Forecast Webinar: Wildfire Season

Forecast Webinar: May 15, 2026
1h 21m 29s

Glenn McGillivray 00:02:16
All right. Why don't we get started then. Hello everybody. Thank you for joining us today at this 2026 wildfire season forecasts. I'm Glenn McGoverey, Managing Director of the Institute for Catastrophic Loss Reduction. This is actually a joint event between the Institute for Catastrophic Loss Reduction and the Wild Fire Resilience Consortium of Canada, of which ICLR is a core founding member and co-vice chair of that organization. So, we're welcome, we're welcoming that organization on board here as we do a co-branded exercise here. I, we're really happy and pleased to have Richard Carr with us again this year from the Canadian Fire Service, the Wildfire Service, Forest Service Canada asked Richard, how often he's done this for us. We're, I think, we're into our seventh year, possibly eighth year, but we've been doing this forecast for quite some time, even before our industry got interested in wildfire, and it really took Fort McMurray for that to happen, and it's hard to believe that we're in the 10th year from that event, so that's kind of scary, but we've had numerous interface events since Fort McMurray, numerous wildfires rattling the Canadian insurance industry in several Canadian communities, not, you know, talking about places like, like Jasper, of course, and other places. So, thanks for joining us. We are going to listen to Richard's presentation for the next little while, then we'll have a Q and A at the end. And at this point, I'm not going to read the bio, it's on the flyer that was given to you, and I'm going to hand it over to Richard. So, Richard, go ahead.

Carr, Richard 00:04:43
All right, thanks very much, Glenn. And welcome everybody. Won't spend too much time on the title slide after Glenn's introduction, so I'll just carry on into the material here. We'll start out. Looks like I forgot to take out an animation there, so I'll just pop in that middle image, I Syllab, and Vint, they'll, vi' vi' vi' vis, we'll, we'll Ionic, so on the left we've got conditions at the end of November, see a lot of red, some really deep red across Canada, where we've got d3 or d4 drought, and those uppermost categories are the rarer ones, the d4 is maybe a once in 50 year event, or less frequent, and the d the moderate red there is probably on once in 30 to 50 year event, so some of those are pretty rare, and we had a lot of that across the country, and that was pretty common, I think, over the past few years. Yeah, drought starting in 2022 and then carrying on through the three years after that, just in the middle slide, there is the end of January. We see an improvement across most of the country, still a drought up through northern Manitoba and Northwest Territories and other patches, but a better picture than the end of November. And then at the top right end of March, and we still see less drought on the landscape, but in the US it's been increasing and getting better. In Canada, and we've seen that kind of cycle happen before, where one country has an extreme drought and the other country looks pretty good. Once in a while, you get very severe drought across the whole continent,

just step ahead one more step here until the end of April. Just looking at the Canadian drought monitor, there. So that's most recent product. These are monthly products, they're assessed as the last day of each month, but they're not actually released until full analysis is done, so that usually takes another week or 10 days, so maybe about the 10th or the 12th of each month these drought products are released, so we still see continued improvement in many regions, still though fairly intense drought down into the severe drought, the d2 kind of the middle of the categories through a lot of southern interior British Columbia and extreme southern Alberta. One place where drought is actually intensified a little bit is through eastern Quebec and parts of Labrador. We still have fairly intense drought up through extreme northern Manitoba and up through the territories, so those are areas that we're watching as the fire season progresses. Do note that things are pretty tame right now, but you know it doesn't take too long, just a few weeks of dry weather, and we can start to see those drought conditions intensify quite a bit again. Probably shouldn't leave out the Atlantic region, and we've had fairly persistent drought through New Brunswick, parts of Nova Scotia, and think over the past month they've actually had better precipitation there. New Brunswick, for example, had nine consecutive months of below normal precipitation, and they finally got some above normal through April. So, a bit of a change there, a bit of improvement, but another area to watch, and we have seen some early fires in that area this year, another of the early season factors is snow cover, and it's been a fairly stormy winter in the Northern Hemisphere, so we've really had a lot of deep snowpack across a lot of the country. Now the CCIN, Canadian Cryospheric Information Network maps here discontinued. Unfortunately, they had a good depiction of snow cover and little red band, little red lines showing where the average two centimeter snow depth was for each day of the year. So that was a daily product, but the archive maps are still available, but they're not producing new ones. So we're looking at other solutions for for snow cover, and one kind of rough depiction is from the Canadian Wildland Fire Information System. So, amongst all the weather themes that we produce for Fire Weather Index, well, we like to keep track of snow cover as well, because we don't start calculations until snow is melted off for three consecutive days, and temperature reaches the correct criteria about 12 degrees Celsius at noon. So we do have a snow cover map. The green area is where we don't have snow cover, but it can be a bit bit misleading since a lot of the higher ground don't have weather stations that we receive any information from, or maybe not snow depth, so they don't figure into this map here, so we can see kind of a solid green right across all the rocky mountain ranges and coast mountain ranges, and of course, there's there's snow and glaciers up there, so it doesn't capture all of the snow that's available on the landscape, but what we are seeing, though, is still a fairly deep snow cover through a lot of northern Saskatchewan, Manitoba, and then up through the eastern and extreme northern territories, also got similar pockets of snow remaining through parts of northern Ontario and northern Quebec and some Labrador as well, and I don't think it's all showing up here on this map in Labrador, but you know it eventually does melt, and once it's gone, if you've got a dry period, then you can get into some fire problems, maybe another consequence of having the really deep snowpack this year has been

