

Reducing risks for people and houses

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Presenter: Justin Leonard



Chair

Tonight, our presenter is Justin Leonard who will give us some pointers on reducing risks for houses and that will be followed by a discussion and question and answer session. Justin will then deliver his second presentation about reducing risks for people followed by a discussion and question and answer session.

Many of you will be familiar with the wealth of bushfire knowledge that Justin Leonard brings to these webinars as a result of more than two decades of research with the CSIRO. We're going to begin with Justin's presentation on reducing risks to houses. Thanks Justin.

Justin: Thanks very much Malcolm.

Tonight we're going to present in a slightly different format. I'm going to talk to you and not present a series of slides like I have previously. We're going to cover the topics of weather and house survival and refer back to a lot of the resources that we've previously covered in previous webinars.

Most recently you would have heard a lot of discussion about what weather we're in for in the coming fire season. We've been lucky enough to have had three consecutive years of La Nina which means wetter and cooler summers and winters. And they've certainly helped to moderate or buffer the season's outlook as we've gone through them, and we haven't had any particularly bad fire events, particularly down here in Victoria over those times.

That's a combination of luck and the priming effect La Nina gives us with these wetter cooler conditions. But unfortunately, that prospect is now diminishing with a fairly high likelihood that we're going to pivot to an El Nino event which means drier and hotter conditions for the coming fire season. You might also hear of other things in the news called an Indian Ocean Dipole (IOD) which is another large climactic indicator that also relates to ocean temperatures and the way they drive our climate trends. The Indian Ocean Dipole is also going positive. And unfortunately the combination of El Nino and a positive IOD means that it's even hotter and drier than just having an El Nino event on its own.

Unfortunately, we will see progressive drying as we move through spring and into summer and that's going to mean that different parts of the landscape dry out sooner and become fire prone at different rates. Obviously some areas, some soil types, and some vegetation types will dry sooner than others, so you really need to watch carefully how this unfolds for your local circumstance. Also what's interesting with this El Nino is a global effect and while we've been enjoying cool dry weather in Australia our North American and South American colleagues have been suffering really bad hot dry summer fire weather seasons and that's actually how it falls. While we're enjoying cooler wetter climates America has dealt with the exact opposite and that's why you'd notice quite a lot of severe weather conditions on that side of the world.

I guess what's important about El Nino is it's a primer, it gives us dry conditions but it doesn't actually mean that we've got a higher or lower chance of getting a really nasty fire weather event within that season. It just means that the circumstances around it are primed to make those shorter term severe weather events more nasty, and prime and drive a fire harder through the landscape. What is influencing the likelihood that we have these short extreme events occurring in a summer is climate change. Over the last three years and many preceding years before that, our weather systems are getting warmer because of increased CO² concentrations in our atmosphere.

What that means is while we've been enjoying the last three years of relatively reduced fire weather due to La Nina. Unfortunately the climate has been warming but it hasn't been as obvious to us because we haven't had that direct feedback of those hotter drier conditions. However as we continue to have a warmer and warmer climate we're going, unfortunately, to face a higher and ever increasing likelihood of severe events within the fire season. All indicators are that we could see some significant loss events in this coming summer. As we move forward if we see multiple El Nino summers we are going to see the landscape dry out even more and more through consecutive summers as well.

I guess the sting in the tail of La Nina that you would have heard quite prolifically in the news is that things grow really well in a La Nina season so we're actually also coming into this summer with a lot of fuel load that will eventually dry out and can support significant fire spread through the landscape. And those grassy fuels will be present and quite continuous through the landscape. We're seeing this warming trend over the last number of years. The unfortunate scenario is that our global climate trend is going to continue to warm for many decades to come, even if we aggressively start to try and curb our global emissions. That's because there's a lot of momentum in the system. What we've already putting into the atmosphere this year will continue to support warming and increase over the next few decades.

We're unfortunately going to face significant increases in fire weather severity due to global warming for a number of decades to come. Our best case scenario is that we will start to significantly reduce carbon emissions and that means after two or three decades we'll see some moderation and hopefully decline in the fire weather severity. But if we continue on the path we're currently going we'll actually see ongoing increases for two, three, four, five, six decades right through to the end of the century and beyond if we don't mitigate. Mitigation is pretty much essential but it isn't going to be a panacea at least in the short term future.

