon is we're expanding both the historical scope and the depth of the analysis done with the billion dollar disaster research, first at NOAA and now at Climate Central. And you know, you know, looking at individual wildfire cost or looking at down to the $100 million level, so expanding the kind of the distribution of of our analyzed impacts all the way back to 1980 kind of both a re analysis, and I'm sure we'll run into some roadblocks and challenges, and we can, we can share with other partners what worked well and what didn't, as far as meteorological challenges and also interesting results. Because, you know, many regions around the world have similar perils that they have to deal with, and we have to understand how to better use the data and information to rebuild. So this doesn't happen. So I think it comes back full circle to you know, adding resilience to our exposure, both physical and socioeconomic. Laura, your thoughts

Keith Porter 01:01:54
about additional shared dissemination? I mean, should we? Should the three of us and Zurich and Munich and so on, put out some sort of annual report. This is what each of us thinks about catastrophe losses in the last year. Something like that

Laura Twidle 01:02:11
certainly could be interesting. I think some sort of combined report would be interesting and valuable for the industry, absolutely and other groups that use this kind of information,

Keith Porter 01:02:27
maybe at conferences or workshops or something. Maybe this would be, maybe we start with the natural hazards workshop. I mean, the three of us, for everybody else's information, the three of us have been talking about having a panel at a workshop that happens every year in Boulder, Colorado. This for researchers and emergency response practitioners, and last several days, and we talk about disasters, and there are these sessions, panels that you put together and talk about a particular theme. So the three of us are talking about putting together a panel at this year's we're hoping to offer a panel at this year's workshop. And I wonder if, you know, maybe there are other places where we ought to try that, or maybe we try this one and see if anything useful comes out of it, and decide whether we want to do anything else. Adam, you thoughts about other places to talk together? Yeah.

Adam Smith 01:03:35
I mean, I think with our diverse audiences that use our products and our reports in different ways, whether it's academia, emergency management, decision makers in different industries, or just the general public, they're all different audiences that need different types of information. So I think kind of going to where the audience is, and then speaking the language of the audience is really a key pivot point in any communication, because you want to meet them, not have them meet you just like you want to have input to design a product from the general audience before you just make something and expect someone to use it the way you think they would use it. So, yeah, I think there are so many different conferences, workshops, other types of collaborative environments to better communicate and innovate. What we're all trying to do?

Keith Porter 01:04:27
Well, let's give those venues some thought. Presumably, we're going to have this panel at the hazards workshop. We can't be certain, but let's give it some thought about where else we might want to take the knowledge to as as Adam said, okay with that. Any, any last thoughts from the two of you before we open it up to general Q and A Laura, do you want to lead us off with concluding thoughts?

Laura Twidle 01:04:56
Sure. I would just say, Keith, thank you so. Much for your work and for bringing this to Canada. It's been since I joined CatIQ, and I'm sure before that, we've had questions about, okay, this is the insured loss, but what about do you have any idea about the other side? And I love being able to direct those people to ICLR, and I think you're a great group to be managing that data set. So thank you for your work on that, and I'm sure there's lots more to come.

Keith Porter 01:05:28
Thanks. Adam, any final thoughts about our discussion?

Adam Smith 01:05:33
Yeah, I would echo the Thank you. I think this has been a very fun, robust discussion. I look forward to the Q and A I would say that, you know, in general, when you see trends, and certainly places, the United States are having insurability crises, crises as far as how much they've been impacted, learning from this data, this information, can help you know, mitigate, add more resilience in the future. And I think there's an empowering message in that, because in terms of the trends and where we decide to live and build and rebuild communities that are maybe more vulnerable to these extremes, like the wildland urban interface, the Coast river floodplains, you know. And then, of course, the human imprint, of course, on climate change, which influences some of these extremes into things like building dollar disasters. The human connection touches all those points, and so how we are able to understand and refine our

approaches can have as your presentation showed dividends into the future. Compound dividends in a positive way. I think that that's, at the end of the day, the main goal in terms of having a more robust, resilient society informed by the past.