just the amount of moisture available to either soak into the ground or maybe actually pool in wet areas, bogs or lakes or things like that. One thing that is of note, though, southern BC, southern Alberta, maybe southwestern Saskatchewan, had a minimal snow cover through the winter. It came and went, and it's been off the ground for quite a few weeks in most of those areas. It's probably the northern tip of the snow drought that's been described in the western United States. A lot of the US really didn't have much snow cover at all over the past winter, and that type of weather pattern extended up into southwestern parts of Canada. We have seen some early fire activity in British Columbia, some in Alberta. We actually had a fire in the foothills of Alberta in February, that was a reasonable size, but then they did get snow again in that area, so it kind of put an end to that temporarily. Another thing that we're looking at is snow water equivalent, and you know how much water does that snowpack hold. So one of my colleagues here in Northern Forestry Center, Justin Beckers, has been working with the Globe Snow, which is from Finland, product from Finland, and Copernicus, another European system. So he's developing these, these maps here. There's a daily snow water equivalent, like at the top left, climatology, climatological mean top rate anomaly in millimeters, which is bottom left, so we can see where our CWF is snow map had some fairly high snow cover, we see that pretty good anomaly through there, so through parts of northern Saskatchewan, Manitoba, and then a percentage on the bottom right, so this example is just about a couple of weeks old. Unfortunately, had a system problem over the past couple days, so wasn't able to generate a new map. So this example is from may 4. He's also able to do time series plots, like you see at the bottom right here. So this is an example from earlier this spring from Sudbury, Ontario, and they did have a big snow event, probably, and I think it was March. I can't quite read the scale on this, but it's the slides or that image is a few weeks old, so these time series can be produced for a number of locations across country, so as that last bullet up above there says it's in development. We'll probably see more of this as time goes on. One thing we might look at is sunspots, and you get a large number of sunspots, and they can actually heat up the surface of the earth, a little bit, it's not a huge factor, but it can play a part. So, just at the far side of this plot here, we're actually starting to see that the number of Sunspots is declining, so we've come off that most recent maximum, and we're starting to sink back towards the next minimum, past two minimums, 2020-ish and 2010 have been quite low compared to other minimums, maybe a bit broader as well. So we'll see what comes out of the next one here, but latest maximum is a bit higher than the previous, so we'll see what happens over the coming few years. Now, if we overlay your fire activity with the sunspots, we can see quite often that some of the slower fire years have actually occurred during the minimums there, and maybe not quite as noticeable, I guess. It's get into recent years, but still, you know, 2020 was ultra quiet, and had a few other years that were moderately quiet in that latest kind of broad minimum. But you know, having said that, to get off those minimums a little bit, and you can get to pretty active fire years again, Pacific Decadal oscillation. This is up to the March. We've been in a fairly broad minimum period here, and it's been a little odd looking at sea surface temperatures in the North Pacific over the past few years since the most active fire years,

recently 2023 through 25 featured very warm sea surface temperatures right across the North Pacific. So usually when we have a negative phase of the Pacific Decadal Oscillation, or PDO, we have cold water sitting along the west coast of North America, and warmer water out in the central Pacific, but past few years this featured above normal sea surface temperatures right across the North Pacific. So it's been a little tough to pick out that typical pattern. It's just that the mid-Pacific temperatures were quite a bit warmer than the coastal waters, even though everything was above normal right now, though they're looking a little bit closer to what we'd normally expect, and if you could actually dig into the right-hand side of that graph, or you'd actually see that things are looking a lot more neutral, a lot closer to that center line, so things have cooled off in the North Pacific, but I'll mention this a little bit later, I think, in the presentation as well. So won't talk too much more about it right at this moment. On the other side of the continent, North Atlantic Oscillation out to end of March, if you have a positive phase, we tend to favor dry conditions through northeastern North America, and negative phase, it tends to be wetter there. That's really based on the strength of the Icelandic lower pressure system, and the Azores high below that, so on the plot in the center here, you can see fire areas in Quebec related to the phase of the North Atlantic constellation, so the black arrows indicate years where we've had large areas burned, so 2002 2005 2013 2023 might not be able to pick out too much from this, but quite often we see those big fires where we get a phase transition, so the positive phase might bring dry conditions, especially in the winter out to that region, and if you get that switch towards wet, maybe there's a greater chance of thunder showers starting to accrue, you know, just a, just a theory, haven't really proved any of that, but it's one thing that might lead to the bigger fire years in those transition years, the orange ones, 2007 and 10, are just kind of moderate area burned in those years, and the green ones are where we have a fairly low area burned. So one of the things, a lot of those green ones, we see a fairly good spike of the negative phase of the North Atlantic Oscillation, looking at the sea surface temperatures in the Pacific, currently in the top red oval there is where we look at those Pacific Decadal Oscillation temperatures along the West Coast, and then just to the west of that in the Central Pacific, where the other part of the sea surface temperatures are measured, so see a lot of fairly cold water, blue sitting in the Gulf of Alaska. Warm temperatures a bit further to the south, and even warmer as you get towards the Baja Peninsula, and southwest of that, towards Hawaii, and the blocks below that are the ENSO or El Nino Southern Oscillation regions, and the red one, the 3.4 in the middle, of course, is where the ENSO sea source surface temperatures are measured. So, over the past few weeks, we've seen quite a transition from the La Nina, where we had dominant below normal sea surface temperatures, back into a neutral and heading towards an El Nino looks like things are changing fairly, fairly rapidly. We've had neutral conditions there, it's probably still neutral, but a lot warmer than we've seen over the past few months. The prediction predictions for the El Nino here from April, so month old. We don't have the most recent ones out yet. I think they'll probably be released just about this time of month, or maybe early next week, but you might have seen a lot of media stories talking about a super El Nino developing, and they may be