Along with this warming climate where we're constantly being presented with new and unexpected observations in what it's bringing to our fire weather seasons. If we look back to the 2019/2020 fire season we saw, particularly in New South Wales and down into some parts of Victoria, a very different type of fire season. A fire season that didn't have many periods within it where it was cool enough and wet enough for the fires to either go out themselves or for fire agencies to be able to effectively blackout those fires. It meant that fires that started in the beginning of our fire season persisted throughout an entire fire season. And that meant that we had extensive spread and coverage of fires because every time the wind did pick up the fires would push and spread from the existing footprint that it had already covered. So rather than worrying about fires igniting or being lit within the fire season there was always places that the fires would grow from when the weather picked up.

Now, that's a really scary prospect and something we haven't really seen previously. It's something that's got a lot of people in the fire hazard and risk space really concerned about these new and emerging paradigms we haven't been aware of up until we've actually observed them. That particular fire season, luckily, didn't have any really catastrophic fire weather days within that entire season. There were certainly a couple of days when they forecasted catastrophic weather

conditions, but those conditions luckily didn't actually eventuate. But if they did then we would face a really serious run of fires because there were so many places the fires would immediately begin and grow from. In a way it was a really bad summer but in a way it could have been far far worse. Some sobering thoughts about what we may be up for in the coming decades.

I'll pivot from fire weather across to the specific attack mechanisms around structures. As I've covered quite extensively in previous webinars the really dominant attack mechanisms that you see when we're looking at fire danger ratings up to the level of Extreme are embers, radiation, flame, and surface fire, and of course all the secondary things that are ignited and burn due to that ember, radiation and flame attack. As we move into a fire danger rating of Catastrophic we have to seriously consider the implications of damaging winds which are synonymous with moving up into the highest fire danger rating and the wind-borne debris carried by those winds.

Winds can act directly on structures and actually weaken them, we're talking about lifting roof tiles or dislodging sheets of steel or facade coverings, it can actually open up or weaken structures, it can even break windows. We have to think about adequacy for those things.

What's interesting is our building standards don't actually attempt to address the implications of that type of damage. In fact our building standards only target, or attempt to be effective, for fire danger ratings up to the top of Extreme. So you definitely get into an 'all bets are off' scenario once you get into catastrophic fire weather conditions. And if it's not already part of anyone's bushfire plan it certainly should be. I'd strongly emphasize the idea that not being in a bushfire prone area with your house on days that get to catastrophic if not a lower level is a very sound and robust approach to managing your life safety.

And while we're on the topic of regulation and what they do and don't cover it's probably important to highlight that these building standards like AS3959 are really minimum compliance building standards. And they actually seek to increase the likelihood that your house survives but they certainly aren't seeking to ensure your house will survive. And if we're looking at say what level of success the building standards are actually aiming to achieve they're actually aiming for a survival rate of at least 80%. So, 80% survival rate in a fire. Noting that houses that aren't built to regulation are typically experiencing a survival rate of around 60%. It's actually only a fairly modest improvement in the survival prospects of your house, that may be a surprise to some. I'd probably say that it would be probably not necessarily be meeting quite a lot of homeowners' expectations or the expectations of the neighbours to those houses that are built relatively close.

That helps to emphasize the idea that maybe the regulations aren't necessarily the best guide for trying to achieve a highly reliable and robust house design. I'd certainly point people more to the emerging bushfire best practice guides that provide a more comprehensive guide to house and landscaping design. Why building standards on their own and the way they overlook things like wind damage and wind loads and all those secondary ignition processes help explain why they're only really achieving an 80% survival rate rather than a much higher level.

I'd also point you back to say our webinar series in 2021 that gives you a detailed profile of what to go through and understand in and around your property for its design. And that helps guide you through those processes of looking in the broader landscape, then the immediate landscape around your structure, and then the actual structure and structure design itself. The key takeaway here is creating a culture of preparedness for your household. Making sure each and every one of your initiatives around trying to improve your home, the housekeeping efforts around your home, in the immediate landscaping, the way you consider upgrading your gardens and your garden layouts can all help to dramatically improve your house survival. And in doing so can also be very clever ways to improve the prospects that you can survive either in that house or survive even in the

event that your house actually ignites by providing the effective ways to leave your house and find other places of secondary shelter around your property.

Malcolm

Do you want to say something about your background which is pretty dramatic?

Justin

That's one of my favourite backgrounds I stole from a newspaper article which was a house burning down in one of the floods we've experienced through our La Nina year period. And it's actually quite common for houses to burn down in floods due to leaking gas that's been damaged in structurally damaged houses and even power shorts and things that cause things to burn down.