Keith Porter 01:06:46
And I want to give one more thought from my perspective, you know, I came from the world of catastrophe modeling, where the other modelers were arrivals. You know, we talked about it was really common to say, well, Echo cats model is great because blah blah blah, and it's better than RMS is because blah blah blah, and which was, I did not enjoy that. I didn't enjoy running down the work of colleagues whom I admired. And it's this is so refreshing, such a refreshing difference to be collaborating with the two of you, where I think our work complements each other and we can, it serves all of our interests to think through The synergies. How we can, you know, advance our this little area of study in interesting, useful ways. So I want to thank you both for being so collaborative on this topic, and really for, you know, for paving the way for ICLR. Very grateful. Okay with that. I am going to stop sharing, I'm going to close my deck, and I'm going to go to Q and A, and I'll be moderating the Q and A. Wait a second for the questions to come up. Okay? First question from Robert Muir, I wonder if that's my old colleague, Robert Muir. He asks given pre CatIQ losses data are not very robust, per the ICLR cattails, would trends from 2008 onward, be more accurate. Comments mean, agree ransom uninsured divided by insured ratios for Canada, for our NRC cost benefit guidance, and it agrees with your ratio presented for us, uninsured was almost equivalent to insured. Okay, so do I think that the figures from 2008 are more sort of accurate or reliable than the figures from before 2008 probably. I think that, CatIQ, Laura, you can correct me if I'm wrong, but I think that you are. You introduced a systematic approach, a new systematic approach that is more repeatable, and you're probably spending more sort of labor, hours per catastrophe to tabulate these things than IBC could afford to to spend. Is that a reasonable take on relative accuracy between pre 2008 and post

Laura Twidle 01:09:49
2008 don't want to speak to like how accurate each individual event estimate would have been, because I think from the pre 2008 on the chart that we see from IBC there to. Working from several different sources. So the other groups are putting a lot of thought into their own event estimates on that. I think where we came in as this independent aggregator that had this standard that we always collect at the 30 million mark. And we are specifically looking at it for Canada, not the global picture, where the other groups, you know, I'm certain they would not have missed the big events of the those times like they would know about it. It's triggering reinsurance, but it just might be those smaller events that might have been missed, but I think, and Keith, maybe I'm going to throw it back to you here, given the general magnitude or the idea that they're capturing the larger events that would cause the main differences in your calculation, maybe in terms of magnitude, it's fine.

Keith Porter 01:11:08
Yeah, I remember a colleague from Cal Tech saying that earthquakes, earthquake losses, follow a power law, meaning that a few of them dominate the total. So seems likely that the same thing happens with climate losses. It'd be it'd be a really interesting question to take the statistics, especially the CatIQ statistics for Canada and see if catastrophe is the distribution of catastrophe follow a power law. And if so, what can we say about the implications for, you know, $30 million plus losses as fraction of of all losses. I'm not aware of anybody having done that. Are either of you,

Adam Smith 01:12:02
I could say the United States, we informally looked at that and did not publish a paper. This was probably maybe eight, nine years ago. And at the time the billion dollar plus, you know, the larger impact weather and climate extremes would represent 75 to 80% of the total direct losses for all the different variables consistent for the sub billion to the billion plus, as you move forward decade by decade, 80s, 90s, 2000s 2010s, the larger events would add one to 2% more per decade. And in fact, kind of the Pareto distribution adding more signal to the total losses. And part of that, of course, is growth and concentration of exposure for different perils as well. So that's what we kind of generally saw.