focusing on these kind of outliers just at the very top of the plot here that are really going sky high with the predictions. There's two types of models built into this, the deterministic, or just a single, a simple single model output just based on predicted weather conditions tend to favor a much higher prediction. The mean of those is following that dark red line through the middle there, and the other statistical models use more climate drivers to help formulate the El Nino Southern Oscillation Forecast, and the mean of those is quite a bit lower, the dark green line. So, yeah, it looks like we'll have a pretty good chance of a fairly good El Nino developing over the summer and into next fall, but maybe not quite as intense as what some of the media stories portray now. You know, is that going to affect the fire season? If we look at 2023 we had an El Nino develop through the summer as well, but you know there are some differences, I think. You know, we're not seeing the same type of lead in conditions as we had in 2023 So, got the neutral pattern continuing for now, but it does look like we'll move into an El Nino over the coming few months. We've had a more fluctuating temperatures, maybe more typical for a La Nina type spring. We've had some cold periods and some warm periods, so a lot of flip-flopping and temperatures over the past few weeks. Much deeper snow cover. In 2023 we didn't have that much winter snow, and it disappeared quite early, so left a lot of the country prone to fire quite early in the season, so with the lingering snow cover it's delaying things, and with ground water coming from the snow melt, it's probably keeping a lid on fire activity in a lot of regions as well. Also, may help green up a little bit more quickly with a good water supply and warm temperatures from time to time, and of course, around that decline in sunspot activity that we looked at a few slides back as well, so definitely a different set of conditions heading into 2026 just showing a kind of a typical La Nina spring pattern that we see here, and sometimes they can drive large fires, but I think it's been wetter this fast winter and spring than during a lot of these La Nina events, but on the left hand slide, where we've got that red arrow and dash line, where you tend to see a what we call an upper ridge, so it's like a high pressure system, five or six kilometers up above the earth. This particular case, it's really kind of a long, thin type feature, so not quite as prominent as we quite often see. But what really drives fires is what we see on the right, an arctic surface high pressure cell that usually sinks down to the south or southeast, through the prairies, maybe into central Canada, that brings really dry air, might not be particularly warm, just depending on the time of year. So you get further into the spring, it becomes warmer, but what can really drive the fire is the tight pressure gradient, where you see those black lines or isobars, usually around the western side of that, as we get Pacific Air trying to make its way back in, and the Arctic air sinking to the south, so you're going to get those really strong south to southeasterly winds. I've seen that type events in 2011 with Slate Lake Fire, and some of the other years I think with a La Nina type spring pattern, but in this particular example it's from early April, april 6, and the South had snow over a lot of the landscape, so nothing really became of that, even though we did get a pretty stiff southeast wind at the time, the history of fire problems with the El Nino Southern Oscillation, so yeah, the blue ones are La Nina years of Chisholm in 2001 Slave Lake 2011 Over the past few years, we've had really long standing episodes of La Nina. We just had that brief

interruption in 2023 2024 when we we moved into the the red numbers, or El Nino, so one thing that we have seen over some of these long La Nina episodes, and I guess this chart doesn't really go back far enough to show the previous one, but following strong El Nino in 1998 we had an extended La Nina period through 2001 and then extreme drought across lost a lot of western Canada following that. Chisholm fire kind of originated through that dry period with a La Nina spring just emerging from it had some fairly big fire problems following that through the next few years. Yeah, all the red numbers, as I mentioned, are El Nino type springs or summers, and neutral conditions can actually favor bigger fire years in British Columbia, and some of those are highlighted with the orange boxes through there. I guess you know, if we compare 2023 again, the latest number here, you know, we're still just on that borderline and negative point five there for March, so still sitting on that border between a La Nina and neutral conditions, so maybe a bit of a slower return into that neutral and El Nino this year. Some of the other neutral, it's so analogs here, it's quite a variety, so 2012 orange arrow kind of a moderate area burned fairly a large area burned, where we've got the black arrows, so 2013 and 14, 2017 and 2024 then a super quiet here in 2020 so as usual with a kind of a neutral El Nino Southern Oscillation spring can probably get quite a variety of weather conditions, and might lead into minimal far problems or fairly active seasons. So, just in keeping with the very variable weather patterns associated with that. All right, let's start looking out into the summer predictions, so we've got the June temperature forecast from the North American Multimodal Ensemble, or NMME, just at the bottom right here is an international version of that, so International Multimodal Ensemble that comes out of Europe and features a number of European models, the two Canadian models that we use for a seasonal forecast are in the green box, just in the middle row here, so at the Can ESM five and the Gem NEMO, and you know, they unfortunately sometimes they can predict kind of offset trends, so with our ensemble forecast, we do our best to try to balance out the results of that, but for June, we're seeing fairly good indication of warm temperatures across a lot of country, a lot of the country do have some of the models that are favoring a bit of a cool pool through the north central prairies, so the Gem NEMO shows that, and the NCAR model on the bottom row, and NASA models all feature a cool pool somewhere close to that region, not exactly in the same place, but fairly similar, but if you take all of the these models combined from the US and Canada, and put it into the NMME forecast at the top left here. Now we're seeing a still a fairly good indication of a lot of warm temperatures across southern portions of the country, the western parts of the north. Look at the calibrated forecast at the top right here, probably the highest confidence through British Columbia, maybe the southern prairies, and up through parts of the southeastern Northwest Territories. If we look at precipitation, it's a much more difficult thing to forecast, and we can quite often see a lot of variation between models, what we do look for is how much of the landscape is one particular shade. Do we see a lot of green? Green indicates better indication of precipitation, where it's orange and red, better indication of dry areas. So, how much of that do we see across the country from each model? Do they represent the same areas? Sometimes they do, sometimes they don't. You know, quite a disparity

between the precipitation in the central prairies through the NME versus the international one, which tend to tends to feature fairly dry through that same region, so yeah, it's a, it's kind of tough to sort out precipitation, and especially if it's convective. If you have showers or thunder showers, you can get quite a range of values across small areas and get very heavy precipitation in some regions, and nothing, or next to nothing, and others. We are seeing, I think, more green on the forecast this year than we have seen in previous years, so kind of harp on that, I think, stopping into July, very similar picture, lot of warmth thrown across the country, but still some pools of cool air up through the northern regions, and what's interesting, I think, is the NCAR down at the bottom middle there, just showing a huge pool of cool air across the northern prairies and Hudson Bay into northern Quebec. You know, maybe exaggerating that a little bit too much, but Jim NEMO has a bit of a cool signal through that area, and NASA model as well, just a little further south. Precipitation, once again, quite a variety. We see the two Canadian models at one can of CM five features a lot of dry signal across the central and western part of the country, where as the Gem NEMO has a lot of precipitation there, so really tough to sort out the precipitation signals through a lot of these climate models. August, once again, very similar picture to July, just a lot of warmth across firm under the country, but still holding on to those cool pockets through the central part of the country, and it's quite interesting to see that continued throughout the summer months, with precipitation maybe a little less dryness, we don't see quite as much orange or red on these maps, and a little bit more greener white areas. The white areas might indicate kind of a normal precipitation, or maybe there's just not a good enough signal to swing it one way or the other. One thing that's interesting is we've had El Nino summers historically, it can quite often swing precipitation back into kind of a normal regime after extended drought, so the one difference was 2023 where just the opposite happened, but think historically when we have the El Nino developing or extending through the summer, we tend to maybe get more normal precipitation, and I'm thinking that maybe some of these forecasts are actually reflecting that type of signature coming in. So, just a few notes about the CanSIPS model, the Canadian Seasonal to Interannual Prediction System, so that's represented by the two boxes, green boxes on the previous slides are the ESM five and the Gem NEMA models. Recent changes to that featured an ensemble increase from 10 members each to 20 members each. So now there's 40 individual forecasts in that ensemble, all trying to predict the same few things out for the coming months, so these models were developed by the Canadian Center for Climate Modeling and Analysis, or RPN, or Research on Prevision America, which is based in Montreal. There were beneficial versions of the forecast, so I can look at kind of interim steps here as well. The longer term forecasts are produced, I think, twice monthly, and we use the version that's produced at the end of each month, just for, I guess, further information. The NEEMO and the GEM five NEMO is for the European nucleus for European modeling of the ocean. Now, with the new forecast process here that we've developed at for the CWF is these maps look a lot different than we've seen at the past in the past just due to the prediction method, so now we're actually doing our forecast fire weather index on each grid cell, which are one by one degree, so roughly say 70 by 100

kilometers, but getting a little bit finer as you move north as the lines of longitude converge near the pool, so that's why we get this blocky look to the maps here, just because everything is calculated on grid cells. This is just an example from August last year, August 2025 so it's got nothing to do with the current forecast, but we can see that we've got similar themes. The first maps at the left, the forecast of early rating, and the anomaly are the same types of things that we've used in the past, just with a different approach. What we've added is a probability, so maps number three and four, probability are how many of those ensemble members are predicting the same type of outcome, and the extreme days are where we have a fiber index at the 95th percentile or higher, so it's actually based on climatology for the whole season, so you don't normally see too much color in the spring, but that would become more common as you get into mid or late summer. We also produce a forecast for the startup, so with the modeling system now we can predict where the snow is going to disappear from the landscape, or the temperature will meet up startup criteria, so I can actually get a prediction of startup fire weather index calculations as we move through the spring. IRA five, just the European re-analysis model, version five, that we're using for that, and mentioned some of my colleagues down here. Pierce Jane, he's a researcher just down the hallway from me, has developed the theory and method for producing these new forecasts, and to give out thanks and thanks to Rob Jagozinski and Carly Sammit for doing the coding and bringing it into the Canadian Roundland Fire Information System, so actually actually, looking at our forecast now for June and July, June on the left here and July on the right. Interestingly, you know, we're seeing a fairly good indication of maybe less normal fire activity through a lot of the northern prairies and BC, looking like probably a bit more active with the dry weather through a lot of the winter and spring, so far, and that's where we've seen the most fires. We've seen some in Alberta this spring so far, and you might have heard of evacuations around White Court, just in the central part of the Alberta, northwest of Edmonton. Here it's kind of on the edge of the, in the Swan Hills area, and there's a bit of a interface there. The fires did occur in the interface zone, but they haven't been really that big, you know. We've had a lot of really big spring fires historically, but for the most part, these ones in Alberta have been less than 100 hectares, and I've had some recent precipitation in that region. So, I think, think things are calming down a little bit more. Some of the fires in BC have got a little bit larger than that, but still, I don't think we have the stats in here. But just looking at our latest saturation reporter area burned for this time of year is less than 5% of the annual average, so really quiet start to the year now with the June, you know, we're got a lot of fairly red showing up in the eastern Manitoba through Quebec and the Atlantic region, so you know it looks kind of like a scary forecast, but if we look at the bottom map here, the probabilistic values, you know, we're not showing a huge amount of orange on there, so probabilities are fairly moderate that we, we get that type of condition there, there are some orange spots showing up in parts of the region, so maybe a higher certainty in some areas, but maybe not quite as widespread as the severity anomaly map shows. Tends to taper off a little bit as you get into July, and still holding on to that below normal signal through a lot of the northern prairies, so that could be quite different than we've

seen from last year and seem to have been missing the the August forecast, here I am not quite sure why, so that might show up in the the PDF that got sent out with this announcement, so I'll check into that, yeah. I'm just wondering if I had that slide ignored, hidden for some reason, and forgot to unhide it. Anyways, carry on here. This new forecast method, there's probably still going to be some changes made over the coming month here, and when we get the June version out, it might show some differences. We have been using the mean of all those ensemble forecasts to develop a severity rating at each grid cell, and if you do have a lot of outliers in there, might get a few that are showing really high forecasts that tend to skew our product a little bit, so in previous years we have used a median of the forecast, and I'll be heading back into using the median for June, the june 1, or the early June forecast, so we urge you to look at the Canadian Wildland fire information system and just compare any differences as we move through the summer months here. Yes, just at the last bullet there with the median, or hope that we're going to even out the differences between the anomaly forecast and the probability forecasts. We're hoping they come out a little closer to agreeing to each other. Now, just pointing to the new Canadian Wildland Fire Information System website, we're calling it CWFAS 2.0 first major update really since probably the late 1990s or early 2000s So that was released to the public on march 31 this year. The forecast go out for three months on the CWF is website. Our forecast system actually goes out to four months, but we only display a three month forecast. But just on the main page, towards that center part of the page on the left hand side is forecast conditions, and if you go in there, you have to scroll down the page to vote the middle to actually get the seasonal forecast. Just above that is the kind of the short term forecast, where we look out over the next two weeks, but go down below that to the middle of the page, and you'll see the seasonal forecast, and there's a slider that you can move across the top of the map to go from the first to the second to the third month, so a few comments and conclusions seen warmers, some are highlighted in a lot of the country, but still maybe a cool patch laying around in northern and central regions may coincide with where we've had that really heavy snowpack and maybe a lot of lingering water on the landscape, at least through part of the summer. Rainfall is usually the determining factor, and things can change quite rapidly, potentially dry in southern BC, and maybe parts of central Canada, up through northern Manitoba, and into the eastern northwest territories, where we had the lingering drought, is one place to watch for sure, seeing less dry areas in the climate model predictions than in the previous few years, which is a positive sign, but you know it's, it's really something to monitor over the period of weeks. We've had some of those big fires in British Columbia, 2017 and 18, where we had fairly good spring precipitation, and then it just stopped in mid to late May, and they had six weeks of dry weather, and then everything was really prone to lightning strikes, for example. So, do have to watch for emergent conditions like that. Some El Nino developing maybe a tendency to Ridging in the Eastern Pacific, probably keeping British Columbia a bit warmer and drier, and might make it more prone to fire again, as I mentioned before. We get kind of a summer rainfall tamping more towards normal with historical El Nino episodes, except for 2023 with those extreme