Keith Porter 01:12:50
Makes sense. Let's see Alain cast on way asks. I'll need further explanation to understand the 15 year lag between Canada and the USA slide, 32 large part of the population in the US is living in coastal regions where hurricanes are major peril. I'm not sure the comparison of Canada is useful and how it explains that 15 year lag Elena, I think that's a really good point. I mean, they're different countries. They're suffering losses from, from, you know, different dominant perils, but the fact that Paul Kovacs curve for us losses track when you scale it down on a per capita basis, track so tightly with Canadian losses says that there is something systematic going on here that maybe it has to do with the similarity in the safety factors that we build into buildings. Doesn't matter if the to use an arcane engineering term, if the reliability index is for flood or earthquake or wind, use the same reliability index you see, get the same factor of safety. You get the same chance of exceedance, regardless of which parallel you're talking about. That might help to explain how closely Canada's losses are tracking with America is, despite the geographic and hazard differences, as to why a 15 year lag, presumably, that has to do with climate. But it's a really good, interesting question. I mean, we have Paul just identified this 15 year lag. Sometime the last 18 months or so, we haven't done anything more than notice it and start, sort of start scratching our heads about it. It's going to take a lot of research to really dig down and see if there's something, if there's some explanation that has to do with, you know, buildings and reliability indices and what. Not third question here a few questions. This is from Cassie AVI or Avis and CA, since you are the you offer. The only

remaining question, I'm going to go through all three years for CatIQ, water. Refers to SBU. Laura, do you want to handle that?

Laura Twidle 01:15:33
Okay, that's just the question that's

Keith Porter 01:15:36
That's it?

Laura Twidle 01:15:38
Yeah, yeah, we've got so water is in contrast, we also have flood as an option on the platform. So flood referring to over land and water referring to sewer backup, SVU, or other types of water damage. So could be roof shingles are gone, and there's water now leaking into my house. So it's there's flood, overland flood, and then other water,

Keith Porter 01:16:13
including SEO second question, Cassie, second question is for costing of losses. CatIQ reporting is for losses greater than $30 million have how have smaller events been factored in into, I guess, Cassie, you're referring to ICLR's Cat history? And the answer is, they have, we, you know, the ICLR's numbers are just CatIQ, cat IQs numbers just with seven more quantities for each catastrophe. So these smaller catastrophe, these smaller losses, anything that CatIQ doesn't report on, doesn't collect data for, doesn't get reflected in ICLR numbers tag on to that. Keith, please. Yeah, please do.

Laura Twidle 01:17:05
And Cassie, if you have access to the CatIQ platform, we've got the notable events ICLR at this time for the uninsured loss portion, doesn't use that one, but there's those which are somewhere between 15 to 30 million. We survey the industry to get that range, but we don't do the formal data collection because we have to find the right amount of asking them to submit the data and not burden them too much. And then the other thought that came to mind is the government led Canadian disaster database may have different types of data, I don't want to say necessarily smaller events, but they also have different criteria, where ours is that cat loss threshold and screw some as it may sound, maybe theirs is a little bit tied to like fatalities on events, or where DFA information has, our DFA arrangements have been triggered. So it's another part of the puzzle that might if you're looking to try to find those smaller events, they also might have a different subset, right?

Keith Porter 01:18:22
And as Adam alluded to earlier, the there's a Pareto distribute the parade radio effect. What's the term where you know the big ones represent the bulk of the losses? Third question, when

using the US trajectory, is there concern on different cat exposure, for example, US coastal exposure is exponentially higher than Canada and the regulatory environment or uninsurable, particularly in California. How is that considered in your trending? Well, it isn't. All we did was we took Adam all Paul did was to take Adams numbers, total annual losses from billion dollar or greater catastrophe, and we scaled them down on a per capita basis to Canada. And we said, hey, and we shifted it 15 years, and we noticed, hey, look when we overlay Canadian losses on that shifted per capita curve, they line up. What about how about that? Isn't that interesting? That's pretty much all we've done. And we've said, Okay, well, what are the implications? If that means that we're following America's trajectory on that sort of total so, yeah, there's different catastrophe exposure. There's a different regulatory environment. But you know, up until just a few years ago, Florida was. Kind of the only isn't Florida, kind of the only place with really heavy regulation of catastrophe losses. I mean, can't the California has had the California Earthquake Authority, and it does regulate prices and stuff. But that hasn't, that hasn't really been much of a burden until well, until recently. Adam, do you have thoughts about this last question?

Adam Smith 01:20:31
Actually? Could you remind me the question again? Yeah, yeah.