Pacific Ocean temperatures across the north, possibly with the El Nino coming, we'll see a lengthening of the potential fire season, just as it might bring a warmer autumn through at least Western Canada, maybe other parts of the country as well, and it would often bring a warmer, drier winter in Western Canada as well. So it's once again, it's something to watch as we head into 2027 Now, something else that may happen, and if you do get a good El Nino, we quite often see a swing in that Pacific occasional oscillation, and in that case, we'll see a tendency for ocean waters to warm along the west coast and maybe cool out through the central Pacific, so we'll see if that happens. If they coincide, then we tend to get the strongest effects of the El Nino with that positive Pacific Decadal Oscillation at the same time. So just a few reminders, in the past our seasonal forecast is really released on the first working day of each month, but with the new process we're actually releasing it on the sixth or the seventh of each month, that's just because the European re-analysis actually takes about a, there's about a week lag in combining all of the conditions for the end of the month, so it takes about a week to get conditions in there to represent that last day of the month, so therefore we release it about a week into the month. Serious fires can occur in any year, and even with small fires, and with the Alberta White Court area fires, we've seen evacuations. People are returning back to their properties now, but get serious fires occurring in any year, and in a normal year, historically, I've seen two and a half to 3 million hectares burned in an average year, so if you get those conditions, there's going to be some big fires somewhere, and really it depends on ignitions. We don't predict where things will ignite. It's really tough to predict lightning activity long term, months in advance, but we can't predict where weather conditions may lead to potential for fire starts, and again, you know, human activity plays a big part in that. So, there are models that people have been working on to predict lightning and human fire starts, but that's not part of this forecast process at the time here, so here it's people just to check data conditions on the provincial, territorial, or the Canadian Wildland fire information websites, and we've got all the logos up from the provinces and territories here, and apologies if any of these are outdated, they do change them from time to time, and don't always keep up to dispute on those changes, but all the provinces and territories should be represented there. Great, so there's my contact information, and I'll turn it back over to our moderator and the audience for any questions or comments?

Glenn McGillivray 00:47:05
Thanks, Richard. That was awesome, as always. We really appreciate it. I was wondering if I could ask you to maybe provide a re-provide a new file with that August map in there. We checked the PDF, it's not in there. So,

Carr, Richard 00:47:17
yeah, all right. Apologies for that.

Glenn McGillivray 00:47:20
No problem. We're going to open up questions, so if you could use the Q and A function at the top of the screen, that would be great. And, as usual, I'll start off here. First off, you start off talking about drought. How do we define a drought? What is the scientific definition of

Carr, Richard 00:47:40
a drought? Really varies on the application, you know, there's quite a few different definitions of drought, and you can break it into a few different categories, you know, there's a meteorological drought, or where an area doesn't receive a normal amount of rainfall for a certain period, if you're looking at growing things, you know, crops or maybe even forest can get a hydro well, you know, there's other types. There's the agricultural drought, I guess, in that case, right, might affect growing capabilities, and and hydrological drought, you know, whether lakes and streams have the necessary water levels in them to qualify as being normal, so there's a lot of different applications of drought, and with the Canadian North American drought monitors, there's a huge number of indicators too that go into those. The dirt code from the Canadian Forest Fire Weather Index System is also something that we've been helping to define droughts, especially in northern areas with agriculture and agri-food Canada, combining all these indicators for the Canadian drought monitor. They don't really have the best information for forested areas, so they lean on us a little bit too, use our drought code compared to the historical normals to help indicate drought through the north. There now we can get drought that really intensifies quickly. You might have heard the term flash drought at some point, and really, you know, it's that's kind of a loose definition again, and really depends on the application. So, usually in forestry, I think if we have a dry period that maybe lasts for four weeks or longer, we've seen that happen quite a bit over the years. We can start to get into some fire problems, so you might term things like that a flash drive. So, yeah, there's a bit of a primer on Dr. It is fairly complicated thing to define, and definitions vary a lot for the people that are using

Glenn McGillivray 00:50:00
it, right, and it's just quite remarkable to me that in 2023 for example, the worst year we've had for area burned was fairly hot and dry across huge portions of the country. This year is a fairly wet over huge portions of the country. A lot of places got above average snowpack, a lot of places got that, and also above average rain, and in the spring period. So, what's driving this macro, these macro changes? Is it the jet stream? Is it.. I mean, I know it's complicated, but you know, we're just seeing these really widespread macro changes in short periods of time.

Carr, Richard 00:50:39
Yeah, there's probably quite a few drivers, and we've got a number of atmosphere ocean oscillations that play a part in that, and you know how they combine can define what a year looks like. Something that I didn't show here, which is a kind of a shorter term driver, is

something that we call the Matt and Jillian oscillation, so that's a tropical feature, it just has an increase in convective activity that loops around the globe, around the equator, usually in a one to two month period. If that is fairly active, we might have a fairly active weather pattern in the mid latitudes in our prior Canada is located, for example, and there's a bit of a lag between the Matt and Julian Oscillation bursts and the weather that we see in Canada, so that's one thing that can influence our kind of week to week weather patterns here, and if that's fairly active. You might see more varied weather if it's very quiet. We might end up in kind of a stagnant weather pattern, and in that case, if we're located under a fairly dry air mass, it might remain there more consistently. So, there's a lot that can go into these things, and these outcomes. I think historically I've had the La Nina complaint combined with a fairly active Man Julian Oscillation over the winter, so might have been driving more stormy activity, I think, through the mid latitudes.

Glenn McGillivray 00:52:22
Yeah, it's very complex, that's for sure. And it kind of brings me to this question, question from an attendee: if similar temperatures existed in 2025 wouldn't this mean that wildfires aren't just a result of only temperatures, but other factors, such as insufficient maintenance of forests, excess, you know, fuel arsons mentioned, but I think, but anyway, I mean, I just, it just goes to show how many factors we have to add in to consider, you know, what a forest fire scene is going to, how it's going to unfold.

Carr, Richard 00:52:54
Yeah, it's a, it's kind of an interesting question. Our forests are so vast in Canada, and a lot of the forest lies a great distance away from, you know, any type of, I guess, human habitation. There are some settlements here and there, but we do have huge tracts of forests that are basically in their natural state, and if you go into some of the northern parts of the provinces that are fairly remote are up into the territories. Fires are quite often left to burn naturally, unless they actually threaten the community, and then suppression may be applied to them. So, in those really remote areas, you know, there's.. we can't really say that we've done a bad job of managing the forest just because they're not managed there. We just leave that up to nature, and you probably get these cycles where they burn a lot, and other cycles where they tend to recover with maybe cooler, Wetter conditions. The question of arson is interesting too, that there are some arson fires cross country, but area burned for an arson-caused fire tends to be very small, at least the proven ones, anyways. And it's probably a fine line between carelessness and arson. I mean, how do you, how do you really define whether it's it's one act or another, a lot of the human-caused fires that are fairly big, or probably caused by just careless carelessness, people not really paying attention to what the weather conditions are like, or whether there's fire advisories or bands in place, for example, just random acts of carelessness, or even things that maybe they're not aware of, like operating some type of a

motor vehicle, and dry grass, for example, can ignite the vegetation, so you might not just think of the possible consequences. Yeah, so it's another kind of complex question.

Glenn McGillivray 00:55:03
Yeah, I mean, it's never any.. it's never one thing. It's always, you know, fire is a pretty complicated thing, and it's always numerous things. I, you know, personally, I don't get too concerned about ignition sources, because they're ubiquitous, they're everywhere. And I remember one case of in British Columbia, and during the bad fire season in 2017 or something like that, where a rancher was fixing a fence and threw the hammer, and the hammer hit the nail, and threw a spark, and and caused a wildfire. It's really remarkable what what can start a fire, and I don't get too, too, too concerned about ignition sources, because quite often we can't do a lot about some of them anyway,

Carr, Richard 00:55:42
but

Glenn McGillivray 00:55:43
yeah, you mentioned the chunkiness of the forecast maps that you were, you were showing, and I was just wondering, is has or is there any consideration to using AI, particularly things like Python. Python, apparently, is very good at interpolation and kind of smoothing maps that have rough and coarse resolutions. Is there any have Have you been using AI? Looking into AI, is there any consideration for that going off into the future?

Carr, Richard 00:56:10
So we got some projects that are using AI, so we're starting to experiment with it. I don't think we've discussed it with the seasonal forecast yet. In our previous years, we did use an interpolation method to produce a smoother looking map, and instead of running off grid cells, we're just running off a few 100 specific locations across the country. I think there's two or 300 weather station sites that we base those often interpolated the maps from that, but you know, we've, we have a process for identifying, I guess, bugs or, you know, features that we want to see in our new product products, so you know it's something that we can throw at the team and see if there'd be any consideration for going back to an interpolated product in the future,

Glenn McGillivray 00:57:03
so yeah, I mean, we hear mostly about about this on the flood side, not so much on the wildfire side, but it would really be interesting to see what the future of fire modeling and forecast modeling would be using something like a Python or something like that, and of course, you have to train it, you have to teach it, and that makes it a little bit challenging as well, but just be interesting to see where it all goes. I know there's a lot of discussion about AI and weather

forecasting, and apparently it's improving day-to-day forecasting quite a bit, but it's still no good at forecasting extremes, for example. So early days for it all, but really, really fascinating. I think

Carr, Richard 00:57:45
certainly

Glenn McGillivray 00:57:47
I've read in the past, or in the past, that fire seasons are starting about a week early for every 10 years in the Western US. What are we seeing in Canada in terms of early starts, late runs to fire season? Are there any macro trends? Are we seeing, are we seeing definite expansion of the fire season in Canada?

Carr, Richard 00:58:09
I think it's fair to say that we have it's about 10 years ago that Alberta decided to move the start of their official wildfire season to the beginning of March instead of the beginning of April, so I think that's based on seeing a number of seasons with earlier starts to the fire activity, and we've certainly seen a lot of activity carry on later into the autumn as well, and that's been pretty common over the past 10 years, I think we're actually seeing more fires that the big fires, especially in Waggi areas, that will continue to smolder over the winter, and then spring up again the following year, and we've probably got a 2015 or 20 of those on our map right now that are what we call holdover fires, you know, some people might call them zombie fires, but we tend to use the term hold over over winter fires, just quite a number of those, so fairly dry weather for a long period of time, especially in those boggy, deep organic layers, and those fires can't smolder in that deep peat layer, or maybe in roots or other things that are underneath the surface and spring up again the next year, so those are becoming more, more commonplace as well, and there has been some discussion to, you know, whether the fire decision should be just termed a year-round type event and not confined to particular months, so you know it's the ideas in the air.

Glenn McGillivray 00:59:45
Well, I think I think that's exactly what British Columbia has done with 12 month preparedness now, and you know we're seeing it in California and places like that. Yeah, I mean from a risk management perspective, it's probably the prudent thing to do, rather than so-called chasing fires, understanding that the risk can always be there and almost being ready for it, and even when your people are not actually fighting fires, they could be doing other things as well, but trying to ramp up for a may 1 and ramp down, I think those days are slowly or quickly coming to an end, and we're understanding that we need preparedness and resources available all the time. I think,

Carr, Richard 01:00:27
yes, that's true. One of the challenges in that regard has been getting crews ready for the fire season, and a lot of the crews have been composed of university students, for example, which have a limited length of time that they can spend there, but there has been talk, of course, of having maybe a national team of national suppression crew available upon call, so you know these things are in the works. Things, things are changing slowly. Nick will continue to see changes as time goes on.

Glenn McGillivray 01:01:07
Yeah, and I think that you have both the length of the fire season being concerned, the severity of fire ramping up, but also part and parcel of that is the fires aren't settling down through the overnight as they used to, and so putting a great deal of pressure on human resource, resource assets, air crew, and that sort of thing. Alberta, I think, is only the second place in the world that began fighting fires through the night. Cal Fire was the first, I think, and I think BC or Alberta was the second, and now I think BC is playing with it now as well, so really, really changing, but putting massive pressure on resources. I think

Carr, Richard 01:01:50
quite true. Yeah, we've seen a number of those fires that remain active, quite active through the overnight period, which is something you might not have seen historically.