Keith Porter 01:20:40
So Cassie saying, What is it, you know, why are you bothering with this 15 year lag, and how Canada is following the United States on this 15 year lag? She points out, the coastal exposure is different. The regulatory environment is different. Does it have any meaning? And have I sort of factored that into my trending and I guess my question to you is, do you see any meaning in the fact that Canada's losses are tracking with America? Its just 15 years later, 15 years later?

Adam Smith 01:21:14
Yeah, I find it is striking. I mean, those first time I've heard of that comparison done, and you know, it's striking enough And interesting enough, since we're geographically next to one another and more of the weather and climate shared systems are changing. New Canada has had some really catastrophe. Wildfires getting a little bit more severe, conductive storm activity, even the tropical cyclones, you know, can hit parts of eastern Canada. And that's just the weather climate side. But then, of course, the human side, you know, people tend to concentrate together in cities, and that compound exposure, you know, changes risk changes for different perils. So, you know, yeah, the regulatory landscape. I'm not an expert in it at all. That is perhaps a bit of a difference. But I think the weather climate shared system, and then the general human shared system. As far as growth and exposure and vulnerability, there's probably some general commonalities there that perhaps support the 15 year alignment.

Keith Porter 01:22:14
And the Canadian buildings look just like American buildings. The two building codes share a lot of common approaches. That's the last of the questions. So I think we could wrap up. I want to give you each couple of minutes to offer any final thoughts on on these cat histories. Adam, do you have any final thoughts?

Adam Smith 01:22:44
Yeah, I think one area that, just in my view, some more research is focused on, is this compound disasters with Cascade impacts. And that could be a combination of small and large catastrophe, or a bunch of small catastrophe. Is not just from the same peril, but of course, multiple perils, like the classic setup in California, where you get a semi arid environment becoming going to a flash drought, enhancing the wildfire season, create wildfire burn scars. Then you got the atmospheric rivers and December, January, and creating the debris flows and floods. Some of you know that's a different mix of insured and uninsured perils. And or you can have a hurricane launched out the energy grid in Louisiana, and then they have a heat wave right after the hurricane, and people die during the hurricane and after the hurricane, during cleanup and lack of power, and so as a common so when, when, that's something I've been looked at, looking at more closely, is compound perils with cascading impacts, you know, is really a combination of weather, climate and human systems, and I think that's probably a growing problem that we all should collectively pay closer attention to, to figure out how what we learn from that can add to future planning and resilience.

Keith Porter 01:23:59
Laura, I'm gonna give you the last word.

Laura Twidle 01:24:03
Thank you, actually thinking about what Adam just mentioned. And I know the difference between, like we have the Keith data, and you're working on in that for the US. But another interesting part, in addition to how a fire the year before may impact a flood in that same location on the following year. For us, you know, we collect in the close claim information, and we do resurvey at certain intervals with respect to the date of the catastrophe and when it happened. And so another interesting piece on there might be, like, how many claims are still open going into the next cat season the following year, and how that strains the resources as well. And then otherwise, I think. There's there's so much room for us to collaborate, and probably other groups as well. And I think in general, as long as you know methodologies may be different, but as long as the users understand limitations assumptions made, there can be a lot of, like, really good work that's that's done between the data sets here that we have, or and, or other ones. So I'd say if anybody that's listening today, or if you know other groups, it never hurts to ask or to connect, make connections and, and we can always see if there's more work that can be done to improve the resiliency of the greater public.

Keith Porter 01:25:49
Awesome, yeah, that's my focus as well. Okay, so I want to wrap up and remind everybody that you can find the report and the data set on ICLR's web page at www.iclr.org/research papers. Or you can search for the term societal loss from historic natural catastrophe in Canada. And that information is going to appear in we're going to make a video of today's conversation, put it up on ICLR's web page, and be able to find my deck there and find that URL there. So if you can't remember that long search term, just go looking for it on the workshops web page in the next day or so. So thank you again, Laura and Adam for participating today. Remember everybody you can find video, audio, transcript and my deck by Monday at www.iclr.org/workshops and please remember to join me and Rob Moore next month, on Friday, April the 10th, when Rob Moore from the US Natural Resources Defense Council is going to present his report an uninsurable country. Thanks very much, everybody. And have a great weekend. Bye.