Glenn McGillivray 01:02:01
Yeah,

Carr, Richard 01:02:02
there's a, you know, some some outfits are developing methods to combat. There's nighttime fires, you know, maybe with drones and things like that. So,

Glenn McGillivray 01:02:16
yeah, night vision. Yeah, it's, it's amazing how quickly things have changed. I'm going to be wrapping up very shortly. We don't have any other questions in the Q and A, I don't believe, but I was just wondering if you can give a kind of a brief overview. You touched on a little bit, but some of the tools available in the online tools available from the Forest Service that might be of interest to the people on the call

Carr, Richard 01:02:43
certainly the basis for all this, of course, is the Canadian forest fire weather and behavior prediction system. So we've got the newer interactive map can feature all of those as overlays now, and in the past we only had the fire danger fire weather index, but now we can on the interactive map again loaded up, you know, things like our fine fuel moisture code, which is the

moisture in the top layer of the forest floor or other fine fuels, grasses or needles and things, so gives an indication where fire could be ignited most readily, and look at a drought code with fire behavior prediction system, it adds in things like topographic factors and types of trees or elevation and slope to give a better indication of fire behavior in different landscapes, so those are all available as overlays now do have a, you know, a number of fire growth models as well, which I think they can be displayed as well. There's probably a number of other products too that I just can't recall off the top of my head, but for anybody that's familiar with the things like the OG OGC standards, you know, the web map coverage, or things like that, different data sharing methods, you can get a list of capabilities, and there's quite a huge number of layers that's available through the those types of data exchanges, so yeah, huge, huge number of others available. We also have things behind the scenes, and you know there's any interest in some of these other things, it's probably best just to contact us and see if we have such a thing available. There are some things that are maybe a bit more sensitive to that we don't really display, and are things like evacuations, and it's really been a challenge, I think, to keep good evacuation data available that can be sensitive to the provinces and territories or communities, and might not want it released to the public until you know the events have terminated, for example. So, yeah, lot of lot of things out there, a lot of things that we have, and I think, anyway, we have had presentations earlier in this year about all the capabilities on the CW FIS, so you know if you're interested in the future, maybe we can do that type of presentation for your group as well.

Glenn McGillivray 01:05:35
Yeah, I think that'd be a great consideration. Thank you. Remind people to use the Q and a at the top for your questions, we don't have that, the mics open, we have a question here. Does forest condition, that's in quotes, get factored into wildfire risk model models at all? For example, if a forest has a high percentage of especially flammable species, the risk of fire is greater there. So, yeah, so does forest condition or forest condition, but also type, type of fuel, I guess. Yeah, I think it's very, it's very important for fire models. But do you have a comment on that, Richard?

Carr, Richard 01:06:13
Yes, that's what our fire behavior prediction system does. So, the FBP system, in historically, we've had 17 or 18 different types of fuel classifications, so that's everything from standing or matted grass through the in the broad leaf trees to the different types of conifers. Now, recently we've had a number of our fire danger group working on a new system as well, which actually allows more of a physical description of fuel types, and be hard to apply that across the whole country, but for localized type studies, or maybe fire growth modeling, some of these more physically based descriptions would be useful as well, and that would include things like crown closure, you know, how much of that sky is covered over by the tree tops, or then the distance from the on the ground up to the lower branches around the base height, or

some of the underlying fuel types in there as well, you know, bushes and shrubs, so yeah, new system has a much greater capability, but certainly the fuel types are factored into the fire behavior prediction system themes and into the fire growth models. One of the challenges, I think, is just to keep up with changes in the forest, so where we do have big fires, of course, that can be incorporated into the fuel models, but there's other things like harvesting or clearing for industrial applications and things like that that might be a little bit harder to keep up to dispute with,

Glenn McGillivray 01:07:53
right. Another question here is, this data used at all to assess potential resource requirements from a BPC perspective. We are seeing stronger calls for more active forest management around communities, either aligning with fire smart initiatives or local forest companies. The start appears quite macro, but are you seeing any changes in and around communities that are taking strides?

Carr, Richard 01:08:19
Yeah, so maybe a question that's interesting, but I don't think I can really answer it. I, you know, we produce a number of products, and there's probably lots of uptake on quite a few of these products, but you know, it'd be a question I think that would be better answered by some of the practitioners out there, provinces, territories, maybe different communities, or forest industry, there's quite a variety, and it's probably, probably quite a variety of how things are used, even within one agency or company. So, sorry, I can't really give you a better answer than that at the moment, here.

Glenn McGillivray 01:09:04
Okay, yeah, we're getting questions are popping up. Does, okay, hang on for a sec. Sorry,

Carr, Richard 01:09:17
certainly.

Glenn McGillivray 01:09:19
When you say wildfires start about a week earlier, every 10 years. Is that based on a fixed rate of change, like temperature increasing by the same amount each year? Or does that, or does the model update over time as conditions change? Yeah, I mean, I would say it's not linear. It's definitely not a linear thing, where each year getting temperatures increasing. We know that's not the case. It's a bunch of the other factors that we've talked about. It's never one thing I think is kind of a fair thing to say, but any comment on that?

Carr, Richard 01:09:52
Yeah, I don't know of the origin of the, you know, the one week earlier for every 10 years. It's

not something that I mentioned in my presentation, but there might be something that some rat or researcher is captured out there, but I think the, you know, the fire seasons are pretty noisy, so as I say, it might not be a linear increase, really. It's, yeah, it's kind of hard to tell, and I don't really know the answer to that.

Glenn McGillivray 01:10:24
Yeah, absolutely. You brought up CWFIS version two and resources. Any additional info available on the state and timing of the GeoServer layer migration? The Grass curing layer changed this week, which broke a few integrations.

Carr, Richard 01:10:46
Okay, well, there's all the ongoing changes within the system, and we've got a whole team of IT developers that are handling that part of it, you know, how layers are formulated and displayed and made available. Yeah, I think can't recall if there should be something on the CWFIS that would allow you to pose a question there if you have any concerns about layers that are changing or maybe not available. There are a lot of ongoing changes, so to post any questions there, if possible. Okay, a lot of that is kind of beyond the scope of my knowledge, you know. Just because we've got an IT team that's that's working on it, they're probably dealing with a lot of changes, and maybe a lot of questions, and trying to sort out some details for various things, so it is a team effort that I'm just on the periphery of.

Glenn McGillivray 01:11:56
We're getting some pretty technical questions here, which is good, but these are going to be completely on your issue, because I haven't included one of the interesting observations I had is that the spatial resolution for the global simulation models like CanSem is one degree, which is very coarse, and within a one degree grid cell there can be a lot of train variation. Has Natural Resources Canada considered using regional climate model ensembles like any cortex, which provides finer grain resolutions, like point five degrees. Wondering if finer climate model resolutions would improve wildfire modeling.

Carr, Richard 01:12:31
Yes, well, certainly with our short to medium term forecast, so you know when we're looking at a number of days to two weeks, those use a fairly fine scale model when we're looking at forecast months in advance, though the models tend to be fairly coarse resolution, and they're fairly computer intensive at the time, so you know, I think making those finer scale would take quite an increase in required computer resources, as well. I'm not sure if any of the finer scaled ones would go out three or four months in advance. We do have some of the Environment Climate Change Canada models that do produce a five week forecast now, so it's always possible in the future that maybe we can build that in for the first month's forecast, but not for the second month or beyond.

Glenn McGillivray 01:13:32
Hopefully that answers the question. This may have been covered, and I didn't understand. Not going to lie, this is not my forte, but the extra moisture that we got this year. I'm from Alberta. How should this extra ground moisture help with fires in Longland, or doesn't even matter, as the, as this can be a bigger issue with embers flying, and that's not so much a ground issue. So, ground moisture, yeah. How important is ground moisture?

Carr, Richard 01:14:00
Yep, yeah, it's on the hind the short term, it can be quite important, since if you have a good ground moisture, you might get fires going, but they wouldn't burn as deeply as they would in really dry ground, so fires might not be quite as intense. You can still get a good surface fire that rips across the landscape quite rapidly, but they might not burn as intensely and deeply, so maybe not generate quite as much smoke, maybe not last quite as long. So there could be changes, but of course that diagram moisture can disappear after a few weeks as well. So you know it's always critical to pay attention to the changing weather conditions and what's happening on the ground or below

Glenn McGillivray 01:14:47
it, right? I mean, the same process that takes water out of bodies of water, turns it into vapor, it's the same process that pulls the water out of the ground, right? So part of the part of the water cycle, and yeah, are there any proactive attempts from government to reduce wildfire severity? So, I mean, you know, we're getting into fuels management here. I know Mike Flanagan is very big on the pushing this, the notion that this is a damn stinking damn big country that we have on our hands, and any idea, any notion that we're going to be able to manage our forest to the extent where we can reduce fire intensity is to some extent a pipe pipe dream, but this work would be done on the provincial level, federal government's responsible for Parks Canada and all that sort of thing, but any commentary on the fuels management question.

Carr, Richard 01:15:44
Yeah, I think you know it's probably more of a local effort than a cross-Canadian effort, for sure. Yeah, you know, we've got hundreds of millions of hectares of forest out there, so it's a huge amount of landscape to try to manage, and it's mentioned before in the presentation, maybe during the question and answers, can't remember exactly when, but these remote areas are, you know, sometimes hundreds of kilometers away from major settlements and things like that, so you know it's probably pointless to try to manage forest out there, there's just too much, and it's, it's too far away to get people into equipment into, unless it's really necessary. If a community or industrial site is threatened, for example, then there's suppression done. But, yeah, tough to, tough to manage all the forest on in such a large country, I think, in so many

remote areas, so, yeah, I think it's more of a local thing around towns, other communities, and industrial sites, and things like that. Maybe, yeah, there's some recreational properties as well, you know, things like fishing lodges, and things like that around lakes that tend to be protected, protected as well,

Glenn McGillivray 01:17:07
right? Are some of these forecasts validated against real fires, or compared against fire models like Burn P?

Carr, Richard 01:17:17
Yeah, the burn p is kind of a long term analysis, you know what, what areas are more likely to burn based on 1000s of simulations of fire in that particular landscape. So I'm sure that there are people within our CFS research community here that maybe comparing burn p results with some of the fires that we've seen, but yeah, I don't have information on if they're doing that or what they may have found.

Glenn McGillivray 01:17:57
Does burn p factor in climate change, or can you factor it in with

Carr, Richard 01:18:05
it, I don't know if that's been addressed yet, you know what it does is it uses a number of weather streams just based on the climatology for a certain region, so maybe you know within that climatology, you might, as time goes on, you might have an emerging climate warning, warming trend that's actually built into that climatology, but I don't think it's looking out into future scenarios where you've got, you know, double your carbon dioxide content, for example, 50 years from now, or anything, so yeah, just don't think it's reached that level of complexity,

Glenn McGillivray 01:18:49
right? I think we're going to call it a day in terms of questions. I thank you very much. There's just a couple of things I wanted to mention here. First off, recently ICLR has rolled out a Google Maps-based GIS natural hazard portal. There's a fair bit of fire data in there, but there's a data on a bunch of other hazards as well. So, if you're interested, it's free. You do have to register, and I do have to approve your registration, but if you go to Cat view.ca I'll approve your registration, and you can check it out, and it's a, it's an evergreen resource where you upload data all the time, new data all the time, and we've got a lot of quake in there, and in some fire, some wind, some hail, landslide, a bunch of other things as well. So, check that out if you're interested. And also, earlier this week, ICLAR has launched, rolled out our new website, so iclr.org Check that out if you can. Finally, keep your eyes open for the flyer for the next Friday forum. It will take place on Friday, may 29 Emilia Cameron from ICLR will be talking about basement flood incentive programs and all the work that we're doing in the area to understand

basement flood programs. Why take up is poor, how they can be improved, how we can plug them into the clean process, and all that sort of thing. We will have the replay of today's session up on our YouTube channel by early next week. We'll have the slides on our website by early next week. Want to thank everybody for tuning in today. Really appreciate it again. Thanks so much, Richard. We'll see you again next year, for year eight or nine, or whatever year it is. We'll keep our fingers crossed on fire season this year, remembering all it takes is one big interface fire to change things. Thanks everybody, and we'll see you next time.

Carr, Richard 01:20:44
Great, thanks everybody for attending, and thanks very much, Glenn, for moderating the session today. Bye.